42-04

Halifax County Public Utilities Department
Cell 2 – Coal Ash Monofill
Construction Record
Documentation Report

Carmen Johnson

Fac/Perm/Co ID #	Date	Doc ID#
42-04	3/21/12	DIN

APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 5/15/00 BY SLC

2000

HAZ
Environm

HAZEN AND SAWYER
Environmental Engineers & Scientists

Hazen and Sawyer, P.C.
4011 WestChase Blvd.
Raleigh, NC 27607
919 833-7152
Fax: 919 833-1828

RECEIVED
2000
DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

April 14, 2000

RECEIVED
APR 24 2000
DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

Mr. Jim Barber, Eastern Area Engineer
Solid Waste Section
North Carolina Department of Environment and Natural Resources
225 Green Street, Suite 601
Fayetteville, NC 28301-1791

RECEIVED
APR 24 2000
DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

Re: Construction Record Documentation
Halifax County Coal Ash Monofill
Cell 2 Lateral Expansion
H & S No. 3786-004

Dear Mr. Barber:

Enclosed are three copies of the Construction Record Documentation Report for the Halifax County Coal Ash Monofill Cell 2 Lateral Expansion. The information provided in this Report includes all documentation related to the construction of a new 9 acre disposal cell (No. 2) at the facility. Construction of Cell 2 was substantially completed in June of 1999. However, excessive winds associated with Tropical Storm Dennis damaged the HDPE geomembrane apron covering the Cell 1/Cell 2 Intermediate Berm before Construction Record Documentation was submitted for the new cell. The apron wind damage and remedial actions were detailed in a letter prepared by Hazen and Sawyer and submitted to the Solid Waste Section on September 8, 1999. A discussion of the apron damage and repair has been included in the attached Report.

Hazen and Sawyer was responsible for design, Construction Management and Construction Quality Assurance (CQA) of the Cell 2 Lateral Expansion. Our representatives reviewed and approved contractor submittals, monitored construction, and conducted the testing outlined in the attached report. Record Drawings are provided as an attachment to the report.

In accordance with approvals granted by NCDENR on May 17, 1996 and July 31, 1998, and the Permit to Construct issued on May 12, 1993, the liner system for Cell 2 was constructed using a 40-mil Unreinforced Polypropylene (UPP) Geomembrane placed in direct contact with compacted on-site subgrade soils. Cell 2 construction was completed by Barnhill Contracting Company of Tarboro, North Carolina, under contract to Halifax County.

The following construction elements are addressed in the attached report:

Doc ID#
Fac/Perm/Co ID #
Date
DIN
Carmen Johnson
3/21/12
42-04 60

Introduction	**Section 1**
Earthwork	**Section 2**
Geomembrane	**Section 3**
Internal Stormwater Collection System	**Section 4**
Access Ramp and Tipping Area	**Section 5**
Groundwater Monitoring Well Abandonment & Installation	**Section 6**

Three copies of the **Record Drawings** (11 sheets) are also provided separately.

On the basis of our observations and testing, and the documentation provided herein, Hazen and Sawyer, P.C., certifies that, to the best of our knowledge and belief, construction of Cell 2 was completed in general accordance with the approved Application for Permit to Construct and the Construction Plans and Specifications. Any known additions, deletions, and modifications are noted in the attached Construction Record Documentation Report.

The attached report is provided for review and approval of the Solid Waste Section as part of the requirements to obtain a Permit to Operate for the facility. If you or your staff have any questions or require additional information, please contact us. We will gladly meet with you or your staff to address any questions or comments.

NORTH CAROLINA PROFESSIONAL SEAL 023570 ENGINEER ROBERT C. BAKER 4/14/00

Very Truly Yours,

HAZEN AND SAWYER, P.C.

Robert C. Baker, P.E.
Principal Engineer

NORTH CAROLINA PROFESSIONAL SEAL 19391 ENGINEER JOHN A. BOVE 4/14/00

John A. Bove, P.E.
Associate

Attachments: Construction Record Documentation Report and Record Drawings
cc: Frank Ralph, Director
Halifax County Public Utilities Department (w/Attachments)
James C. Coffey, Supervisor
NCDENR Permitting Branch (w/o Attachments)

Table of Contents

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

1.1 Project Description 1
1.2 Scope of Services 2
1.2.1 Project Criteria 3
1.3 Project Schedule 3

2.0 EARTHWORK 5

2.1 Cell Excavation 5
2.2 Compacted Embankment/Compacted Coal Ash 6
2.3 Erosion and Sedimentation Control 8
2.4 Access Road 8

3.0 GEOMEMBRANE 9

3.1 Overview 9
3.2 Contractor Submittals 9
3.3 Geomembrane Inventory and Conformance Testing 10
3.4 Geomembrane Subgrade and Panel Deployment 12
3.5 Geomembrane Seaming 13
3.5.1 Trial Seams 14
3.5.2 Production Seaming 14
3.5.3 Nondestructive Seam Testing 15
3.5.4 Destructive Seam Testing 15
3.6 Cell 2 Sump Tie-In 16
3.7 Cell1/Cell 2 Intermediate Berm Rub Sheet and Apron 17
3.7.1 Apron Repair 18
3.8 Subgrade Repair 19

4.0 INTERNAL STORMWATER COLLECTION SYSTEM 21

4.1 Overview 21
4.2 Toe Drain 21
4.2.1 Cell 2 21
4.2.2 Cell 1 22

4.3 Sump/Riser 22
4.3.1 Cell 2 22
4.3.2 Cell 1 23
4.4 Discharge Piping 23

5.0 ACCESS RAMP AND TIPPING AREA 25

6.0 GROUNDWATER MONITORING WELL ABANDONMENT AND INSTALLATION 27

6.1 Groundwater Monitoring Well and Piezometer Abandonment 27
6.2 Groundwater Monitoring Well Installation 28

7.0 RECORD DRAWINGS 29

LIST OF APPENDICES

SECTION 2 EARTHWORK

2.1 CME ASSOCIATES FIELD DENSITY TEST RESULTS
2.2 FIELD DENSITY TEST LOCATION DRAWING
2.3 LABORATORY TEST DATA
2.4 ACCESS ROAD PERIMETER BERM COAL ASH CROSS-SECTIONS
2.5 CONTRACTOR AS-BUILT SURVEY

SECTION 3 GEOMEMBRANE

3.1 SERROT CORP. MATERIAL DATA SHEETS
3.2 SERROT CORP. AND GSE GEOMEMBRANE QUALITY CONTROL CERTIFICATES
3.3 CONFORMANCE TEST RESULTS
3.4 SERROT CORPORATION CONFORMANCE TESTING LETTERS
3.5 GEOMEMBRANE INVENTORY FORMS
3.6 SUBGRADE APPROVAL FORMS
3.7 PANEL DEPLOYMENT FORMS
3.8 TRIAL SEAM FORMS
3.9 SEAM INSPECTION FORMS
3.10 DESTRUCTIVE SEAM TESTING RESULTS
3.11 MID-AMERICA LINING GEOMEMBRANE PANEL DIAGRAM

SECTION 4 INTERNAL STORMWATER COLLECTION SYSTEM

4.1 HDPE RISER AND FIBERGLASS GRATING SUBMITTALS
4.2 AGGREGATE SUBMITTALS

SECTION 6 GROUNDWATER MONITORING WELL DECOMMISSIONING AND INSTALLATION

6.1 GRAHAM & CURRIE WELL ABANDONMENT RECORDS
6.2 ECOSCIENCE CORPORATION WELL COMPLETION AND WELL ABANDONMENT RECORDS AND REPORT

SECTION 7 RECORD DRAWINGS

Section 1

SECTION 1
INTRODUCTION

1.0 INTRODUCTION

1.1 Project Description

This report provides Record Documentation for construction of Cell 2 of the Halifax County Coal Ash Monofill. This facility is part of the existing County Solid Waste Management Facility located near Aurelian Springs in Halifax County, North Carolina. The Coal Ash Monofill is operated by the Halifax County Public Utilities Department. The landfilled coal ash originates at the Westmoreland Energy coal-fired power plant located in Weldon, North Carolina. The residue from this plant is the only material placed in this facility.

Cell 2 was originally approved for construction by the North Carolina Department of Environment and Natural Resources (NCDENR) Solid Waste Section on May 17, 1996, and the project went out to bid shortly thereafter. However, before construction of the cell commenced, Westmoreland Energy determined that there was no immediate need for additional disposal capacity at the facility. Construction of Cell 2 was subsequently delayed until July, 1998, during which time new Regulatory requirements for the facility were published. In response to these revisions, Hazen and Sawyer submitted a Compliance Demonstration to the Solid Waste Section for review in December, 1997. The Solid Waste Section approved the Compliance Demonstration on July 31, 1998. Construction of Cell 2 was subsequently approved and was completed in accordance with the conditions of the Permit to Construct originally issued for the facility on May 12, 1993.

Cell 2 of the Coal Ash Monofill has a disposal area approximately 9 acres in size. It is located in the northeast portion of the County landfill property and is adjacent to existing Coal Ash Cell 1, as shown on Figure 1.1. Cell 1 was constructed in 1993, is approximately 12 acres in size, and began to receive ash in May, 1994. Cells 1 and 2 represent the first two phases in a planned four phase, 36 acre Coal Ash Monofill. The design life for Cell 2 is approximately five years. The actual cell life will depend on the quantity of coal ash diverted for beneficial reuse projects. Westmoreland Energy is actively pursuing such projects.

The Coal Ash Monofill liner system consists of a Geomembrane installed over prepared on-site subgrade soils. The 1997 Compliance Demonstration showed that the synthetic liner system exceeds the regulatory performance standard. An access ramp and initial tipping

area were constructed atop the Geomembrane using coal ash. An internal stormwater runoff collection system was installed along the Cell 2 (South) Intermediate Berm. The collection system conducts surface water runoff that contacts coal ash to the existing internal stormwater basin via a sump and gravity discharge line. In addition to the new collection system for Cell 2, the existing runoff collection system in Cell 1 was upgraded as part of this project. The replacement system was installed along the Cell 1/Cell 2 (North) Intermediate Berm.

As part of the construction of Cell 2, the facility's groundwater detection monitoring system was modified. These modifications included abandoning two existing groundwater detection monitoring wells and four piezometers, and the installation of one new groundwater detection monitoring well.

Complete descriptions of the construction of each main element of Cell 2 are provided in subsequent sections. Record Drawings are provided in Section 7 of this report.

1.2 Scope of Services

Hazen and Sawyer, P.C. was retained by Halifax County to provide Construction Management (CM) and Construction Quality Assurance (CQA) services during construction. Hazen and Sawyer also designed the facility. Barnhill Contracting Co. was awarded the construction project and was responsible for Construction Quality Control (CQC).

Hazen and Sawyer provided a Resident Engineer during critical portions of construction. The engineering staff reviewed all contractor submittals for materials and equipment to assure compliance with the project specifications. Hazen and Sawyer contracted with CME Associates, Inc. to provide inspection and testing services for earthwork operations. Resident Engineer and CME Associates, Inc. daily field reports were prepared during the construction of Cell 2, and have been retained in Hazen and Sawyer's project files for reference.

1.2.1 Project Criteria

The goal of the CQA effort is to ensure that construction is completed in accordance with the permitted project plans and specifications as well as the criteria outlined in the facility design and construction permit. The following documents were incorporated into the project construction and CQA:

- Contract Documents - "Halifax County Public Utilities Department Cell 2 Ash Monofill, Contract 1", prepared by Hazen and Sawyer, July, 1998 (Contract Plans and Specifications)

- Construction Permit - "Amendment to Solid Waste Permit No. 42-04" dated May 12, 1993, prepared by NCDENR

- Construction Permit Application - Prepared by Hazen and Sawyer dated April 27, 1992, including:
  - Design Drawings
  - Specifications
  - Construction Quality Assurance (CQA) Plan
  - Operations Manual

1.3 Project Schedule

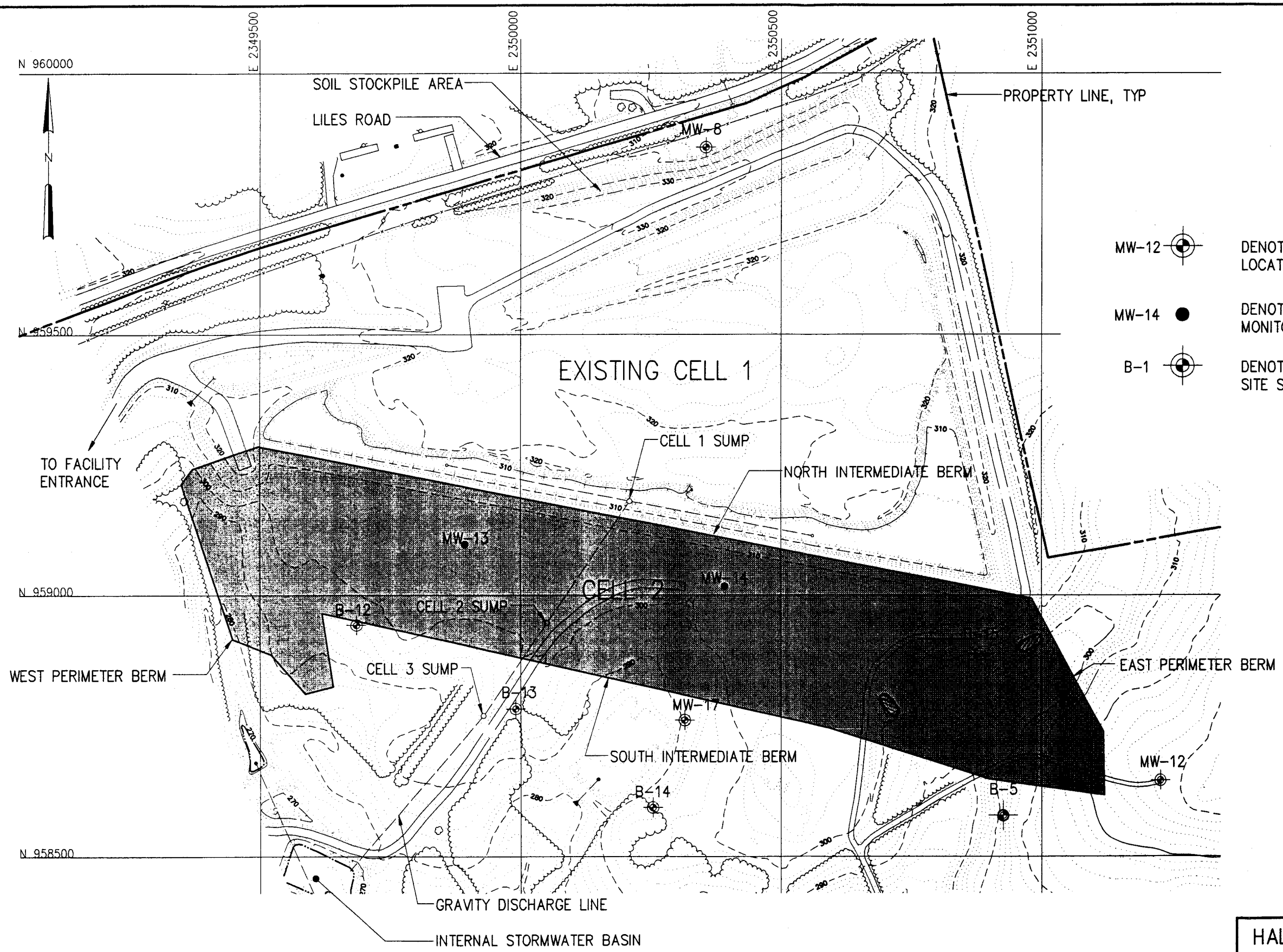
The construction contract was awarded to Barnhill Contracting Company of Tarboro, NC on September 8, 1998. Notice to Proceed was issued on October 12, 1998. Groundwater monitoring well and piezometer abandonment, as well as clearing, grubbing and construction of erosion control structures was initiated on October 13, 1998.

Cell excavation and construction of perimeter and intermediate berms commenced soon after clearing and grubbing was completed. However, all earthwork operations were suspended on December 9, 1998, and did not resume until March 31, 1999 due to unfavorable weather conditions. Geomembrane subgrade preparation was completed on April 23, 1999, and the Geomembrane was installed between April 26 and May 17, 1999. Cell 2 construction was essentially completed on May 28, 1999. A summary of project milestones is presented on Table 1.1.

TABLE 1.1 HALIFAX COUNTY COAL ASH MONOFILL CELL 2 CONSTRUCTION MILESTONES

Project Bid	August 21, 1998
Project Award	September 8, 1998
Notice to Proceed	October 12, 1998
Groundwater Monitoring Well and Piezometer Abandonment	October 13-14, 1998 and January 7, 1999
Clearing	October 19-23, 1998
Erosion & Sedimentation Control	October 22-27, 1998
Cell Excavation	October 28-December 9, 1998 March 31-April 23, 1999
Perimeter and Intermediate Berms	October 28-December 9, 1998 March 31-April 23, 1999
Groundwater Monitoring Well Installation	January 7, 1999
Piping and Sumps	May 4-13, 1999
Geomembrane Placement	April 26-May 17, 1999
Access Road	May 6, 1999
Access Ramp and Tipping Area	May 19-24, 1999
Seeding	June 15, 1999
Closeout	June 15, 1999

FIGURE 1.1



LEGEND

MW-12	DENOTES PERMANENT MONITORING WELL LOCATION AND IDENTIFYING NUMBER
MW-14	DENOTES ABANDONED TEMPORARY DOWNSTREAM MONITORING WELL AND IDENTIFYING NUMBER
B-1	DENOTES TEMPORARY PIEZOMETER INSTALLED DURING SITE SUITABILITY STUDY, 2/91.

PLAN

1"=200'-0"

HALIFAX COUNTY COAL ASH MONOFILL
HALIFAX COUNTY, NORTH CAROLINA

CELL 1 / CELL 2
SITE PLAN

HAZEN AND SAWYER

9 3:20pm FILE=3786-001.dwg by PWSELISKER XREF=H:\3786AB\BASE\CBL, H:\3786AB\BASE\SP-XB,

Section 2

SECTION 2
EARTHWORK

2.0 EARTHWORK

For this project, earthwork included cut and fill operations, fine grading, testing and monitoring related to soil excavation and placement of Compacted Embankment and Compacted Coal Ash. A brief discussion of Erosion and Sedimentation Control structures is also included in this section.

2.1 Cell Excavation

As the first step in excavation, the Contractor established a grid layout based on the construction baseline provided on the Contract Drawings. The layout grid was established and maintained by the Contractor by survey methods during all earthwork operations. Excavation for Cell 2 commenced in the western half of the cell footprint.

During excavation, the condition of the design subgrade was visually evaluated by either a Hazen and Sawyer or CME Associates representative. Any topsoil, organic materials, debris, or otherwise unsuitable materials that were encountered were removed and not used for cell construction. Any such materials encountered at proposed subgrade elevations were removed and replaced with Compacted Embankment (refer to Section 2.2). The soils encountered during excavation consisted mainly of cohesive sandy to clayey silts. A few rock "floaters" were encountered during excavation of the eastern half of the cell, and were removed with earth moving equipment. The on-site soils were otherwise generally free of large rock fragments or cobbles. No groundwater was encountered during the excavation of Cell 2.

Excavated soil was used directly for berm construction, or placed in the on-site stockpile located to the north of existing Cell 1. Excavation of Cell 2 was completed using scrapers and bulldozers. Fine grading was accomplished using a motor grader. In areas where the design subgrade was in cut, the subgrade was left 3 inches above design elevations in order to protect the subgrade from erosion or excessive moisture. Excess material was removed immediately before Geomembrane installation.

2.2 Compacted Embankment/Compacted Coal Ash

The controlled compacted structural fill used for construction of Perimeter and Intermediate Berms and the Geomembrane subgrade is referred to as Compacted Embankment. The Compacted Embankment consisted of on-site cohesive soils free from topsoil, debris, and other unsuitable materials. Compacted Embankment consisted solely of soils excavated for Cell 2 construction.

The compaction criteria for Compacted Embankment for this project were as follows:

- Density: Minimum 95% Standard Dry Density (ASTM D698);
- Moisture Content: Minimum 1% below to 3% above Optimum Moisture Content (ASTM D 698) for upper 1 ft of Geomembrane subgrade only; and
- Lift Thickness: 12-inches maximum (loose measure).

Prior to placement of Compacted Embankment over excavated areas, the exposed subgrade was proofrolled using loaded scrapers. No evidence of unsuitable subgrade (e.g., pumping, etc) was observed in the Cell 2 area.

In addition to Compacted Embankment, Compacted Coal Ash was also used to construct the Access Road (West) Perimeter Berm. The Coal Ash formed the "core" of the berm and was covered by a minimum of 2 feet of Compacted Embankment on all sides, except for the interior berm slope, which was covered by 3 feet of soil in accordance with the Permit Drawings. The design cross-section for the West Perimeter Berm is shown as Section B, Drawing G4 of the attached Record Drawings. As-built cross-sections for the Coal Ash core of the West Perimeter Berm were surveyed by the Contractor and are attached as Appendix 2.4. The Coal Ash used in the West Perimeter Berm was obtained from Westmoreland Energy's Weldon plant and is the same material currently disposed of in Cell 1. The compaction criteria for Compacted Coal Ash were the same as those for Compacted Embankment for this project.

A total of approximately 2,900 cubic yards of coal ash was placed within the West Perimeter Berm in accordance with Beneficial Reuse Regulations (NCAC 13B.1700). Ash used in berm construction was placed in accordance with groundwater setback and cover requirements.

Construction of the West Perimeter Berm began on October 28, 1998. Representatives of CME Associates, Inc., the soils testing firm under contract to Hazen and Sawyer, monitored soil and coal ash fill placement on a full-time basis. CME's technicians visually classified the soils and monitored loose lift thickness during placement. Any areas where lift thickness was excessive were graded out or removed by the Contractor prior to compaction. The lifts were placed evenly, essentially parallel to the subgrade surface. Soil was placed by scrapers and leveled using bulldozers. Coal ash was end dumped by tri-axle hauling trucks and then spread and leveled using bulldozers. Each lift of Compacted Embankment or Compacted Coal Ash was compacted using a Caterpillar CP-563C vibrating sheepsfoot roller. Any areas that exhibited evidence of excessive moisture or other damage were repaired as necessary by the Contractor.

In order to confirm that the Compacted Embankment and Compacted Coal Ash met compaction criteria, CME Associates, Inc., conducted a total of 121 in-place density tests. The location of each test conducted was plotted on a testing grid and the results recorded. If the results of any in-place density test indicated a non-conforming area, the Contractor employed the required remedial measures. A summary of Compacted Embankment and Compacted Coal Ash in-place density tests conducted by CME Associates, Inc., is presented in Appendix 2.1. The testing grid is presented on "Cell 2 - Density Test Locations", Drawing CQA-1, attached as Appendix 2.2. Moisture/Density test data used to evaluate Compacted Embankment and Compacted Coal Ash are provided in Appendix 2.3

Upon completion of earthwork operations, the Contractor retained Joyner-Keeny and Associates, Rocky Mount, North Carolina, to record As-Built grades. The Contractor's As-Built Drawing depicting Geomembrane subgrade elevations is provided in Appendix 2.5. [redacted]

2.3 Erosion and Sedimentation Control

Erosion and Sedimentation Control measures were constructed in accordance with the North Carolina Sedimentation Control Act (15 NCAC, Chapter 4) and the approved Erosion and Sedimentation Control Permit. Existing Sedimentation Basins Nos. 1, 2, and 3 were cleaned out and refurbished prior to the start of earthwork activities. Additional temporary erosion control structures, such as silt fence and temporary sediment traps, were constructed as required. The Contractor was responsible for maintenance of these structures throughout the construction period.

2.4 Access Road

Construction of the 25-foot wide access road atop the West Perimeter Berm was completed on May 6, 1999. The road was an extension of the existing access road located atop the Cell 1 Perimeter Berm. Once proper lines and grades were obtained atop the Cell 2 West Perimeter Berm, a Separator Geotextile was installed and a 1-foot lift (final thickness) of aggregate base course (ABC) was placed. The Separator Geotextile was pretensioned by construction traffic, ABC was then end dumped along the leading edge of the roadway, and subsequently spread and leveled using a bulldozer.

APPENDIX 2.1
CME ASSOCIATES
FIELD DENSITY TEST RESULTS

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF COMPACTED EMBANKMENT/FLYASH DENSITY TESTS

CLIENT: HALIFAX COUNTY PUBLIC UTILITIES DEPARTMENT
BY: JTC DATE: 7/20/99 REV.: RCB DATE: 11/12/99 H & S PROJ. NO.: 3786-004

TEST DATE	TEST NO.	MOISTURE (%)	OPTIMUM MOISTURE (%)	DRY DENSITY (PCF)	MAX. DRY DENSITY (PCF)	FIELD COMPACT. (%)	SPECIFIED COMPACT. (%)	LOCATION (Grid #)	ELEVATION (Lift #)	PASS/FAIL	COMMENTS
10/30/98	1	16.8	17.8	100.1	104.3	96.0	95.0	11	1	PASS	
10/30/98	2	17.0	17.8	99.5	104.3	95.4	95.0	10	1	PASS	
10/30/98	3	16.9	17.8	99.7	104.3	95.6	95.0	10	2	PASS	
10/30/98	4	17.7	17.8	99.6	104.3	95.5	95.0	10	2	PASS	
10/30/98	5	18.2	17.8	101.2	104.3	97.0	95.0	20	1	PASS	
10/30/98	6	18.4	17.8	101.4	104.3	97.2	95.0	21	1	PASS	
11/2/98	7	20.1	17.8	100.6	104.3	96.5	95.0	23	1	PASS	
11/2/98	8	20.7	17.8	100.2	104.3	96.1	95.0	23	1	PASS	
11/9/98	9	25.0	21.9	98.0	99.0	99.0	95.0	23	1	PASS	
11/9/98	10	24.7	23.5	94.7	97.0	97.6	95.0	23	2	PASS	
11/9/98	11	24.5	23.5	95.5	97.0	98.5	95.0	22	2	PASS	
11/9/98	12	24.2	23.5	96.1	97.0	99.1	95.0	21	3	PASS	
11/9/98	13	24.9	23.5	96.4	97.0	99.4	95.0	23	3	PASS	
11/9/98	14	24.2	23.5	97.3	97.0	100+	95.0	23	3	PASS	
11/9/98	15	22.6	23.5	98.2	97.0	100+	95.0	22	4	PASS	
11/10/98	16	21.7	21.9	98.1	99.0	99.1	95.0	23	4	PASS	
11/10/98	17	22.4	21.9	98.2	99.0	99.2	95.0	22	5	PASS	
11/10/98	18	38.1	39.0	75.9	70.0	100+	95.0	10	Flyash 1	PASS	
11/10/98	19	22.6	21.9	97.7	99.0	98.7	95.0	23	5	PASS	
11/10/98	20	22.2	21.9	98.2	99.0	99.2	95.0	21	6	PASS	
11/23/98	21	19.9	20.1	99.7	101.9	97.8	95.0	20	1	PASS	
11/23/98	22	20.2	20.1	99.1	101.9	97.3	95.0	11	4	PASS	
11/23/98	23	19.6	20.1	98.9	101.9	97.1	95.0	10	4	PASS	
11/23/98	24	19.9	20.1	101.3	101.9	99.4	95.0	20	2	PASS	
11/23/98	25	20.5	20.1	99.1	101.9	97.3	95.0	21	3	PASS	
11/23/98	26	21.7	20.1	99.1	101.9	97.3	95.0	22	3	PASS	
11/24/98	27	19.8	20.1	98.7	101.9	96.9	95.0	23	4	PASS	
11/24/98	28	21.3	20.1	101.2	101.9	99.3	95.0	22	4	PASS	
11/24/98	29	20.8	20.1	100.3	101.9	98.4	95.0	20	2	PASS	
11/24/98	30	22.0	20.1	101.4	101.9	99.5	95.0	20	3	PASS	
11/24/98	31	20.5	20.1	99.3	101.9	97.4	95.0	10	4	PASS	
11/24/98	32	19.6	20.1	99.8	101.9	97.9	95.0	10	4	PASS	
11/24/98	33	21.9	20.1	99.3	101.9	97.4	95.0	21	5	PASS	

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF COMPACTED EMBANKMENT/FLYASH DENSITY TESTS

CLIENT: HALIFAX COUNTY PUBLIC UTILITIES DEPARTMENT
BY: JTC DATE: 7/20/99 REV.: RCB DATE: 11/12/99 H & S PROJ. NO.: 3786-004

TEST DATE	TEST NO.	MOISTURE (%)	OPTIMUM MOISTURE (%)	DRY DENSITY (PCF)	MAX. DRY DENSITY (PCF)	FIELD COMPACT. (%)	SPECIFIED COMPACT. (%)	LOCATION (Grid #)	ELEVATION (Lift #)	PASS/FAIL	COMMENTS
11/24/98	34	20.6	20.1	99.9	101.9	98.0	95.0	20	5	PASS	
11/24/98	35	23.4	20.1	99.8	101.9	97.9	95.0	19	5	PASS	
11/25/98	36	37.1	39.7	67.8	67.4	100+	95.0	10	Flyash 4	PASS	
11/25/98	37	22.6	21.4	98.9	102.1	96.9	95.0	10	5	PASS	
11/25/98	38	21.3	21.4	100.4	102.1	98.3	95.0	23	4	PASS	
11/25/98	39	19.4	21.4	100.3	102.1	98.2	95.0	10	5	PASS	
11/25/98	40	20.7	21.4	100.0	102.1	97.9	95.0	20	5	PASS	
11/25/98	41	21.8	21.4	99.7	102.1	97.6	95.0	21	6	PASS	
11/30/98	42	21.2	21.4	100.2	102.1	98.1	95.0	23	4	PASS	
11/30/98	43	20.6	21.4	100.9	102.1	98.8	95.0	22	4	PASS	
11/30/98	44	21.7	21.4	99.3	102.1	97.3	95.0	20	5	PASS	
11/30/98	45	22.2	21.4	100.1	102.1	98.0	95.0	11	5	PASS	
11/30/98	46	21.7	21.4	99.8	102.1	97.7	95.0	10	6	PASS	
11/30/98	47	21.3	21.4	99.8	102.1	97.7	95.0	1	6	PASS	
11/30/98	48	20.9	21.4	100.3	102.1	98.2	95.0	36	1	PASS	
12/1/98	49	21.8	21.4	99.9	102.1	97.8	95.0	1	7	PASS	
12/1/98	50	21.2	21.4	99.1	102.1	97.1	95.0	10	7	PASS	
12/1/98	51	21.4	21.4	101.0	102.1	98.9	95.0	20	6	PASS	
12/1/98	52	20.7	21.4	101.6	102.1	99.5	95.0	22	8	PASS	
12/1/98	53	20.2	21.4	101.8	102.1	99.7	95.0	23	7	PASS	
12/2/98	54	22.9	21.4	100.2	102.1	98.1	95.0	24	7	PASS	
12/2/98	55	22.2	21.4	100.7	102.1	98.6	95.0	27	2	PASS	
12/2/98	56	22.5	21.4	100.3	102.1	98.2	95.0	27	2	PASS	
12/2/98	57	21.3	21.4	100.0	102.1	97.9	95.0	27	3	PASS	
12/2/98	58	21.6	21.4	98.0	102.1	96.0	95.0	36	3	PASS	
12/3/98	59	22.7	20.6	101.0	105.5	95.7	95.0	26	3	PASS	
12/3/98	60	22.1	20.6	100.9	105.5	95.6	95.0	36	3	PASS	
12/3/98	61	19.5	20.6	104.0	105.5	98.6	95.0	26	4	PASS	
12/3/98	62	20.3	20.6	102.9	105.5	97.5	95.0	27	4	PASS	
12/3/98	63	37.7	39.7	70.1	62.4	100+	95.0	10	Flyash 5	PASS	
12/4/98	64	20.8	21.8	99.8	101.4	98.4	95.0	27	4	PASS	
12/4/98	65	37.2	39.7	68.6	67.5	100+	95.0	10	Flyash Final	PASS	

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF COMPACTED EMBANKMENT/FLYASH DENSITY TESTS

CLIENT: HALIFAX COUNTY PUBLIC UTILITIES DEPARTMENT
BY: JTC DATE: 7/20/99 REV.: RCB DATE: 11/12/99 H & S PROJ. NO.: 3786-004

TEST DATE	TEST NO.	MOISTURE (%)	OPTIMUM MOISTURE (%)	DRY DENSITY (PCF)	MAX. DRY DENSITY (PCF)	FIELD COMPACT. (%)	SPECIFIED COMPACT. (%)	LOCATION (Grid #)	ELEVATION (Lift #)	PASS/FAIL	COMMENTS
12/4/98	66	21.9	21.8	99.2	101.4	97.8	95.0	27	8	PASS	
12/7/98	67	16.0	21.8	107.4	101.4	100+	95.0	24	Final	PASS	
12/7/98	68	18.2	21.8	101.4	101.4	100.0	95.0	35	5	PASS	
12/7/98	69	21.1	21.8	106.5	101.4	99.1	95.0	35	6	PASS	
12/7/98	70	19.4	21.8	100.8	101.4	99.4	95.0	27	7	PASS	
12/7/98	71	19.8	21.8	101.8	101.4	100+	95.0	27	3	PASS	
12/7/98	72	20.6	21.8	101.6	101.4	100+	95.0	26	4	PASS	
12/8/98	73	19.5	21.8	100.6	101.4	99.2	95.0	27	5	PASS	
12/8/98	74	20.6	21.8	101.1	101.4	99.7	95.0	27	6	PASS	
12/8/98	75	20.7	21.8	101.1	101.4	99.7	95.0	27	7	PASS	
3/31/99	76	25.8	21.9	90.0	99.0	90.9	95.0	24	6	FAIL	See 80 & 81 for Retest
3/31/99	77	25.1	21.9	93.8	99.0	94.7	95.0	36	6	FAIL	See 80 & 81 for Retest
4/1/99	78	27.8	21.9	90.5	99.0	91.4	95.0	27	6	FAIL	See 82 & 84 for Retest
4/1/99	79	28.3	21.9	88.2	99.0	89.1	95.0	27	6	FAIL	See 82 & 84 for Retest
4/1/99	80	28.1	21.9	88.8	99.0	89.7	95.0	35	6	FAIL	See 83 for Retest
4/1/99	81	25.3	21.9	94.9	99.0	95.9	95.0	35	6	PASS	
4/5/99	82	23.9	21.9	94.3	99.0	95.3	95.0	27	6	PASS	
4/5/99	83	23.5	21.9	94.6	99.0	95.6	95.0	35	6	PASS	
4/5/99	84	22.0	21.9	96.2	99.0	97.2	95.0	27	7	PASS	
4/5/99	85	22.0	21.9	96.4	99.0	97.4	95.0	35	7	PASS	
4/5/99	86	22.3	21.9	96.8	99.0	97.8	95.0	36	8	PASS	
4/5/99	87	22.1	21.9	96.8	99.0	97.8	95.0	36	8	PASS	
4/6/99	88	22.3	21.9	97.7	99.0	98.7	95.0	35	9	PASS	
4/6/99	89	21.7	21.9	97.9	99.0	98.9	95.0	35	9	PASS	
4/6/99	90	24.0	21.9	97.3	99.0	98.3	95.0	36	9	PASS	
4/6/99	91	22.6	21.9	98.1	99.0	99.1	95.0	27	9	PASS	
4/6/99	92	21.7	21.9	98.3	99.0	99.3	95.0	27	10	PASS	
4/6/99	93	22.2	21.9	97.4	99.0	98.4	95.0	35	10	PASS	
4/6/99	94	22.4	21.9	97.3	99.0	98.3	95.0	36	10	PASS	
4/6/99	95	21.6	21.9	98.1	99.0	99.1	95.0	26	11	PASS	
4/6/99	96	22.2	21.9	97.5	99.0	98.5	95.0	34	11	PASS	
4/6/99	97	22.5	21.9	97.2	99.0	98.2	95.0	27	11	PASS	

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF COMPACTED EMBANKMENT/FLYASH DENSITY TESTS

CLIENT: HALIFAX COUNTY PUBLIC UTILITIES DEPARTMENT
BY: JTC DATE: 7/20/99 REV.: RCB DATE: 11/12/99 H & S PROJ. NO.: 3786-004

TEST DATE	TEST NO.	MOISTURE (%)	OPTIMUM MOISTURE (%)	DRY DENSITY (PCF)	MAX. DRY DENSITY (PCF)	FIELD COMPACT. (%)	SPECIFIED COMPACT. (%)	LOCATION (Grid #)	ELEVATION (Lift #)	PASS/FAIL	COMMENTS
4/7/99	98	24.2	21.9	96.4	99.0	97.4	95.0	25	3	PASS	
4/7/99	99	24.0	21.9	96.8	99.0	97.8	95.0	35	3	PASS	
4/7/99	100	23.9	21.9	96.8	99.0	97.8	95.0	35	12	PASS	
4/7/99	101	24.8	21.9	95.9	99.0	96.9	95.0	26	12	PASS	
4/7/99	102	23.7	21.9	96.3	99.0	97.3	95.0	26	12	PASS	
4/7/99	103	23.4	21.9	96.7	99.0	97.7	95.0	27	12	PASS	
4/7/99	104	23.7	21.9	96.5	99.0	97.5	95.0	27	13	PASS	
4/7/99	105	23.6	21.9	96.6	99.0	97.6	95.0	35	13	PASS	
4/8/99	106	23.4	21.9	96.6	99.0	97.6	95.0	35	14	PASS	
4/8/99	107	23.4	21.9	96.9	99.0	97.9	95.0	36	14	PASS	
4/8/99	108	23.9	21.9	96.2	99.0	97.2	95.0	27	14	PASS	
4/8/99	109	24.5	21.9	95.8	99.0	96.8	95.0	36	15	PASS	
4/8/99	110	24.1	21.9	96.3	99.0	97.3	95.0	27	15	PASS	
4/9/99	111	23.1	21.9	96.5	99.0	97.5	95.0	36	16	PASS	
4/9/99	112	24.4	21.9	95.3	99.0	96.3	95.0	26	16	PASS	
4/9/99	113	22.8	21.9	96.7	99.0	97.7	95.0	35	16	PASS	
4/9/99	114	23.1	21.9	96.0	99.0	97.0	95.0	35	16	PASS	
4/9/99	115	23.9	21.9	95.7	99.0	96.7	95.0	27	16	PASS	
4/9/99	116	23.6	21.9	95.8	99.0	96.8	95.0	36	16	PASS	
4/19/99	119	20.3	21.9	97.4	99.0	98.4	95.0	10	Final	PASS	
4/19/99	120	22.0	21.9	95.7	99.0	96.7	95.0	20	Final	PASS	
4/19/99	121	22.0	21.9	96.2	99.0	97.2	95.0	22	Final	PASS	
4/19/99	122	22.0	21.9	96.7	99.0	97.7	95.0	25	Final	PASS	
4/19/99	123	22.6	21.9	95.8	99.0	96.8	95.0	35	Final	PASS	

NOTES:

1. Test Nos. 117 and 118 were performed for Moisture Content determination only and are not listed.

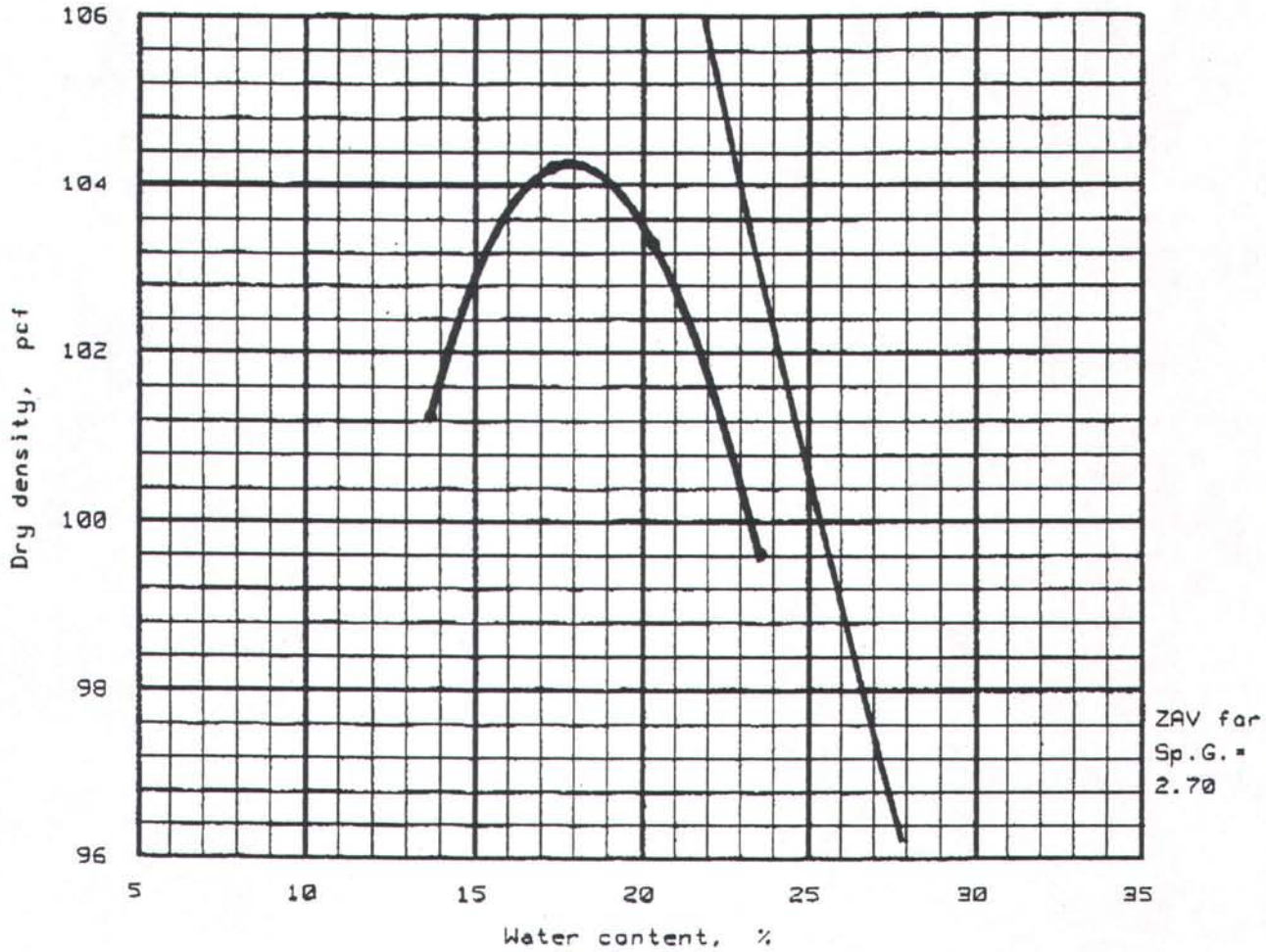
2. Density testing performed by CME Associates, Inc.

APPENDIX 2.2
FIELD DENSITY TEST LOCATION DRAWING

"Under Seperate Cover"

APPENDIX 2.3
LABORATORY TEST DATA

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	MH		18.1 %		51	19	0.3 %	57.6 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.3 pcf Optimum moisture = 17.8 %	Orange fine sandy clayey SILT

Project No.: 8600S-01-1198
Project: Halifax County Landfill
Location: Roanoke Rapids, NC

Date: 11-05-1998

Remarks:
Proctor #1
On-Site Borrow

MOISTURE-DENSITY RELATIONSHIP TEST

CME ASSOCIATES, INC.

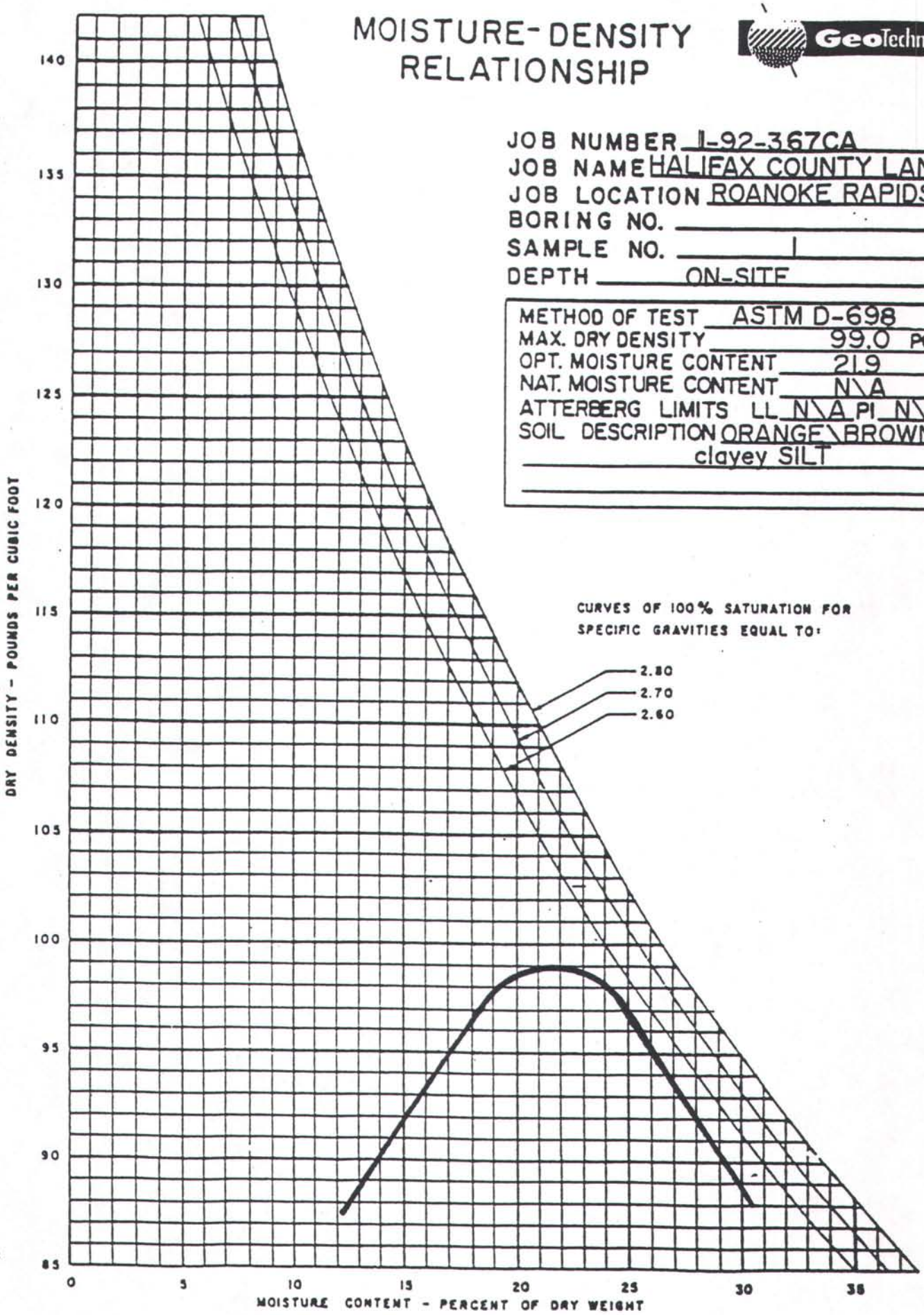
Fig. No. 1

MOISTURE-DENSITY RELATIONSHIP

GeoTechnologies, Inc.

JOB NUMBER I-92-367CA
JOB NAME HALIFAX COUNTY LANDFILL
JOB LOCATION ROANOKE RAPIDS, N.C.
BORING NO. _____
SAMPLE NO. I
DEPTH ON-SITE

METHOD OF TEST ASTM D-698
MAX. DRY DENSITY 99.0 PCF
OPT. MOISTURE CONTENT 21.9 %
NAT. MOISTURE CONTENT N\A %
ATTERBERG LIMITS LL N\A PI N\A
SOIL DESCRIPTION ORANGE\BROWN clayey SILT



169A

GeoTechnologies Inc

Job No: 1-95-0075-CA Date: 2/24/95

Job Name: Westmoreland Energy

Job Location: Raleigh, North Carolina

Boring No:

Sample No: 1.0

Depth:

TEST RESULTS

Method of Test: ASTM D 698

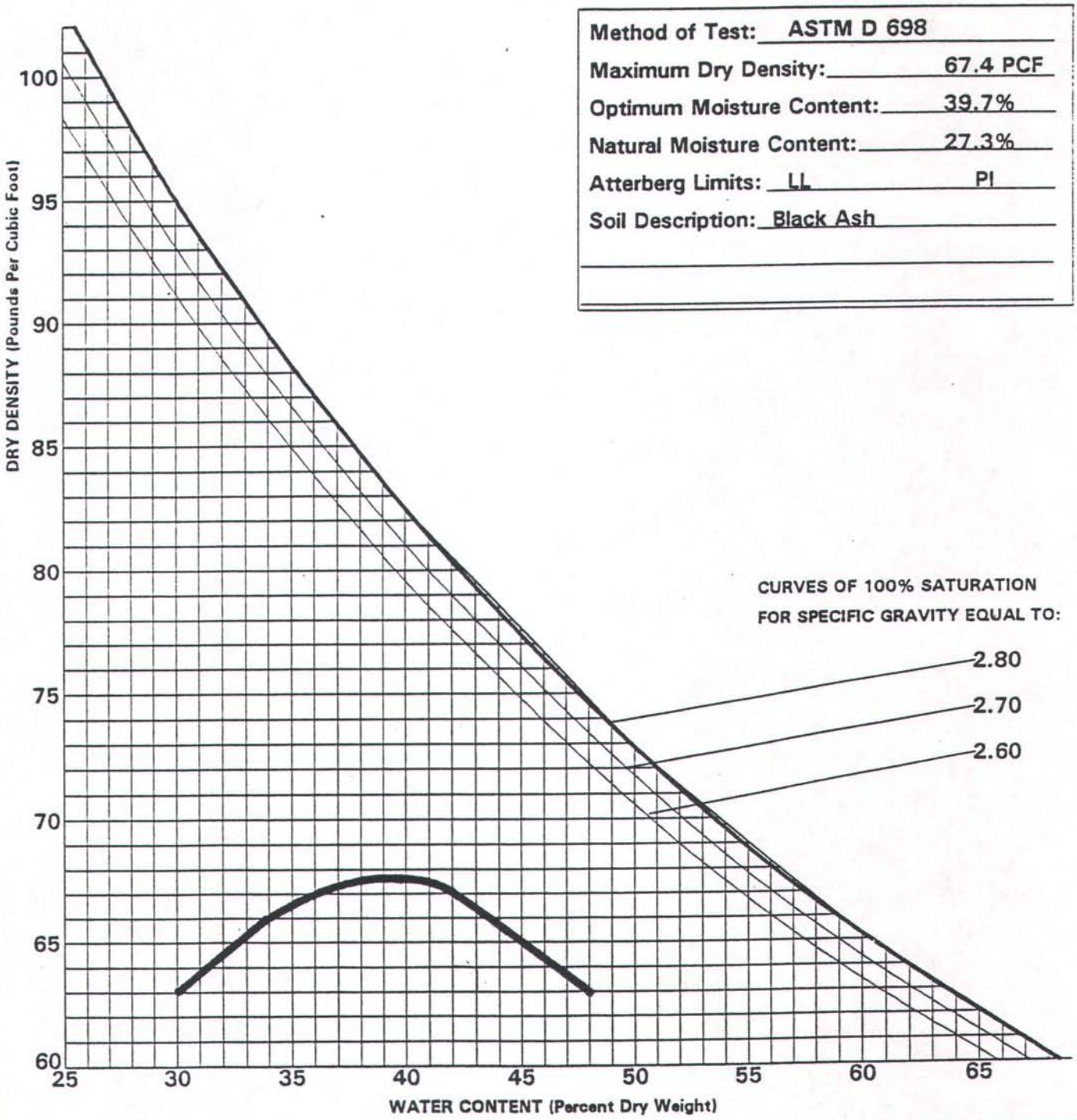
Maximum Dry Density: 67.4 PCF

Optimum Moisture Content: 39.7%

Natural Moisture Content: 27.3%

Atterberg Limits: LL PI

Soil Description: Black Ash



MOISTURE-DENSITY RELATIONSHIP

Geotechnologies, Inc.

Raleigh, North Carolina

GeoTechnologies Inc.

Job No: 1-95-0075-CA Date: 2/24/95

Job Name: Westmoreland Energy

Job Location: Raleigh, North Carolina

Boring No:

Sample No: 2.0

Depth:

TEST RESULTS

Method of Test: ASTM D 698

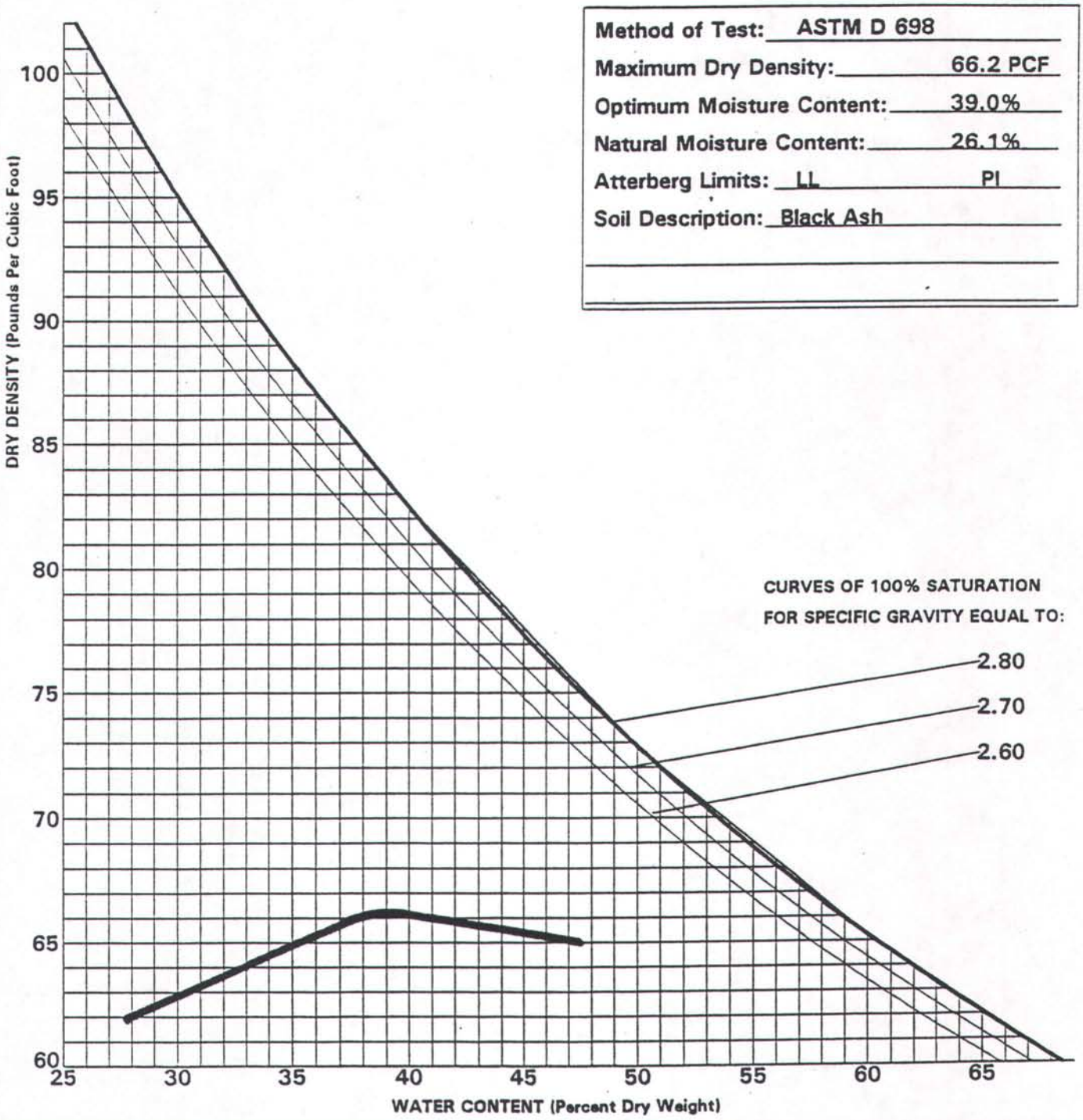
Maximum Dry Density: 66.2 PCF

Optimum Moisture Content: 39.0%

Natural Moisture Content: 26.1%

Atterberg Limits: LL PI

Soil Description: Black Ash



MOISTURE-DENSITY RELATIONSHIP

Geotechnologies, Inc.

Raleigh, North Carolina

GeoTechnologies, Inc.

Job No: 1-95-0075-CA Date: 2/24/95

Job Name: Westmoreland Energy

Job Location: Raleigh, North Carolina

Boring No:

Sample No: 3.0

Depth:

TEST RESULTS

Method of Test: ASTM D 698

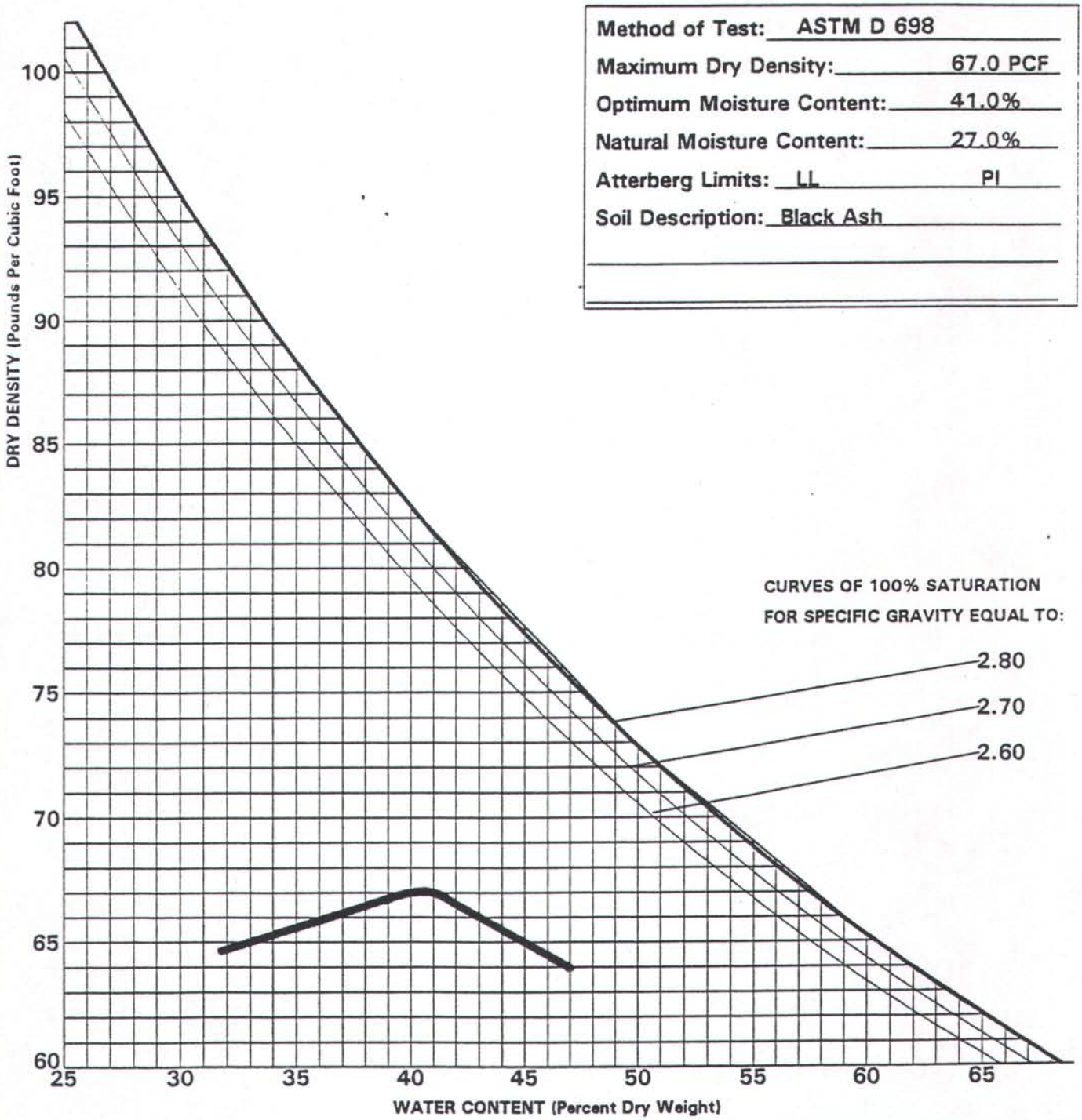
Maximum Dry Density: 67.0 PCF

Optimum Moisture Content: 41.0%

Natural Moisture Content: 27.0%

Atterberg Limits: LL PI

Soil Description: Black Ash



MOISTURE-DENSITY RELATIONSHIP

Geotechnologies, Inc.

Raleigh, North Carolina

GeoTechnologies, Inc.

Job No: 1-95-0075-CA Date: 2/24/95

Job Name: Westmoreland Energy

Job Location: Raleigh, North Carolina

Boring No:

Sample No: 4.0

Depth:

TEST RESULTS

Method of Test: ASTM D 698

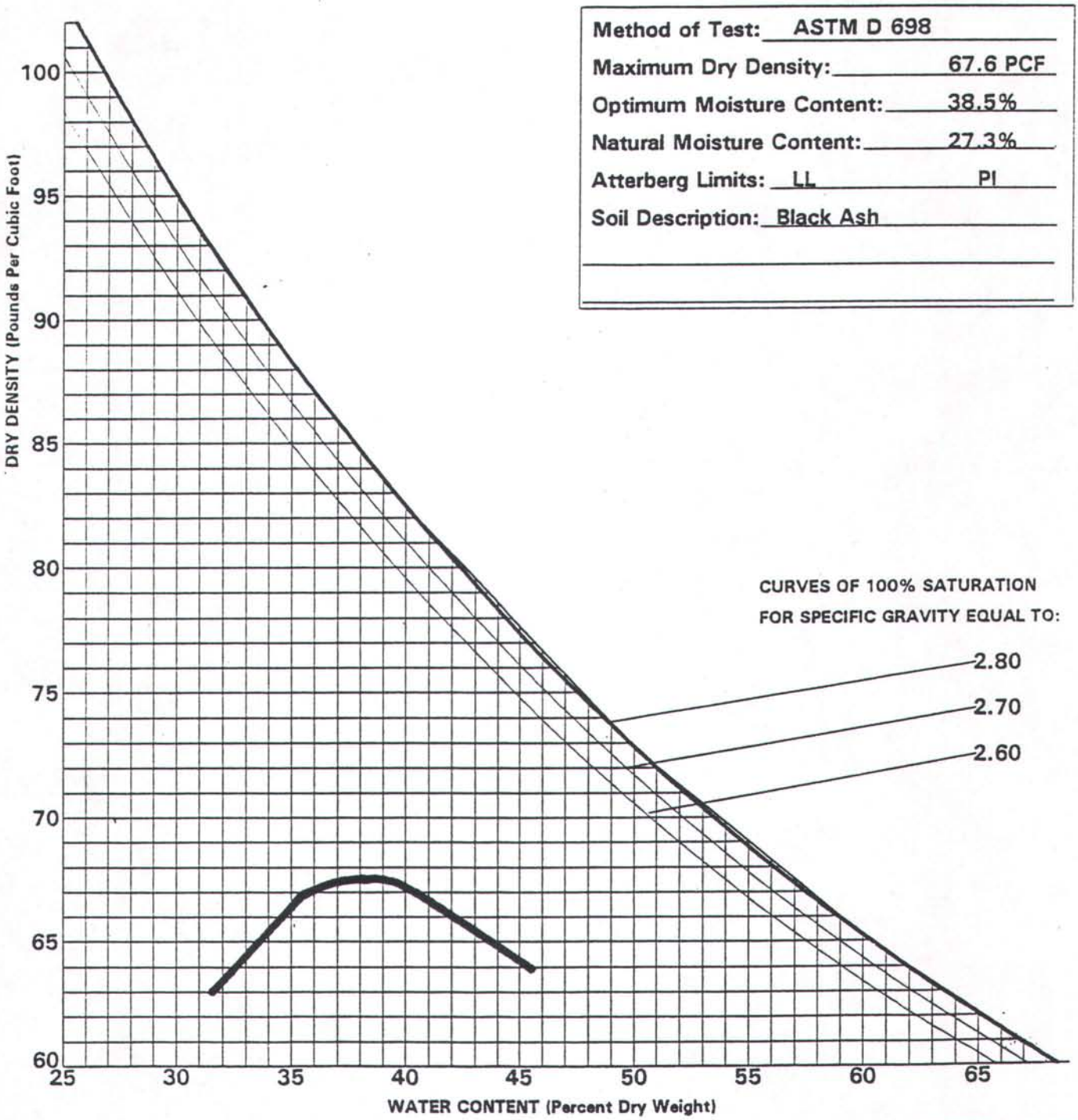
Maximum Dry Density: 67.6 PCF

Optimum Moisture Content: 38.5%

Natural Moisture Content: 27.3%

Atterberg Limits: LL PI

Soil Description: Black Ash



MOISTURE-DENSITY RELATIONSHIP

Geotechnologies, Inc.

Raleigh, North Carolina

APPENDIX 2.4
ACCESS ROAD PERIMTER BERM
COAL ASH CROSS-SECTIONS

"Under Seperate Cover"

APPENDIX 2.5
CONTRACTOR AS-BUILT SURVEY

"Under Seperate Cover"

SECTION 3
GEOMEMBRANE

3.0 GEOMEMBRANE

3.1 Overview

The Geomembrane used for Cell 2 construction was 40-mil thick Unreinforced Polypropylene (UPP) manufactured by Serrot Corporation, Inc. Prior to construction, material property data sheets were submitted by the Contractor and reviewed by Hazen and Sawyer for conformance with the project specifications. The Geomembrane was installed by Mid-America Lining Company, of Union City, Tennessee, under Contract to Barnhill Contracting Co., the General Contractor.

Hazen and Sawyer conducted conformance testing on representative samples of the Geomembrane delivered to the site to assure conformance with project criteria. The Geomembrane Manufacturer was responsible for providing Quality Control Certificates for each roll as well as installation guidelines.

The installer was responsible for Construction Quality Control, non-destructive testing (NDT) of all Geomembrane seams and repairs, and destructive testing of Geomembrane seams. Hazen and Sawyer provided full time Construction Quality Assurance (CQA) monitoring during installation and duplicate destructive testing of selected Geomembrane seams.

3.2 Contractor Submittals

As required in the project specifications, Barnhill Contracting Co. submitted material specifications and qualifications of Serrot Corporation, the Geomembrane Manufacturer. As shown in Appendix 3.1, the submittals indicate that the 40 mil UPP meets project criteria. Additional Geomembrane Manufacturer submittals, including a list of completed projects and the Manufacturer's Quality Control manual have been retained in the Hazen and Sawyer project files. Barnhill also provided resumes for the installation crew as well as a list of completed projects for the installer. These have also been retained in the Hazen and Sawyer project files.

On October 8, 1998, a Pre-Construction meeting was held at the project site. The meeting included representatives of Hazen and Sawyer, CME Associates, Halifax County, the General Contractor, the Geomembrane Installer, Westmoreland Energy, and NCDENR. Project phasing as well as subgrade preparation and maintenance, Geomembrane repair, and Geomembrane testing requirements were discussed.

3.3 Geomembrane Inventory and Conformance Testing

A total of 87 rolls (466,800 square feet) of 40 mil UPP Geomembrane were delivered for Cell 2 construction. Serrot Corporation provided Manufacturing Quality Control (MQC) Certificates for each roll prior to shipment. Hazen and Sawyer reviewed the certificates for conformance with the Geomembrane and resin properties outlined in the project specifications. On the basis of this review, the rolls were approved for shipment. MQC certificates for the rolls are presented in Appendix 3.2.

Prior to shipment to the project site, representatives of Serrot Corporation removed samples from six rolls of Geomembrane, randomly selected by Hazen and Sawyer. These samples were then forwarded to TRI Environmental, Inc. (TRI) who, under contract to Hazen and Sawyer, conducted conformance testing to assure that the Geomembrane met project specifications. One sample was removed for testing for each 100,000 square feet of Geomembrane delivered with at least one test for each resin batch (i.e., production lot) in accordance with the approved CQA Plan.

Results of the Conformance Testing program, which are provided in Appendix 3.3, indicate that each of the 6 samples tested met or exceeded project criteria for Geomembrane, with the exception of Carbon Black Content. Upon reviewing the conformance test data, Hazen and Sawyer noted a discrepancy between the Carbon Black Content results reported by TRI and the values reported by Serrot as part of their MQC testing. The MQC testing indicated average Carbon Black Contents of 2.7 to 2.8 percent, while the TRI results showed roll values of 2.8 to 3.3 percent.

With respect to the certain Carbon Black Content readings exceeding the specified maximum value of 3.0 percent, Serrot informed Hazen and Sawyer that the polypropylene resin manufacturer (Montell Polyolefins) had recently revised their Carbon Black Content

specification to a range of 2.25 to 3.25 percent. Previously, Montell's specification was a range between 2.0 and 3.0 percent, which formed the basis of the 1996 Specifications used for this project. Therefore, the Carbon Black Contents measured during conformance testing fell within the recommended limits for UPP Geomembrane. This information was provided to Hazen and Sawyer by Serrot Corporation in a letter dated March 16, 1999. This letter is attached in Appendix 3.4.

Based on these discussions, Hazen and Sawyer approved the Geomembrane for shipment to the project site. Rolls sampled for conformance testing were archived by the County.

The Geomembrane was delivered to the site on March 31, April 2, and April 7, 1999. Immediately after delivery, a Hazen and Sawyer engineer inventoried each roll and checked the roll number against the roll numbers on the Manufacturer's QC Certificates. Each roll of Geomembrane delivered had an approved MQC Certificate. The Geomembrane Inventory forms prepared by Hazen and Sawyer are provided in Appendix 3.5.

The Geomembrane Installer requested that an alternative material be allowed for the rubsheet to be used on the Cell 1/Cell2 (North) Intermediate Berm, shown in Section E, Drawing No. G5 of the Record Drawings. 40-mil smooth High Density Polyethylene (HDPE) was proposed instead of UPP. Since the rubsheet and apron are not part of the containment system and are not seamed to the Geomembrane liner itself, Hazen and Sawyer approved this request and 6 rolls of HDPE (manufactured by GSE) were shipped to the site. As with the UPP Geomembrane, GSE provided MQC certificates for each of the rolls. Hazen and Sawyer reviewed the certificates, inventoried the material, and checked the delivered roll numbers against the MQC certificates. No conformance testing of the HDPE Geomembrane used as the rubsheet or apron was performed.

The UPP Geomembrane was delivered in 10 foot wide rolls wrapped with protective covers, which were stored in the soil stockpile area located north of Cell 1. No factory fabrication of the UPP was conducted for Cell 2. The HDPE Geomembrane was delivered in 22.5 foot wide rolls and stored in the same area. All rolls were kept dry and stored away from areas where potential damage could occur.

3.4 Geomembrane Subgrade and Panel Deployment

Prior to Geomembrane installation, the subgrade surface was prepared by Barnhill. The subgrade was graded to design elevations and rolled with a smooth drum vibratory roller. Rock fragments were removed from the subgrade surface and replaced with suitable soil. Sideslopes were prepared by blading with a dozer, rolling where possible, and raking by hand to a relatively smooth condition as required by the project specifications.

A Hazen and Sawyer engineer visually inspected the subgrade for rutted, uneven or otherwise unsuitable areas. Any such areas were repaired by the Contractor. No excess moisture was observed. When all required repairs were completed, the subgrade was approved.

Immediately prior to Geomembrane placement, the Hazen and Sawyer Resident Engineer delineated the limits of approved subgrade and prepared a Subgrade Approval Form. This form was also signed by representatives of the Installer and General Contractor. Copies of these Subgrade Approval Forms are presented in Appendix 3.6. All UPP Geomembrane deployed during Cell 2 construction was placed in direct contact with approved subgrade, with the exception of the Cell 2 sump area. In this area, subgrade was first covered with a geosynthetic clay liner (GCL) manufactured by CETCO, Inc. (Bentomat ST). The GCL was installed as a redundant liner in order to minimize the potential for leakage in this critical area. The GCL was deployed by rolling the material out and cutting it to pre-measured lengths, manually pulling the GCL panels into place, and then applying a layer of granular bentonite to the panel overlap areas. GCL was placed around the sump such that it extended approximately 20-feet out into the cell to the north, east, and west, and approximately 5-feet up the adjacent South Intermediate Berm.

Mid-America Lining deployed the UPP panels from the tops of the cell berms by suspending the rolls from a rubber-tired loader using a spreader bar. Panels were placed on the East and West Perimeter Berms by manually pulling the sheet from the suspended roll and extending the panel a minimum of 10 feet past the toe of the berm before it was cut. Geomembrane was installed across the base of the cell by suspending rolls from the South

Intermediate Berm, pulling the panels across the cell base using an ATV, and then manually pulling the panels up the North Intermediate Berm. Where necessary, up-gradient Geomembrane panels were placed over down-gradient panels to promote runoff.

Geomembrane placement commenced along the West Perimeter Berm on April 26, 1999, and was suspended due to poor weather from April 28 through May 3. Placement proceeded across the cell base from west to east, and was completed along the East Perimeter Berm on May 9, 1999. The rubsheet and apron covering the North Intermediate Berm was completed on May 16, 1999.

As each panel was placed, a Hazen and Sawyer representative confirmed that the subgrade was suitable, recorded the panel identification number, source roll number and panel dimensions. The panel number was also written on the Geomembrane. Each panel was visually examined by Hazen and Sawyer soon after deployment for evidence of material damage or defects. Any such defects were marked on the panel for repair. Overlaps with adjacent panels were checked, and all exceeded the 3-inch minimum.

A total of 234 UPP panels were placed between April 26 and May 16, 1999 by Mid-America Lining Company. Geomembrane was installed only over previously approved subgrade. Panel dimensions and documentation of any observed defects, etc. were recorded on a "CQA Panel Inspection Form". Panel Inspection forms prepared by Hazen and Sawyer for each of the 234 UPP panels are presented in Appendix 3.7. The locations of the panels are shown on the Geomembrane Installer's As-Built Panel Diagram (prepared by Mid America Lining Company) attached as Appendix 3.11

3.5 Geomembrane Seaming

Production seaming for the 40 mil UPP was completed using hot wedge fusion equipment resulting in a single 1.5-inch wide seam. Patches and the connection to the sump flange were completed using extrusion welding methods.

3.5.1 Trial Seams

Test welds, or pre-welds, were completed by welding personnel before each shift began or whenever cold starts of welding equipment were required. Seaming temperature and rate were recorded. No production seaming was performed until test welds were completed and tested by the Installer and approved by Hazen and Sawyer. Test weld samples were tested in peel on site by representatives of the Installer. Qualification criteria for pre-welds was that all peel specimens exhibit Film Tearing Bond (FTB) type failures at a minimum load of 20 pounds. A rate of travel of 20 inches per minute was used. Any pre-weld sample that did not meet this criteria resulted in disqualification of the pre-weld. The Installer then repaired or adjusted equipment and/or seaming procedures and prepared a new test seam, or the seaming equipment was marked as "out of service" and repaired.

Trial seam data were recorded by a Hazen and Sawyer representative on "Trial Seam Report" forms. Completed forms are presented in Appendix 3.8.

3.5.2 Production Seaming

Each field seam was given a unique identification number by Hazen and Sawyer representatives. The seam number represented the two panels incorporated in the seam. For instance, Field Seam P1/P2 identifies the field seam formed by Panels P1 and P2.

Panels were seamed on the day they were placed. Hazen and Sawyer representatives inspected each seam and marked areas where "fishmouths", "burn throughs" or other defects were observed. These areas were later repaired by the Installer with a minimum 12-inch by 12-inch patch. The seam number, machine number, welder and seaming parameters were recorded for each seam. The "CQA Seam Inspection Forms" prepared by Hazen and Sawyer are presented in Appendix 3.9.

During fusion seaming, Mid-America Lining technicians inspected the overlap area and cleaned the seam area with cloth gloves. Extrusion seam areas were prepared by grinding the seam area to remove surface oxidation and accumulated wax, dirt, etc. Patches were first bonded using hot air "Liester" equipment, then the extrusion seam was completed.

Hazen and Sawyer personnel observed preparation and seaming procedures and marked any areas that were overheated or showed signs of excessive grinding outside of the extrusion seam area. Any such areas were cut out and repaired by the Installer.

3.5.3 Nondestructive Seam Testing

Mid-America Lining Company conducted nondestructive testing of all field seams. Fusion seams were tested using an air lance operating at a pressure of 50 psi. The seams were tested by inserting the tip of the air lance under the seam overlap flap and running it along the seam edge. Defects in the seam (burn throughs, fish mouths, etc) were evident as the defect would allow air from the lance to blow beneath the adjacent Geomembrane panel, causing it to "pillow". In addition, a distinct change in the sound of the air stream would occur at such defects. All defects were marked, subsequently repaired by the Installer, and the seam retested. Extrusion welds were nondestructively tested using a vacuum box.

3.5.4 Destructive Seam Testing

Destructive seam evaluation was performed on production seams as required in the project specifications. The Installer removed samples at locations selected by Hazen and Sawyer. The Geomembrane seams were tested on the basis of at least one destructive sample per 1000 linear feet of seam length. For the approximate total of 41,000 linear feet of seaming completed, a total of 50 destructive seam samples were removed for an average of one sample per 820 linear feet of seam length.

The destructive samples removed by Mid-America Lining were approximately 30 inches long. Each sample was divided into two nominally equal segments; one for evaluation by the Installer or Installer's laboratory and one for archive. Selected archive samples were forwarded by Hazen and Sawyer to TRI Environmental as confirmation of the Installer's on-site testing results. Remaining archive samples will be retained by the County.

On-site destructive seam testing was conducted by Mid-America Lining's CQC Representative, in the presence of Hazen and Sawyer's Resident Engineer. On-site testing was performed using a tensiometer with the travel rate set at 20 inches per minute. Test samples were 1-inch wide by 4-inches long, and were cut using a manually operated die. A

total of 10 tests were run for each Destruct Sample, with 5 tests run in peel and 5 tests run in shear, in accordance with the project specifications.

Duplicate destructive seam testing was conducted by Precision Laboratories, under contract to Mid-America Lining, and also by TRI Environmental, under contract to Hazen and Sawyer. The single hot wedge fusion seams and extrusion welds were tested in peel in accordance with ASTM D413 (as modified in NSF Standard 54). Both fusion and extrusion seams were also tested for Bonded Shear Strength in accordance with ASTM D3083 (as modified in NSF 54).

The qualifying criteria for all destructive seam evaluations are listed below:

- Peel Adhesion
  1. Film Tearing Bond (FTB)-type Failures on 4 of the 5 specimens, and
  2. A minimum load of 20 lb./in width.

- Bonded Shear Strength
  1. FTB-type failures on 4 of the 5 specimens, and
  2. A minimum load of 35 lb./in. width.

Of the 50 samples tested on-site and in laboratories, none were disqualified on the basis of the criteria listed above. A total of 10 samples were selected at random by Hazen and Sawyer for laboratory duplicate testing. Laboratory test data indicated good agreement with field-tested samples.

A summary of the destructive seam evaluation program, along with Destructive Seam Sample Reports, and laboratory test data are provided in Appendix 3.10.

3.6 Cell 2 Sump Tie-In

The Cell 2 Sump is a prefabricated HDPE section which is 30-inches in diameter, 36-inches deep, and has a 12-inch wide flange around its top. This sump was installed during Cell 1 construction and was sealed at the time using a piece of 60-mil HDPE Geomembrane which was extrusion welded to the sump flange. During Cell 2 construction, the sump was

exposed by the Contractor and the seal removed by the Geomembrane Installer in order to tie-in the Cell 2 Geomembrane.

The Cell 2 Sump tie-in was completed on May 5, 1999. After removing the sump seal, Mid-America Lining technicians cleaned and dried the sump flange, then ground down the sump seal extrusion bead so that the finished surface was rounded and smooth. The area for the new tie-in weld was prepared by grinding the flange surface. The UPP Geomembrane was then Leistered to the flange, and the welding edge was reground.

Prior to extruding the tie-in weld, test welds were performed using the UPP Geomembrane, a 0.5-inch thick HDPE plate, and HDPE welding rod. The test welds were approximately 24-inches long and were evaluated by rolling up a pull-bar in excess UPP Geomembrane (welded to the plate), and then using the pull-bar to try to detach the weld. After trial and error, the required preheat and barrel temperatures were identified. The UPP Geomembrane was then attached to the Cell 2 Sump flange with a singe HDPE extrusion weld. After cooling, the sump weld was vacuum boxed, with no defects detected.

3.7 Cell 1/Cell 2 Intermediate Berm Rub Sheet and Apron

After liner installation in Cell 2 was complete, the Cell 1/Cell 2 (North) Intermediate Berm was covered with a rub sheet (underlain by GCL) and an apron, as shown on Section E, Drawing No. G5 of the Record Drawings. The purpose of the GCL/rub sheet is to "seal off" the top of the Intermediate Berm after expansion into an adjacent cell. The primary function of the apron is to minimize the shear stress induced on the liner system when coal ash is placed over and against the North Intermediate Berm during disposal operations.

The GCL used on the North Intermediate Berm was Bentomat ST (manufactured by CETCO, Inc.). The GCL was deployed by cutting a GCL roll into 5-ft wide sections (1/3 of the standard roll width), and then manually pulling the sections into place. Panel end overlaps were then sealed using a bead of granular bentonite. The GCL was deployed from the eastern and western ends of the North Intermediate Berm, working back towards the center of the berm. Once the GCL was in place, it was overlaid with a 10-ft wide (standard roll width), 40-mil UPP Geomembrane rub sheet. The rub sheet was deployed by manually pushing rolls of UPP out over the GCL, working from the eastern and western ends of the

berm towards the center. Once the rub sheet was in place, it was Leistered to the Cell 1 and Cell 2 liners on approximately 10-ft centers to prevent movement during deployment of the overlying apron.

The North Intermediate Berm apron was constructed using 40-mil smooth High Density Polyethylene (HDPE) Geomembrane manufactured by GSE. The apron was constructed by manually pulling HDPE panels out along the top of the Intermediate Berm from rolls suspended at the eastern and western ends of the berm. The rolls were suspended from a rubber-tired loader using a spreader bar. The rolls were pulled and then cut into 58-ft long panels. These panels were rotated 90 degrees and manually spotted into final position for fusion welding. Fusion welding was accomplished using wedge welding equipment that produced a single, 1.5-inch wide weld. Once welding was completed, the end of the apron extending out into Cell 2 was temporarily anchored using a combination of Leister "tack" welds and placement of sand bags. The end of the apron in Cell 1 could not be Leistered to the Cell 1 liner, so it was temporarily anchored using sand bags.

3.7.1 Apron Repair

On May 20, 1999, strong winds dislodged the Cell 1 side of North Intermediate Berm apron, lifting portions of the apron out of Cell 1 and depositing the excess material into Cell 2. On May 21, Barnhill Contracting reset the apron by pulling the material back up and over the North Intermediate Berm. Hazen and Sawyer's Resident Engineer then directed Barnhill to anchor the Cell 1 side of the apron by constructing a series of coal ash buttresses against the Intermediate Berm, at approximately 50-ft centers (where access was possible). Barnhill constructed the buttresses using a track excavator working along an access bench cut into the coal ash. The buttresses were built-up to within approximately 5-ft of the top of the North Intermediate Berm. This anchorage method was effective within the limits of buttress placement, however, on May 27, the eastern and western edges of the apron (which were unbuttressed) were again dislodged by strong winds.

The ends of the apron were replaced and temporarily held using sand bags. It was then decided that Westmoreland Energy (the owner of the power plant generating the coal ash) would be responsible for buttressing the remainder of the apron using coal ash removed from Cell 1.

In August, 1999 Westmoreland's contractor placed ash on the top of the Intermediate berm using a tracked excavator and spread it using a Cat D3 (LGP) dozer. Coal ash was also carefully placed on the south (Cell 2) side of the Intermediate Berm. During this operation, the HDPE apron was visually inspected. The only visible damage was where the apron was intentionally cut to facilitate placement. No damage was evident on the underlying Geomembrane.

Heavy rain associated with Hurricane Floyd in September, 1999 caused some of the ash placed on the Intermediate Berm slope to slough and wash into Cell 2. The coal ash remained at the toe of the slope and was effective in anchoring the HDPE apron. In this case the apron functioned as designed in that it remained in tact and transferred little stress to the underlying Geomembrane.

The repair area was again inspected by Hazen and Sawyer on March 15, 2000. Little additional washing of the coal ash on the Intermediate Berm was observed. Visual inspection of the apron indicated no evidence of excessive tension on the slopes. The coal ash placed in August, 1999 has effectively anchored the apron and rubsheet. The eastern terminus of the apron (where the Intermediate Berm intersects the Eastern Perimeter Berm) was not anchored with coal ash and some evidence of wind-related folding was evident. A representative of Westmoreland agreed to place additional soil or coal ash to anchor the exposed edge.

It should be emphasized that no damage to the Geomembrane was observed prior to or during placement of the apron and coal ash anchor material. The apron was cut in several locations to allow it to be replaced on the Intermediate Berm. Since the apron serves no barrier function, these silts were not repaired. The apron functioned as intended in that the base Geomembrane was protected.

3.8 Subgrade Repair

On April 28, 1999, after two days of Geomembrane placement in Cell 2, a steady rain fell at the site for four consecutive days. During this time, runoff pooled along the entire length of

the South Intermediate Berm as the Cell 2 sump had not yet been tied into and opened. The General Contractor made a continued effort to pump down the water level in the cell, but water was still able to "back up" beneath the edge of several in-place Geomembrane panels. This caused the Geomembrane placed in the southwest corner of the cell to float. On May 3, 1999, the cell was completely pumped out, and the Hazen and Sawyer Resident Engineer inspected the lined area and exposed subgrade to evaluate damage.

It was determined that the only lined subgrade that would have to be exposed and repaired was that in the southwest corner of the cell. In addition to this area, it was also determined that the subgrade along the entire length of the South Intermediate Berm was too soft to deploy additional Geomembrane. To avoid excessively delaying the Geomembrane installation to allow the subgrade to dry out, Hazen and Sawyer and the General Contractor agreed to cut out all of the soft material along the toe of the berm and replace it with dry, compacted soil. Barnhill subsequently cut out and hauled off the wet soil, then placed, compacted, fine graded, and smooth drum rolled in dry material. These repairs were inspected and approved by Hazen and Sawyer's Resident Engineer.

To "daylight" the lined subgrade needing repair, the Geomembrane Installer made a large "T" cut across 7 cell base panels (P-29, P-48, P-49, P-50, P-51, P-52, and P-53) and 5 West Perimeter Berm panels (P-1, P-2, P-3, P-45, and P47). These panels were pulled back and temporarily anchored. Barnhill then entered this area and cut out all wet subgrade using a CAT D6 bulldozer. Dry material was subsequently placed back in this area, compacted, fine graded, and smooth drum rolled. The Resident Engineer inspected and approved the repaired area, at which time the Installer pulled the Geomembrane panels back into position and repaired the cuts with cap strips. The locations of these cap strip repairs are shown on the Geomembrane Installer's Panel Layout Drawing attached as Appendix 3.11. Complete Geomembrane Installer records, including field reports and test data, is located in the Hazen and Sawyer project files.

APPENDIX 3.1
SERROT CORPORATION
MATERIAL DATA SHEETS

SERROT INTERNATIONAL, INC.

POLYPROPYLENE (UNREINFORCED) GEOMEMBRANE

Serrot UPP is a flexible polypropylene geomembrane produced from first quality resins. Serrot UPP is chemically inert, enabling the material to maintain flexibility throughout it's use. With a low coefficient of thermal expansion and a low modulus of elasticity, Serrot UPP has fewer wrinkles thereby conforming better to uneven subgrade. Serrot UPP geomembranes have been formulated to be resistant to chemicals, ultraviolet degradation and leaching additives.

			30-mil	40-mil
Property	**Method**	**Units**	**Min./Typ.**	**Min/Typ.**
Resin Density[1]	ASTM D 1505	g/cm^3	0.91/0.90.088	0.91/0.90.088
Sheet Density[1]	ASTM D 1505	g/cm^3	0.925/0.910	0.925/0.910
Thickness	ASTM D 5199	mils	Average: 30.0/31.5 Individual: 27.0/28.3	Average: 40.0/41.5 Individual: 36.0/37.4
Carbon Content	ASTM D 4218	%	2.0/2.5	2.0/2.5
Carbon Dispersion	ASTM D 5596	rating	Category 1 or 2/Cat. 1	Category 1 or 2/Cat. 1
Dimensional Stability[1]	ASTM D 1204	% change	±3.0/±1.0	±3.0/±1.0
Tensile Stress at Break	ASTM D 638	ppi	63/88	84/116
Tensile Strain at Break	2.0" gage 2.5" gage	% %	520/650 415/520	520/650 415/520
Multi-Axial Tensile	ASTM D 5716 Method A	%	135/150	135/150
Tear Resistance	ASTM D 1004	lbs	10/12	14/16
Puncture Resistance	ASTM D 4833 FTMS 101C, 2065	lbs lbs	38/41 35/38	50/54 46/50
UV Resistance	ASTM G 26	12,000 hrs @ 70°c	Pass/Pass	Pass/Pass

1 - Indicates maximum average roll value

STANDARD ROLL WIDTH IS 12.5'

PRODUCT IS AVAILABLE IN BLACK

CONTACT Serrot International Incorporated FOR CURRENT SPECIFICATIONS

06/99 English

Information regarding the physicial properties of Serrot International Incorporated products, including the information contained in this specification sheet is, to the best of our knowledge, information and belief, representative of Serrot International Incorporated products. All information, data, suggestions, opinions and recommendations are offered without guarantee or warranty of any kind. The final determination as to the appropriateness of suitability of any Serrot International Incorporated product in any particular application rests with the user and is the user's sole responsibility. Serrot International Incorporated reserves the right to alter, change or modify its products and its product specifications at any time without notice. Please check with your Serrot International Incorporated sales or technical representative to assure that specifications are current.

APPENDIX 3.2
SERROT CORPORATION AND GSE GEOMEMBRANE QUALITY CONTROL CERTIFICATES

SERROT CERTIFICATE OF QUALITY ASSURANCE

PROJECT NAME: UPP Material - Halifax Co. Coal Ash Monofill
MATERIAL TYPE: 40 mil UPP Black/Black **LOCATION:** Halifax, NC **SALES ORDER #:** 8669

TEST DESCRIPTION		MINIMUM THICKNESS	TENSILE @ BREAK MACHINE DIRECTION	TENSILE @ BREAK CROSS DIRECTION	ELONG. @ BREAK MACHINE DIRECTION	ELONG. @ BREAK CROSS DIRECTION	TEAR	PUNCTURE	CARBON BLACK	DENSITY
TEST METHOD		D5199	D638	D638	D638	D638	D1004	D4833	D1603	D792
(modifications)										
FREQUENCY		Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Each Lot	Every Roll
UNITS		mils	ppi	ppi	%	%	lb	lb	%	g/cc
SPECIFICATION		36	90	90	600	600	14	45	2.0 - 3.0	0.880
ROLL #	LOT/BLEND									
2806196	BAFZ185000	43	112	99	770	790	16	49	2.5	0.886
2806197	BAFZ185000	45	115	100	802	811	16	46	2.6	0.887
2806198	BAFZ185000	43	109	95	761	770	16	48	2.6	0.889
2806199	BAFZ185000	44	110	98	764	780	15	47		0.885
2806200	BAFZ185000	42	105	108	767	804	15	47	2.5	0.887
2806201	BAFZ185000	42	114	104	758	823	15	47	2.6	0.888
2806202	BAFZ185000	43	114	107	795	866	15	46		0.888
2806203	BAFZ185000	43	116	107	801	854	15	45	2.7	0.886
2806204	BAFZ185000	43	116	105	788	814	16	46		0.888
2806205	BAFZ185000	43	112	101	771	772	15	48	2.8	0.887
2806206	BAFZ185000	44	118	103	828	806	15	48	2.8	0.888
2806207	BAFZ185000	43	115	104	794	808	15	48	2.8	0.887
2806208	BAFZ185000	44	114	105	793	810	15	47		0.886
2806209	BAFZ185000	43	117	101	801	792	15	46	2.7	0.888
2806211	BAFZ185000	42	107	104	806	791	15	45	2.8	0.888
2900174	BAFZ185000	44	106	91	752	755	14	46	3.0	0.880
2900178	BAFZ185000	45	117	101	796	821	14	47	2.9	0.880
2900179	BAFZ185000	44	111	110	692	795	16	52	3.0	0.887
2900181	BAFZ185000	44	112	111	803	826	15	47	2.9	0.893

For SJ

Certified By:
Quality Control Laboratory Supervisor 3/4/99

SERROT CERTIFICATE OF QUALITY ASSURANCE

TEST DESCRIPTION		MINIMUM THICKNESS	TENSILE @ BREAK MACHINE DIRECTION	TENSILE @ BREAK CROSS DIRECTION	ELONG. @ BREAK MACHINE DIRECTION	ELONG. @ BREAK CROSS DIRECTION	TEAR	PUNCTURE	CARBON BLACK	DENSITY
TEST METHOD		D5199	D638	D638	D638	D638	D1004	D4833	D1603	D792
(modifications)										
FREQUENCY		Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Each Lot	Every Roll
UNITS		mils	ppi	ppi	%	%	lb	lb	%	g/cc
SPECIFICATION		36	90	90	600	600	14	45	2.0 - 3.0	0.880
ROLL #	LOT/BLEND									
2900182	BAFZ185000	45	105	113	658	822	16	46	2.9	0.895
2900183	BAFZ185000	45	115	114	729	830	16	45	2.7	0.893
2900184	BAFZ185000	45	102	111	731	877	15	45	2.8	0.889
2900185	BAFZ185000	45	109	111	782	871	15	46	2.8	0.891
2900186	BAFZ185000	44	108	108	781	853	16	47	2.7	0.889
2900187	BAFZ185100	44	118	104	813	799	16	45	2.7	0.886
2900188	BAFZ185100	44	115	106	815	828	15	48	2.6	0.887
2900189	BAFZ185100	44	117	106	801	827	15	47	2.8	0.886
2900190	BAFZ185100	44	114	104	788	845	14	45	2.6	0.886
2900191	BAFZ185100	44	115	103	797	850	14	46	2.8	0.880
2900192	BAFZ185100	44	115	103	770	781	14	47	2.7	0.880
2900193	BAFZ185100	45	116	107	778	798	15	50	2.7	0.880
2900194	BAFZ185100	45	117	101	798	796	15	45	2.7	0.880
2900195	BAFZ205400	45	118	107	814	841	15	48	2.8	0.880
2900196	BAFZ205400	45	123	112	781	815	15	46	2.9	0.880
2900197	BAFZ205400	45	121	116	759	802	15	47	2.8	0.890
2900198	BAFZ205400	45	111	101	737	783	16	51	2.8	0.887
2900199	BAFZ205400	45	115	109	771	820	16	47	2.8	0.897
2900200	BAFZ205400	45	104	117	796	780	16	54	2.8	0.886
2900201	BAFZ205400	45	108	118	798	817	16	49	3.0	0.894
2900202	BAFZ205400	45	116	103	748	793	16	48	2.7	0.889
2900203	BAFZ205400	45	110	119	801	778	16	51	2.8	0.888

Certified By: for S.J.
Quality Control Laboratory Supervisor 3/4/99

SERROT CERTIFICATE OF QUALITY ASSURANCE

TEST DESCRIPTION		MINIMUM THICKNESS	TENSILE @ BREAK MACHINE DIRECTION	TENSILE @ BREAK CROSS DIRECTION	ELONG. @ BREAK MACHINE DIRECTION	ELONG. @ BREAK CROSS DIRECTION	TEAR	PUNCTURE	CARBON BLACK	DENSITY
TEST METHOD		D5199	D638	D638	D638	D638	D1004	D4833	D1603	D792
(modifications)										
FREQUENCY		Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Each Lot	Every Roll
UNITS		mils	ppi	ppi	%	%	lb	lb	%	g/cc
SPECIFICATION		36	90	90	600	600	14	45	2.0 - 3.0	0.880
ROLL #	LOT/BLEND									
2900204	BAFZ205400	45	110	106	788	755	16	48	3.0	0.887
2900205	BAFZ205400	45	118	108	773	801	15	51	2.8	0.888
2900206	BAFZ205400	44	122	104	816	792	15	49	2.8	0.889
2900207	BAFZ205400	44	112	104	797	790	15	52	2.6	0.887
2900208	BAFZ205400	44	111	106	802	795	15	48	2.8	0.889
2900209	BAFZ205400	44	114	103	773	809	15	49	2.6	0.888
2900210	BAFZ205400	44	118	108	802	843	15	51	2.9	0.888
2900211	BAFZ205400	44	118	108	797	834	16	54	2.9	0.886
2900212	BAFZ205400	44	125	108	782	781	16	52	2.8	0.889
2900213	BAFZ205400	44	122	115	768	797	16	48	2.8	0.888
2900214	BAFZ205400	44	117	105	758	788	16	48	2.9	0.887
2900215	BAFZ205400	45	114	113	729	815	16	49	2.8	0.888
2900216	BAFZ205400	44	121	112	788	788	16	47	3.0	0.888
2900217	BAFZ205400	44	122	115	781	797	16	45	2.9	0.886
2900218	BAFZ205400	44	120	111	800	802	17	50	2.9	0.891
2900219	BAFZ205400	44	118	115	774	826	16	48	2.9	0.890
2900220	BAFZ205400	44	115	103	770	777	16	50	2.9	0.890
2900221	BAFZ205400	44	110	109	763	767	16	48	2.6	0.892
2900222	BAFZ205400	44	113	114	761	740	17	50	2.9	0.890
2900223	BAFZ205400	44	120	114	760	777	17	51	2.9	0.890
2900224	BAFZ205400	44	116	111	764	808	16	51	2.8	0.890
2900225	BAFZ205400	44	117	105	822	808	16	45	2.7	0.885

Certified By: [signature] for ST

Quality Control Laboratory Supervisor 3/4/99

SERROT CERTIFICATE OF QUALITY ASSURANCE

TEST DESCRIPTION		MINIMUM THICKNESS	TENSILE @ BREAK MACHINE DIRECTION	TENSILE @ BREAK CROSS DIRECTION	ELONG. @ BREAK MACHINE DIRECTION	ELONG. @ BREAK CROSS DIRECTION	TEAR	PUNCTURE	CARBON BLACK	DENSITY
TEST METHOD		D5199	D638	D638	D638	D638	D1004	D4833	D1603	D792
(modifications)										
FREQUENCY		Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Each Lot	Every Roll
UNITS		mils	ppi	ppi	%	%	lb	lb	%	g/cc
SPECIFICATION		36	90	90	600	600	14	45	2.0 - 3.0	0.880
ROLL #	LOT/BLEND									
2900256	BAFZ205400	43	114	107	787	801	16	50	2.8	0.889
2900257	BAFZ205400	44	118	111	755	790	17	47	2.8	0.885
2900258	BAFZ205400	44	112	114	711	822	17	47	2.8	0.886
2900259	BAFZ205400	44	113	104	739	750	17	48	2.8	0.883
2900260	BAFZ205400	44	111	117	724	831	17	52	2.6	0.884
2900261	BAFZ205400	44	113	108	739	775	17	52	2.8	0.884
2900262	BAFZ205400	44	118	116	744	803	17	51	2.7	0.883
2900264	BAFZ205400	44	120	112	779	818	16	50	2.6	0.891
2900266	BAFZ205400	44	118	108	760	796	16	52	2.9	0.895
2900267	BAFZ205400	45	120	111	773	792	16	53	2.8	0.892
2900268	BAFZ205400	45	120	111	791	778	15	46	2.8	0.891
2900269	BAFZ205400	44	109	113	731	826	16	47	2.8	0.890
2900270	BAFZ205400	45	110	107	736	743	16	56	2.9	0.892
2900271	BAFZ205400	44	108	107	722	780	17	49	2.8	0.891
2900272	BAFZ205400	44	103	101	693	774	16	50	2.9	0.890
2900273	BAFZ205400	44	106	104	704	766	16	49	3.0	0.893
2900274	BAFZ205400	44	111	113	756	820	16	51	2.9	0.894
2900275	BAFZ205400	44	101	105	679	777	16	48	2.9	0.889
2900277	BAFZ205400	45	106	110	707	821	16	47	2.9	0.888
2900278	BAFZ205400	44	111	103	731	788	16	52	3.0	0.889
2900279	BAFZ205400	44	110	111	737	816	16	53	2.9	0.889
2900335	BAFZ205400	43	106	93	739	731	15	47	3.0	0.890

Certified By: for SJ
Quality Control Laboratory Supervisor 3/4/99

SERROT CERTIFICATE OF QUALITY ASSURANCE

TEST DESCRIPTION		MINIMUM THICKNESS	TENSILE @ BREAK MACHINE DIRECTION	TENSILE @ BREAK CROSS DIRECTION	ELONG. @ BREAK MACHINE DIRECTION	ELONG. @ BREAK CROSS DIRECTION	TEAR	PUNCTURE	CARBON BLACK	DENSITY
TEST METHOD		D5199	D638	D638	D638	D638	D1004	D4833	D1603	D792
(modifications)										
FREQUENCY		Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Every Roll	Each Lot	Every Roll
UNITS		mils	ppi	ppi	%	%	lb	lb	%	g/cc
SPECIFICATION		36	90	90	600	600	14	45	2.0 - 3.0	0.880
ROLL #	LOT/BLEND									
2900336	BAFZ205400	42	112	96	774	779	15	45	3.0	0.892
2900339	BAFZ205400	43	111	109	798	840	14	47	2.8	0.887
2900340	BAFZ205400	43	114	99	840	759	14	48	2.8	0.888
2900341	BAFZ205400	42	111	109	796	850	15	49	2.6	0.886
2900342	BAFZ205400	42	112	109	790	796	15	46	2.8	0.888
2900343	BAFZ205400	42	120	104	816	859	15	47	2.7	0.891
2900344	BAFZ205400	42	115	110	774	835	15	45	2.6	0.887
2900345	BAFZ205400	42	117	94	795	718	16	45	2.6	0.889
2900346	BAFZ205400	42	115	103	807	827	16	49	2.8	0.889
2900347	BAFZ205400	42	114	103	823	824	15	45	2.7	0.890
2900348	BAFZ205400	42	111	104	783	806	15	46	2.8	0.892
2900349	BAFZ205400	42	113	103	807	825	15	46	2.8	0.889
2900350	BAFZ205400	42	115	100	827	821	15	46	2.6	0.887
2900351	BAFZ205400	43	111	102	793	841	15	46	2.5	0.890
2900352	BAFZ205400	43	113	106	789	809	16	48	2.6	0.888
2900353	BAFZ205400	43	113	100	807	780	15	45	2.6	0.891
2900354	BAFZ205400	42	113	101	761	781	16	45	2.5	0.891
2900355	BAFZ205400	43	105	99	761	810	15	47	2.5	0.888
2900356	BAFZ205400	43	103	101	758	805	15	46	2.4	0.889
2900357	BAFZ205400	43	110	100	774	793	15	45	2.4	0.888
2900358	BAFZ205400	43	110	102	769	784	15	48	2.6	0.888

for S.J.

Certified By:
Quality Control Laboratory Supervisor 3/4/99

Shipping Order - Packing List - Original - Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Order Form

GSE Lining Technology, Inc. at HOUSTON,TEXAS

SHIPPERS NO. 1652

Received at Houston, Texas from GSE Lining Technology, Inc. the property described below, in apparent good order, except as noted (contents and condition of packages unknown), marked, consigned, destined as indicated below, which said Carrier (the word "Carrier" being understood throughout this Shipping Order as meaning the person or corporation in possession of the property) agrees to to the place of delivery at said destination. It is mutually agreed as to each Carrier of all or any of said property, over all or any portion of said route to destination, and as to each party at any interested in all or any of said property, that every service performed hereunder shall be subject to either: (a) if the Shipper noted herein is GSE Lining Technology, Inc. as indicated by the designation of the "Shipper" to be GSE Lining technology, Inc., then the Shipper and Carrier are subject to the terms and conditions contained in the Contract for Truck Transportation existing between the parties, or (b) if the Shipper noted herein is not GSE Lining Technology, Inc., then GSE Lining Technology, Inc. is acting solely as the agent for the denoted Shipper, and thus every aspect of the service to be performed hereunder between the Shipper and the Carrier shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western, and Illinois Freight Classifications in effect on the date hereof, if this is a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. When acting in the capacity of an agent for a Shipper in placing the material in transit on behalf of a Shipper, GSE Lining Technology, Inc. accepts no liability for loss of cargo, damage to containers, or any other consequences occuring during transportation, Carrier having agreed that the transportation arrangement was initiated by the Shipper and not by GSE Lining Technology, Inc.

Subject to the above terms and conditions as to which party is the Shipper, Shipper hereby certifies that he is familiar with the terms and conditions that govern the transportation of this shipment, and the said terms and conditions are hereby agreed and accepted for himself and his assigns.

Ship To: Mid America/Halifax County Landfill
920 Lykes Rd.
Littleton NC 27650

Bill To: Mid America Lining
P. O. Box 458
420 East Jackson Street
Union City TN 38281

Date: 3/30/99

Shipping Instructions: Contact Jennifer @ 901-885- 8888. Ship w/ Pickett County.

Sales Order 6110

Project# 502568

No. Line	Roll #	QTY Shipped	UM	Kind of Package, Description of Articles, Special Marks, and Exceptions	Weight
1	101101186	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,988.71
2	101101187	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,990.71
3	101101188	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,972.73
4	101101190	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,973.73
5	101101194	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,966.73
6	101101195	14625	SF	HDE040A000 40 mil Avg GSE HD Blk, HD, Smooth, 22.5'	2,964.74

TERMS: Prepaid / Collect

Customer P.O. #: 99100069

Section 7

Load Verification

Signed

X

Pick Up # 265

Seal #

Truckers P.O. #

Total Square Ft 87,750

Total Weight 17,857.335

Driver Requirements:

1) Driver must pre call 24 hrs prior to delivery and on Friday for Monday delivery.
2) Driver must call (281) 230-6781 when unloaded.
3) Driver must call and advise any delay in transit.
4) A copy of this B/L must accompany Freight Invoice.

CARRIER NAME: _____

CARRIER SIGNATURE: _____

DATE: _____

Sign Here For Shipper

Shipper: _____

Address: GSE Lining Technology Inc.
19103 Gundle Rd.
Houston, Tx. 77073-3598

Sign Here For Agent Of Shipper

Agent for Shipper: _____

(GSE LINING TECHNOLOGY, INC.
APPROVED AGENT FOR SHIPPER)

Agent must sign, detach and retain a copy of this Shipping Order

COPY 3

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 101101186

ROLL IDENTIFICATION

Roll Number	101101186
Product Name	HDE040A000
Production Date	3/27/99

Length	650	feet
	198	meters
Width	22.5	feet
	6.9	meters
Sheet Area	14,625	sq. feet
	1,359	sq. meters
Weight	2,992	pounds
	1,357	kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	40	(1.02)
Minimum		every roll	36	(0.89)	38	(0.94)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	108	(189)
- MD		every roll	86	(151)	110	(192)
break strength, ppi - TD		every roll	162	(284)	182	(319)
- MD		every roll	162	(284)	197	(344)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD		every roll	13		18	
break elongation, % - TD	gauge length = 2.5"	every roll	560		584	
- MD		every roll	560		632	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	34	(150)
- MD		every roll	30	(134)	35	(157)
Puncture Resistance, lb. (N)	FTMS 101-C					
		every roll	52	(231)	67	(300)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.3	
- MD		every roll	-2.0		-0.3	
Density, g/cc	ASTM D1505					
		every 5th *	0.940		0.946	
Carbon Black Content, %	ASTM D1603					
		every 5th *	2.0		2.5	
Carbon Black Dispersion	ASTM D3015					
		every 5th *	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B					
	Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
c.m.
3/31/99
QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 101101187

ROLL IDENTIFICATION

Roll Number	101101187
Product Name	HDE040A000
Production Date	3/27/99

Length	650 198	feet meters
Width	22.5 6.9	feet meters
Sheet Area	14,625 1,359	sq. feet sq. meters
Weight	2,994 1,358	pounds kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	40	(1.03)
Minimum		every roll	36	(0.89)	38	(0.95)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	108	(189)
- MD		every roll	86	(151)	108	(189)
break strength, ppi - TD		every roll	162	(284)	183	(321)
- MD		every roll	162	(284)	194	(339)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD		every roll	13		18	
break elongation, % - TD	gauge length = 2.5"	every roll	560		592	
- MD		every roll	560		632	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	35	(158)
- MD		every roll	30	(134)	35	(156)
Puncture Resistance, lb. (N)	FTMS 101-C					
		every roll	52	(231)	70	(311)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.3	
- MD		every roll	-2.0		-0.3	
Density, g/cc	ASTM D1505					
		every 5th *	0.940		0.946	
Carbon Black Content, %	ASTM D1603					
		every 5th *	2.0		2.5	
Carbon Black Dispersion	ASTM D3015					
		every 5th *	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
L.M.
3/31/99
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 101101188

ROLL IDENTIFICATION

Roll Number	101101188
Product Name	HDE040A000
Production Date	3/27/99

Length	650	feet
	198	meters
Width	22.5	feet
	6.9	meters
Sheet Area	14,625	sq. feet
	1,359	sq. meters
Weight	2,976	pounds
	1,350	kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	41	(1.04)
Minimum		every roll	36	(0.89)	38	(0.95)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	109	(191)
- MD		every roll	86	(151)	107	(188)
break strength, ppi - TD		every roll	162	(284)	190	(332)
- MD		every roll	162	(284)	186	(326)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD		every roll	13		17	
break elongation, % - TD	gauge length = 2.5"	every roll	560		608	
- MD		every roll	560		624	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	35	(158)
- MD		every roll	30	(134)	36	(162)
Puncture Resistance, lb. (N)	FTMS 101-C					
		every roll	52	(231)	72	(321)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.4	
- MD		every roll	-2.0		-0.3	
Density, g/cc	ASTM D1505					
		every 5th *	0.940		0.946	
Carbon Black Content, %	ASTM D1603					
		every 5th *	2.0		2.5	
Carbon Black Dispersion	ASTM D3015					
		every 5th *	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
L.M.
3/31/99
QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 101101190

ROLL IDENTIFICATION

Roll Number	101101190
Product Name	HDE040A000
Production Date	3/27/99

Length	650	feet
	198	meters
Width	22.5	feet
	6.9	meters
Sheet Area	14,625	sq. feet
	1,359	sq. meters
Weight	2,977	pounds
	1,350	kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	40	(1.02)
Minimum		every roll	36	(0.89)	37	(0.93)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	111	(194)
- MD		every roll	86	(151)	109	(191)
break strength, ppi - TD		every roll	162	(284)	205	(358)
- MD		every roll	162	(284)	197	(346)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD		every roll	13		17	
break elongation, % - TD	gauge length = 2.5"	every roll	560		675	
- MD		every roll	560		613	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	33	(149)
- MD		every roll	30	(134)	36	(159)
Puncture Resistance, lb. (N)	FTMS 101-C					
		every roll	52	(231)	71	(316)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.4	
- MD		every roll	-2.0		-0.3	
Density, g/cc	ASTM D1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D1603					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D3015					
		every 5th	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B					
	Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
L.M.
3/31/99
QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 101101194

ROLL IDENTIFICATION

Roll Number	101101194
Product Name	HDE040A000
Production Date	3/28/99

Length	650	feet
	198	meters
Width	22.5	feet
	6.9	meters
Sheet Area	14,625	sq. feet
	1,359	sq. meters
Weight	2,970	pounds
	1,347	kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	40	(1.02)
Minimum		every roll	36	(0.89)	37	(0.91)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	111	(194)
- MD		every roll	86	(151)	105	(184)
break strength, ppi - TD		every roll	162	(284)	212	(370)
- MD		every roll	162	(284)	200	(351)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD		every roll	13		17	
break elongation, % - TD	gauge length = 2.5"	every roll	560		698	
- MD		every roll	560		592	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	30	(134)
- MD		every roll	30	(134)	35	(156)
Puncture Resistance, lb. (N)	FTMS 101-C					
		every roll	52	(231)	69	(308)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.3	
- MD		every roll	-2.0		-0.2	
Density, g/cc	ASTM D1505					
		every 5th *	0.940		0.946	
Carbon Black Content, %	ASTM D1603					
		every 5th *	2.0		2.5	
Carbon Black Dispersion	ASTM D3015					
		every 5th *	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B					
	Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
L.M.
3/31/99
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 101101195

ROLL IDENTIFICATION

Roll Number	101101195
Product Name	HDE040A000
Production Date	3/28/99

Length	650	feet
	198	meters
Width	22.5	feet
	6.9	meters
Sheet Area	14,625	sq. feet
	1,359	sq. meters
Weight	2,968	pounds
	1,346	kilograms

RESIN INFORMATION

Lot Number	7190105
Type	TR400GS
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
density, g/cc	ASTM D 1505	0.938
melt index, g/10 min.	ASTM D 1238 (E)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTMD 1593/D751/D5199					
Average		every roll	40	(1.00)	41	(1.03)
Minimum		every roll	36	(0.89)	37	(0.93)
Tensile Properties:	ASTM D638, Type IV					
yield strength, ppi - TD		every roll	86	(151)	111	(194)
- MD		every roll	86	(151)	103	(181)
break strength, ppi - TD		every roll	162	(284)	209	(366)
- MD		every roll	162	(284)	199	(348)
yield elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD		every roll	13		17	
break elongation, % - TD	gauge length = 2.5"	every roll	560		692	
- MD		every roll	560		597	
Tear Resistance, lb. (N)	ASTM D1004					
- TD		every roll	30	(134)	30	(134)
- MD		every roll	30	(134)	35	(156)
Puncture Resistance, lb. (N)	FTMS 101-C	every roll	52	(231)	69	(308)
Dimensional Stability, %	ASTM D1204 (100C, 1hr)					
- TD		every roll	-2.0		-0.4	
- MD		every roll	-2.0		-0.2	
Density, g/cc	ASTM D1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D1603	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D3015	every 5th	A2		A2	
ESCR (hr)	ASTM 1693 Cond. B Start Date = 4/1/99	every roll	1500		Pending	

Order No.	6110
Customer Name	MID-AMERICA
Location	LITTLETON, NC

APPROVED
L.M.
3/31/99
QA

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 792 • PHONE 713 475-3666
PASADENA, TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

February 02, 1999

JHV# 2472-99

FAX: 281-230-2510

GSE Lining Technology, Inc.
19103 Gundle Road
Houston, TX 77073

Rick Schaefer

This letter will certify that the Marlex* resin shown below, as supplied by Phillips Chemical Company, conforms to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	7190105
P.O. Number:	STOCK
Date Shipped:	02/01/99
Package:	PSPX 1027
Quantity:	185300 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate,ASTM D1238:	11.3 G/10 MIN
Density, ASTM D1505:	.938 G/CC
HLMI/MI Ratio:	141.
Production Date:	01/19/99
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C.**
Color:	109.667

J. H. Vaden
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

APPENDIX 3.3
CONFORMANCE TEST RESULTS

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF GEOMEMBRANE CONFORMANCE TEST RESULTS

Roll Number	Avg/Min Thickness (mils)	Specific Gravity (g/cc)	Carbon Black Content (%)	MD Tensile Load @ Break (lb/in)	MD Tensile Strain @ Break (%)	TD Tensile Load @ Break (lb/in)	TD Tensile Strain @ Break (%)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)
2806200	46/43	0.90	2.92	102	610	105	697	21	52
2900174	47/46	0.88	3.20	106	602	101	660	19	56
2900191	46/46	0.91	2.86	113	696	100	701	17	58
2900195	46/46	0.88	3.32	111	688	103	695	17	59
2900218	48/46	0.89	2.76	113	649	116	789	20	57
2900335	43/43	0.88	3.21	95	600	109	724	18	52
Specified Requirements	36 (Min)	0.88 (Min)	2.00 (Min)	90 (Min)	600 (Min)	90 (Min)	600 (Min)	14 (Min)	45 (Min)

NOTES:

1. MD = Machine (Roll) Direction; TD = Transverse (Cross-Machine) Direction.

2. Testing performed by TRI Environmental, Inc.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2806200
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	2.89	2.95									2.92	0.03		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.90	0.90	0.90								0.90	0.00		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	45	51	48	47	53						49	3		N/A
TD Yield Strength (ppi)	35	36	37	38	39						37	1		N/A
MD Break Strength (ppi)	102	100	105	104	101						102	2		90 min
TD Break Strength (ppi)	108	105	111	100	102						105	4		90 min
MD Yield Elongation (%)	97	121	90	90	62						92	19		N/A
TD Yield Elongation (%)	77	85	82	79	90						83	5		N/A
MD Break Elongation (%)	599	572	612	645	622						610	24		600 min
TD Break Elongation (%)	713	696	751	655	669						697	34		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	52	51	50	50	50	50	50	48	54	55	52	2		45 min
	54	56	55	55	56									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	20	20	21	21	18	21	21	21	23	21	21	1		14 min
TD Tear Strength (lbs)	20	19	20	20	20	20	19	19	20	19	20	0		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	45	49	43	45	44	48	48	43	44	46	46			36 - 44
											43	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2900174
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	3.15	3.24									3.20	0.04		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.88	0.89	0.89								0.88	0.00		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	45	49	48	47	49						48	1		N/A
TD Yield Strength (ppi)	35	35	38	38	38						37	1		N/A
MD Break Strength (ppi)	102	113	87	114	113						106	10		90 min
TD Break Strength (ppi)	97	103	104	107	96						101	4		90 min
MD Yield Elongation (%)	72	69	69	69	69						70	1		N/A
TD Yield Elongation (%)	90	90	90	90	90						90	0		N/A
MD Break Elongation (%)	585	625	545	628	628						602	33		600 min
TD Break Elongation (%)	632	673	672	704	621						660	30		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	58	58	57	55	56	55	56	55	56	57	56	1		45 min
	53	53	55	54	55									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	18	17	18	20	20	18	19	19	19	20	19	1		14 min
TD Tear Strength (lbs)	18	18	18	18	18	17	18	18	18	18	18	0		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	46	47	48	47	48	47	48	48	48	47	47			36 - 44
											46	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2900191
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	2.97	2.75									2.86	0.11		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.90	0.91	0.90								0.91	0.01		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	40	42	41	43	43						42	1		N/A
TD Yield Strength (ppi)	36	37	35	36	36						36	1		N/A
MD Break Strength (ppi)	106	116	111	117	115						113	4		90 min
TD Break Strength (ppi)	108	93	98	100	103						100	5		90 min
MD Yield Elongation (%)	62	72	62	64	64						65	4		N/A
TD Yield Elongation (%)	72	87	90	74	69						78	8		N/A
MD Break Elongation (%)	652	720	689	716	704						696	25		600 min
TD Break Elongation (%)	752	643	685	695	732						701	38		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	59	58	58	57	57	59	59	59	59	59	58	1		45 min
	59	59	58	57	57									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	17	17	16	17	16	17	17	16	17	17	17	0		14 min
TD Tear Strength (lbs)	16	15	16	17	17	17	17	17	18	16	17	1		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	47	47	47	46	46	46	46	46	46	46	46			36 - 44
											46	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2900195
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	3.23	3.40									3.32	0.09		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.88	0.88	0.89								0.88	0.00		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	41	42	41	43	43						42	1		N/A
TD Yield Strength (ppi)	36	35	37	38	38						37	1		N/A
MD Break Strength (ppi)	112	110	111	114	108						111	2		90 min
TD Break Strength (ppi)	104	86	104	111	109						103	9		90 min
MD Yield Elongation (%)	67	59	64	64	59						63	3		N/A
TD Yield Elongation (%)	69	69	69	69	74						70	2		N/A
MD Break Elongation (%)	681	671	704	713	672						688	17		600 min
TD Break Elongation (%)	693	580	707	764	732						695	62		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	58	59	58	58	57	61	61	60	60	59	59	1		45 min
	59	60	59	59	58									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	17	15	16	17	16	17	18	17	19	18	17	1		14 min
TD Tear Strength (lbs)	17	17	18	17	17	17	18	18	18	18	18	1		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	47	47	46	46	46	46	46	46	47	47	46			36 - 44
											46	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2900218
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	2.79	2.73									2.76	0.03		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.86	0.87	0.87								0.87	0.00		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	49	51	54	57	49						52	3		N/A
TD Yield Strength (ppi)	37	37	37	38	38						37	0		N/A
MD Break Strength (ppi)	124	111	101	122	105						113	9		90 min
TD Break Strength (ppi)	112	115	120	115	120						116	3		90 min
MD Yield Elongation (%)	51	36	36	33	59						43	10		N/A
TD Yield Elongation (%)	77	77	69	69	69						72	4		N/A
MD Break Elongation (%)	735	635	583	664	627						649	50		600 min
TD Break Elongation (%)	741	764	837	773	829						789	38		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	60	58	57	57	58	56	56	56	58	57	57	1		45 min
	57	57	58	55	56									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	19	19	20	20	20	19	18	23	20	20	20	1		14 min
TD Tear Strength (lbs)	21	19	19	19	19	20	20	19	20	20	20	1		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	48	50	46	47	48	50	49	46	47	47	48			36 - 44
											46	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS
Hazen & Sawyer P.C.
Halifax Co. Coal Ash Mondfill

Material: 40 mil Unreinforced Polypropylene
Sample Identification: 2900335
TRI Log #: E2112-70-01

SRA 02/17/99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STANDARD DEV.	COEFF. OF VAR.	PROJECT SPEC
Carbon Black Content (ASTM D 1603)														
% Carbon Black	3.30	3.11									3.21	0.09		2.00 - 3.00
Density (ASTM D 792)														
Density (g/cm3)	0.89	0.88	0.88								0.88	0.00		0.88 min
Tensile Properties (ASTM D 638/NSF 54)														
MD Yield Strength (ppi)	41	41	46	45	47						44	3		N/A
TD Yield Strength (ppi)	38	38	38	38	38						38	0		N/A
MD Break Strength (ppi)	102	70	105	106	91						95	13		90 min
TD Break Strength (ppi)	117	107	102	110	107						109	5		90 min
MD Yield Elongation (%)	69	69	72	69	92						74	9		N/A
TD Yield Elongation (%)	67	67	67	67	67						67	0		N/A
MD Break Elongation (%)	615	592	632	616	544						600	31		600 min
TD Break Elongation (%)	801	712	664	733	708						724	45		600 min
Puncture Resistance (ASTM D 4833)														
Puncture Strength (lbs)	54	52	53	53	49	52	52	52	52	52	52	1		45 min
	52	52	51	51	52									
Tear Resistance (ASTM D 1004)														
MD Tear Strength (lbs)	18	18	18	17	19	17	17	19	17	19	18	1		14 min
TD Tear Strength (lbs)	17	17	16	14	17	17	17	17	18	18	17	1		14 min
Thickness (ASTM D 5199)														
Thickness (mils)	43	44	44	43	43	43	43	44	43	44	43			36 - 44
											43	<= min		

MD Machine Direction
TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed.
TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

Client: Hazen and Sawyer, P.C.
Project: 3786-004

Material: unreinforced polypropylene geomembrane
Roll #: 2900218
TRI Log #: E2130-23-01

SRA 11.16.99
Quality Review/Date

PARAMETER	TEST REPLICATE NUMBER										MEAN	STANDARD DEV.	COEFF. OF VAR.
	1	2	3	4	5	6	7	8	9	10			
Density (ASTM D 792)													
Density (g/cm3)	0.896	0.881	0.881								0.886	0.007	

MD Machine Direction
TD Transverse Direction
N/A Not Available

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

APPENDIX 3.4
SERROT CORPORATION
CONFORMANCE TESTING LETTERS

SERROT
CORPORATION
GEOMEMBRANE LINING SYSTEMS

125 Cassia Way
Henderson, NV
89014 USA

(702) 566-8600
(800) 237-1777
FAX: (702) 566-4739

March 16, 1999

Mr. Robert Baker, P.E.
Hazen and Sawyer
4011 West Chase Blvd., Suite 500
Raleigh, NC 27607
Fax: 919-833-1828

Dear Mr. Baker:

This letter is sent in reference to our phone conversation of 10 March, 1999. As you can see on the attached literature from Montell Polyolefins, manufacturer of the resin used in the production of material for the Halifax County coal ash project, a typical carbon black content specification value is between 2.25 percent and 3.25 percent. Previously, a typical carbon black content specification was between 2.0 percent and 3.0 percent. However, Montell Polyolefins has recently elevated the specification to its current level.

If you require further information please contact me as soon as possible at 702-566-8600 extension 274.

Sincerely,
Serrot Corporation

Ted Fox
Quality Manager

CC: Mike Joslin, Mid America Lining Co., Inc.
Fax: 901-885-8007

SALES OFFICES

Atlanta, GA
(800) 843-6313
FAX: (770) 631-4194

Huntington Beach, CA
(800) 624-2437
FAX: (714) 895-0903

Mercerville, NJ
(609) 584-0788
FAX: (609) 584-0751

Phoenix, AZ
(800) 682-8251
FAX: (602) 952-0297

Recycled Paper

Smooth FPP Geomembrane Sample Specification

A typical physical and mechanical property specification for smooth unreinforced geomembrane made from Astryn flexible polypropylene resins is in Figure 33.

Figure 33
Minimum Value for Black Smooth Unreinforced FPP Geomembranes

Property	*Test Method*		
Nominal Thickness [mil]		40	60
Minimum Thickness [mil]	ASTM D 751, D 1593 or D 5199	36	54
Carbon Black Content [%]	ASTM D 1603, modified or D4218	2.75 ± 0.5	2.75 ± 0.5
Tensile Properties: (Avg. MD & TD)	ASTM D 638 Type IV, 20 IPM NSF 54 modified		
Strength at Break [lb./in]/		65	95
Elongation at Break [%]	(2.5" gauge length)	>500	>500
Tear Resistance [lb.]	ASTM D 1004	12	18
Puncture Resistance [lb.]	FTMS 101, Method 2065 or D4833	38	45
Dimensional Stability [% change]	ASTM D 1204 (1 hr. at 100 ∞C)	± 2	± 2

A suggested wedge weld strength specification for smooth unreinforced flexible polypropylene geomembrane is in Figure 34.

Figure 34
Minimum Weld Values for Smooth Unreinforced FPP Geomembranes

Property	*Test Method*	
Thickness, mil	ASTM D751	40
Peel strength, ppi	ASTM D 4437	20
Shear strength, ppi	ASTM D 4437	30

The elongation of unreinforced flexible polypropylene is so high that field tensometers can not take the material to break without reclamping the specimen. Reclamping is not recommended, rather the shear strength should be recorded at the maximum travel of the field tensometer.

It is suggested you contact flexible polypropylene geomembrane producers to review any proposed sheet specification. Test methods change and test values vary from lab to lab.

8/98

SERROT
CORPORATION
GEOMEMBRANE LINING SYSTEMS

125 Cassia Way
Henderson, NV
89014 USA

(702) 566-8600
(800) 237-1777
FAX: (702) 566-4739

March 22, 1999

Mr. Robert Baker, P.E.
Hazen and Sawyer
4011 West Chase Blvd., Suite 500
Raleigh, NC 27607
Fax: 919-833-1828

Dear Mr. Baker:

This letter is sent in reference to our phone conversation of 10 March, 1999. Regarding the variation between the test results reported by TRI and Serrot, I can tell you that both laboratories are accredited by the Geosynthetic Accreditation Institute (GAI) under the Laboratory Accreditation Program (LAP). Serrot requested and received material from TRI for additional testing, and has confirmed the content originally reported as correct. Side-by-side testing with TRI has confirmed what Serrot has seen previously: flexible polypropylene exhibits greater interlab and intralab variation in carbon content testing than does polyethylene. However, testing by both Serrot and TRI has confirmed that the material is properly stabilized. Please contact me at your earliest convenience if I can be of further assistance.

Sincerely,
Serrot Corporation

Ted Fox
Quality Manager

CC: Mike Joslin, Mid America Lining Co., Inc.
Fax: 901-885-8007

SALES OFFICES

Atlanta, GA
(800) 843-6313
FAX: (770) 631-4194

Huntington Beach, CA
(800) 624-2437
FAX: (714) 895-0903

Mercerville, NJ
(609) 584-0788
FAX: (609) 584-0751

Phoenix, AZ
(800) 682-8251
FAX: (602) 952-0297

Recycled Paper

APPENDIX 3.5
GEOMEMBRANE INVENTORY FORMS

HALIFAX COUNTY COAL ASH MONOFILL - CELL 2 CONSTRUCTION (CONTRACT 1)
40-mil UNREINFORCED POLYPROPYLENE GEOMEMBRANE MQC CERT CHECK
H & S PROJ. NO.: 3786-004 BY: RCB DATE: 04/14/99

MANUFACTURER: SERROT CORP.
FABRICATOR/INSTALLER: MID-AMERICA LINING COMPANY

MQC CERTS REVIEWED		ROLLS DELIVERED	
ROLL NO.	LOT NO.	ROLL NO.	MQC MATCH
2806196	BAFZ185000	2806196	YES
2806197	BAFZ185000	2806197	YES
2806198	BAFZ185000	---	---
2806199	BAFZ185000	---	---
2806200	BAFZ185000	---	---
2806201	BAFZ185000	2806201	YES
2806202	BAFZ185000	2806202	YES
2806203	BAFZ185000	2806203	YES
2806204	BAFZ185000	2806204	YES
2806205	BAFZ185000	2806205	YES
2806206	BAFZ185000	---	---
2806207	BAFZ185000	2806207	YES
2806208	BAFZ185000	2806208	YES
2806209	BAFZ185000	---	---
2806211	BAFZ185000	---	---
2900174	BAFZ185000	2900174	YES
2900178	BAFZ185000	---	---
2900179	BAFZ185000	---	---
2900181	BAFZ185000	---	---
2900182	BAFZ185000	2900182	YES
2900183	BAFZ185000	2900183	YES
2900184	BAFZ185000	2900184	YES
2900185	BAFZ185000	2900185	YES
2900186	BAFZ185000	2900186	YES
2900187	BAFZ185100	2900187	YES
2900188	BAFZ185100	2900188	YES
2900189	BAFZ185100	2900189	YES
2900190	BAFZ185100	2900190	YES
2900191	BAFZ185100	2900191	YES
2900192	BAFZ185100	2900192	YES
2900193	BAFZ185100	2900193	YES
2900194	BAFZ185100	2900194	YES
2900195	BAFZ205400	2900195	YES
2900196	BAFZ205400	2900196	YES
2900197	BAFZ205400	2900197	YES
2900198	BAFZ205400	2900198	YES
2900199	BAFZ205400	2900199	YES
2900200	BAFZ205400	2900200	YES
2900201	BAFZ205400	---	---
2900202	BAFZ205400	2900202	YES

HALIFAX COUNTY COAL ASH MONOFILL - CELL 2 CONSTRUCTION (CONTRACT 1)
40-mil UNREINFORCED POLYPROPYLENE GEOMEMBRANE MQC CERT CHECK
H & S PROJ. NO.: 3786-004 BY: RCB DATE: 04/14/99

MANUFACTURER: SERROT CORP.
FABRICATOR/INSTALLER: MID-AMERICA LINING COMPANY

MQC CERTS REVIEWED		ROLLS DELIVERED	
ROLL NO.	LOT NO.	ROLL NO.	MQC MATCH
2900203	BAFZ205400	2900203	YES
2900204	BAFZ205400	2900204	YES
2900205	BAFZ205400	2900205	YES
2900206	BAFZ205400	2900206	YES
2900207	BAFZ205400	2900207	YES
2900208	BAFZ205400	2900208	YES
2900209	BAFZ205400	2900209	YES
2900210	BAFZ205400	2900210	YES
2900211	BAFZ205400	2900211	YES
2900212	BAFZ205400	2900212	YES
2900213	BAFZ205400	2900213	YES
2900214	BAFZ205400	2900214	YES
2900215	BAFZ205400	2900215	YES
2900216	BAFZ205400	2900216	YES
2900217	BAFZ205400	2900217	YES
2900218	BAFZ205400	2900218	YES
2900219	BAFZ205400	2900219	YES
2900220	BAFZ205400	2900220	YES
2900221	BAFZ205400	2900221	YES
2900222	BAFZ205400	2900222	YES
2900223	BAFZ205400	2900223	YES
2900224	BAFZ205400	2900224	YES
2900225	BAFZ205400	---	---
2900256	BAFZ205400	2900256	YES
2900257	BAFZ205400	2900257	YES
2900258	BAFZ205400	2900258	YES
2900259	BAFZ205400	2900259	YES
2900260	BAFZ205400	2900260	YES
2900261	BAFZ205400	2900261	YES
2900262	BAFZ205400	---	---
2900264	BAFZ205400	2900264	YES
2900266	BAFZ205400	2900266	YES
2900267	BAFZ205400	2900267	YES
2900268	BAFZ205400	2900268	YES
2900269	BAFZ205400	2900269	YES
2900270	BAFZ205400	2900270	YES
2900271	BAFZ205400	2900271	YES
2900272	BAFZ205400	2900272	YES
2900273	BAFZ205400	2900273	YES
2900274	BAFZ205400	2900274	YES

HALIFAX COUNTY COAL ASH MONOFILL - CELL 2 CONSTRUCTION (CONTRACT 1)
40-mil UNREINFORCED POLYPROPYLENE GEOMEMBRANE MQC CERT CHECK
H & S PROJ. NO.: 3786-004 BY: RCB DATE: 04/14/99

MANUFACTURER: SERROT CORP.
FABRICATOR/INSTALLER: MID-AMERICA LINING COMPANY

MQC CERTS REVIEWED		ROLLS DELIVERED	
ROLL NO.	LOT NO.	ROLL NO.	MQC MATCH
2900275	BAFZ205400	2900275	YES
2900277	BAFZ205400	---	---
2900278	BAFZ205400	2900278	YES
2900279	BAFZ205400	2900279	YES
2900335	BAFZ205400	2900335	YES
2900336	BAFZ205400	---	---
2900339	BAFZ205400	2900339	YES
2900340	BAFZ205400	---	---
2900341	BAFZ205400	---	---
2900342	BAFZ205400	2900342	YES
2900343	BAFZ205400	2900343	YES
2900344	BAFZ205400	2900344	YES
2900345	BAFZ205400	---	---
2900346	BAFZ205400	2900346	YES
2900347	BAFZ205400	---	---
2900348	BAFZ205400	2900348	YES
2900349	BAFZ205400	---	---
2900350	BAFZ205400	2900350	YES
2900351	BAFZ205400	2900351	YES
2900352	BAFZ205400	2900352	YES
2900353	BAFZ205400	2900353	YES
2900354	BAFZ205400	2900354	YES
2900355	BAFZ205400	2900355	YES
2900356	BAFZ205400	2900356	YES
2900357	BAFZ205400	2900357	YES
2900358	BAFZ205400	2900358	YES
106 (# OF ROLLS)		87 (# OF ROLLS)	

GEOSYNTHETICS FIELD INVENTORY RECORD

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 3/31/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: SUNNY, BREEZY, ~50°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (1)

DELIVERY DATE: 3/31/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA HAS BEEN BACKDRAGGED, NO POTENTIAL RUN-ON FROM ADJACENT AREAS

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900351		10	535		CORE SLIGHTLY FLATTENED
2	2900352		10	535		ROLL PUNCTURE ~5 WRAPS DEEP
3	2900256		10	535		
4	2900190		10	535		
5	2900196		10	535		
6	2900213		10	535		ROLL ABRASION & INDENTATION ~2 WRAPS DEEP
7	2900215		10	535		
8	2900206		10	535		
9	2900198		10	535		
10	2900212		10	535		
11	2900354		10	535		SMALL INDENTATION ~2 WRAPS DEEP
12	2900258		10	535		
13	2900355		10	535		
14	2900353		10	535		
15	2900274		10	535		

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD 2 of 3

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 3/31/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: SUNNY, BREEZY, ~50°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (1)

DELIVERY DATE: 3/31/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA HAS BEEN BACKDRAGGED; NO POTENTIAL RUN-ON FROM ADJACENT AREAS

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900257		10	535		
2	2900358		10	535		
3	2900193		10	535		(2) SMALL INDENTATIONS ~1 WRAP DEEP
4	2900192		10	535		UNABLE TO INSPECT ROLL (SURROUNDED BY STACKED ROLLS)
5	2900279		10	535		~2" WIDE TEAR IN OUTER WRAP
6	2900271		10	535		
7	2900267		10	535		
8	2900357		10	535		SMALL INDENTATION ~1 WRAP DEEP
9	2900348		10	535		CORE SLIGHTLY FLATTENED; (2) SMALL INDENTATIONS ~1 WRAP DEEP
10	2900214		10	535		
11	2806201		10	550 ✓		CORE SLIGHTLY FLATTENED; UNABLE TO INSPECT ROLL (@ BOTTOM OF STACK)
12	2900259		10	535		
13	2900260		10	535		PUNCTURE IN OUTER WRAP
14	2900339		10	535		PUNCTURE ~2 WRAPS DEEP
15	2900268		10	535		

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD 3 of 3

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 3/31/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: SUNNY, BREEZY, ~50°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-MIL UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (1)

DELIVERY DATE: 3/31/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA HAS BEEN BACKDRAGGED; NO POTENTIAL RUN-ON FROM ADJACENT AREAS

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900356		10	535		
2	2900194		10	535		SMALL INDENTATION IN OUTER WRAP
3	2900189		10	535		UNABLE TO INSPECT ROLL (SURROUNDED BY STACKED ROLLS)
4	2900350		10	535		
5	2900261		10	535		SMALL ABRASION ON OUTER WRAP
6	2900273		10	535		SMALL ABRASION AND ~ 3" WIDE TEAR IN OUTER WRAP
7	- END OF SHIPMENT -					
8						
9						
10						
11						
12						
13						
14						
15						

36 ROLLS TOTAL
~ 192,750 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/2/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: P. CLOUDY, ~75°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (2)

DELIVERY DATE: 4/2/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS MUDDY FROM HEAVY RAINS ON 4/1/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2806207		10	550 ✓		
2	2806202		10	550 ✓		
3	2900343		10	535		
4	2900346		10	535		
5	2900207		10	535		
6	2900210		10	535		
7	2900199		10	535		
8	2806197		10	550 ✓		
9	2900344		10	535		SMALL ABRASION ON OUTER WRAP
10	2900342		10	535		SMALL ABRASION ON OUTER WRAP
11	2806196		10	550 ✓		~2" WIDE TEAR ~3 WRAPS DEEP
12	2806205		10	550 ✓		
13	2806204		10	550 ✓		
14	2900211		10	535		UNABLE TO INSPECT ROLL (@ BOTTOM OF STACK)
15	2900205		10	535		

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD 2 of 3

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/2/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: P. CLOUDY, ~75°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (2)

DELIVERY DATE: 4/2/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS MUDDY FROM HEAVY RAINS ON 4/1/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE	
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)	SAMPLE NUMBER	DAMAGE/REMARKS
1	2900209		10	535		SMALL INDENTATION ON OUTER WRAP
2	2900218		10	535	✓	~4" WIDE PUNCTURE ~4 WRAPS DEEP
3	2900200		10	535		~2" WIDE PUNCTURE ~3 WRAPS DEEP
4	2806208		10	550 ✓		
5	2806203		10	550 ✓		SMALL INDENTATION ON OUTER WRAP
6	2900272		10	535		
7	2900204		10	535		UNABLE TO INSPECT ROLL (@ BOTTOM OF STACK)
8	2900191		10	535	✓	UNABLE TO INSPECT ROLL (@ BOTTOM OF STACK)
9	2900203		10	535		
10	2900202		10	535		
11	2900195		10	535	✓	
12	2900335		10	535	✓	
13	2900208		10	535		
14	2900174		10	535	✓	UNABLE TO INSPECT ROLL (@ BOTTOM OF STACK)
15	2900269		10	535		

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD 3 of 3

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/2/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: P. CLOUDY, ~75°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERRAT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (2)

DELIVERY DATE: 4/2/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; SOME MINOR HANDLING DAMAGE

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS MUDDY FROM HEAVY RAINS ON 4/1/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900275		10	535		SMALL ABRASION ON OUTER WRAP
2	2900270		10	535		~3" WIDE INDENTATION ON OUTER WRAP
3	- END OF SHIPMENT -					
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

32 ROLLS TOTAL
~ 172,400 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/2/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: P. CLOUDY, ~ 75°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: GSE

GEOSYNTHETIC MATERIAL TYPE: 40-mil (AVG.) HIGH DENSITY POLYETHYLENE (SMOOTH)

SHIPMENT NO.: (1)

DELIVERY DATE: 4/2/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; ROLLS PLACED DIRECTLY ON GROUND

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS MUDDY FROM HEAVY RAINS ON 4/1/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	10110187		22.5	650		
2	10110186		22.5	650		
3	10110188		22.5	650		
4	10110190		22.5	650		
5	10110194		22.5	650		
6	10110195		22.5	650		
7	– END OF SHIPMENT –					
8						
9						
10						
11						
12						
13						
14						
15						

6 ROLLS TOTAL
~ 87,750 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/10/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: SUNNY, ~70°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (3)

DELIVERY DATE: 4/7/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; MINOR HANDLING DAMAGE (MAT'L ARRIVED W/ NO LIFTING STRAPS)

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS A LITTLE WET FROM RAIN ON 4/9/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900185		10	535		ROLL EDGE DAMAGE ON OUTER WRAP
2	2900220		10	535		
3	2900224		10	535		ROLL EDGE DAMAGED ON OUTER WRAP
4	2900266		10	535		ROLL EDGE DAMAGED ON OUTER WRAP
5	2900184		10	535		ROLL EDGE DAMAGED ON OUTER WRAP
6	2900197		10	535		ROLL EDGE DAMAGE ~2 WRAPS DEEP
7	2900182		10	535		ROLL EDGE DAMAGED ON OUTER WRAP
8	2900183		10	535		SMALL TEAR, ABRASION, AND ROLL EDGE DAMAGE ON OUTER WRAP
9	2900188		10	535		ROLL EDGE DAMAGE ON OUTER WRAP
10	2900217		10	535		
11	2900278		10	535		
12	2900264		10	535		SMALL TEAR ON OUTER WRAP
13	2900222		10	535		1" WIDE PUNCTURE ~2 WRAPS DEEP
14	2900221		10	535		
15	2900187		10	535		

HAZEN AND SAWYER
Environmental Engineers & Scientists

GEOSYNTHETICS FIELD INVENTORY RECORD

PROJECT NAME: HALIFAX CO. ASH MONOFILL – CELL 2

INVENTORY DATE: 4/10/99

PROJECT NO.: 3786-004

TECHNICIAN: R.C. BAKER

OWNER: HALIFAX COUNTY, NORTH CAROLINA

WEATHER CONDITIONS: SUNNY, ~70°

STORAGE AREA: SOIL STOCKPILE NORTH OF CELL 1

GEOSYNTHETIC PRODUCT DESIGNATION: SERROT CORP.

GEOSYNTHETIC MATERIAL TYPE: 40-mil UNREINFORCED POLYPROPYLENE

SHIPMENT NO.: (3)

DELIVERY DATE: 4/7/99

GENERAL COMMENTS ON ROLL CONDITION:

ALL ROLLS IN GOOD CONDITION; NO CRUSHED CORES; MINOR HANDLING DAMAGE (MAT'L. ARRIVED W/NO LIFTING STRAPS)

GENERAL COMMENTS ON STORAGE CONDITIONS:

STORAGE AREA WAS A LITTLE WET FROM RAINS ON 4/9/99.

	MATERIAL		ROLL DIMENSIONS		CONFORMANCE SAMPLE NUMBER	DAMAGE/REMARKS
	ROLL NUMBER	BATCH/LOT NUMBER	WIDTH (Ft)	LENGTH (Ft)		
1	2900219		10	535		ROLL EDGE DAMAGE ON OUTER WRAP
2	2900223		10	535		ROLL EDGE DAMAGE ON OUTER WRAP
3	2900216		10	535		2 PUNCTURES ~ 2 WRAPS DEEP & ROLL EDGE DAMAGE
4	2900186		10	535		ROLL EDGE DAMAGE ON OUTER WRAP; SMALL ABRASION ON OUTER WRAP
5	– END OF SHIPMENT –					
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

19 ROLLS TOTAL
~ 101,650 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

APPENDIX 3.6
SUBGRADE APPROVAL FORMS

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 4/26/99 Time: 12:17 P.M.

Reference Sketch: 426-1

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

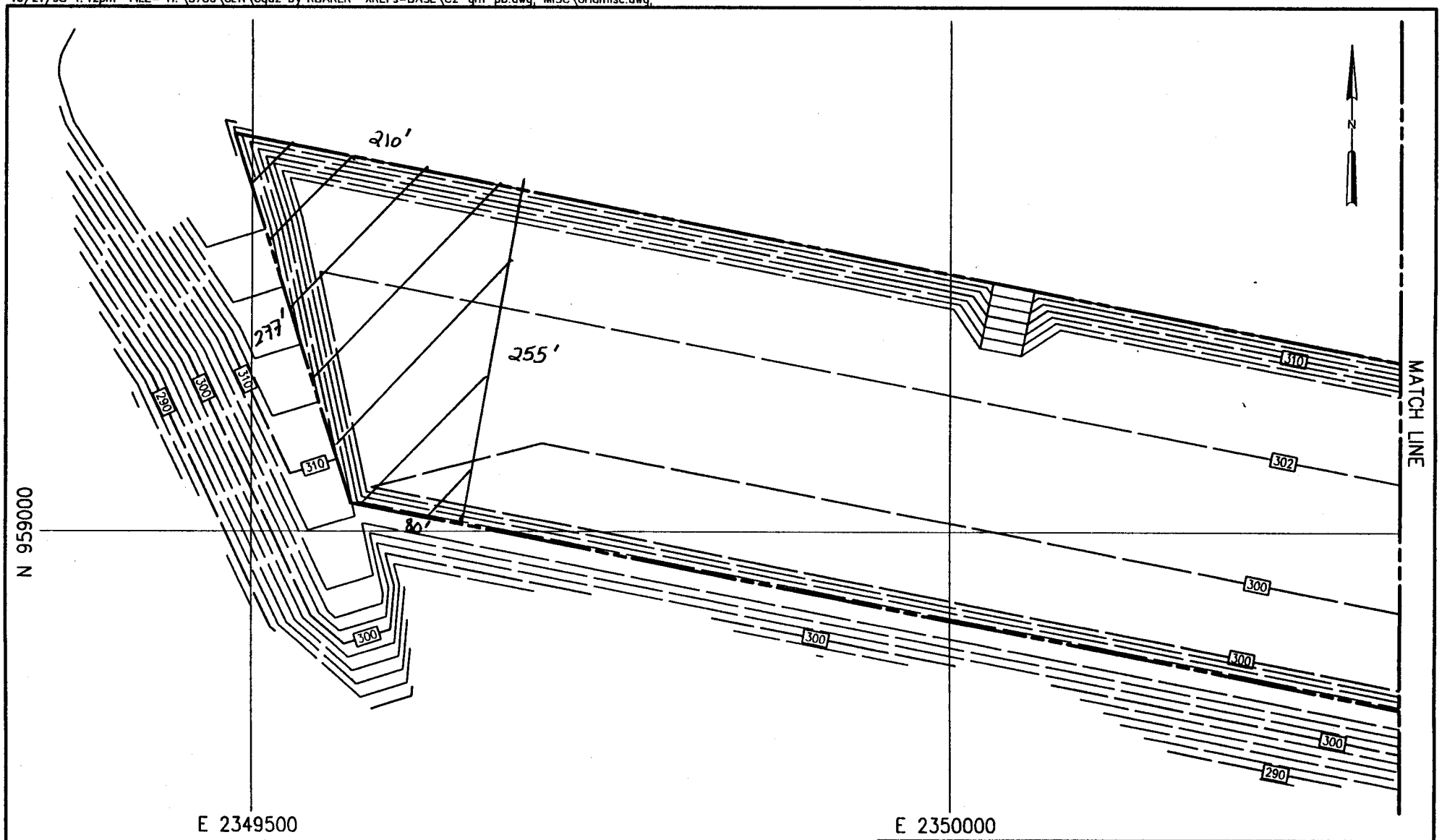
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Superintendent
EARTHWORK CONTRACTOR	Kelly Barnhill	Superintendent
ENGINEER	Robert Sahm	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm FILE= H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 4/26/99

HAZEN AND SAWYER
Environmental Engineers & Scientists

FIGURE 4-26-1

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/3/99 Time: 3:30 P.M.

Reference Sketch: 503-1

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

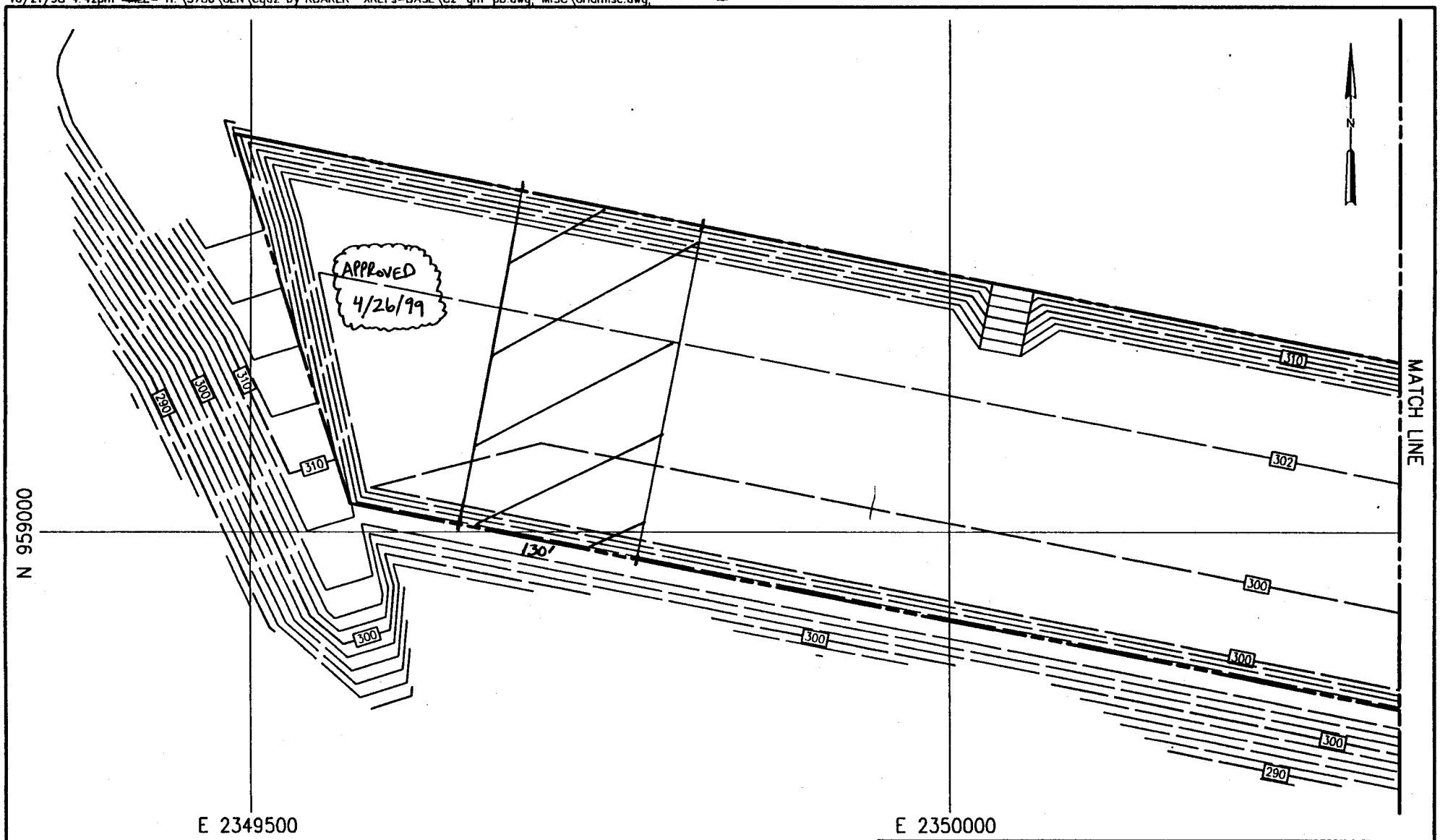
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Superintendent
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	Robert C. [illegible]	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm = H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/3/99

FIGURE 5.3-1

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/4/99 Time: 7:45 A.M.

Reference Sketch: 504-1

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

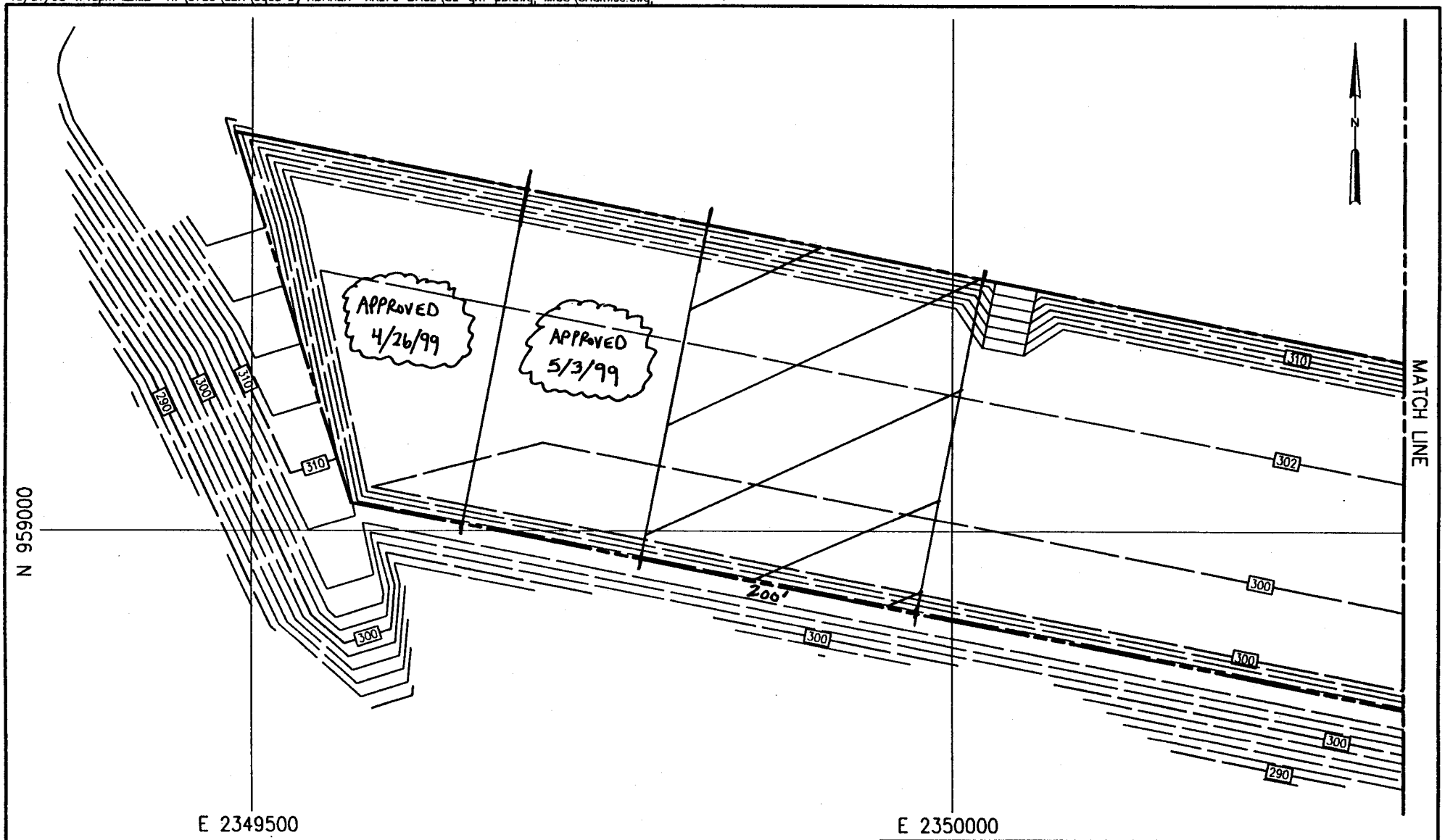
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Supr
EARTHWORK CONTRACTOR	Doug Brinkley	Superintendent
ENGINEER	Robert E. Bak	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm [illegible]E= H:\3786\GEN\Cgo2 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/4/99

HAZEN AND SAWYER
Environmental Engineers & Scientists

FIGURE 504-1

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/4/99 Time: 5:00 P.M.

Reference Sketch: 504-2

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

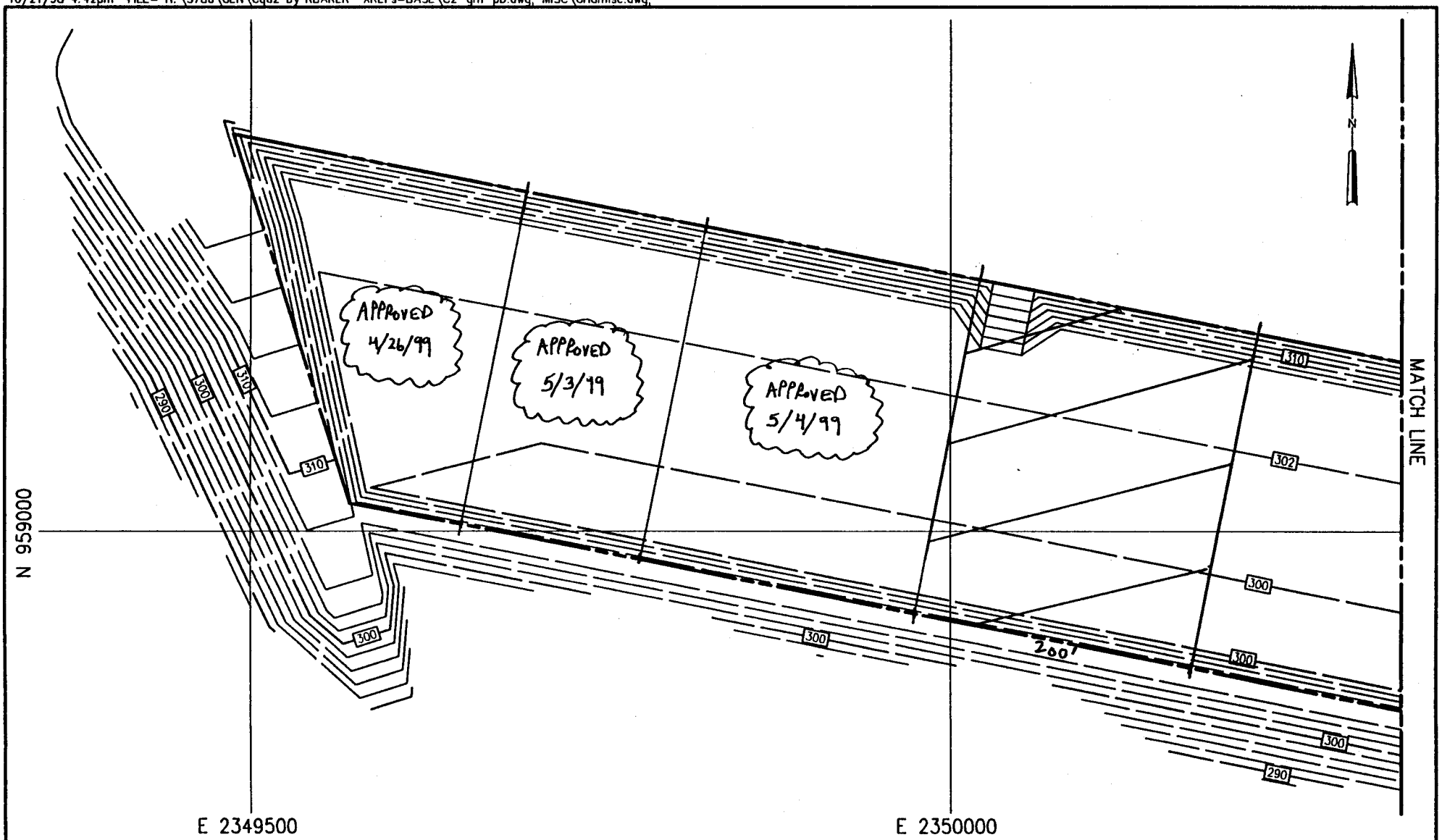
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDaniel	Super.
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	Robert C. Baker	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm FILE= H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-grn-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/4/99

FIGURE 5C4-2

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/5/95 Time: 8:30 AM.

Reference Sketch: 505-1

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

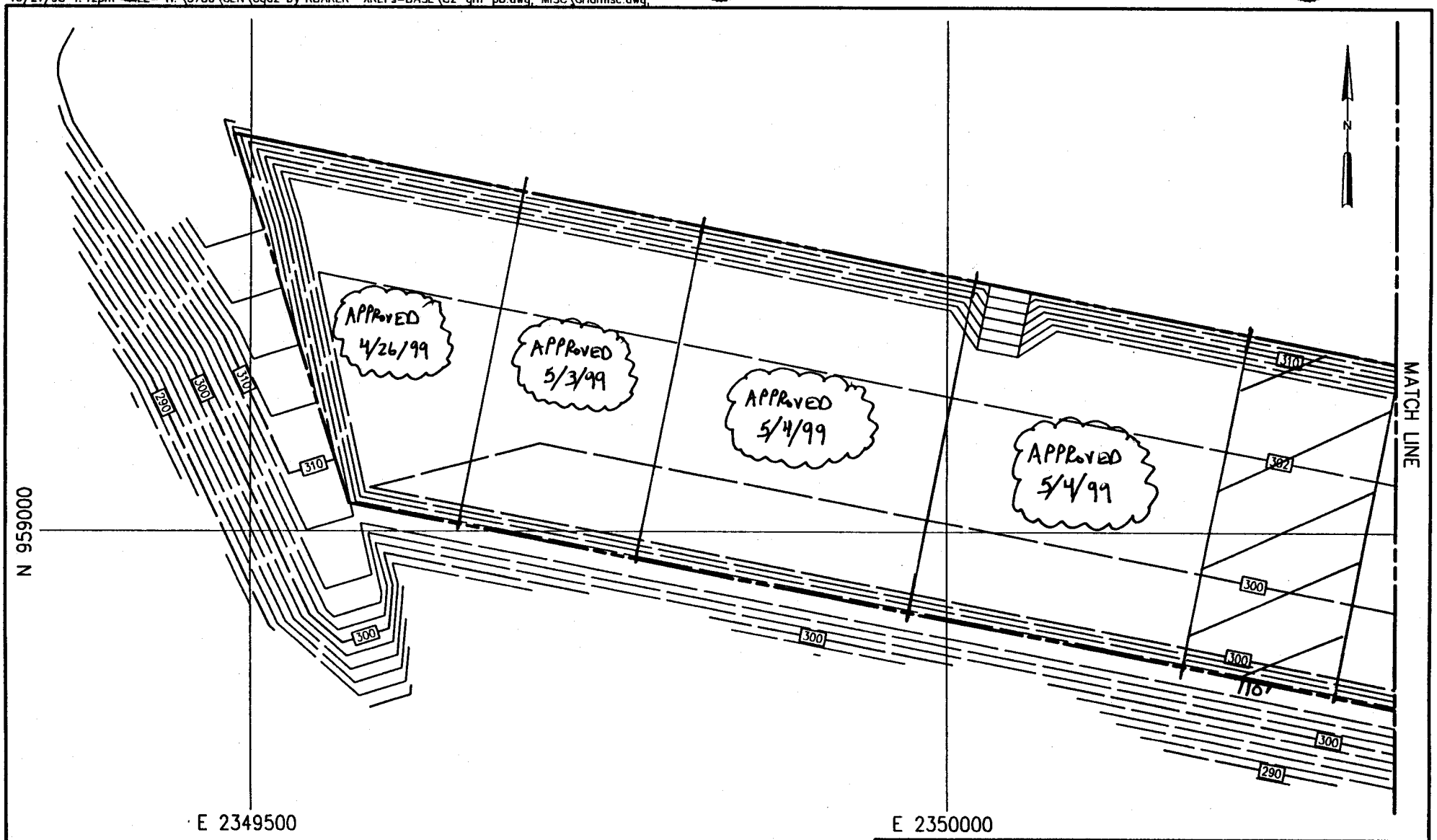
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Supt.
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	Robert C. Bahn	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm LAYOUT= H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-qm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/5/99

FIGURE 565-1

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5-5-99 Time: 4:30 P.M.

Reference Sketch: 505-2, 505-3

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

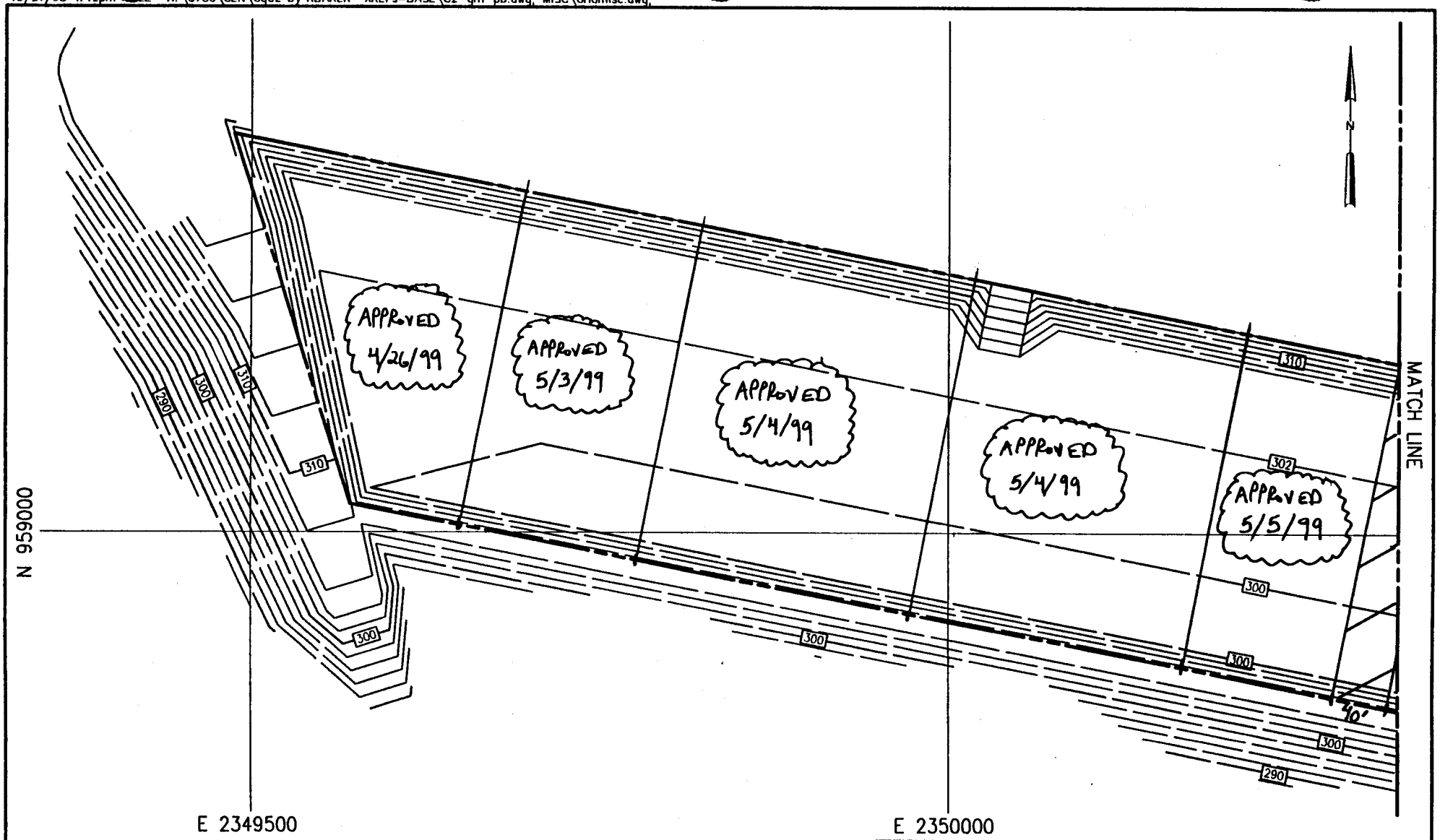
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Supt.
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	Robert C. Baker	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm = H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-qm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

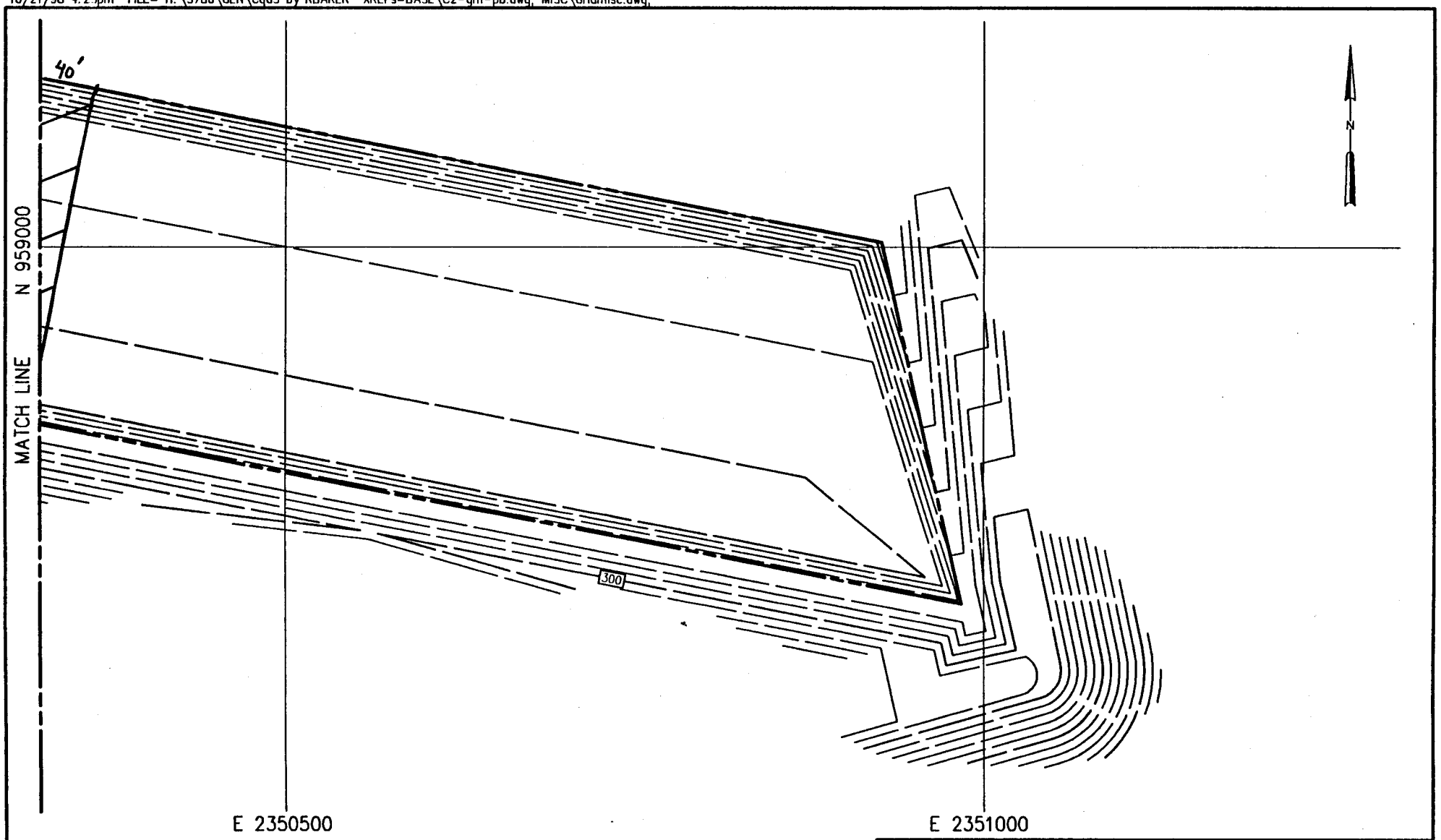
HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: PCB DATE: 5/5/99

FIGURE 5.5-2

10/21/98 4:25pm FILE= H:\3786\GEN\Cqa3 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/5/99

FIGURE 5.5-3

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/7/99 Time: 12:30 P.M.

Reference Sketch: 507-1, 507-2

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

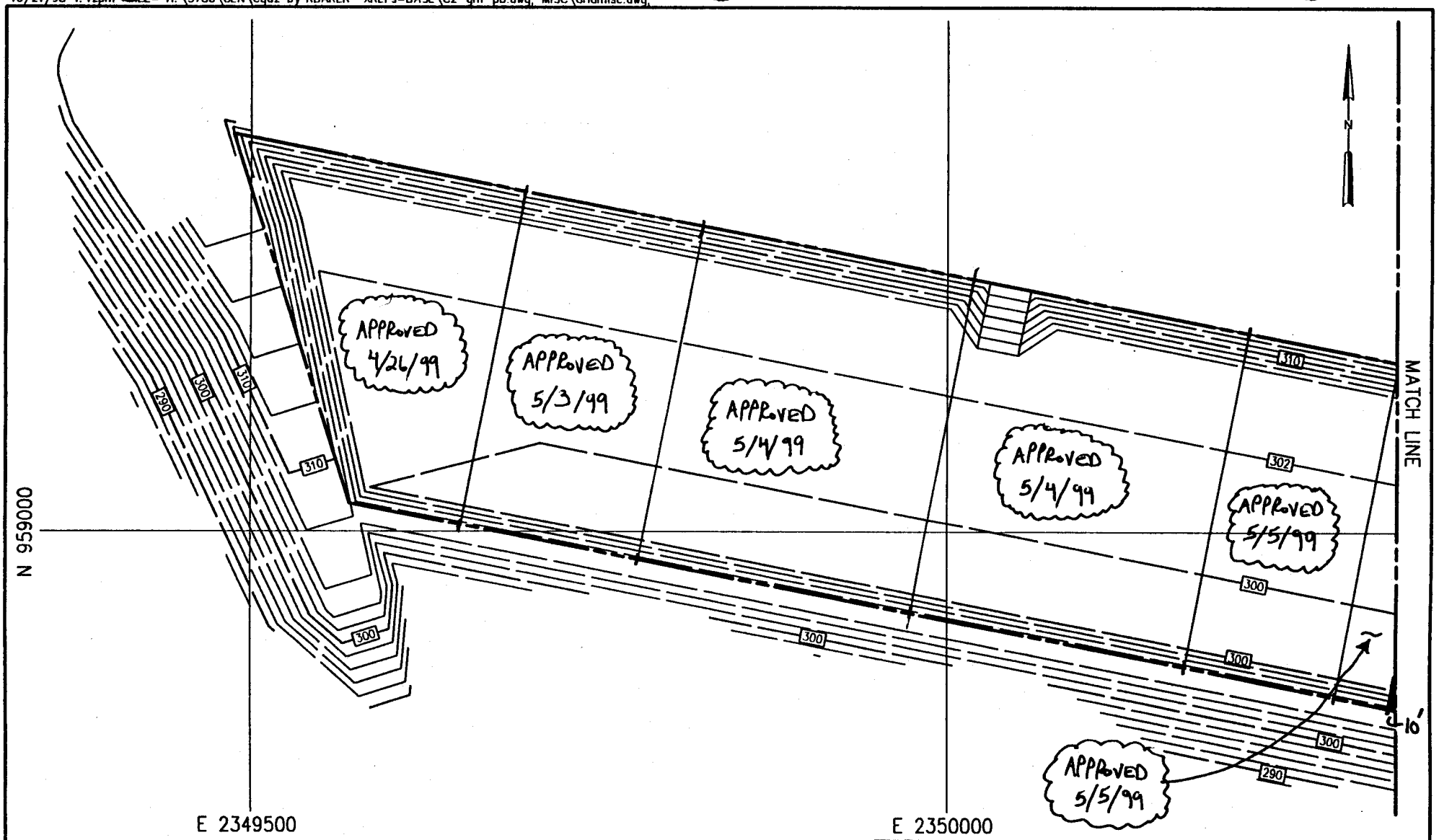
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDaniel	Super
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	[illegible]	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:42pm LEE= H:\3786\GEN\Cqa2 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

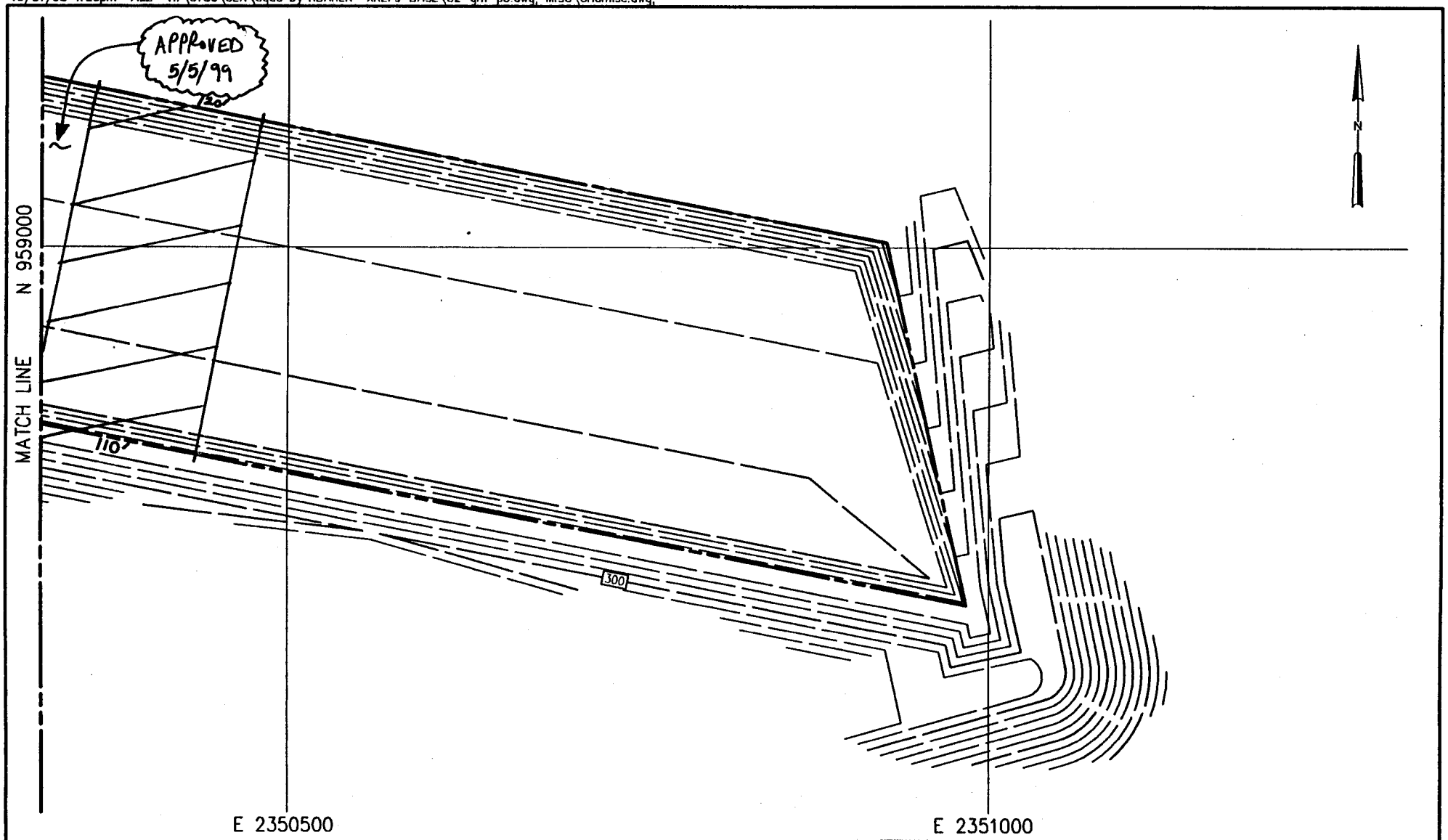
HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/7/99

FIGURE 5071

10/21/98 4:25pm FILE= H:\3786\GEN\Cqa3 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/7/99

HAZEN AND SAWYER
Environmental Engineers & Scientists

FIGURE 507-2

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/7/99 Time: 3:00 P.M.

Reference Sketch: 507-3

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

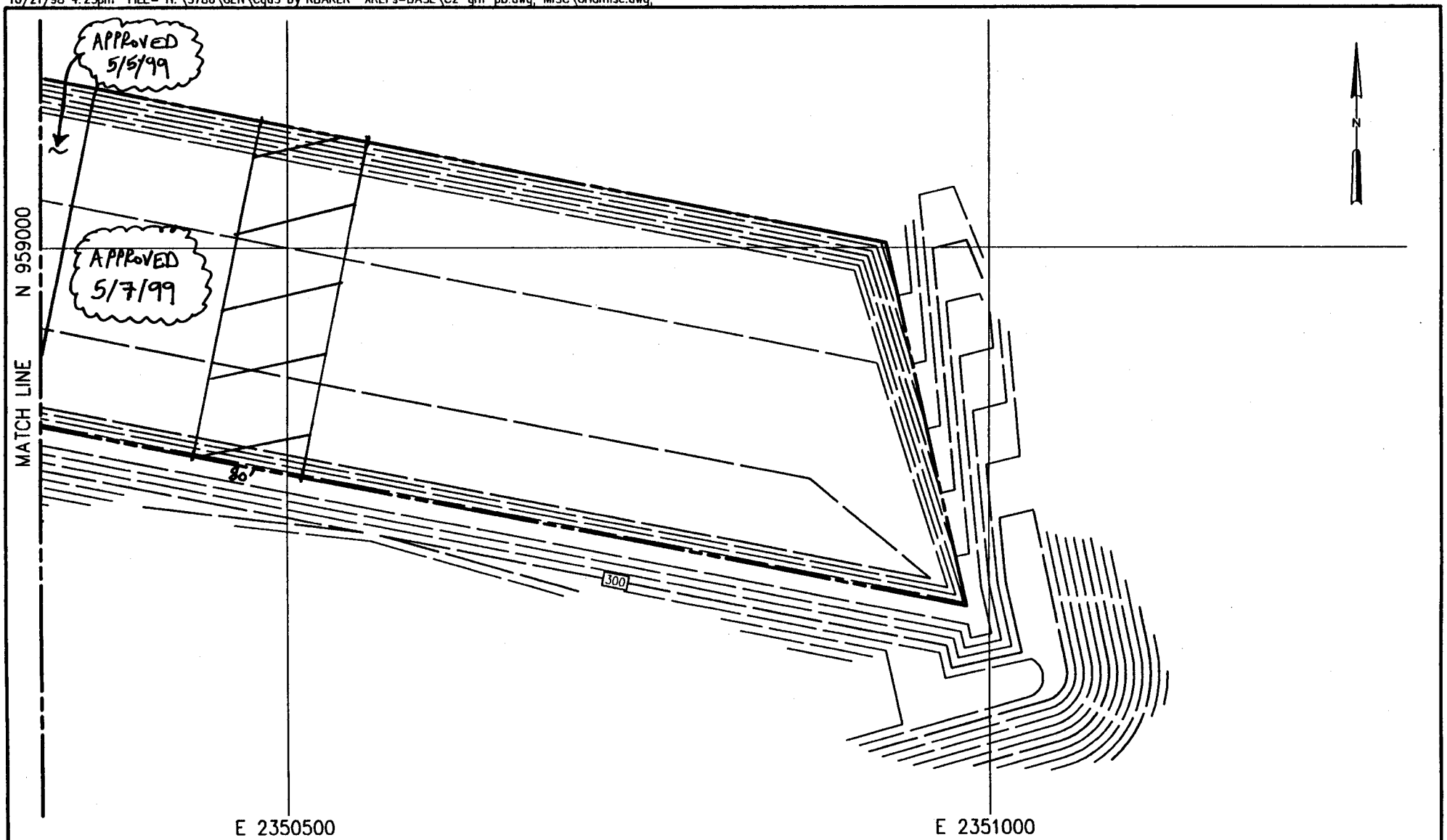
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDaniel	Supt.
EARTHWORK CONTRACTOR	[illegible]	Superintendent
ENGINEER	Robert C. [illegible]	RESIDENT ENGINEER

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:25pm FILE= H:\3786\GEN\Cqa3 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/7/99

HAZEN AND SAWYER
Environmental Engineers & Scientists

FIGURE 503-3

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/8/99 Time: 2:20pM

Reference Sketch: 508-1

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

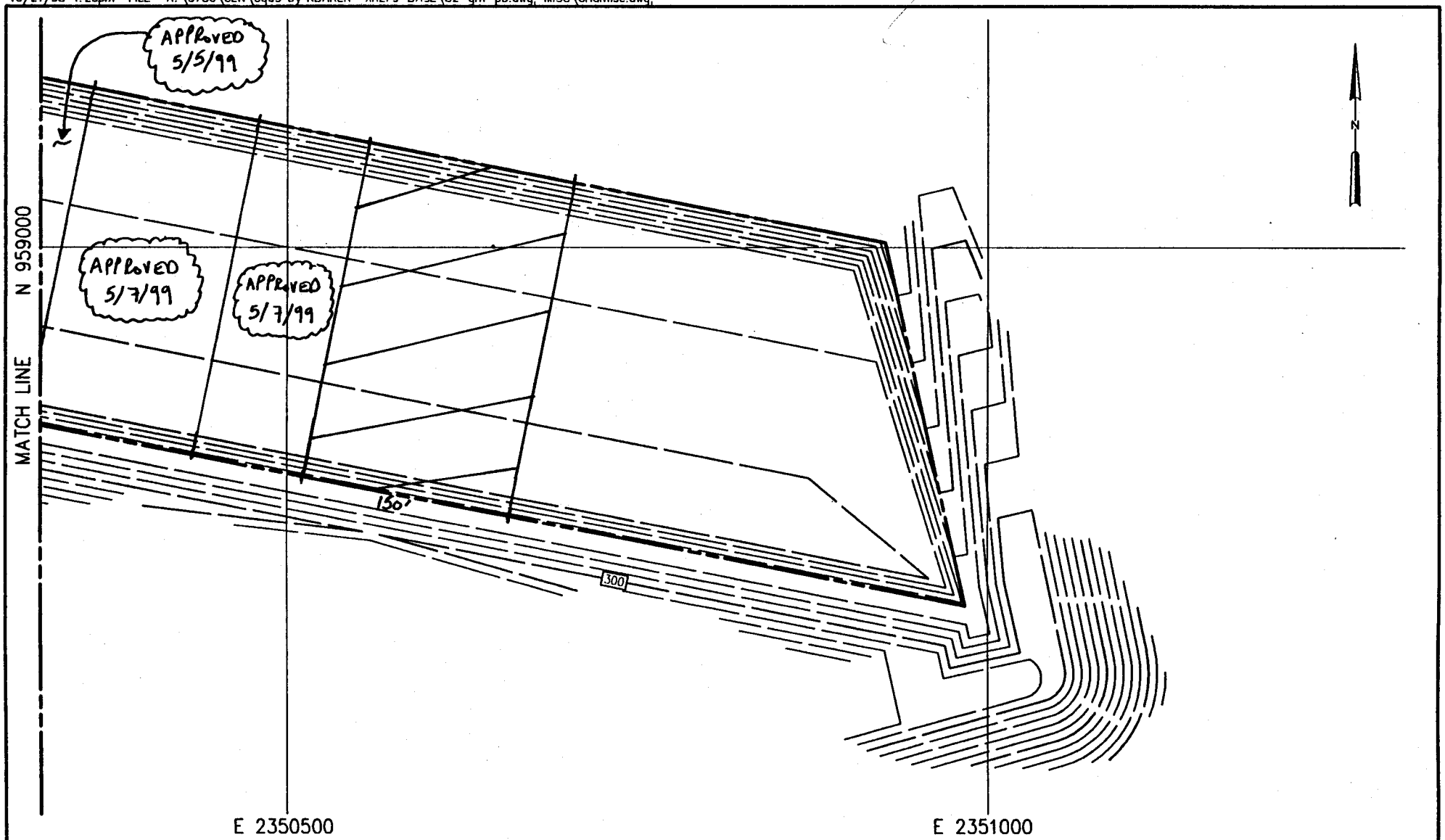
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	Mike McDonald	Supt.
EARTHWORK CONTRACTOR	[illegible]	
ENGINEER	[illegible]	

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:25pm FILE= H:\3786\GEN\Cqa3 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: RCB DATE: 5/8/99

HAZEN AND SAWYER
Environmental Engineers & Scientists

FIGURE 5qa-1

GEOMEMBRANE INSTALLATION
SUBGRADE APPROVAL FORM

Project: **HALIFAX COUNTY COAL ASH MONOFILL – CELL 2**

Location: **HALIFAX COUNTY, NORTH CAROLINA**

Date: 5/8/99 Time: 4:30pm

Reference Sketch: 508-2

This document certifies that the subgrade as described above is acceptable for installation of geomembrane. The subgrade surface is smooth and free from potentially damaging rocks, stones, refuse, debris, or other sharp objects. The surface provides a firm foundation for the geomembrane in conformance with the Project Specifications. No standing water or excessive moisture exists on the subgrade.

The parties below approve the subgrade surface for geomembrane installation on the aforementioned date.

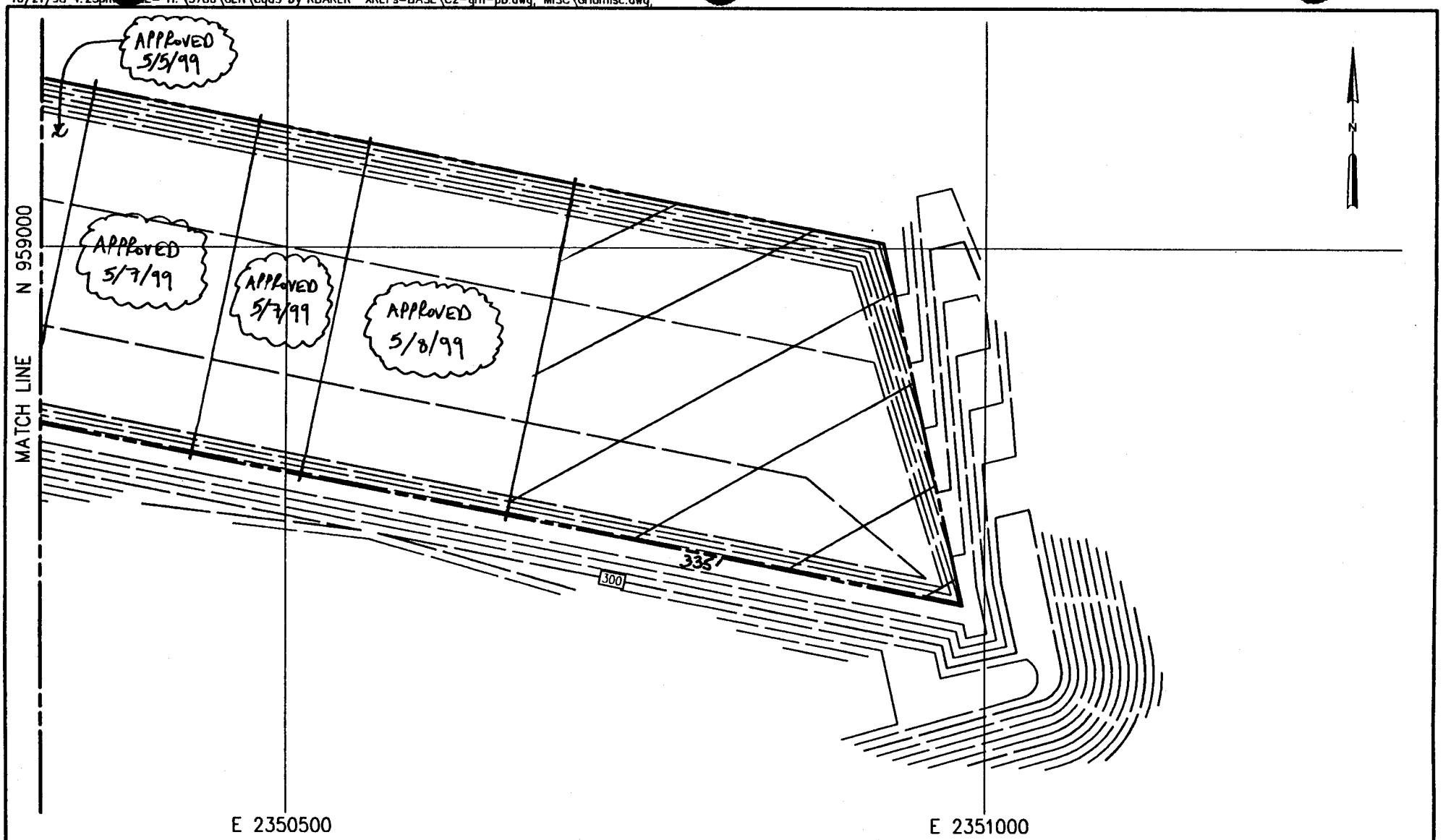
Any changes in subgrade conditions caused by weather conditions, vehicular traffic, or other causes, will require re-approval of affected areas after necessary repairs are completed.

This document covers only the geomembrane subgrade surface, and does not constitute approval of the geomembrane installation. No material shall be placed over the geomembrane until the geomembrane installation is approved by the Engineer in writing.

	NAME	POSITION
GEOMEMBRANE INSTALLER	[illegible]	Supt.
EARTHWORK CONTRACTOR	[illegible]	
ENGINEER	[illegible]	

HAZEN AND SAWYER
Environmental Engineers & Scientists

10/21/98 4:25pm E= H:\3786\GEN\Cqa3 by RBAKER XREFs=BASE\C2-gm-pb.dwg, MISC\Gridmisc.dwg,



PLAN

1"=100'

HAZEN AND SAWYER
Environmental Engineers & Scientists

HALIFAX COUNTY ASH MONOFILL
HALIFAX COUNTY PUBLIC UTILITIES DEPT.

CELL 2 GEOMEMBRANE
SUBGRADE APPROVAL
BY: JAB DATE: 5/8/99

FIGURE 5a8-2

APPENDIX 3.7
PANEL DEPLOYMENT FORMS

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P1, P2

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

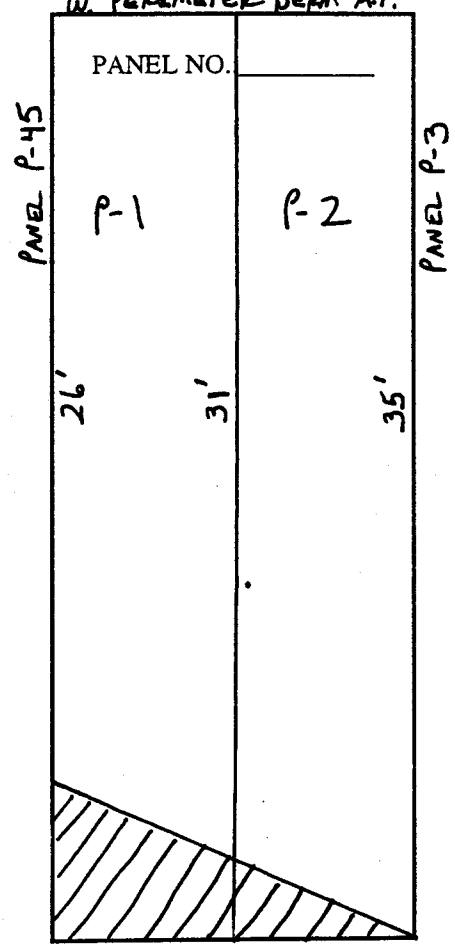
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-1 = 28.5' (AVG.), P-2 = 33' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-1 = 285 SF, P-2 = 330 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-3, P-4

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

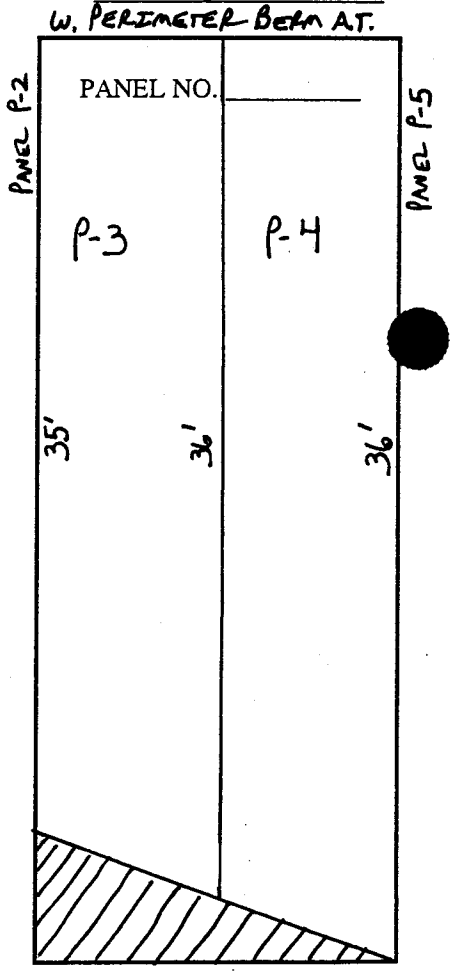
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-2 = 35.5' (AVG.), P-4 = 36'

PANEL WIDTH: 10' EACH

PANEL AREA: P-3 = 355 SF, P-4 = 360 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-5, P-6

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

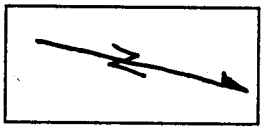
DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

SHOW PROJECT NORTH

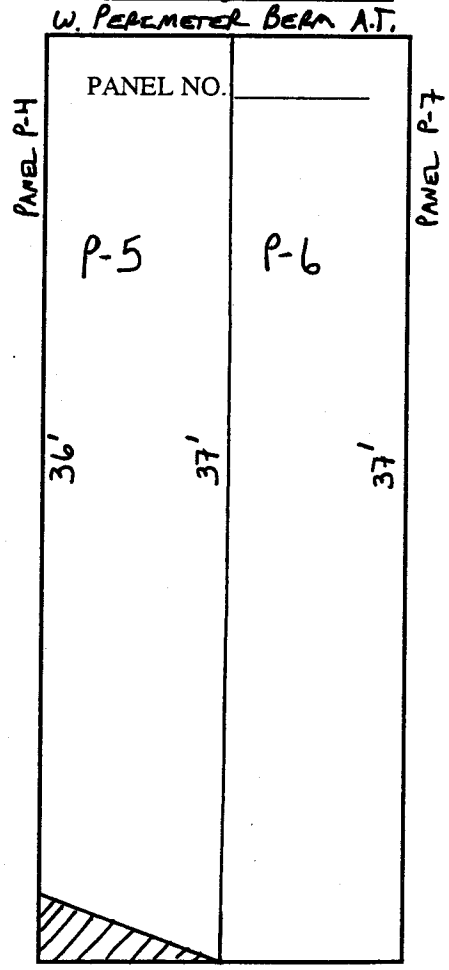


SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-5 = 36.5' (AVG.), P-6 = 37'

PANEL WIDTH: 10' EACH

PANEL AREA: P-5 = 365 SF, P-6 = 370 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-7, P-8

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MED-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

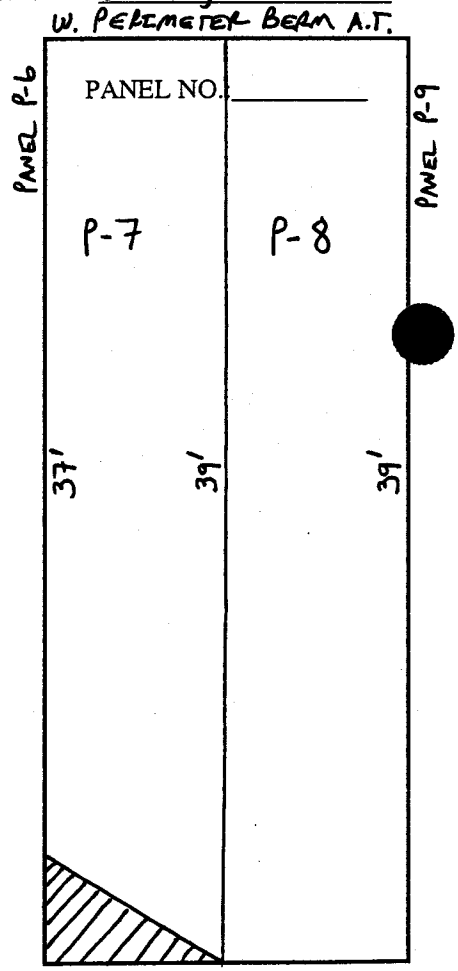
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-7 = 38' (AVG.), P-8 = 39'

PANEL WIDTH: 10' EACH

PANEL AREA: P-7 = 380 SF, P-8 = 390 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-9, P-10

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MED-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

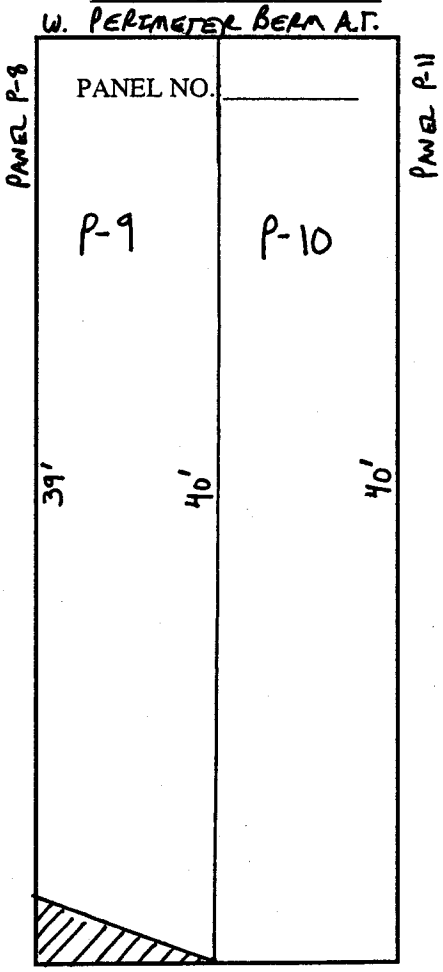
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No Defects				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-9 = 39.5' (AVG), P-10 = 40'

PANEL WIDTH: 10' EACH

PANEL AREA: P-9 = 395 SF, P-10 = 400 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-11, P-12

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

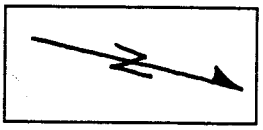
SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, 65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

SHOW PROJECT NORTH

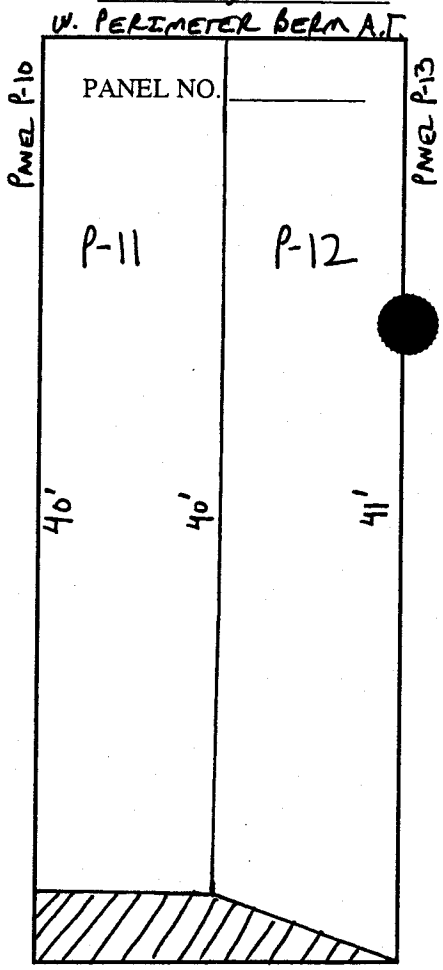
SHOW ALL DIMENSIONS



PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900182, 2900182

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-11 = 40', P-12 = 40.5' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-11 = 400 SF, P-12 = 405 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-13, P-14

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MED-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

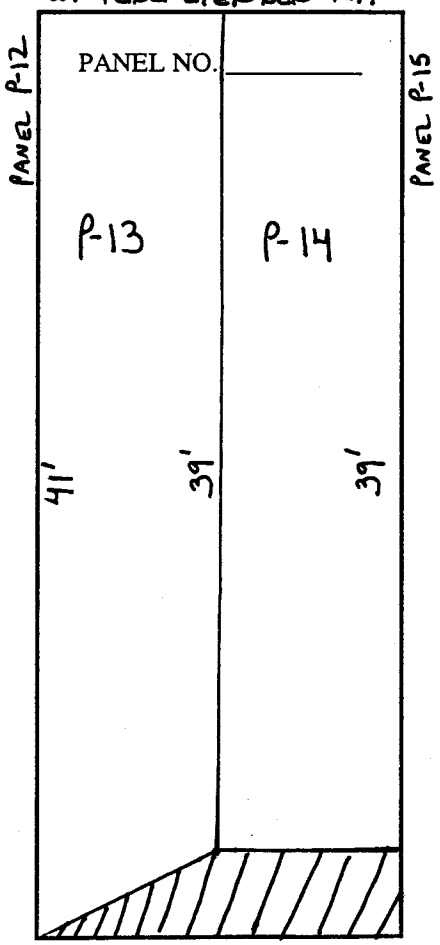
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900217

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-13 = 40' (AVG.), P-14 = 39'

PANEL WIDTH: 10' EACH

PANEL AREA: P-13 = 400 SF, P-14 = 390SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-15, P-16

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

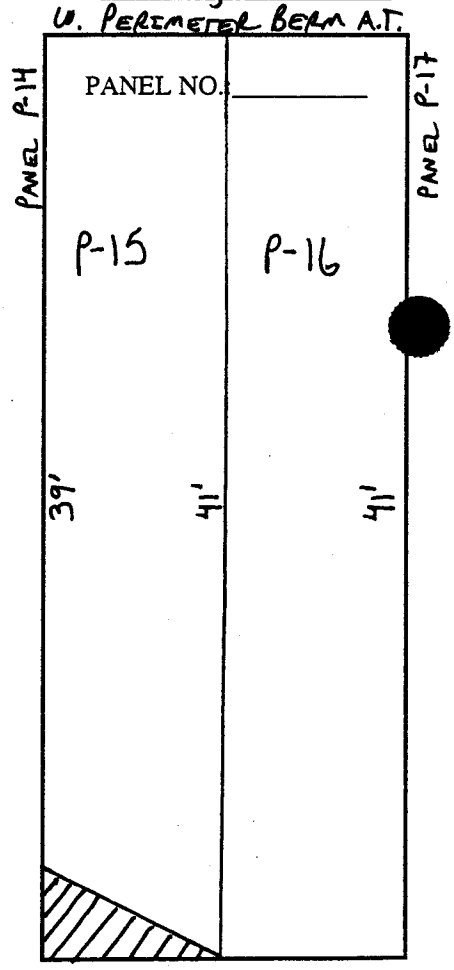
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900217

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-15 = 40' (AVG.), P-16 = 41'

PANEL WIDTH: 10' EACH

PANEL AREA: P-15 = 400 SF, P-16 = 410 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-17, P-18

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

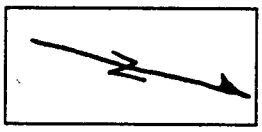
DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

SHOW PROJECT NORTH

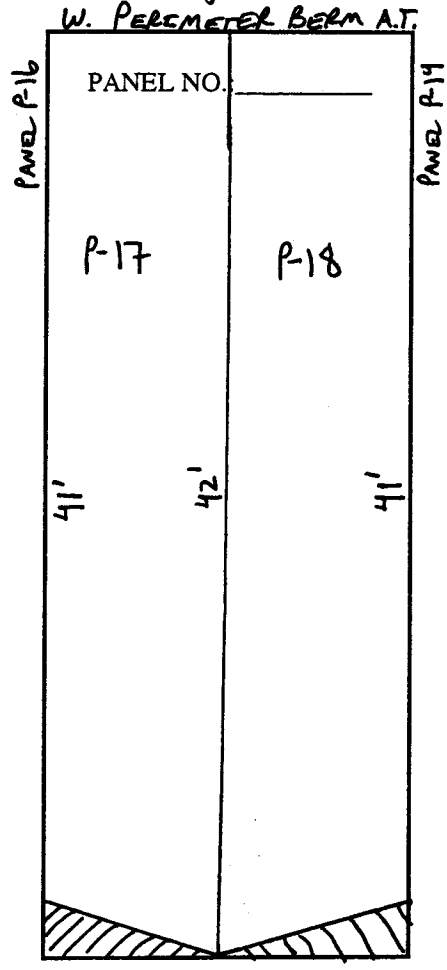


SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900217

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-17 = 41.5' (AVG.), P-18 = 41.5' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-17 = 415 SF, P-18 = 415 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-19, P-20

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

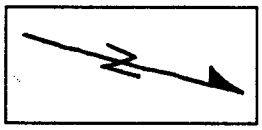
DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

SHOW PROJECT NORTH

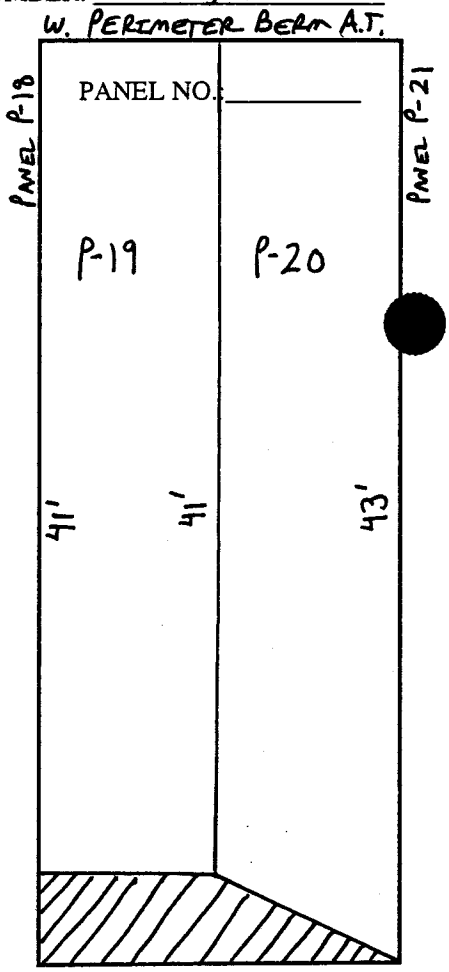


SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900217

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-19 = 41', P-20 = 42' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-19 = 410 SF, P-20 = 420 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-21, P-22

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

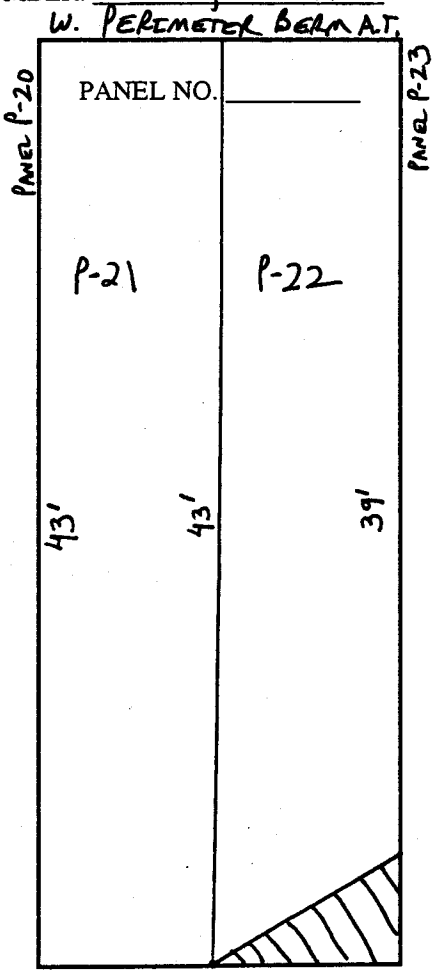
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900217

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-21 = 43', P-22 = 41' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-21 = 430 SF, P-22 = 410 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-23, P-24

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MED- AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

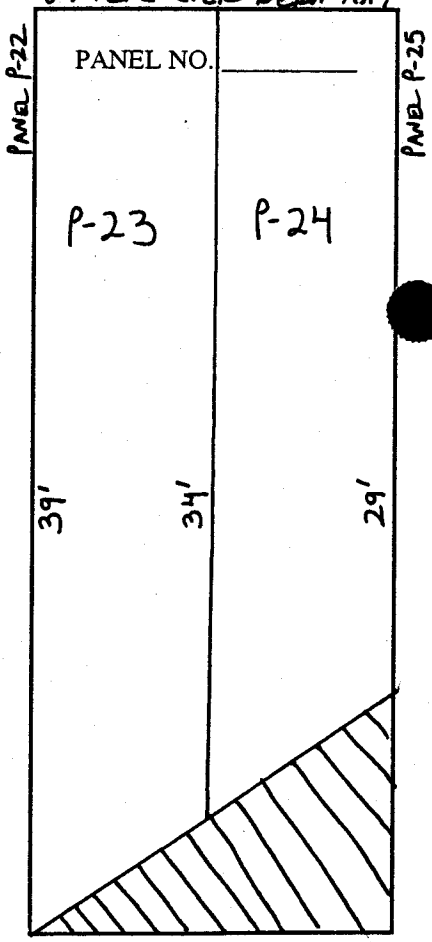
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900217, 2900182 (P-24)

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-23 = 36.5' (AVG.), P-24 = 31.5' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-23 = 365 SF, P-24 = 315 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-25, P-26

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

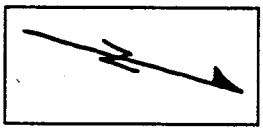
DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

SHOW PROJECT NORTH

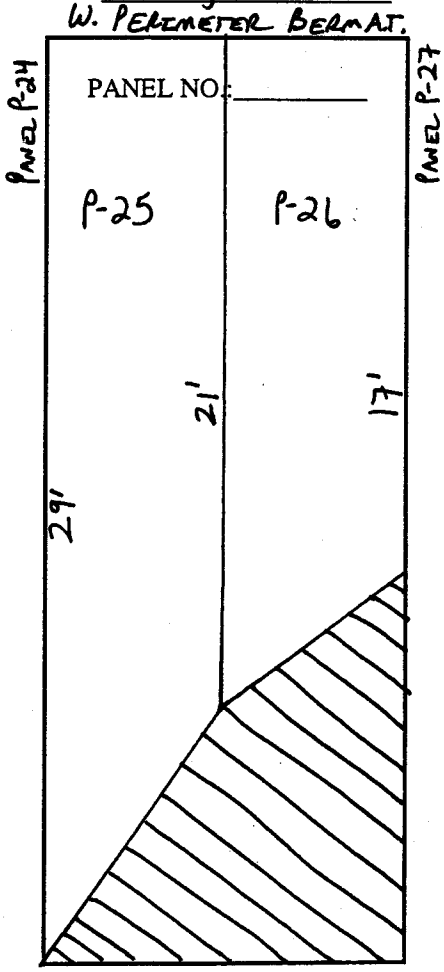


SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900187, 2900217 (P-26)

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-25 = 25' (AVG.), P-26 = 19' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-25 = 250 SF, P-26 = 190 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-27, P-28

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

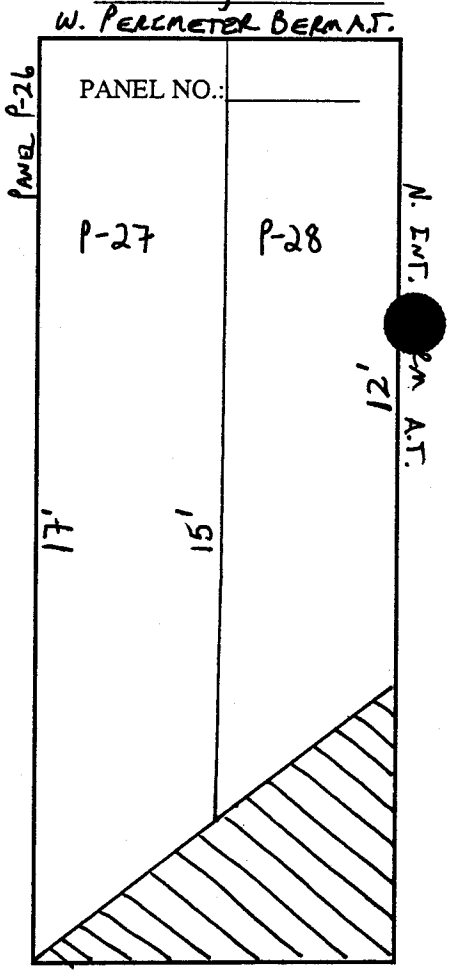
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900187, 2900187

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY



TECHNICIAN COMMENTS:

PANEL LENGTH: P-27 = 16' (AVG.) P-28 = 13.5' (AVG)

PANEL WIDTH: 10' (P-27) P-28 = 10' (TYP)

PANEL AREA: P-27 = 160 SF P-28 = 135 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-29, P-30

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: CLOUDY, BREEZY, ~ 65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

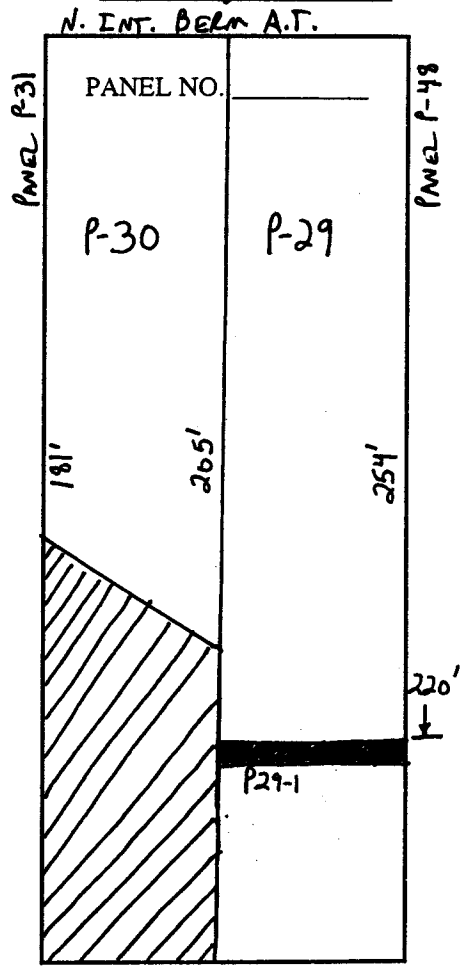
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900216, 2900216

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				
5/3	P29-1	CUT TO REPAIR WET SUBGRADE	5/3	2'×10' CAP STRIP	RLB



TECHNICIAN COMMENTS:

PANEL LENGTH: P-30 = 193' (AVG.), P-29 = 254'

PANEL WIDTH: 10' EACH

PANEL AREA: P-29 = 2540 SF, P-30 = 1930 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-31, P-32

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: CLOUDY, BREEZY, ~65°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

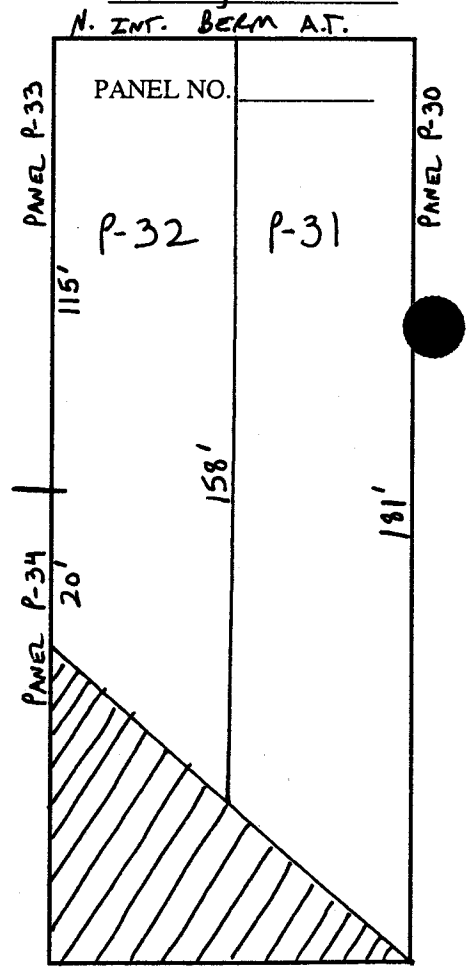
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900187, 2900187

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-31 = 169.5' (AVG.), P-32 = 146.5' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-31 = 1695 SF, P-32 = 1465 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-33, P-34

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: CLOUDY, WINDY, ~60°

DEPLOYMENT METHOD: MANUAL PULL (ROLLS SUSPENDED FROM BACKHOE USING SPREADER BAR)

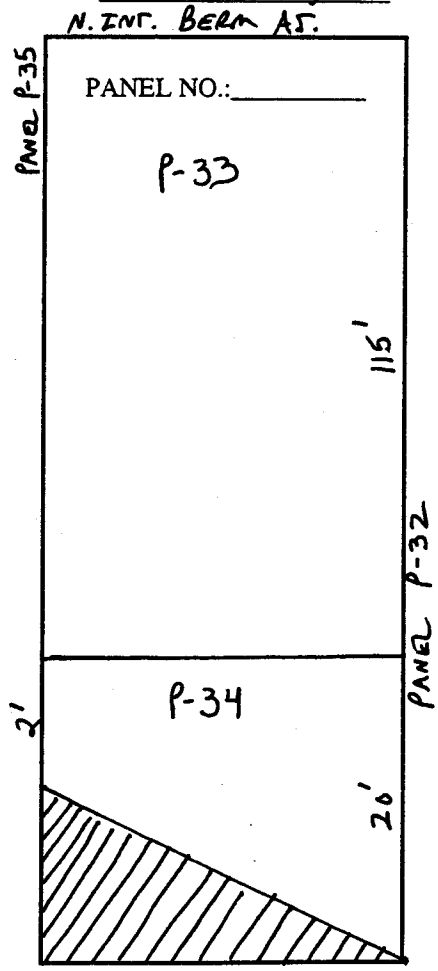
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900167 (P-33) 2900216 (P-34)

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No Defects				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-33 = 115' P-34 = 11' (AVG.)

PANEL WIDTH: 10' EACH

PANEL AREA: P-33 = 1150 SF P-34 = 110 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-35

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/26/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: CLOUDY, WINDY, ~60°

DEPLOYMENT METHOD: MANUAL PULL & SPOT (FOUL CUT & DRAGGED INTO PLACE)

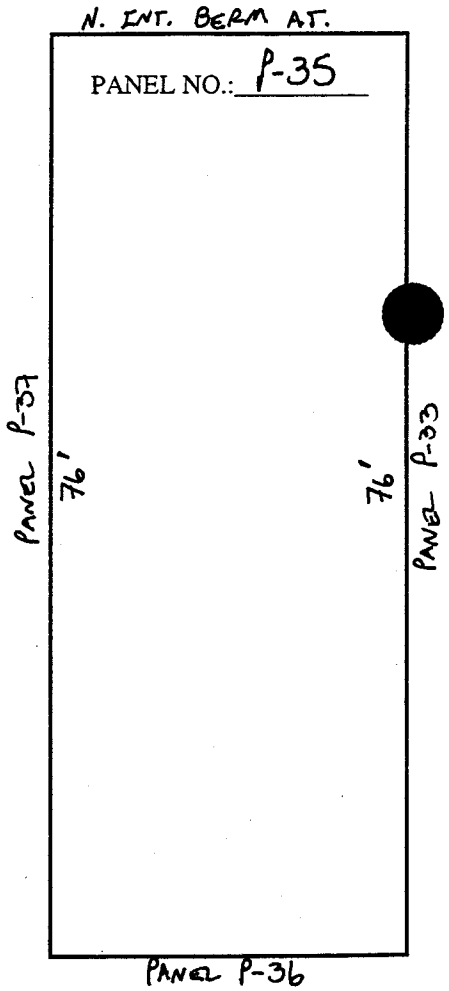
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900216

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/26	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 76'

PANEL WIDTH: 10'

PANEL AREA: 760 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-36

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

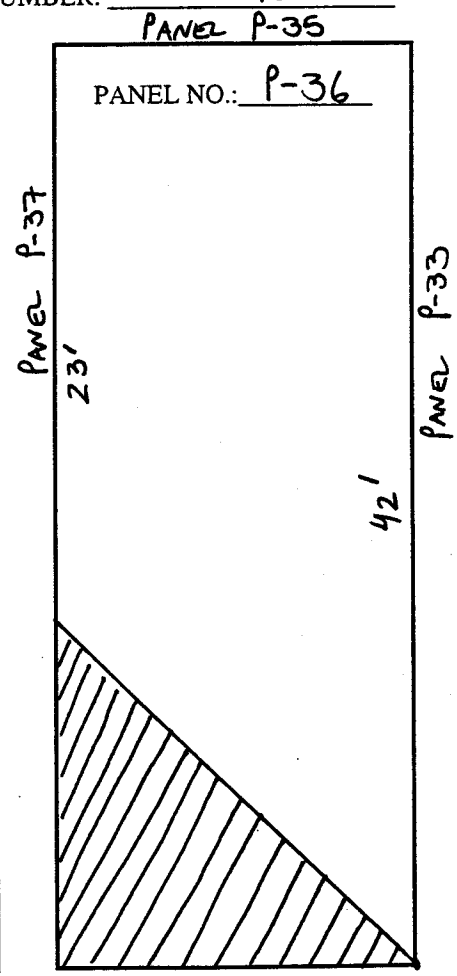
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 32.5' (TYP.)

PANEL WIDTH: 10'

PANEL AREA: 325 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-37, P-38

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

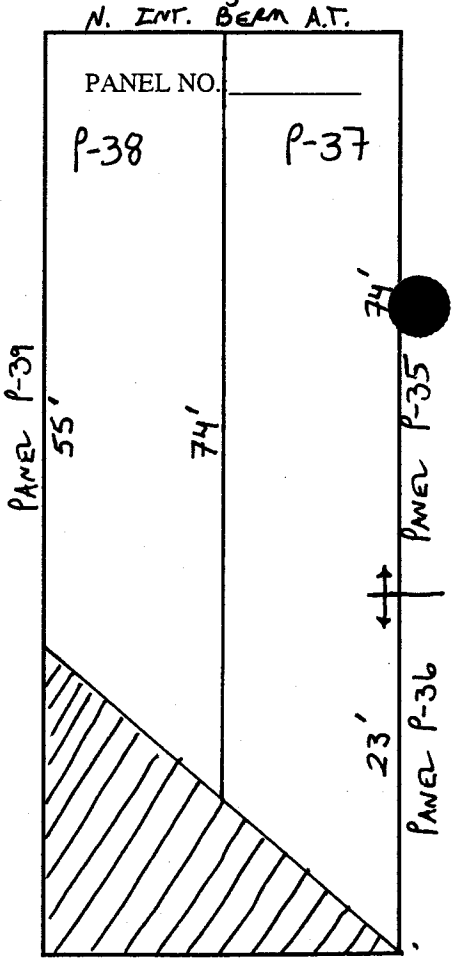
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270, 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-37 = 85.5' (AVG.) P-38 = 64.5' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-37 = 855 SF P-38 = 645 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-39, P-40

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

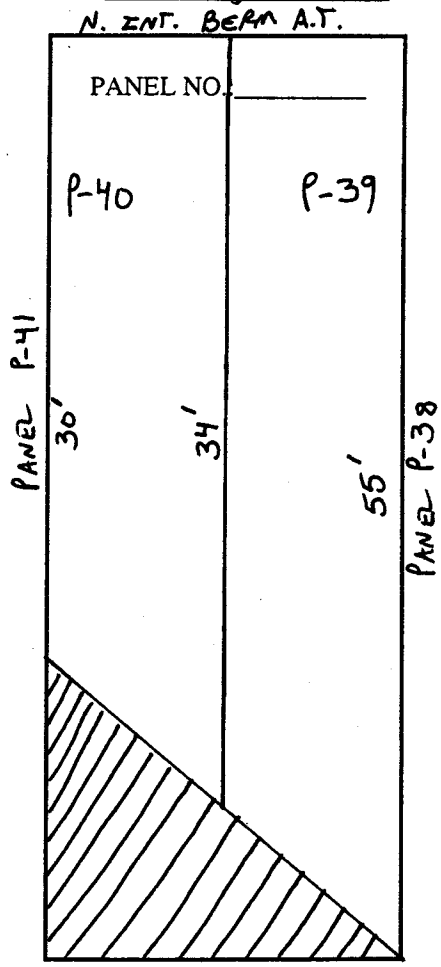
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270, 2906270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-39 = 44.5' (TYP) P-40 = 32' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-39 = 445 SF P-40 = 320 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-41, P-42

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

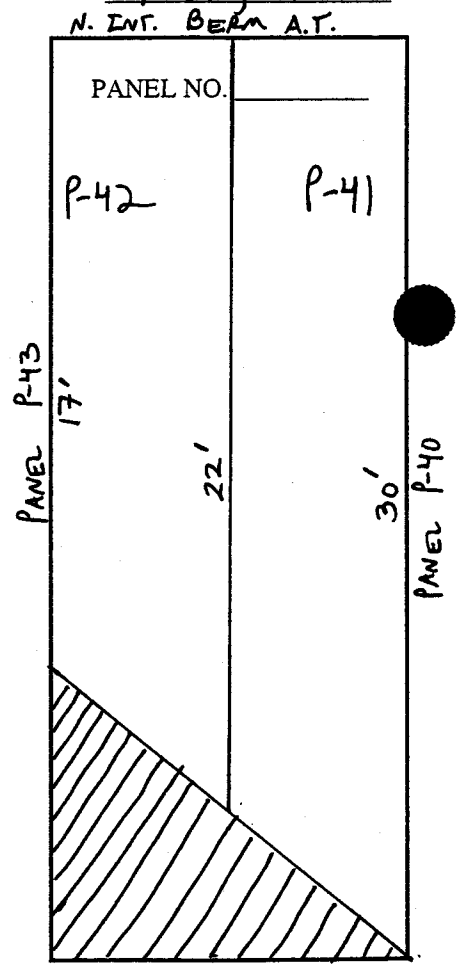
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270, 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-41 = 26' (AVG.) P-42 = 19.5' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-41 = 260 SF P-42 = 195 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-43, P-44

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

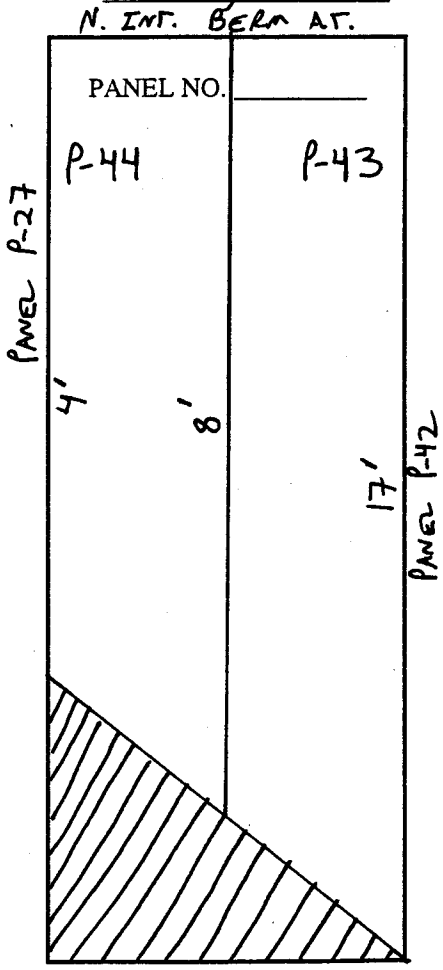
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270, 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-43 = 12.5' (AVG.) P-44 = 6' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-43 = 125 SF P-44 = 60 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-45

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

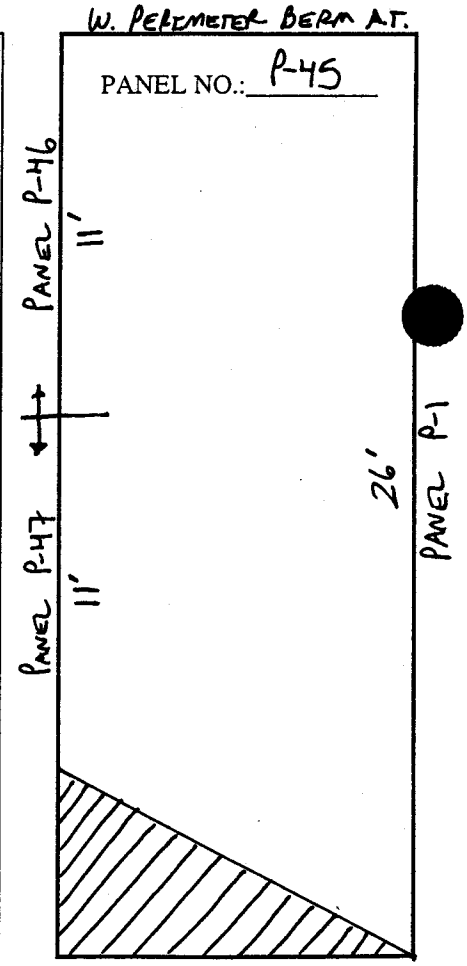
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 24' (AVG)

PANEL WIDTH: 10'

PANEL AREA: 240 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-46

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: SUNNY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

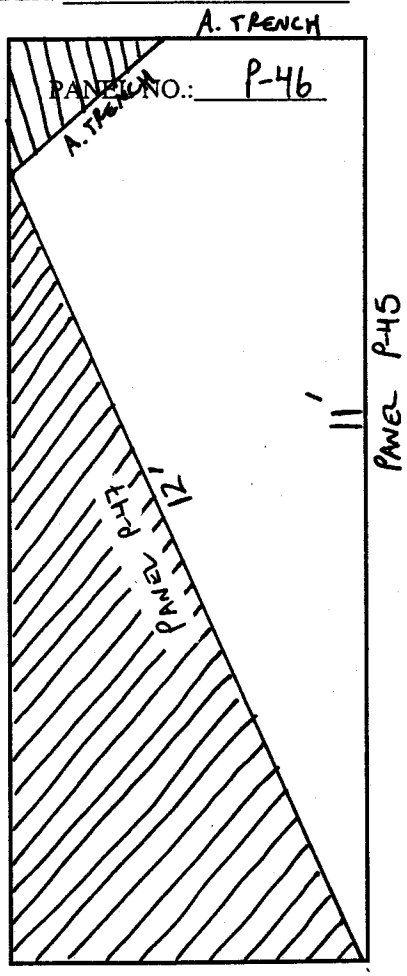
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 11' (TYP)

PANEL WIDTH: 10' (MAX)

PANEL AREA: ~55 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-47

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, BREEZY, ~70°

DEPLOYMENT METHOD: MANUAL PULL & SPOT

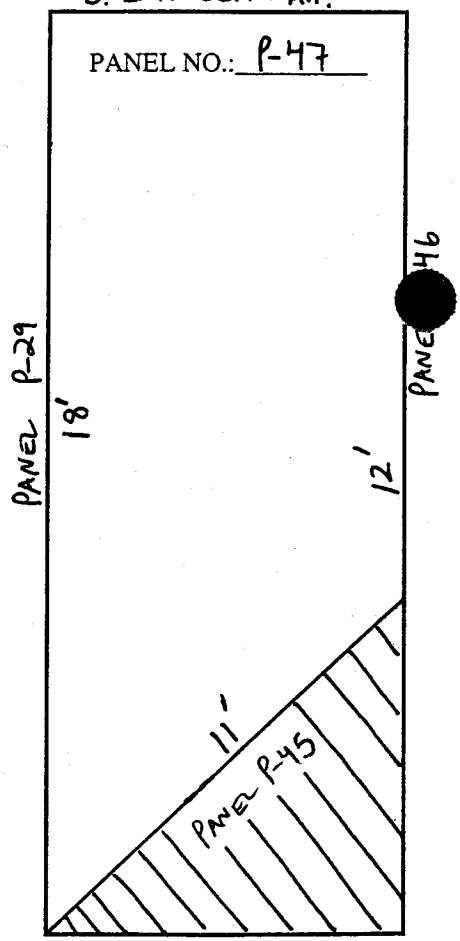
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900270

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 15' (AVG)

PANEL WIDTH: 10'

PANEL AREA: 150 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-48, P-49

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, BREEZY, ~70°

DEPLOYMENT METHOD: ATV PULL

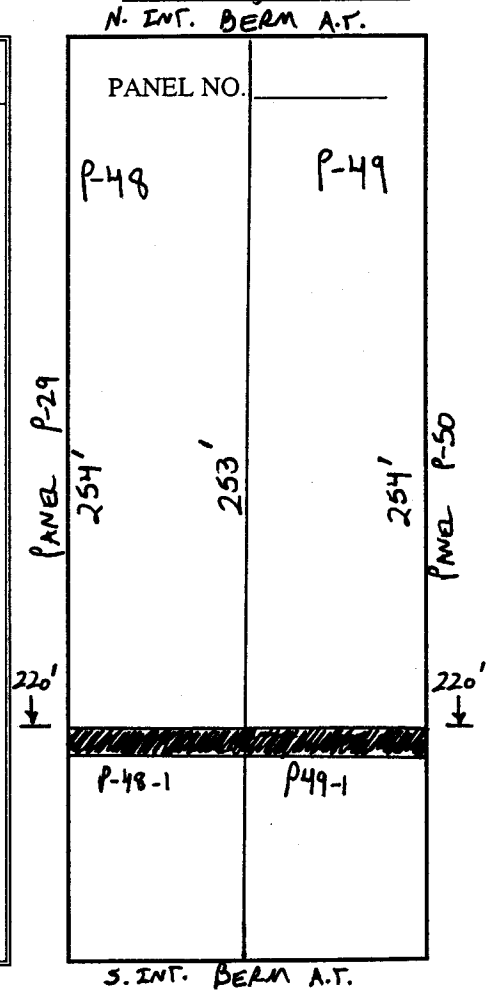
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900183, 2900183

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				
5/3	P48-1 P49-1	CUT TO REPAIR WET SUBGRADE	5/3	2'×10' (EACH PANEL) CAP STRIP	RLB



TECHNICIAN COMMENTS:

PANEL LENGTH: 254' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 2540 SF, 2540 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-50, P-51

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: M. CLOUDY, BREEZY, ~70°

DEPLOYMENT METHOD: ATV PULL

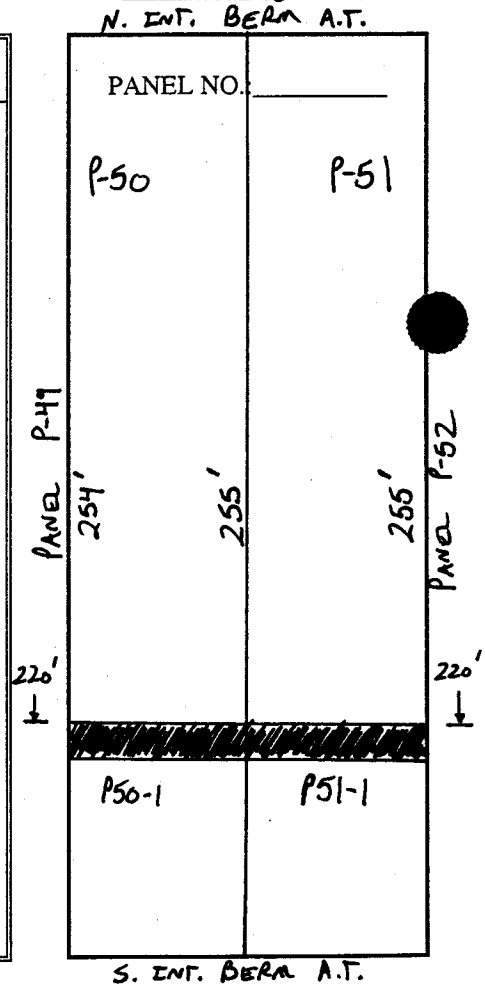
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900354, 2900354

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				
5/3	P50-1 P51-1	CUT TO REPAIR WET SUBGRADE	5/3	2'x10' (EACH PANEL) CAP STRIP	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-52, P-53

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 4/27/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLOUDY, BREEZY, ~65°

DEPLOYMENT METHOD: ATV PULL

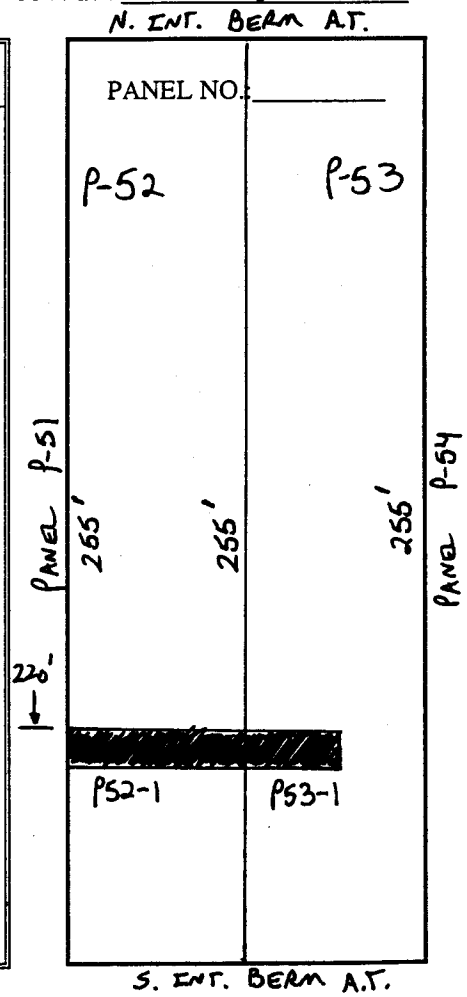
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900258, 2900258

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
4/27	NO DEFECTS				
5/3	P52-1	CUT TO REPAIR WET SUBGRADE	5/3	2'x10' CAP STRIP	RCB
	P53-1	CUT TO REPAIR WET SUBGRADE	5/3	2'x5' CAP STRIP	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P54, P55

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: BREEZY, CLOUDY, ~70°

DEPLOYMENT METHOD: ATV- PULL

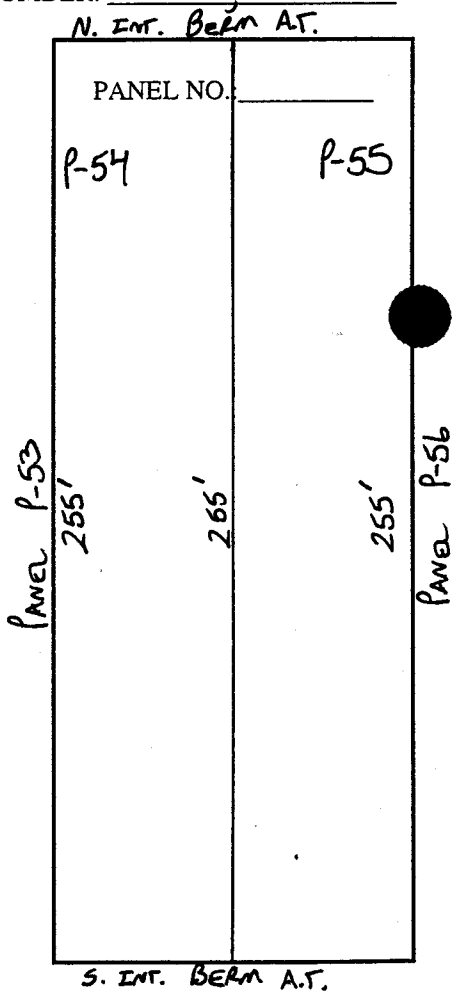
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806208, 2806208

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-56, P-57

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: WINDY, CLOUDY, ~70°

DEPLOYMENT METHOD: ATV PULL

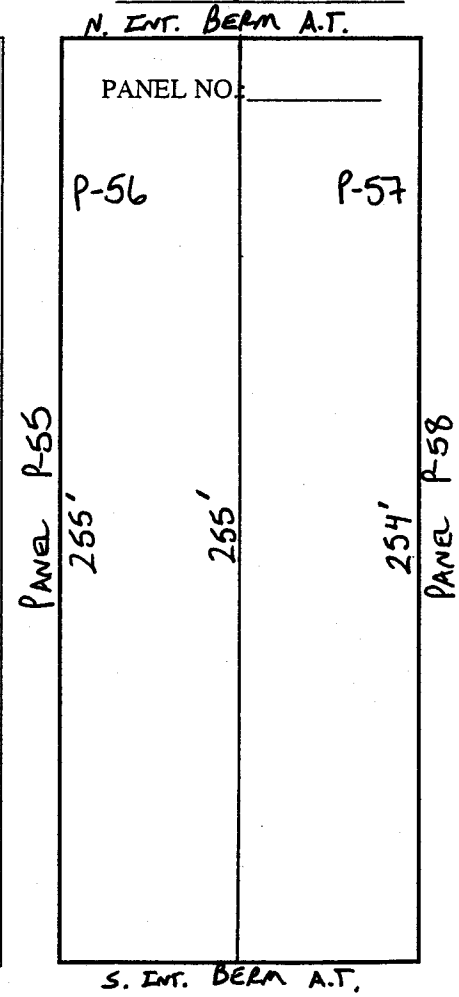
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900272, 2900272

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP, EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: ~5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-58, P-59

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: WINDY, CLOUDY, ~70°

DEPLOYMENT METHOD: ATV PULL

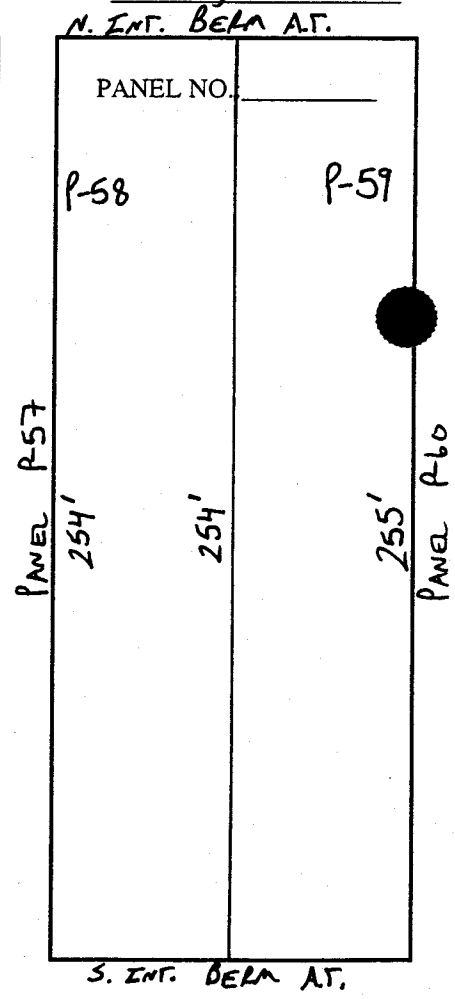
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806203, 2806203

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-58 = 254'; P-59 = 255' (TYP)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P58 = 2540 SF; P59 = 2,550 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-60, P-61

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: WINDY, CLOUDY, ~70°

DEPLOYMENT METHOD: ATV PULL

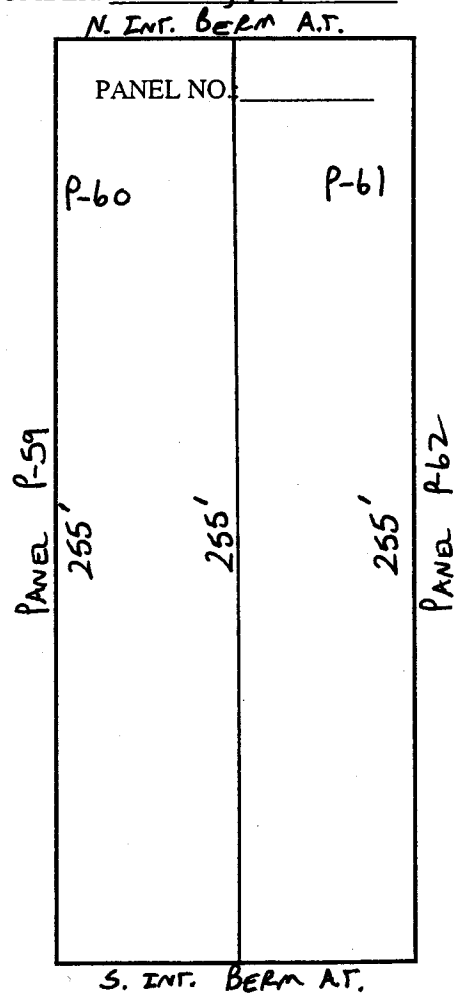
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900356, 2900356

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-62, P-63

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~70°

DEPLOYMENT METHOD: ATV PULL

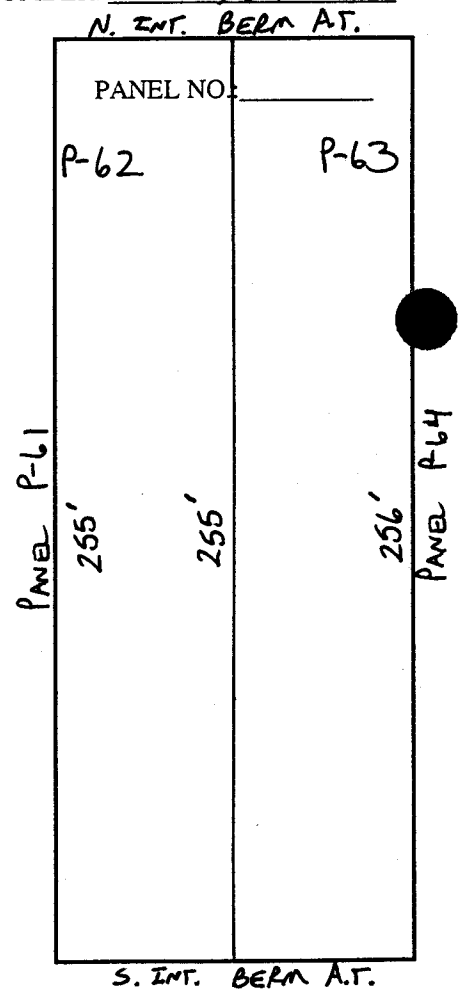
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900268, 2900268

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP. EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: ~5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-64, P-65

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~65°

DEPLOYMENT METHOD: ATV PULL

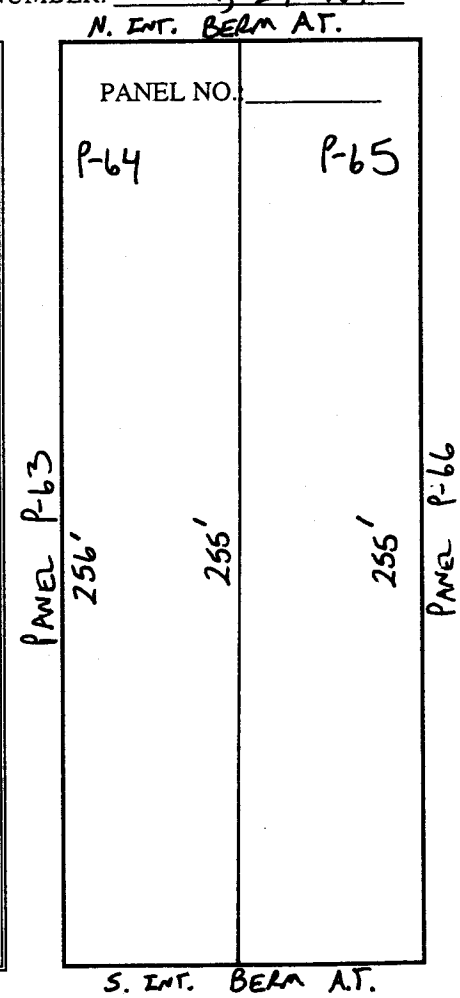
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900189, 2900189

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP)

PANEL WIDTH: 10' (EACH)

PANEL AREA: ~ 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-66, P-67

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/3/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~65°

DEPLOYMENT METHOD: ATV PULL

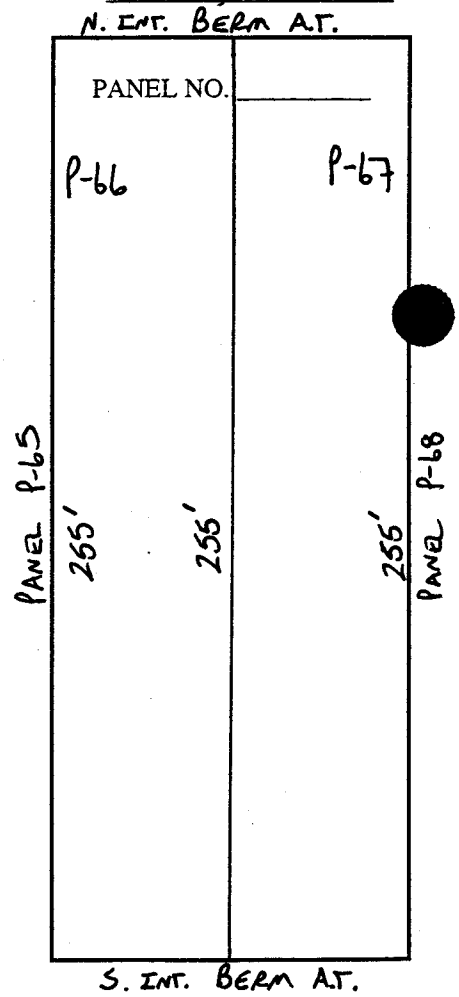
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900204, 2900204

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/3	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-68, P-69

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: M. CLOUDY, ~ 55°

DEPLOYMENT METHOD: ATV PULL

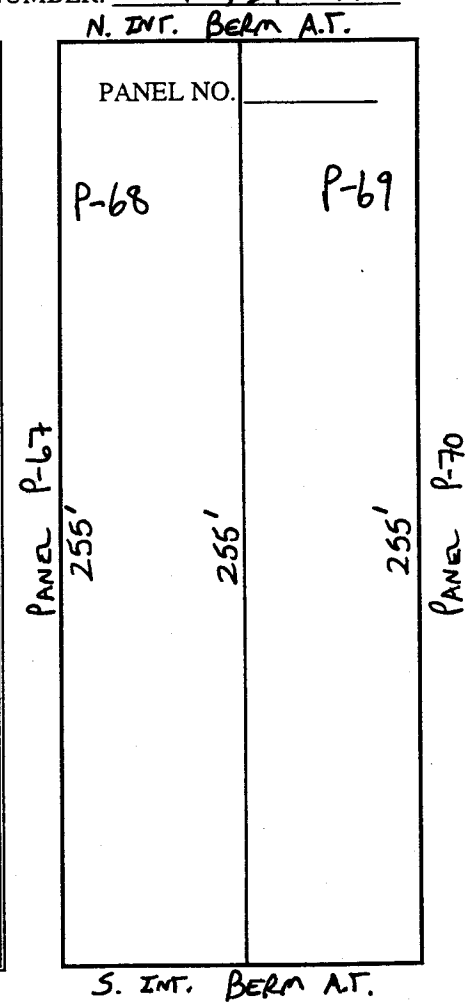
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900194, 2900194

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-70, P-71

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM MOIST

WEATHER CONDITIONS: M. CLOUDY, ~55°

DEPLOYMENT METHOD: ATV PULL

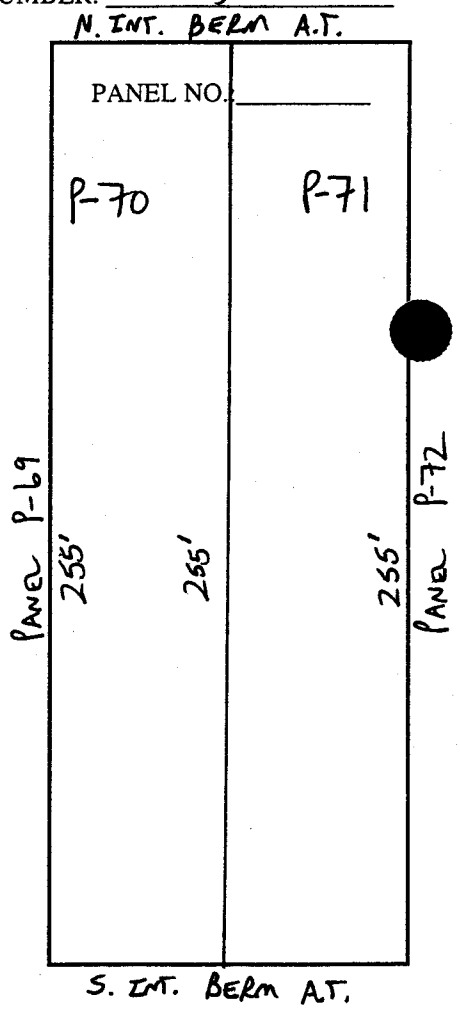
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900203, 2900203

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-72, P-73

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: M. CLOUDY, ~55°

DEPLOYMENT METHOD: ATV PULL

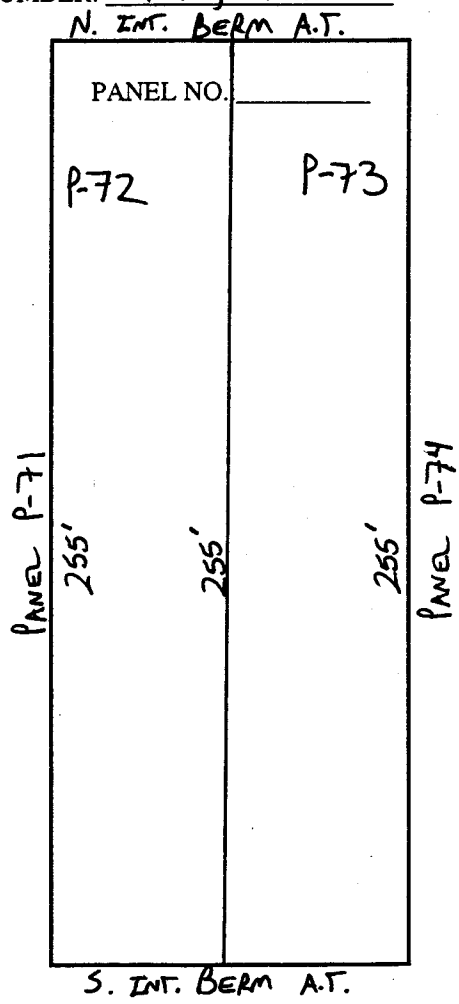
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900191, 2900191

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-74, P-75

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~60°

DEPLOYMENT METHOD: ATV PULL

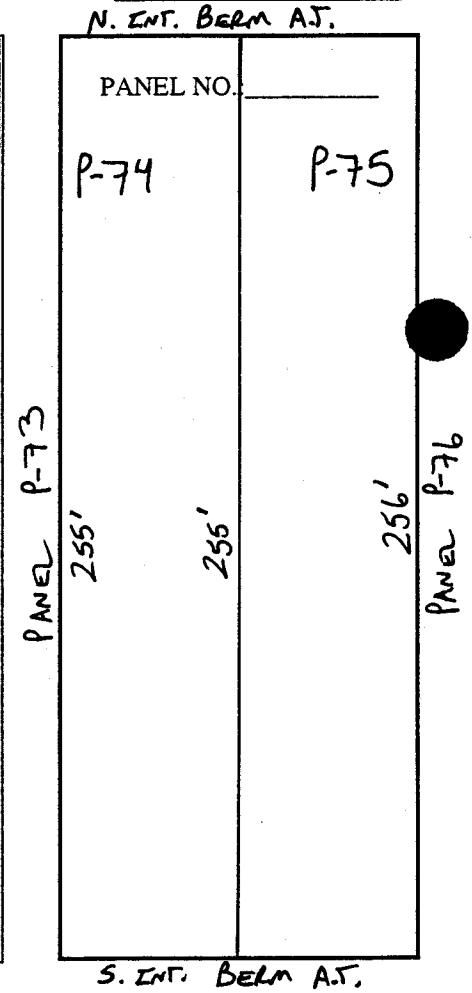
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900278, 2900278

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP, EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-76, P-77

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~60°

DEPLOYMENT METHOD: ATV PULL

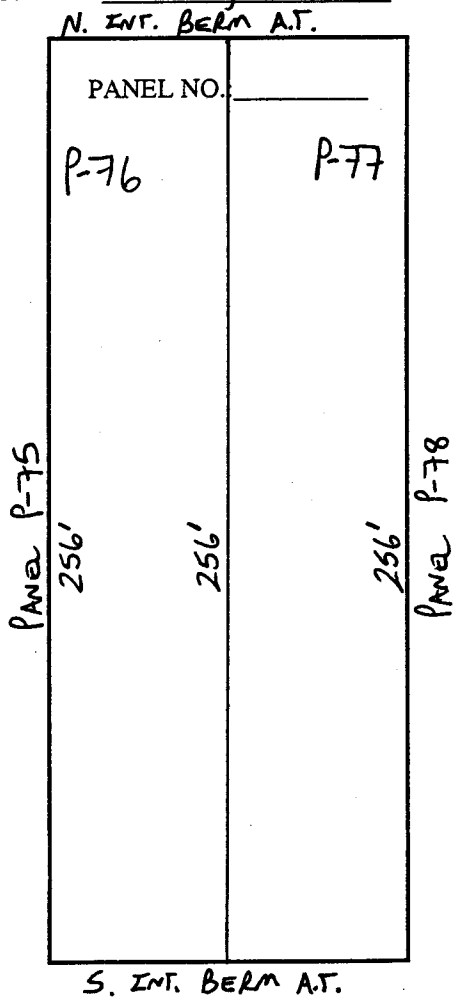
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806204, 2806204

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-78, P-79

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~ 65°

DEPLOYMENT METHOD: ATV PULL

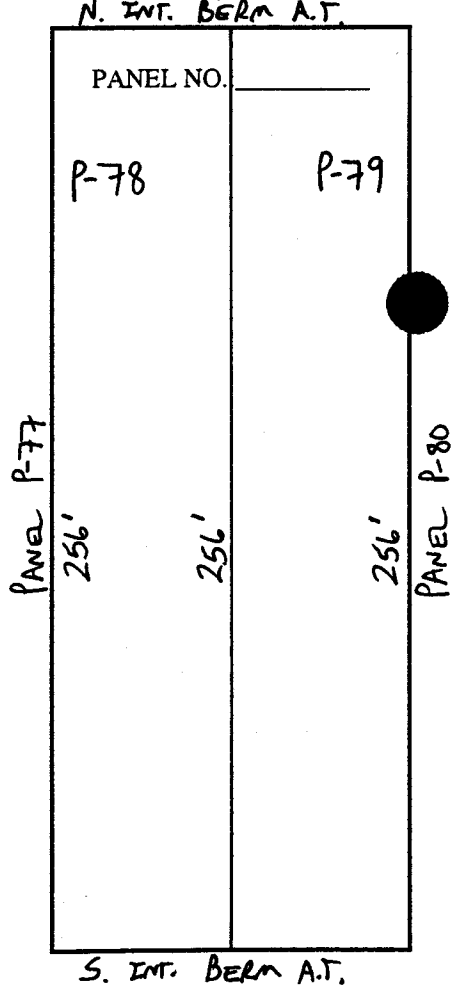
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806196, 2806196

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-80, P-81

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~75°

DEPLOYMENT METHOD: ATV PULL

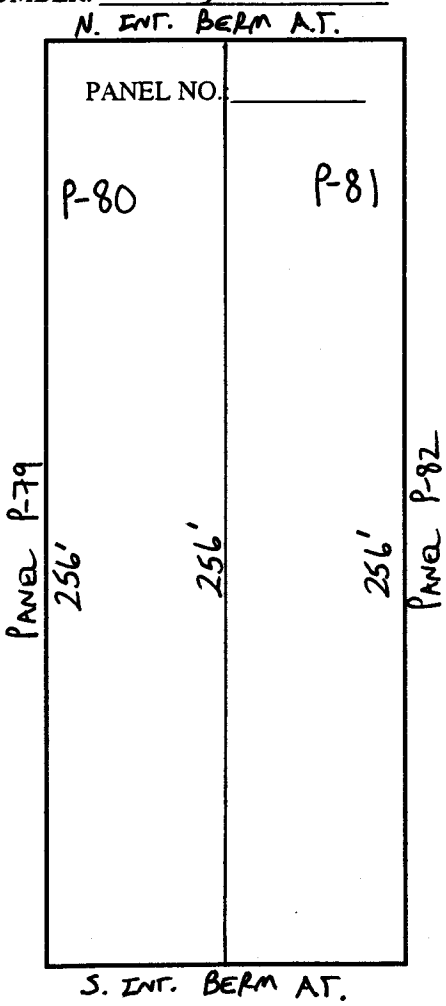
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900184, 2900184

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-82, P-83

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~75°

DEPLOYMENT METHOD: ATV PULL

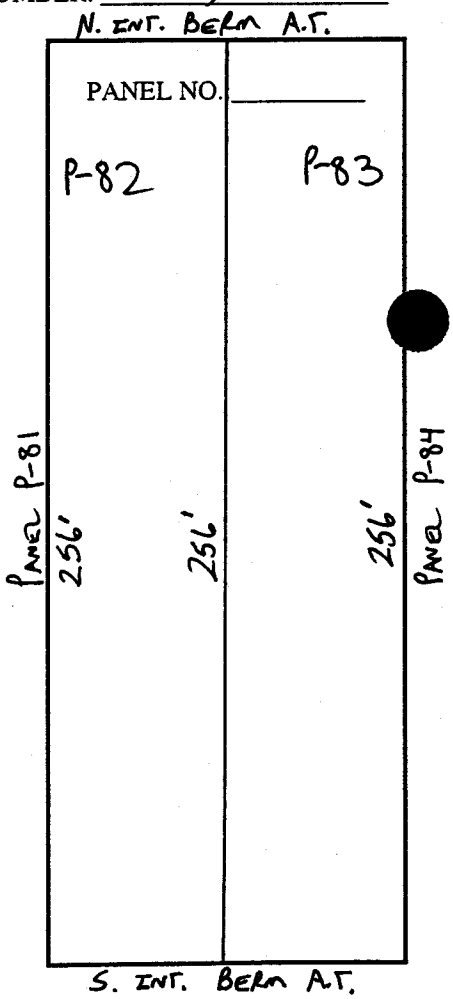
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900186, 2900186

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-84, P-85

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~75°

DEPLOYMENT METHOD: ATV PULL

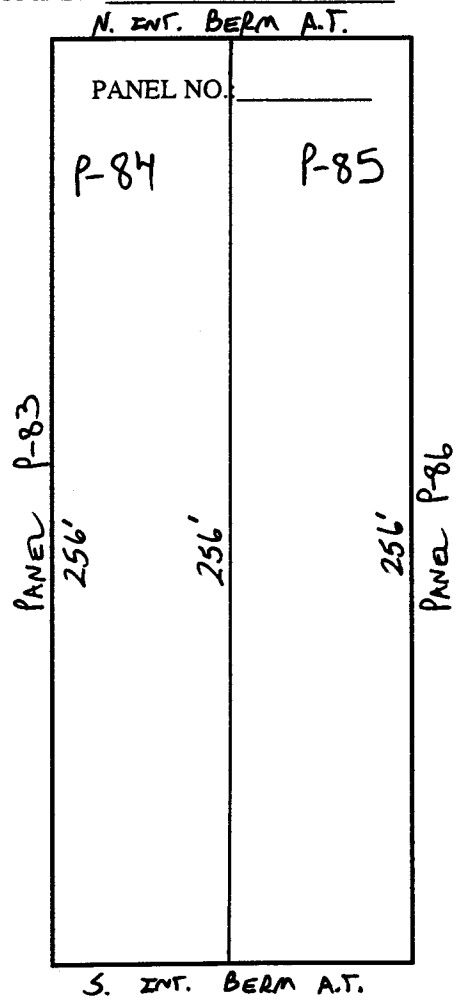
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900220, 2900220

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-86, P-87

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~75°

DEPLOYMENT METHOD: ATV PULL

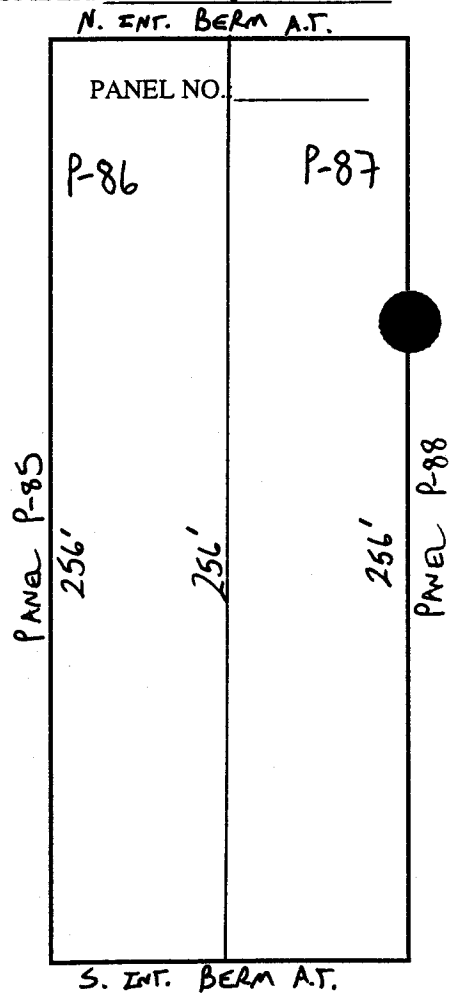
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900185, 2900185

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-88, P-89

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: P. CLOUDY, ~ 70°

DEPLOYMENT METHOD: ATV PULL

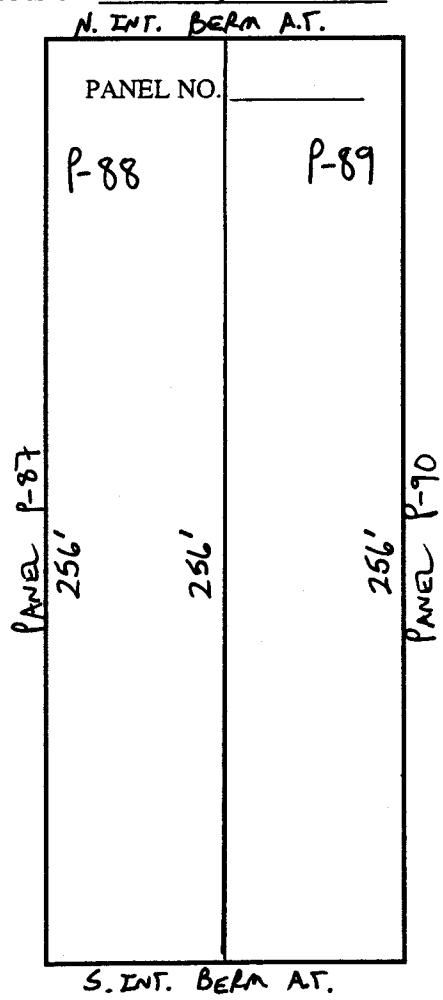
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900350, 2900350

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-90, P-91

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLEAR, ~70°

DEPLOYMENT METHOD: ATV PULL

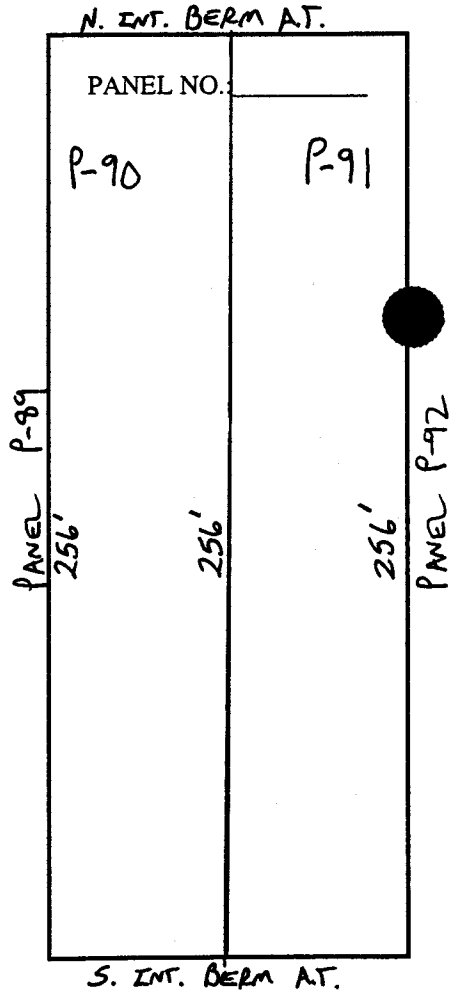
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900261, 2900261

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-92, P-93

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLEAR, ~70°

DEPLOYMENT METHOD: ATV PULL

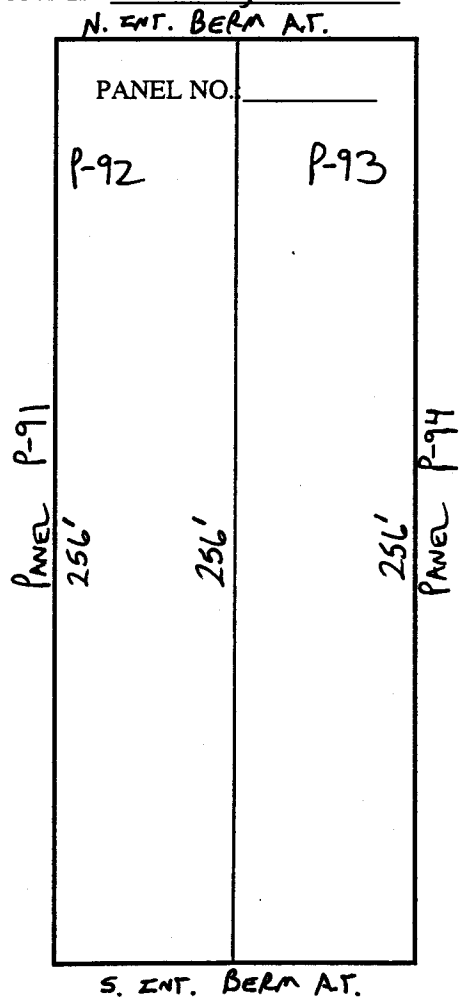
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900273, 2900273

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-94, P-95

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLEAR, ~65°

DEPLOYMENT METHOD: ATV PULL

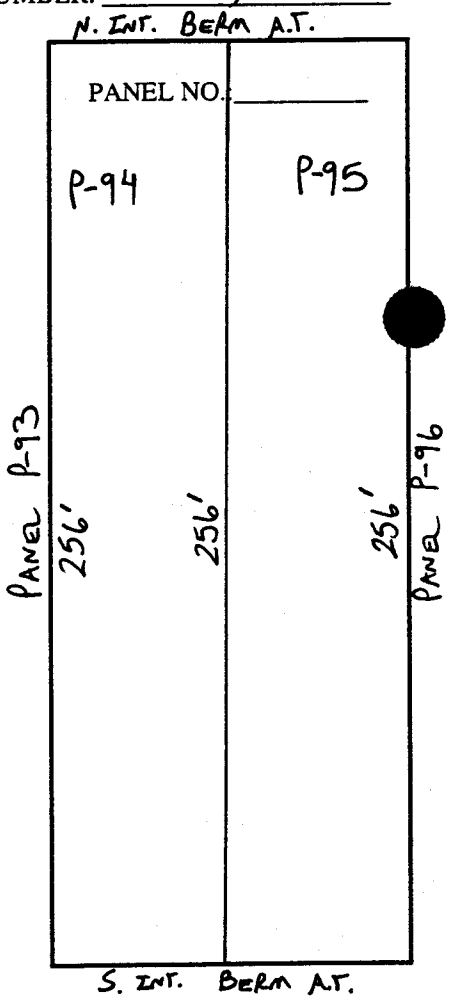
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900266, 2900266

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-96, P-97

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLEAR, ~65°

DEPLOYMENT METHOD: ATV PULL

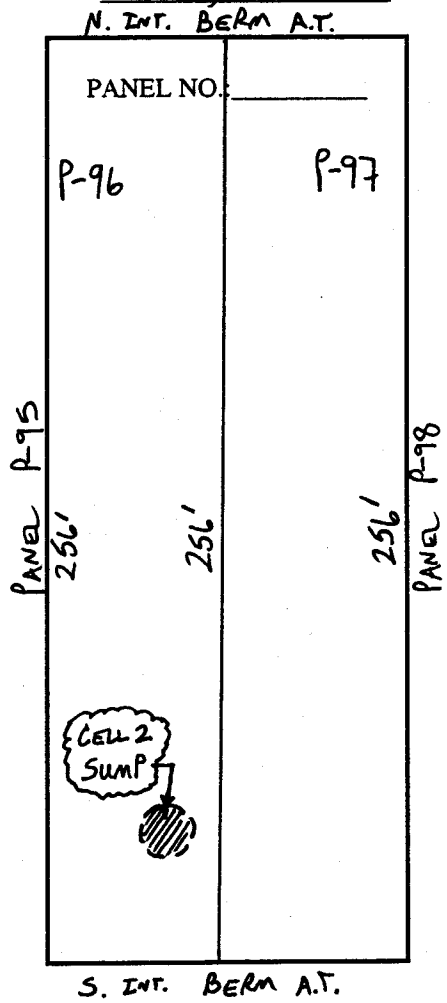
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900224, 2900224

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-98, P-99

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/4/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: CLEAR, ~60°

DEPLOYMENT METHOD: ATV PULL

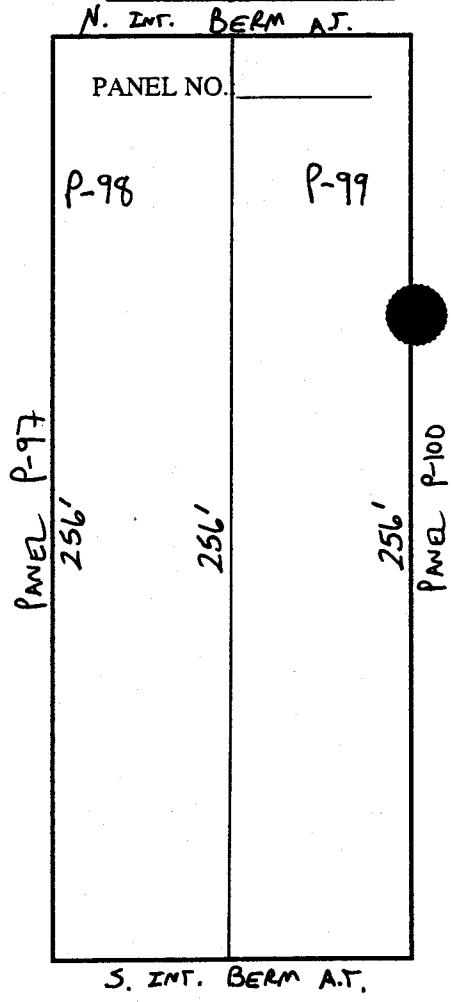
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900197, 2900197

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/4	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-100, P-101

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~60°

DEPLOYMENT METHOD: ATV PULL

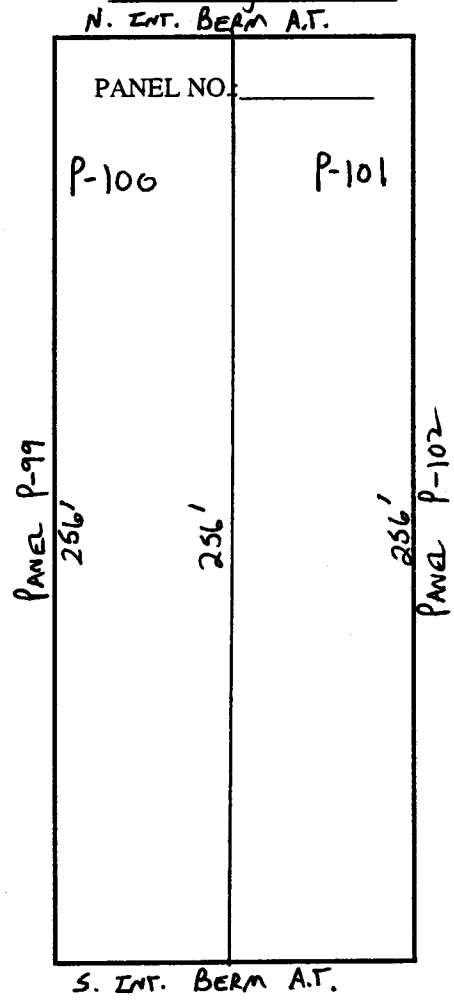
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806202, 2806202

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-102, P-103

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~60°

DEPLOYMENT METHOD: ATV PULL

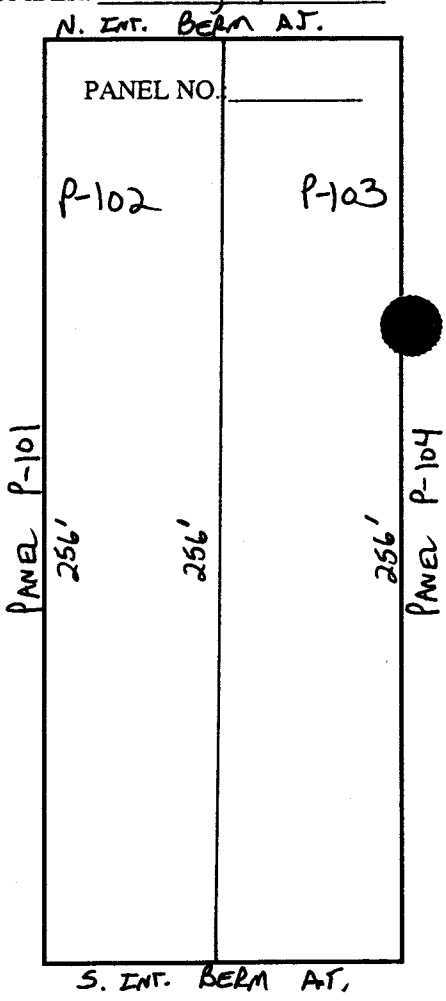
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900355, 2900355

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	NO DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-104, P-105

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~65°

DEPLOYMENT METHOD: ATV PULL

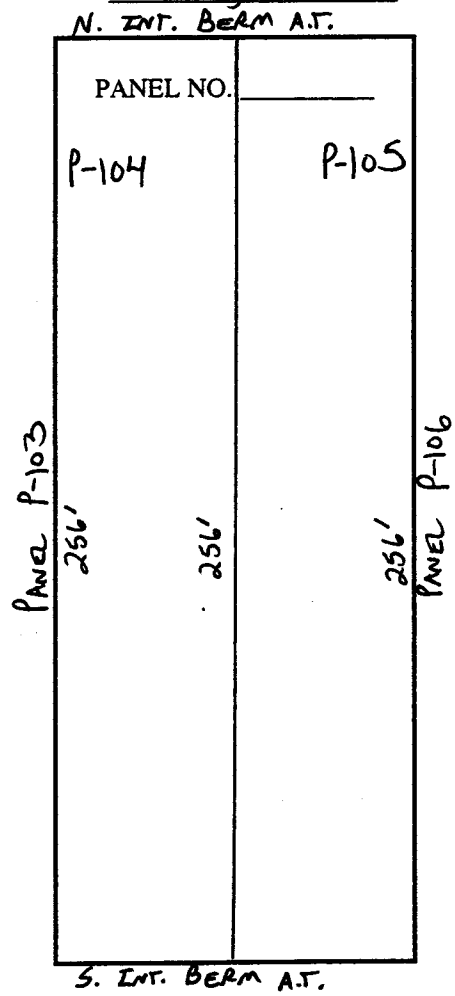
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806205, 2806205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-106, P-107

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~65°

DEPLOYMENT METHOD: ATV Pull

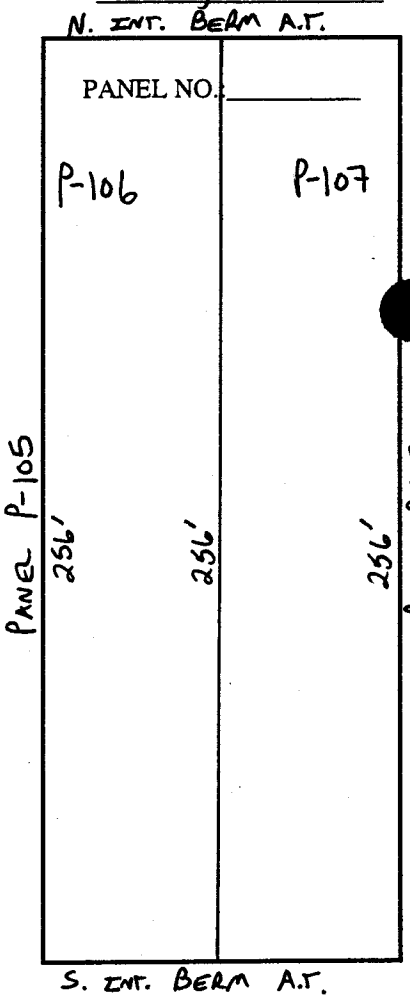
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900199, 2900199

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5 No DEFECTS					



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-108, P-109

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~65°

DEPLOYMENT METHOD: ATV PULL

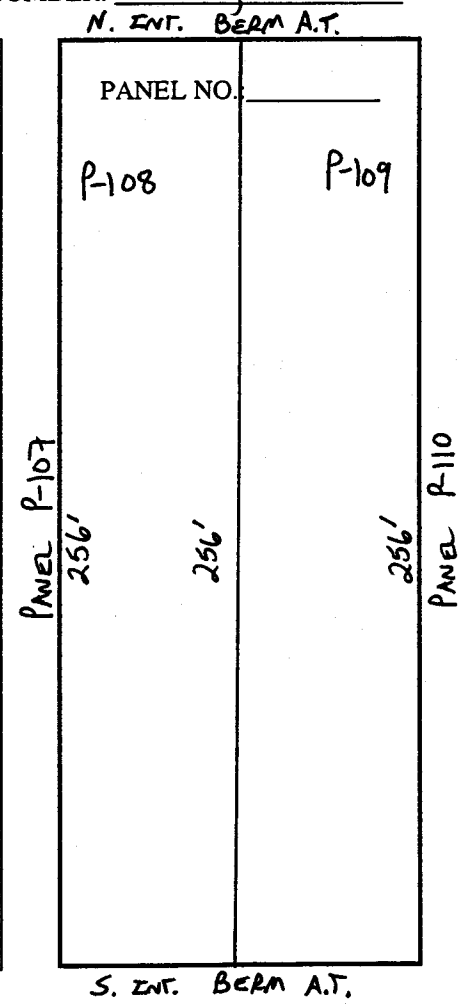
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806197, 2806197

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-110, P-111

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: P. CLOUDY, ~70°

DEPLOYMENT METHOD: ATV PULL

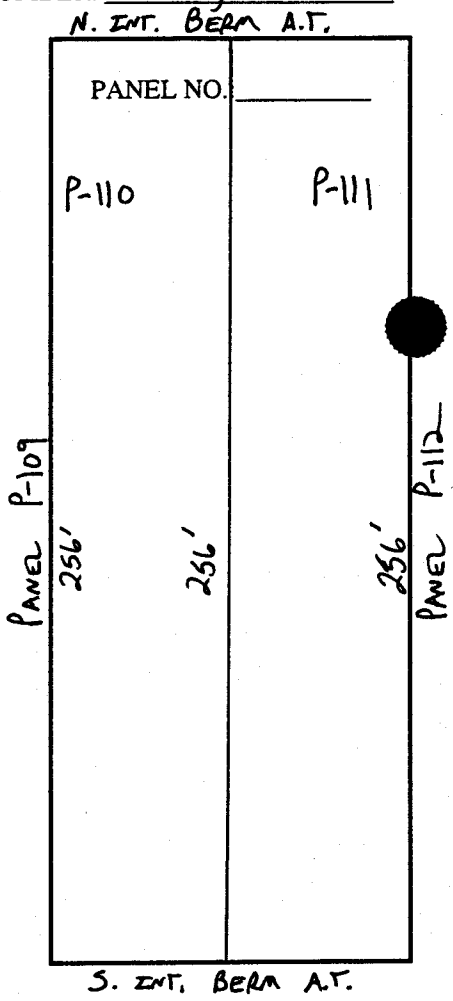
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900188, 2900188

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-112, P-113

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: M. CLOUDY, ~75°

DEPLOYMENT METHOD: ATV PULL

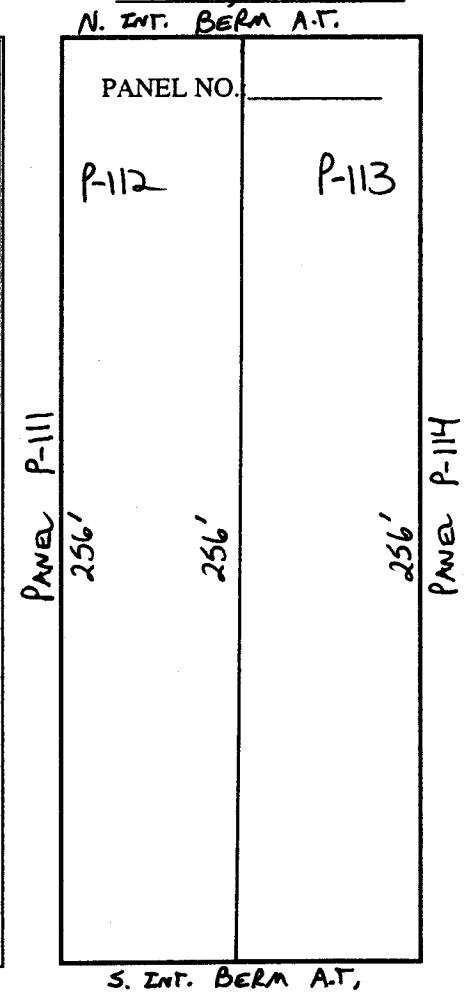
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900207, 2900207

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-114, P-115

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: M. CLOUDY, BREEZY, ~75°

DEPLOYMENT METHOD: ATV PULL

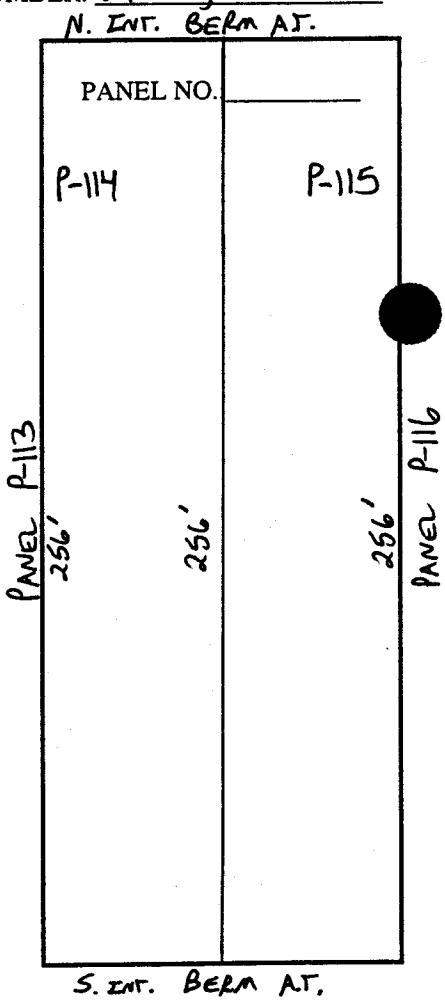
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900210, 2900210

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	No Defects				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-116, P-117

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~75°

DEPLOYMENT METHOD: ATV PULL

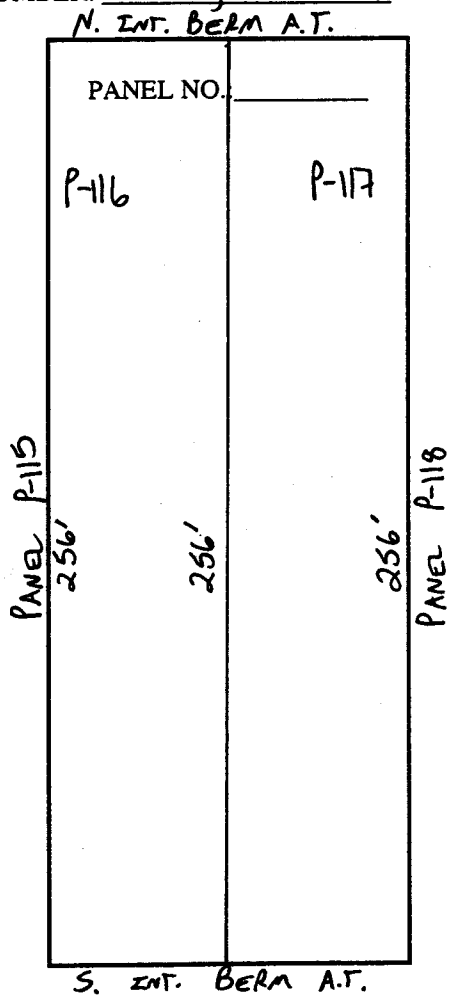
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900174, 2900174

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	No DEFECTS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-118, P-119

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~75°

DEPLOYMENT METHOD: ATV PULL

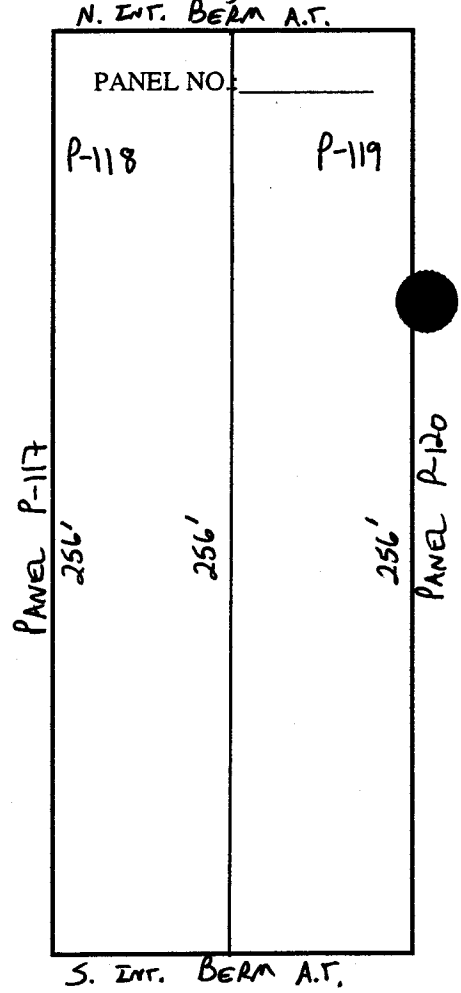
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900269, 2900269

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-120, P-121

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/5/99

SUBGRADE CONDITION: FIRM, SL. MOIST

WEATHER CONDITIONS: CLOUDY, WINDY, ~75°

DEPLOYMENT METHOD: ATV PULL

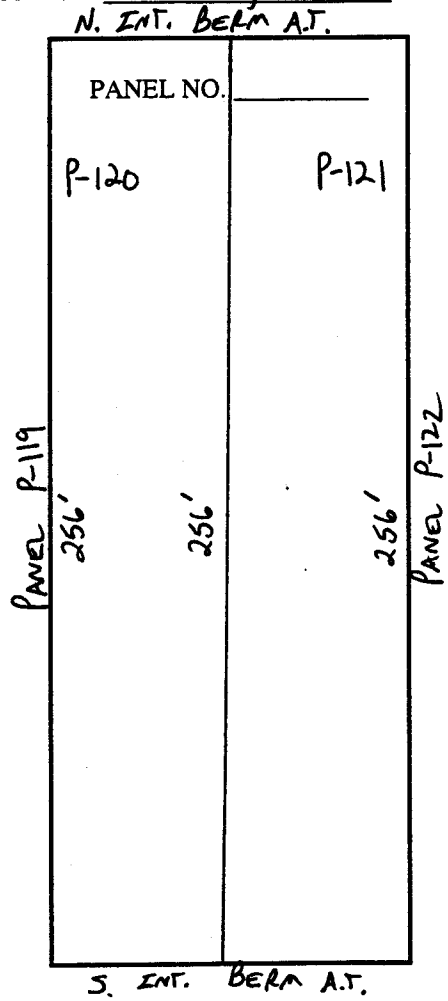
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900352, 2900352

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/5	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-122, P-123

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/6/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: OVERCAST, HUMID, ~65°

DEPLOYMENT METHOD: ATV PULL

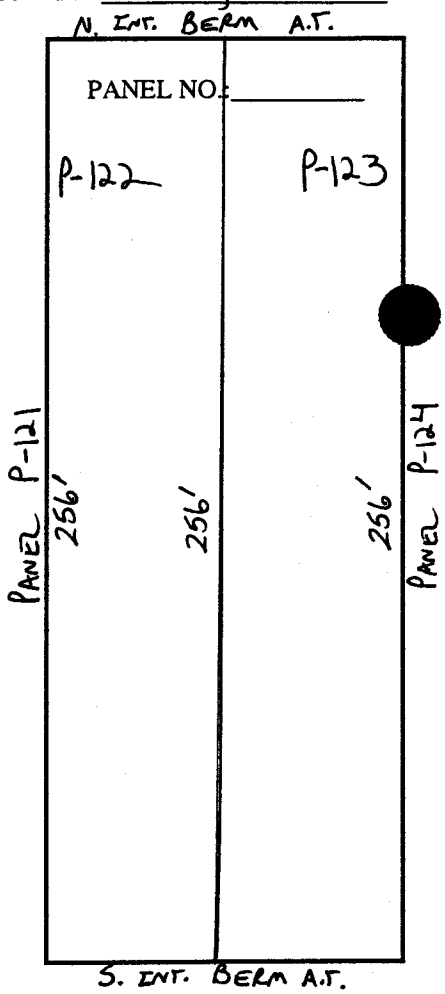
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900351, 2900351

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/6	NO	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-124, P-125

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/6/99

SUBGRADE CONDITION: FIRM, MOIST

WEATHER CONDITIONS: OVERCAST, HUMID, ~65°

DEPLOYMENT METHOD: ATV PULL

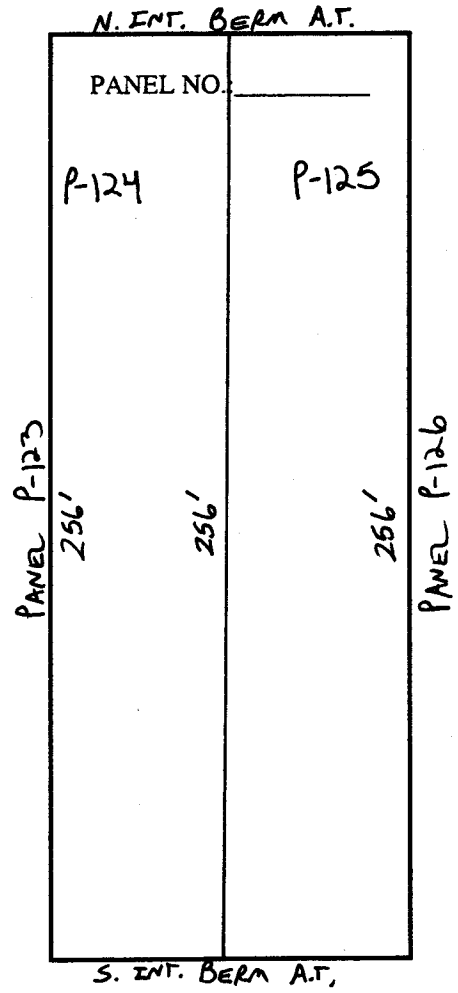
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900275, 2900275

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/6	No	DEFECTS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-126, P-127

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: PARTLY CLOUDY

DEPLOYMENT METHOD: ~~[illegible]~~ ATV PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

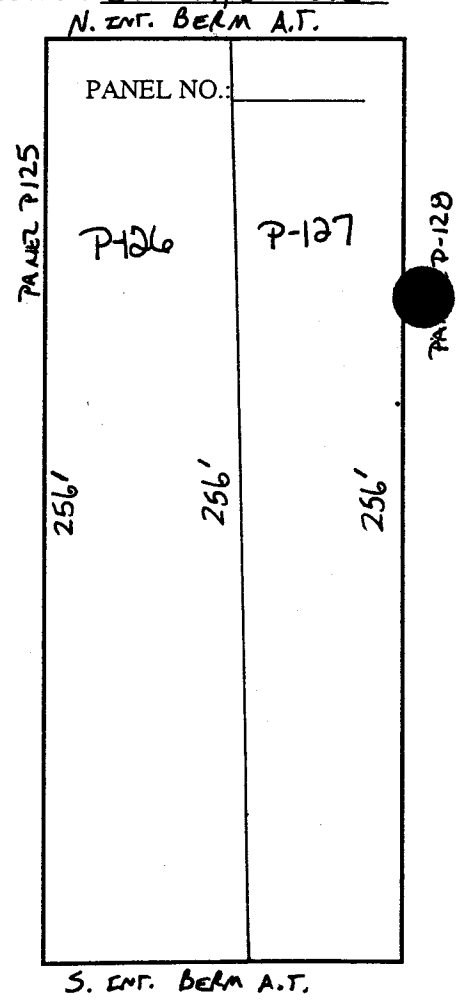
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900346, 2900346

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	NONE				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P128, P129

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: PARTLY CLOUDY

DEPLOYMENT METHOD: ATV PULL (ROLLS SUSPENDED USING BACKHOE & SPREADER BAR)

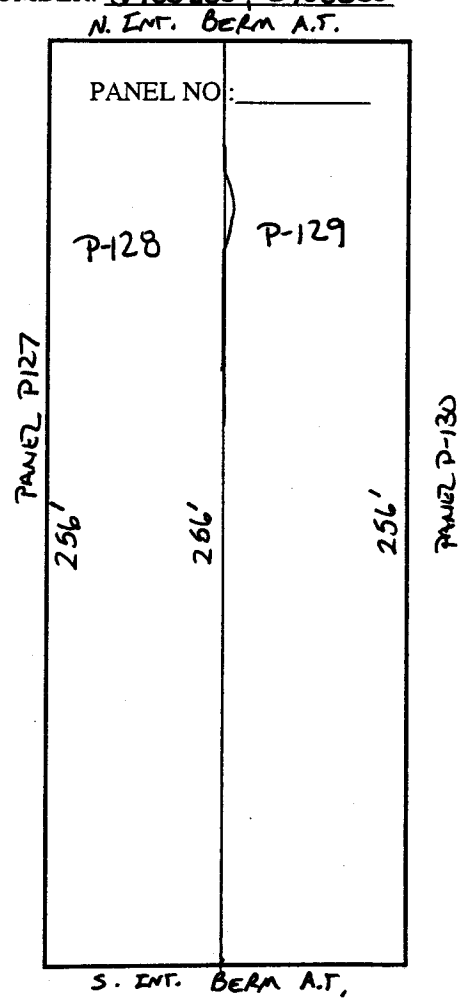
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900200, 2900200

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	NONE				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-130, P-131, P-132, P-133

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

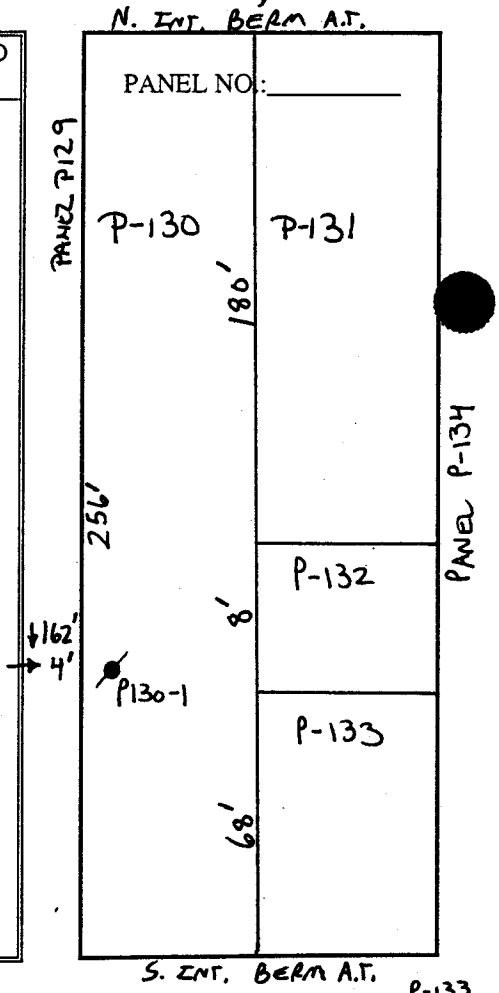
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2806203, 2900218, 2900218, 2900218

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P130-1	SLIT IN LINER	5/12	12"x12" PATCH	RB



TECHNICIAN COMMENTS:

PANEL LENGTH: P-130 = 256', P-131 = 180', P-132 = 8', P-133 = 68'

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-130 = 2,560 SF P-131 = 1,800 SF P-132 = 80 SF P-133 = 680 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-134

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

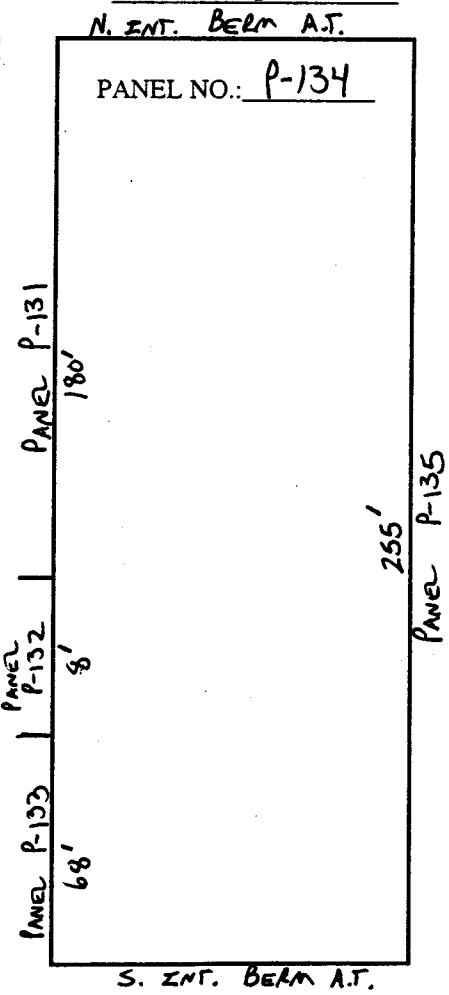
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900343

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP.)

PANEL WIDTH: 10'

PANEL AREA: ~2,550 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P135, P136

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

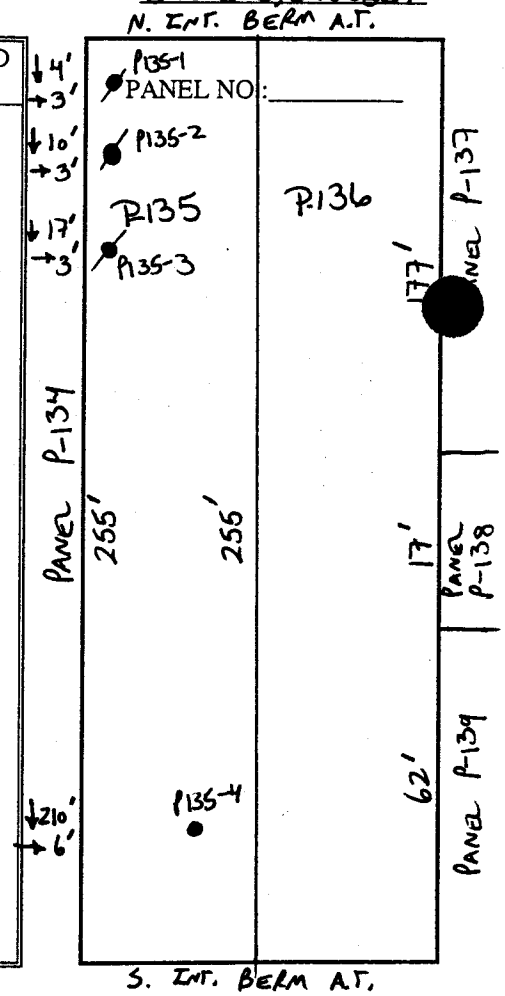
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900343, 2900257

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P135-1	HOLE	5/12	12"x12" PATCH	RCB
5/7/99	P135-2	MATERIAL SCORED	5/12	12"x12" PATCH	RCB
5/7/99	P135-3	HOLE	5/12	12"x12" PATCH	RCB
5/7/99	P135-4	HOLE	5/12	12"x12" PATCH	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP, EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: ~5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-137, P-138, P-139

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY,

DEPLOYMENT METHOD: ATV PULL

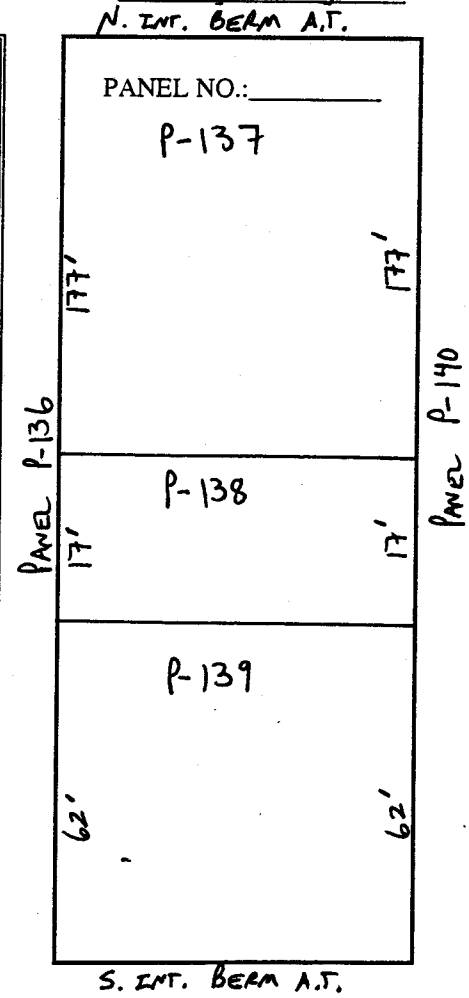
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900257, 2900183, 2900257

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7	No REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-137 = 177', P-138 = 17', P-139 = 62'

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-137 = 1,770 SF P-138 = 170 SF
P-139 = 620 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P 140, P141

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

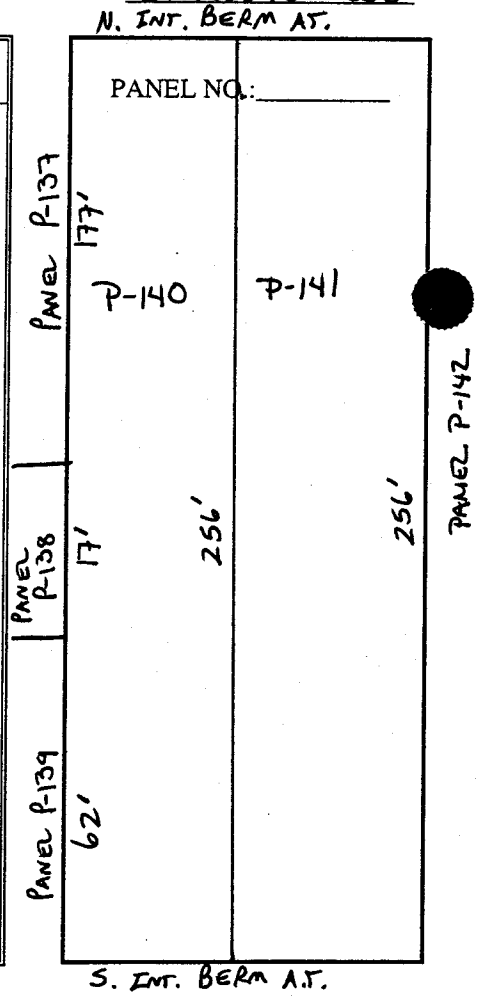
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900358, 2900358

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	NONE				



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-142, P-143

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

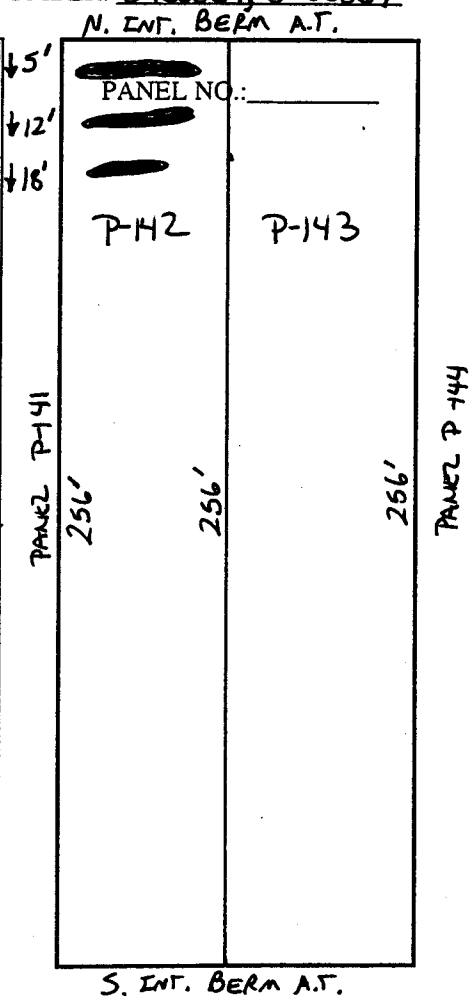
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900267, 2900267

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P142-1	HOLE	5/12	1' x 7' PATCH	RCB
5/7/99	P142-2	HOLE			
5/7/99	P142-3	HOLE			
5/7/99	P142-4	HOLE			
5/7/99	P142-5	HOLE		1' x 7' PATCH	RCB
5/7/99	P142-6	HOLE			
5/7/99	P142-7	HOLE			
5/7/99	P142-8	HOLE			
5/7/99	P142-9	HOLE		1' x 5' PATCH	RCB
5/7/99	P142-10	HOLE			
5/7/99	P142-11	MATERIAL SCORED			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-144, P-145

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV- PULL (ROLLS SUSPENDED W/ SPREADER BAR & RUBBER TIRE LOADER)

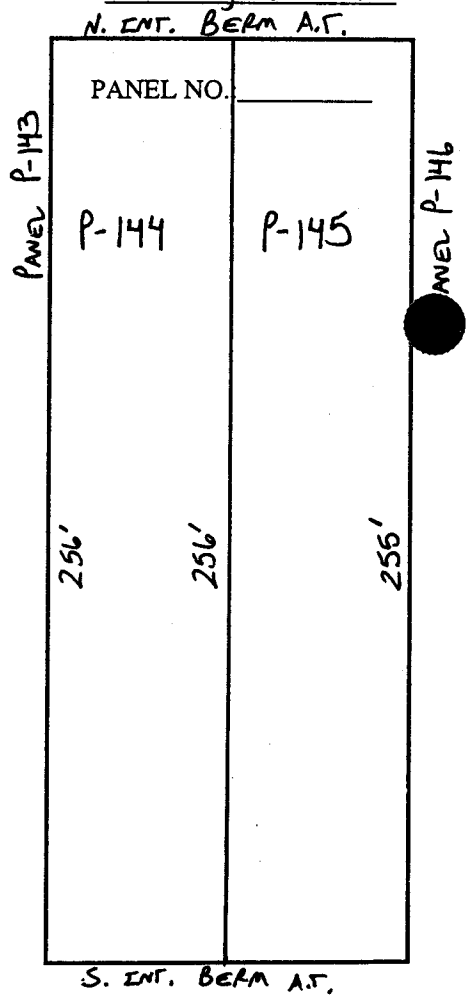
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900357, 2900357

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P144-1	MAT'L. STRECHED	O.K.	NO PATCH NEEDED	RCB 5/12
5/7/99	P144-2	MAT'L. STRECHED			
5/7/99	P144-3	MAT'L. STRECHED			



TECHNICIAN COMMENTS:

PANEL LENGTH: 256' (TYP, EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: ~5,120 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-146, P-147

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV-PULL (ROLLS SUSPENDED W/ RUBBER TIRE LOADER & SPREADER BAR)

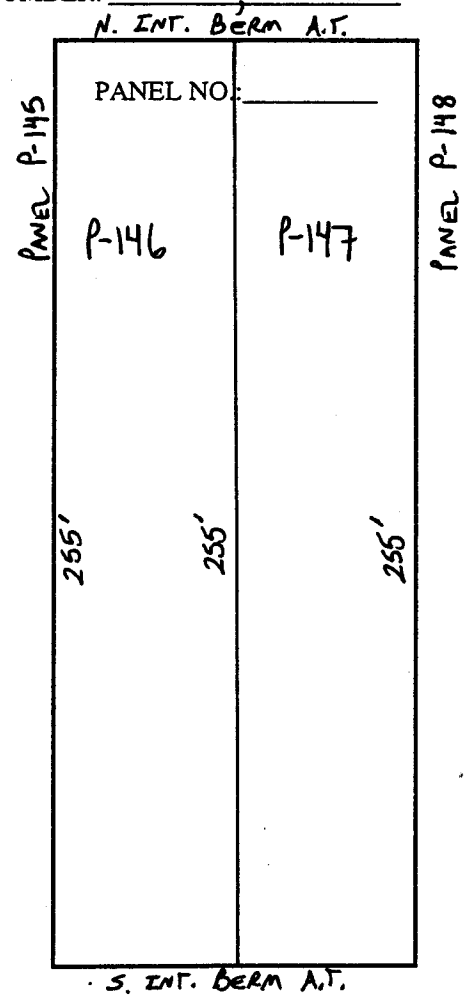
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900348, 2900348

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,160 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-148, P-149

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV-PULL (ROLLS SUSPENDED USING RUBBER TIRE LOADER & SPREADER BAR)

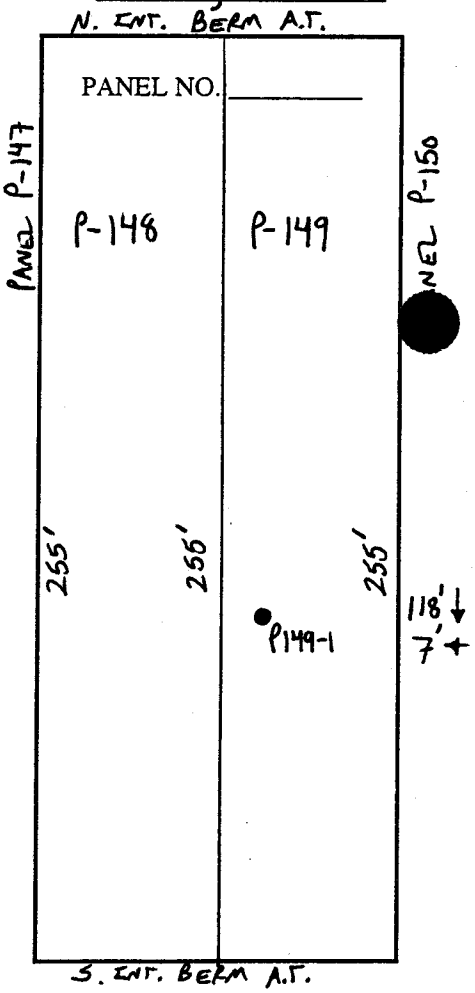
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900193, 2900193

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P148-1	MAT'L. THINNED	O.K.	No PATCH NEEDED	RCB 5/12
5/7/99	P149-1	MAT'L. SCORED	5/12	12"x12" PATCH	RCB
5/7/99	P149-2	MAT'L. THINNED	O.K.	No PATCH NEEDED RCB 5/12	



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-150, P-151

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MEO-AMERICA

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV- PULL (ROLL SUSPENDED FROM RUBBER TIRE LOADER & SPREADER BAR)

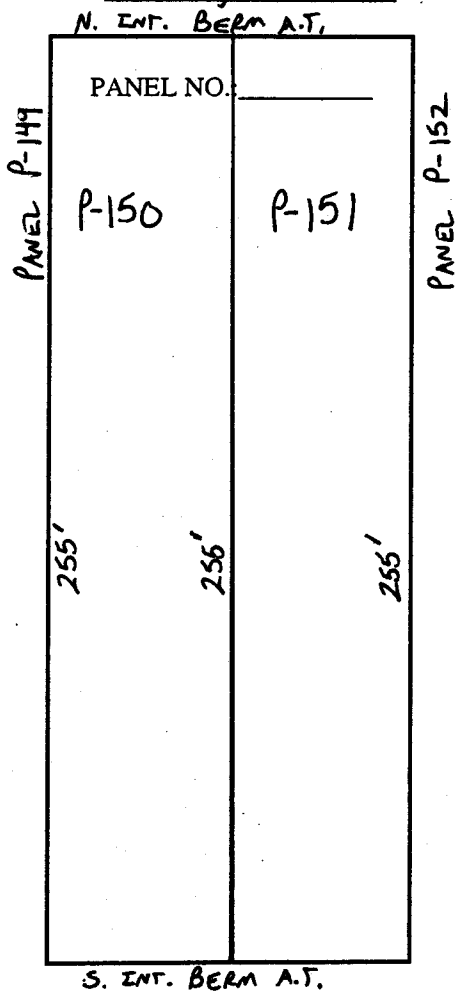
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900192, 2900192

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-152, P-153

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV-PULL (ROLL SUSPENDED FROM RUBBER TIRE LOADER & SPREADER BAR)

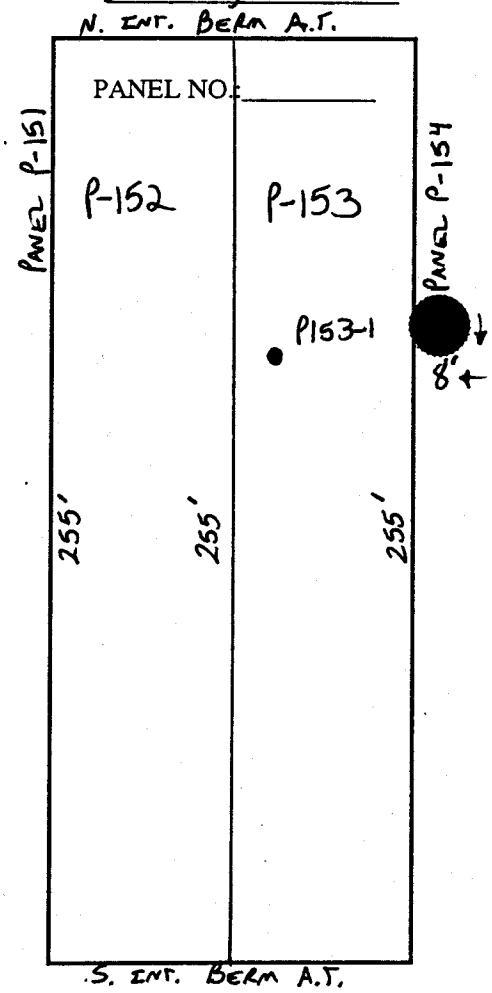
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900342, 2900342

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P153-1	ROCK UNDER LINER	5/12	12"x12" PATCH	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-154, P-155

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV-PULL (ROLL SUSPENDED USING RUBBER TIRE LOADER & SPREADER BAR)

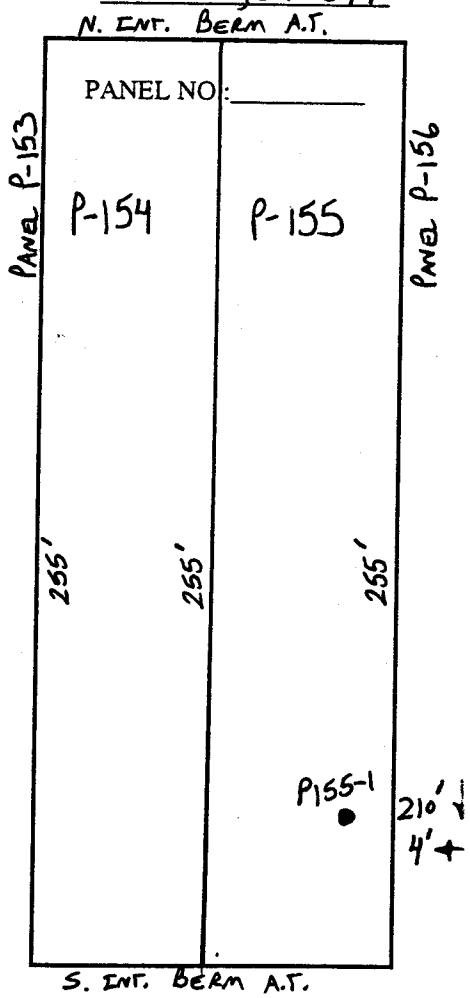
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900344, 2900344

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P155-1	ROCK UNDER LINER	5/12	12" X 12" PATCH	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P156, P-157

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/7/99

SUBGRADE CONDITION: DRY, FIRM

WEATHER CONDITIONS: VARIABLY CLOUDY, BREEZY

DEPLOYMENT METHOD: ATV-PULL (ROLLS SUSPENDED USING RUBBER TIRE LOADER & SPREADER BAR)

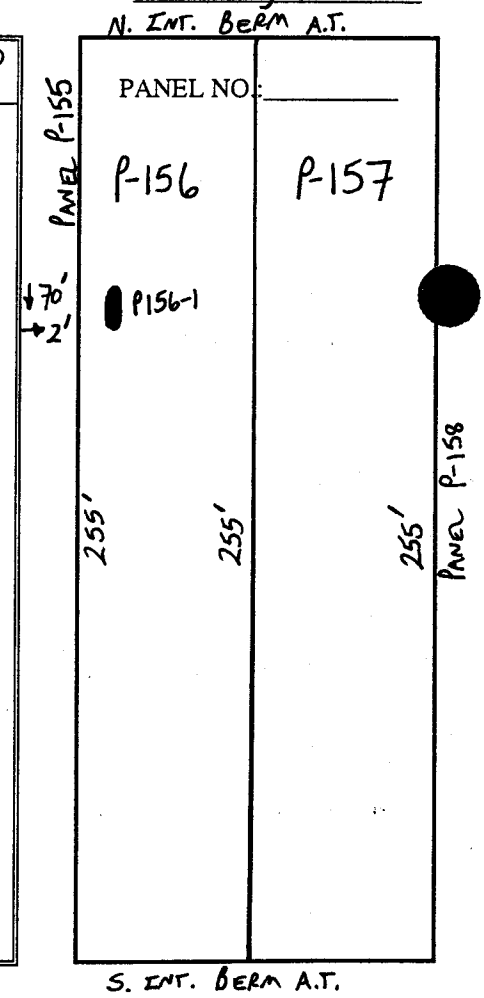
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900271, 2900271

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/7/99	P156-1	DEEP CREASE	5/12	24" x 36" PATCH	RCB
5/7/99	P156-2	DEEP CREASE			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-158, P-159

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, SL. BREEZE

DEPLOYMENT METHOD: ATV PULL

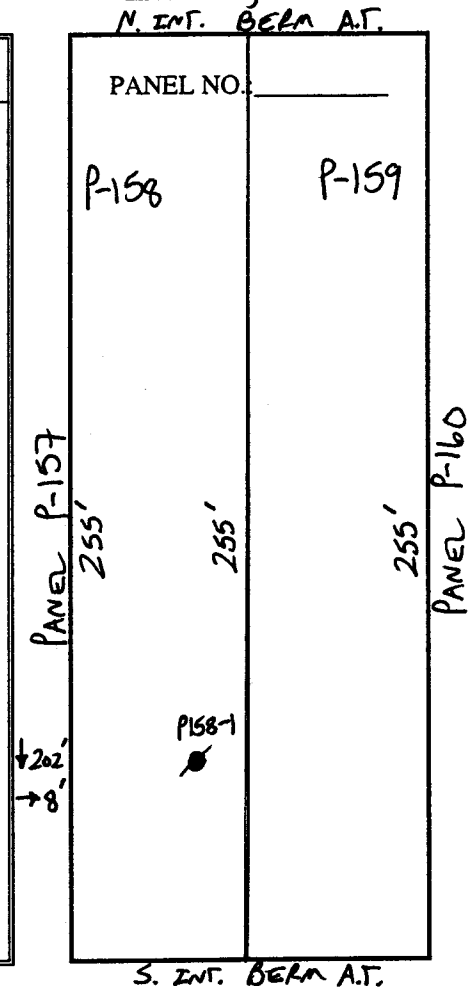
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900279, 2900279

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	P158-1	ABRASION	5/12	12"×12" PATCH	RCB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-160, P-161

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, BREEZY

DEPLOYMENT METHOD: ATV PULL

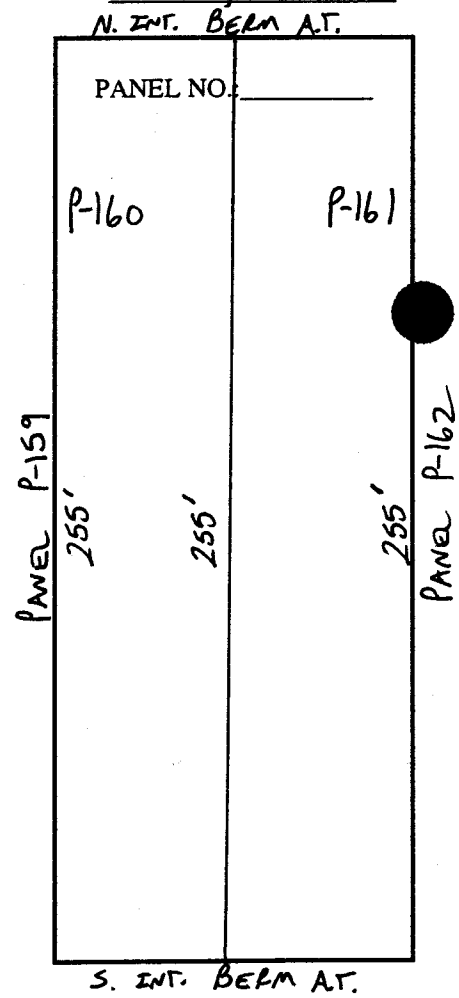
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900196, 2900196

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	NO	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-162, P-163

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/8/99

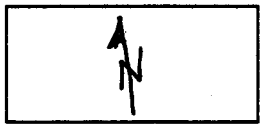
SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, BREEZY

DEPLOYMENT METHOD: ATV PULL

SHOW PROJECT NORTH

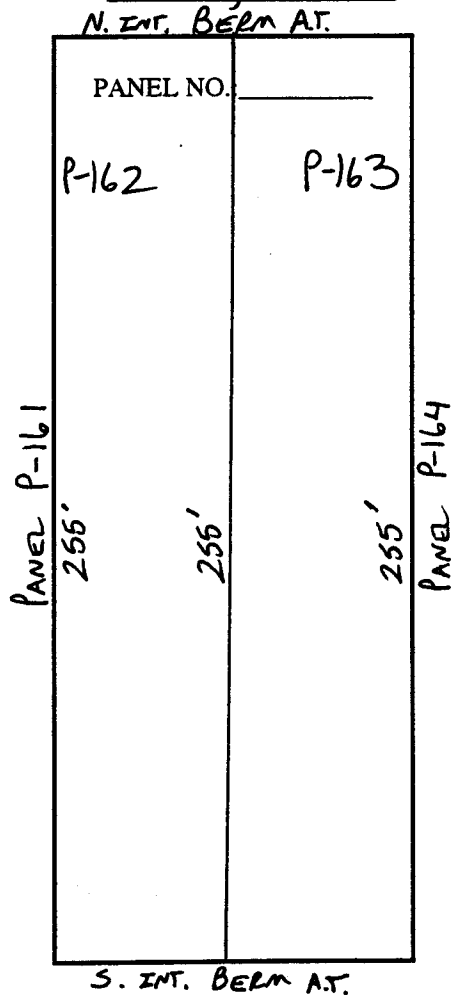
SHOW ALL DIMENSIONS



PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900213, 2900213

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	No REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-164, P-165

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

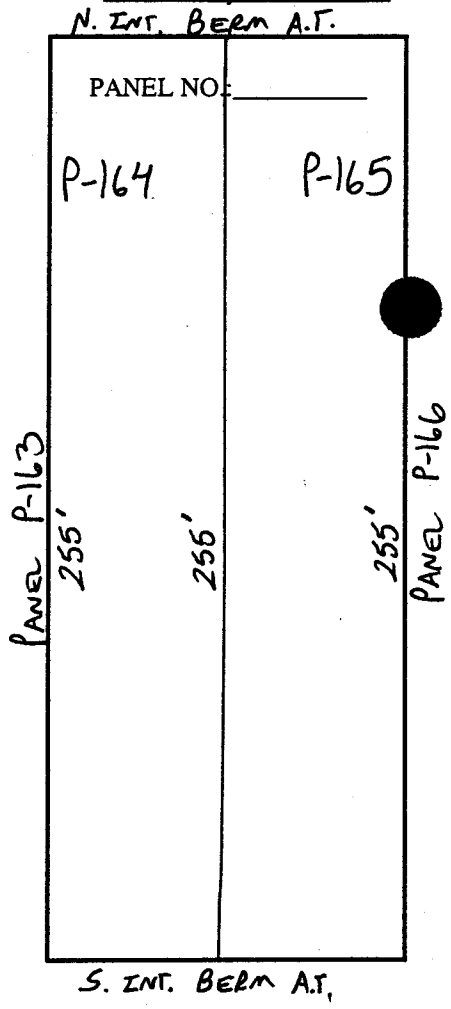
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900202, 2900202

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-166, P-167

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV PULL

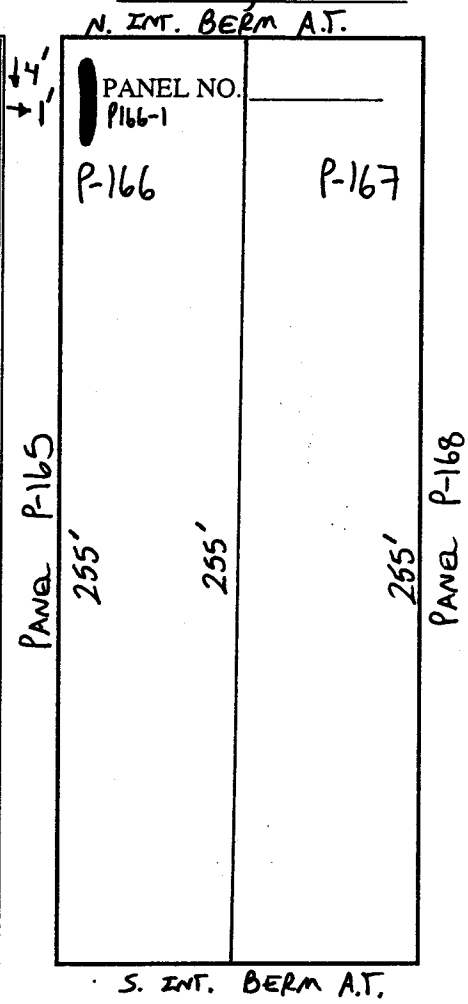
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2960195, 2900195

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	P166-1	PUNCTURES (4 TOTAL)	5/12	12" × 36" PATCH	



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-168, P-169

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY

DEPLOYMENT METHOD: ATV Pull

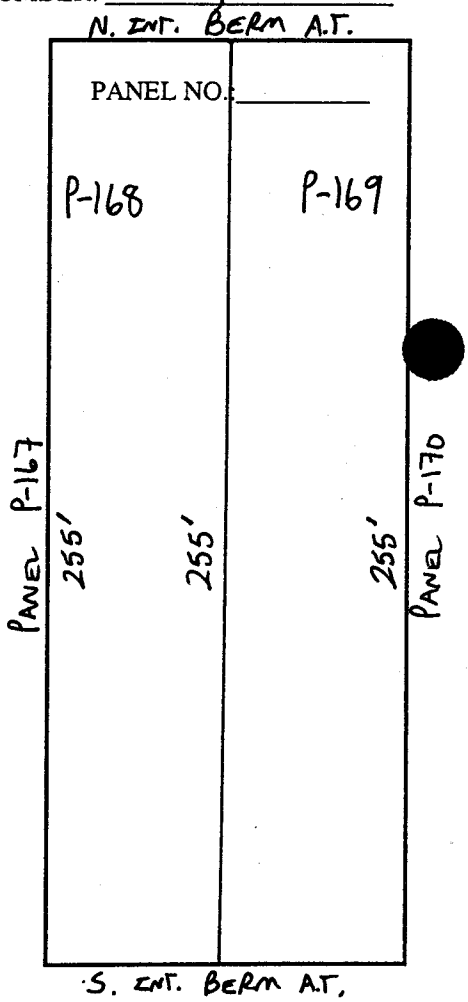
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900214, 2900214

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	No Repairs				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-170, P-171

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, SL. BREEZE

DEPLOYMENT METHOD: ATV PULL

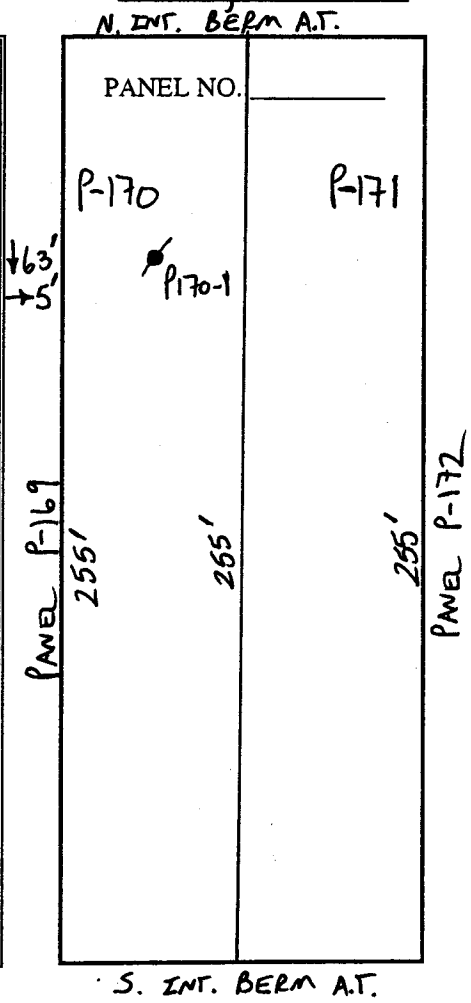
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900198, 2900198

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	P170-1	PUNCTURE	5/12	12"x12" PATCH	RB



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-172, P-173

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA

DATE PLACED: 5/8/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, SL BREEZE

DEPLOYMENT METHOD: ATV PULL

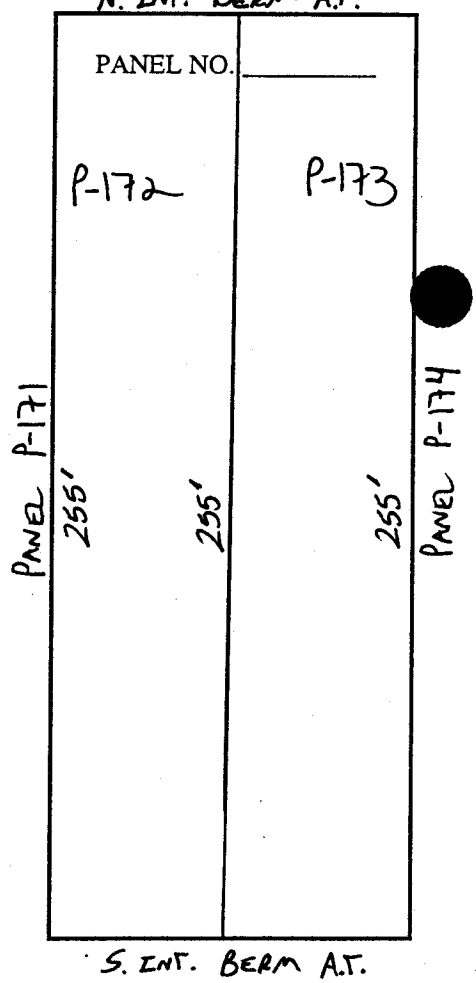
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900274, 2900274

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/8	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 16' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P174, P175

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/10/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

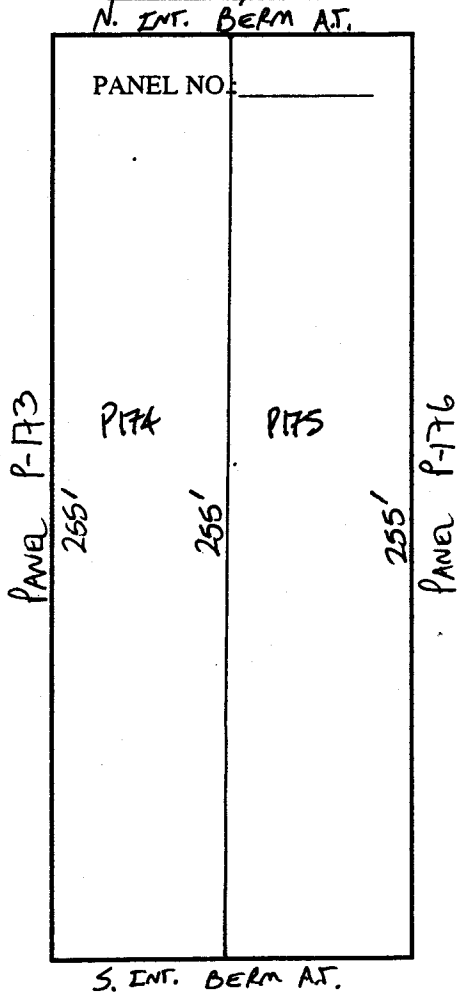
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900253, 2900253

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P176, P177

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5-9-99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

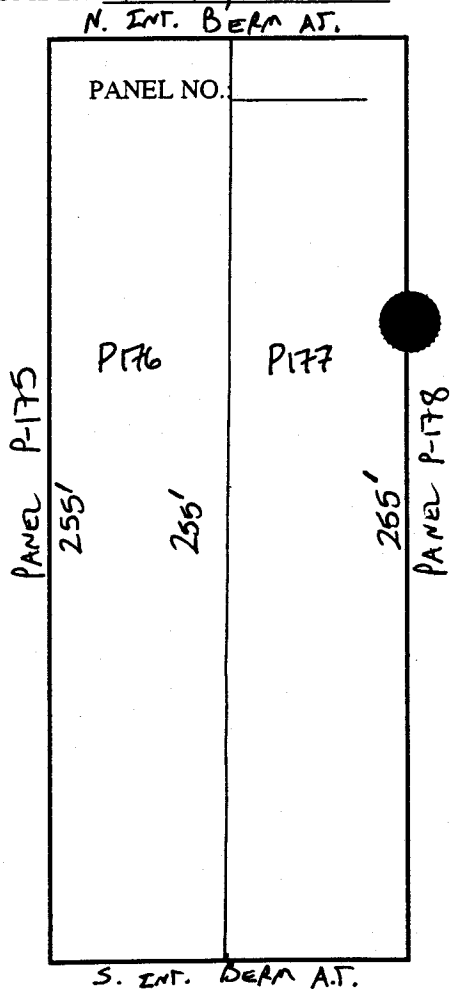
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900212, 2900212

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P178, P179

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

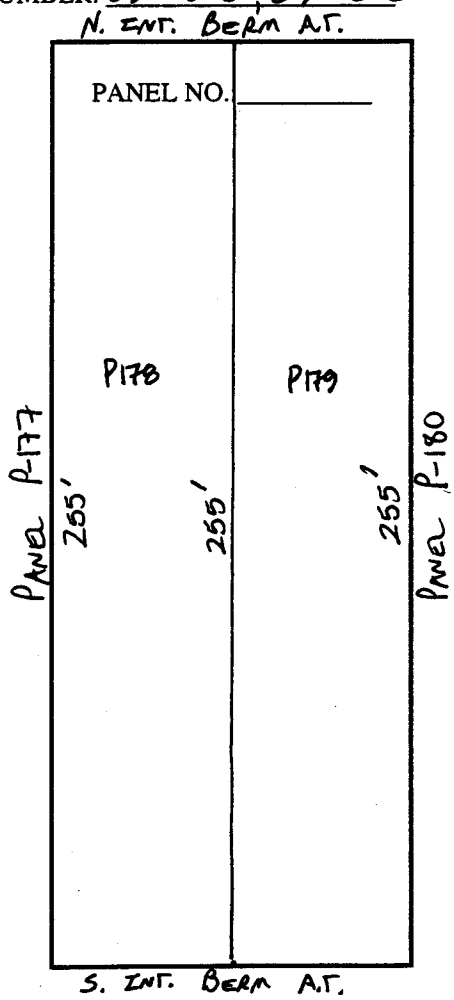
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 29000206, 29000206

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P180, P181

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: HARD, DRY

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

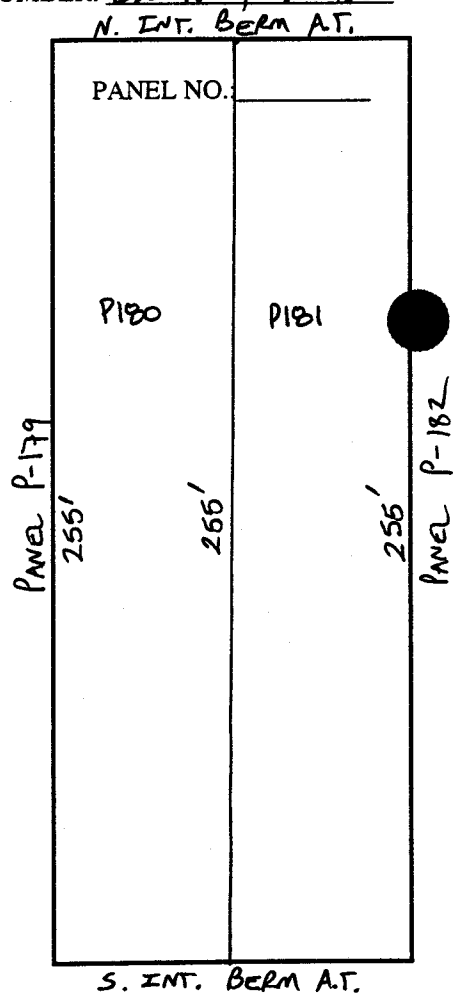
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900190, 2900190

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P182, P183

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: HARD, DRY

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

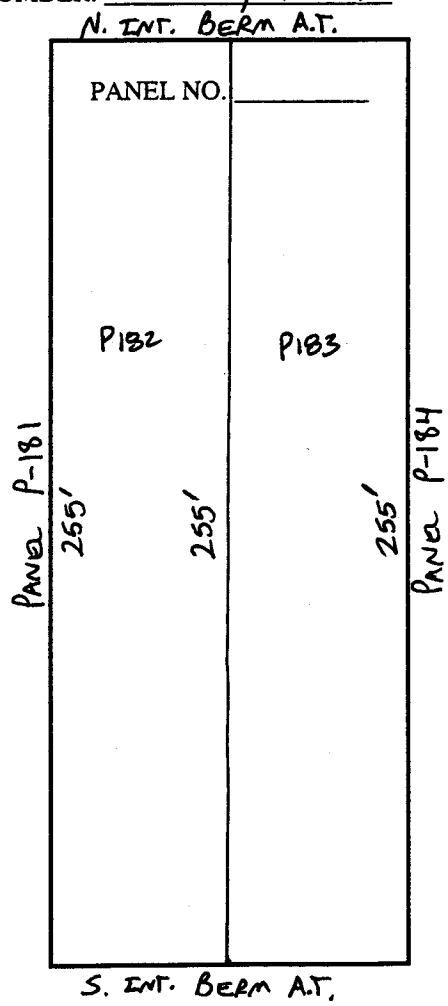
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900214, 2900214

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P184, P185

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL

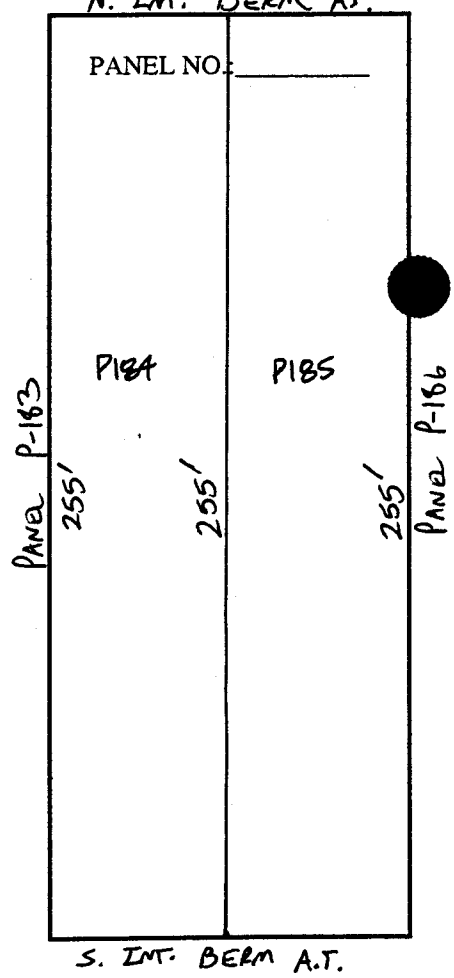
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900259, 2900259

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P186, P187

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, 70°

DEPLOYMENT METHOD: ATV PULL

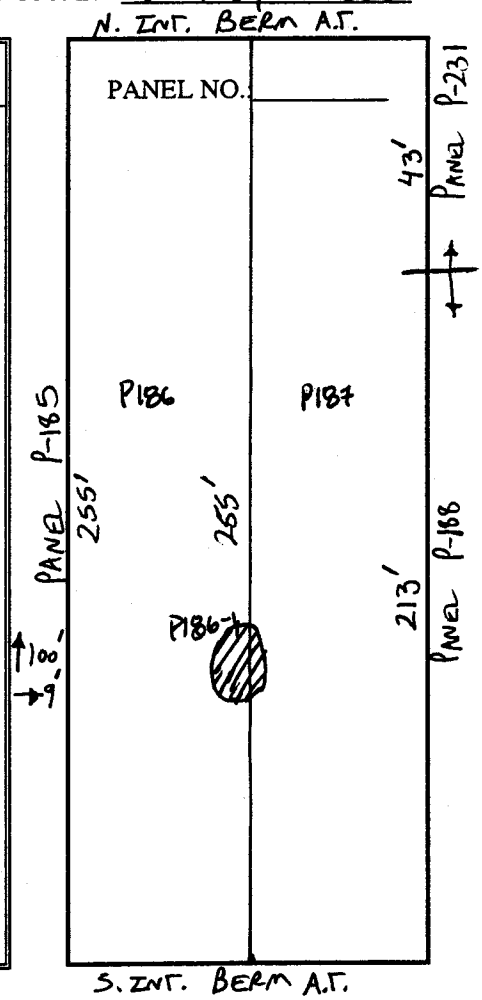
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900339, 2900339

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	P186-1	MAT'L SCORED	5/11/99	PATCH	JTC



TECHNICIAN COMMENTS:

PANEL LENGTH: 255' (TYP)

PANEL WIDTH: 10' (EACH)

PANEL AREA: ~ 5,100 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P188, P189

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL / MANUAL SPOT

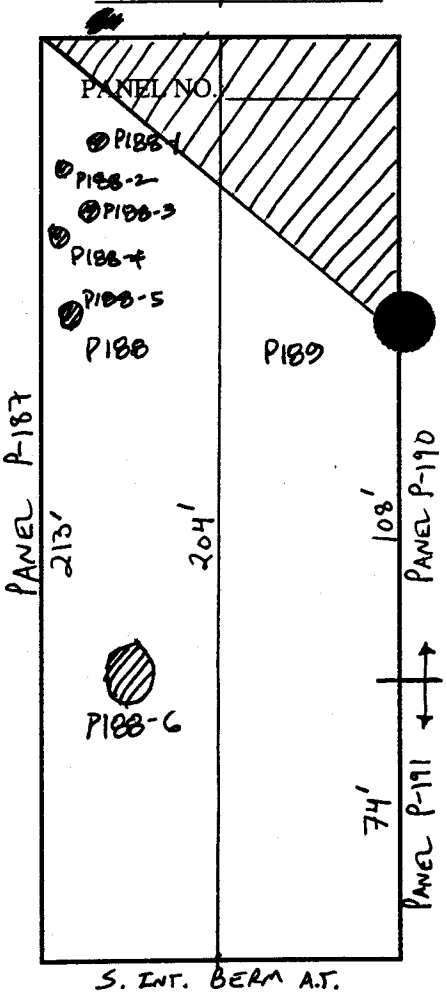
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900256, 2900256

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	P188-6	TEAR	5/11/99	PATCH	JTC
	P188-5	PUNCTURE	5/12/99	PATCH	JTC
	P188-4	PUNCTURE	5/12/99	PATCH	JTC
	P188-3	PUNCTURE	5/12/99	PATCH	JTC
	P188-2	PUNCTURE	5/12/99	PATCH	JTC
	P188-1	PUNCTURE	5/12/99	PATCH	JTC



TECHNICIAN COMMENTS:

PANEL LENGTH: P-188 = 208.5' (AVG.); P-189 = 193' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-188 = 2,085 SF; P-189 = 1,930 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P190, P191, P192

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL / MANUAL SPOT

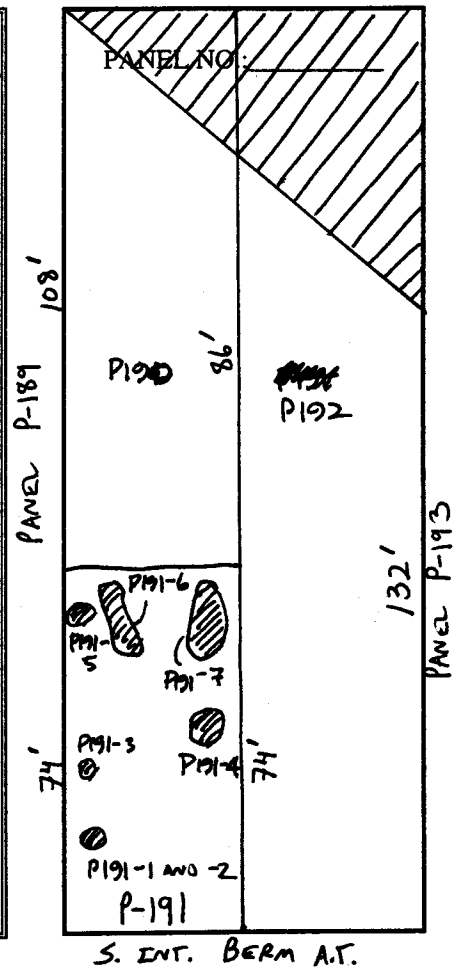
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 29000256, 29000209, 290020[illegible]

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/16	P191-1	PUNCTURE	5/12/99	PATCH	JTC
	P191-2	PUNCTURE	5/12/99	PATCH	JTC
	P191-3	PUNCTURE	5/12/99	PATCH	JTC
	P191-4	PUNCTURE	5/12/99	PATCH	JTC
	P191-5	PUNCTURE	5/12/99	PATCH	JTC
	P191-6	DEEP SCRATCHES	5/12/99	PATCH	JTC
	P191-7	DEEP SCRATCHES	5/12/99	PATCH	JTC



TECHNICIAN COMMENTS:

PANEL LENGTH: P-190 = 97'; P-191 = 74'; P-192 = 146' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-190 = 970 SF; P-191 = 740 SF; P-192 = 1,460 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P193, P-194

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: ATV PULL / MANUAL SPOT

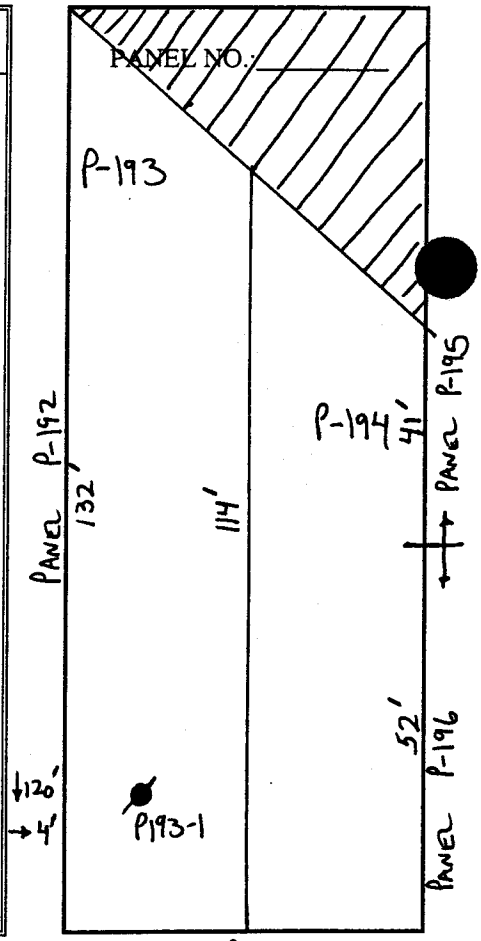
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900209, 2900209

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	P193-1	PUNCTURE	5/11/99	12"x 12" PATCH	JTC



TECHNICIAN COMMENTS:

PANEL LENGTH: P-193 = 123' (AVG.); P-194 = 103.5' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-193 = 1,230 SF; P-194 = 1,035 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-195, P-196, P-197

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FERM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL

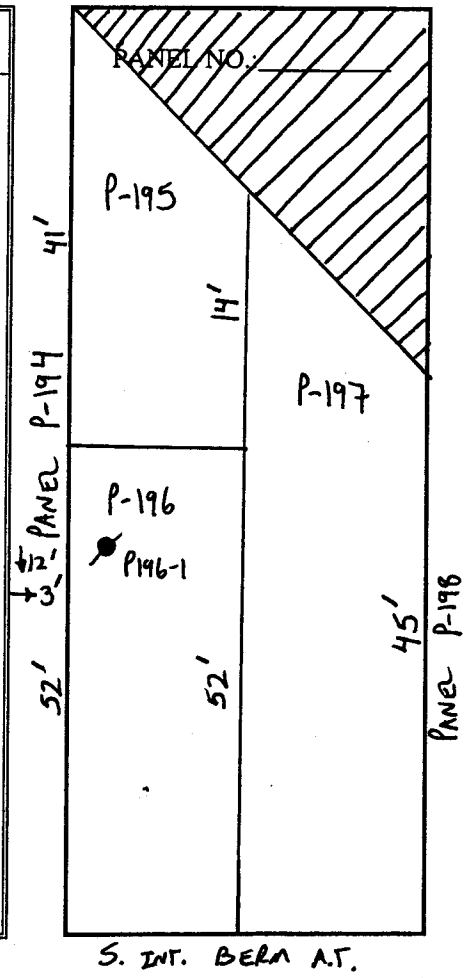
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900209, 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	P196-1	HOLE	5/11	12"x12" PATCH	JTC



TECHNICIAN COMMENTS:

PANEL LENGTH: P-195 = 27.5'; P-196 = 52'; P-197 = 55.5' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-195 = 275 SF; P-196 = 620 SF; P-197 = 555 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P198, P199

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, 70°

DEPLOYMENT METHOD: MANUAL PULL

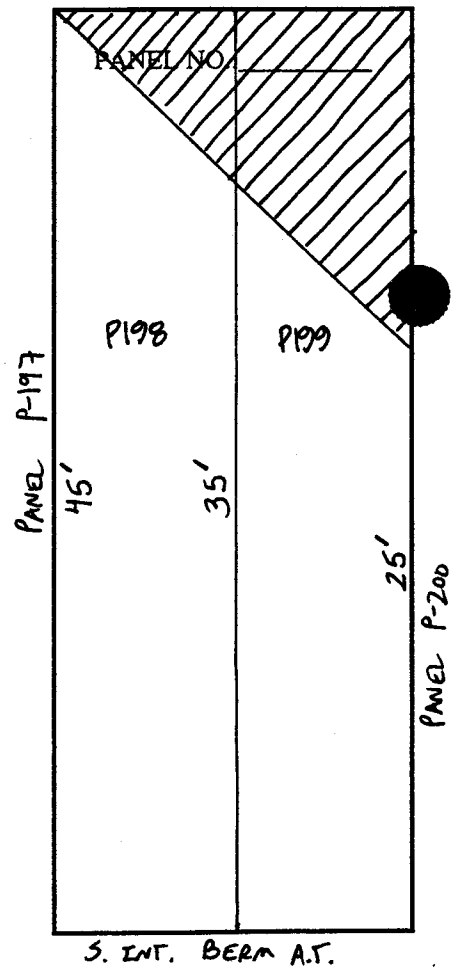
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-198 = 40' (AVG); P-199 = 30' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-198 = 400 SF; P-199 = 300 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P 200, P201

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: DRY, HARD

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL

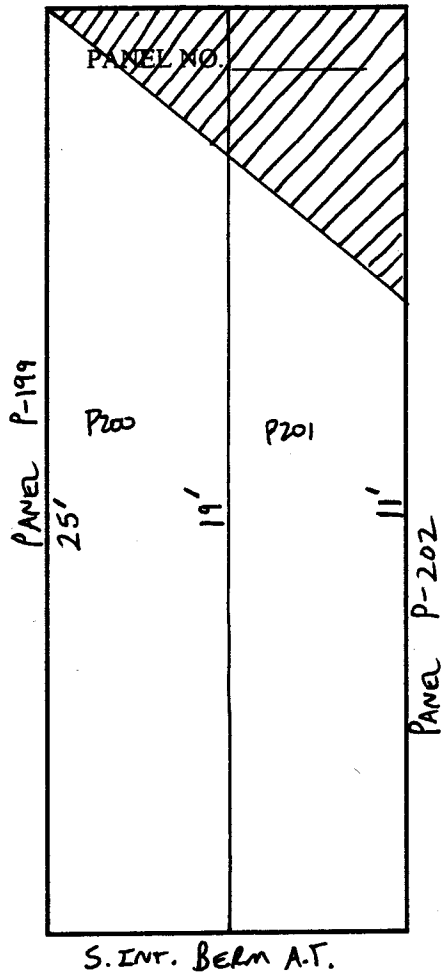
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-200 = 22' (AVG); P-201 = 15' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-200 = 220 SF; P-201 = 150 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-202

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: Firm

WEATHER CONDITIONS: Sunny, ~70°

DEPLOYMENT METHOD: Manual Pull

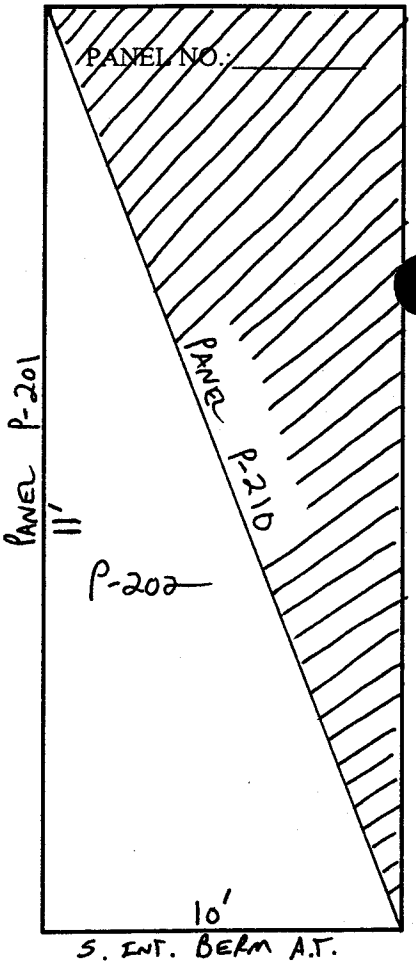
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No Repairs				



TECHNICIAN COMMENTS:

PANEL LENGTH: 55' (AVG.)

PANEL WIDTH: 10' (MAX.)

PANEL AREA: ~55 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-203, P-204

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

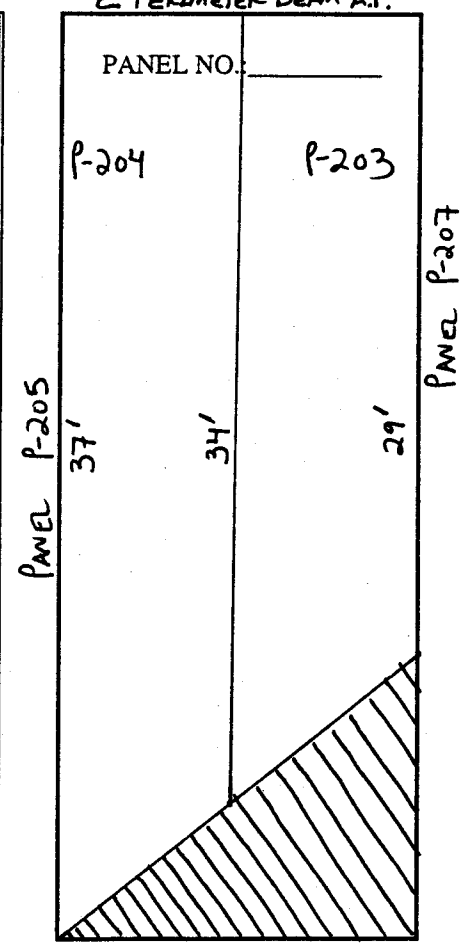
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-204 = 35.5' (AVG); P-203 = 31.5' (AVG.)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-204 = 355 SF; P-203 = 315 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-205, P-206

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

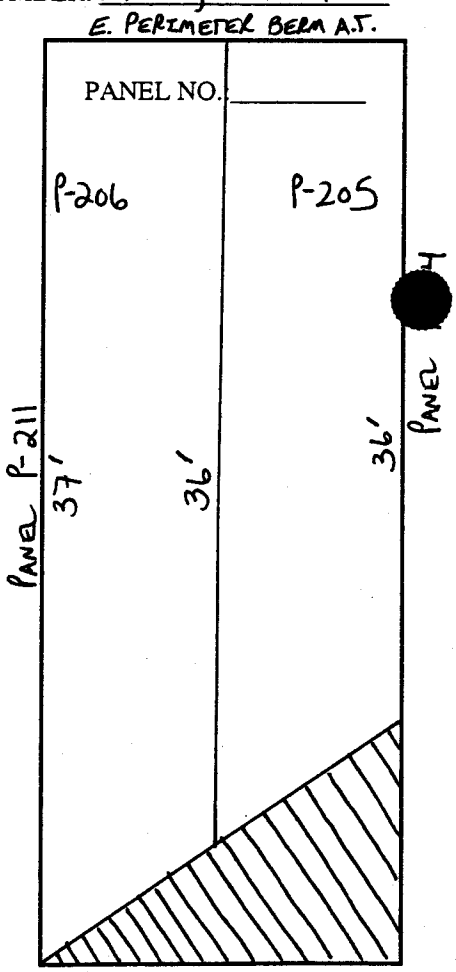
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-206 = 36' (TYP.); P-205 = 36'

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-206 = 360 SF; P-205 = 360 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-207, P-208

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

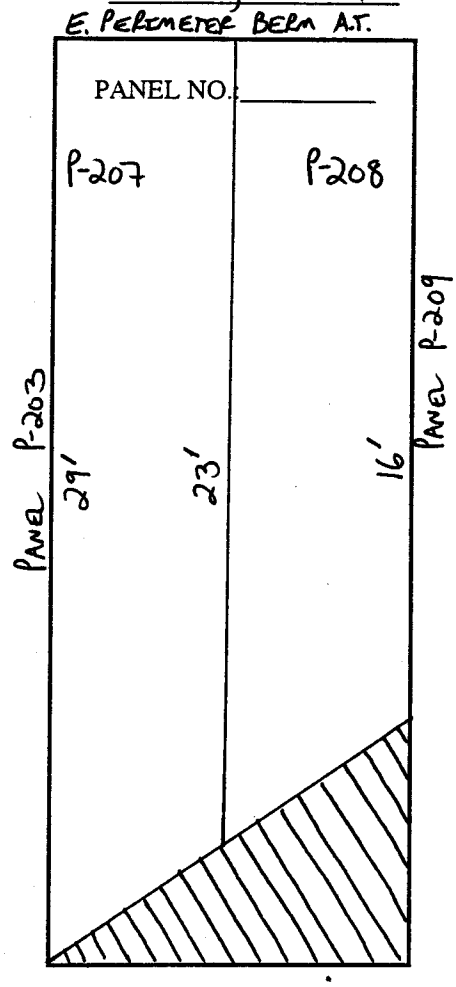
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-207 = 26' (AVG); P-208 = 19.5' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-207 = 260 SF; P-208 = 195 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-209, P-210

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

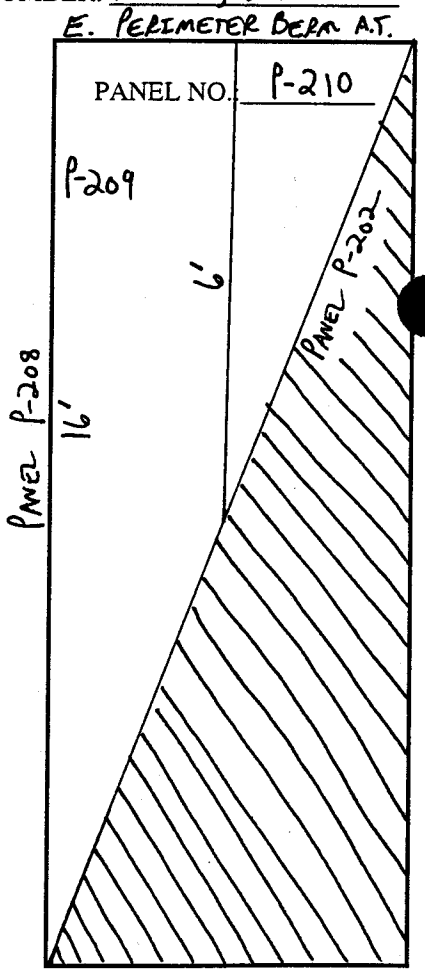
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900211, 2900211

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: P-209 = 11' (AVG); P-210 = 3' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-209 = 110 SF; P-210 = 30 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-211, P-212

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

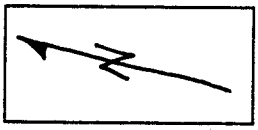
DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

SHOW PROJECT NORTH

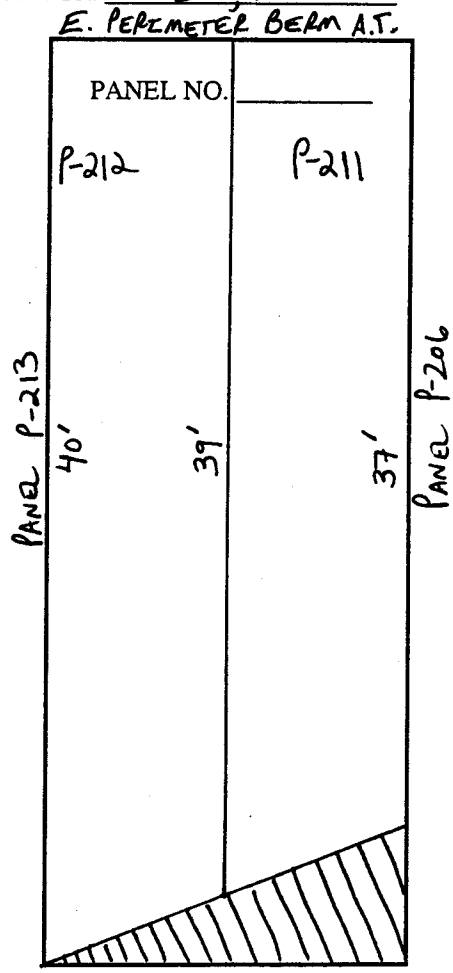


SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-212 = 39' (TYP); P-211 = 38' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-212 = 390 SF; P-211 = 380 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-213, P-214

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

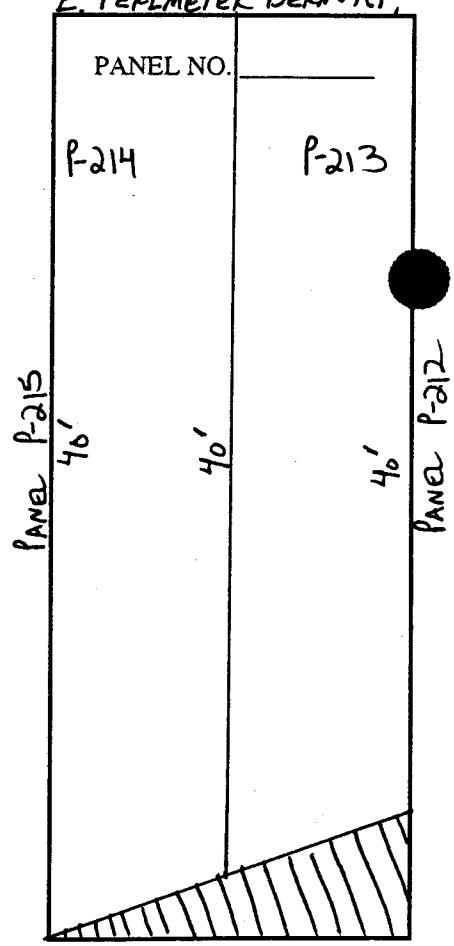
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 40' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 800 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-215, P-216

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

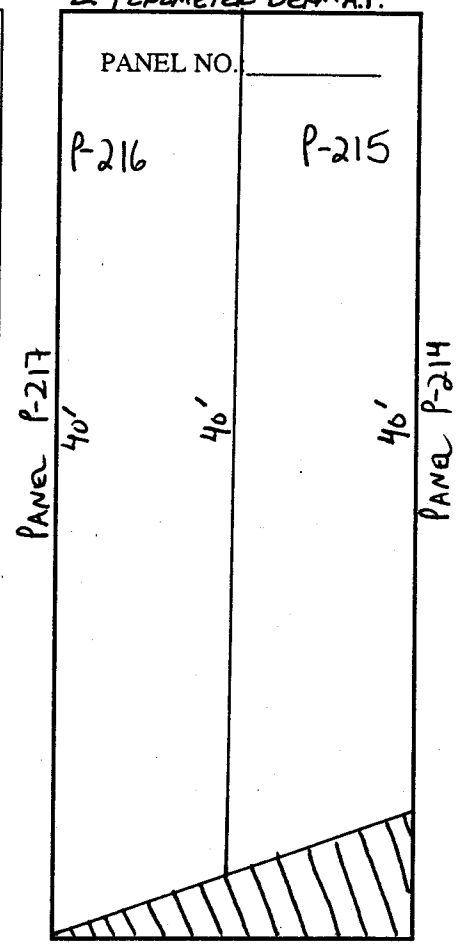
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	No	REPAIRS			



TECHNICIAN COMMENTS:

PANEL LENGTH: 40' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 800 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-217, P-218

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED FOIL

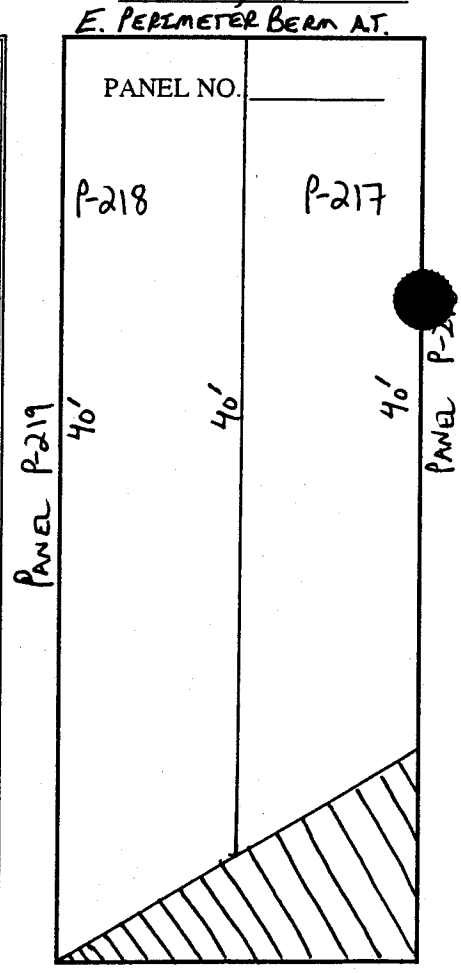
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 40' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 800 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-219, P-220

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

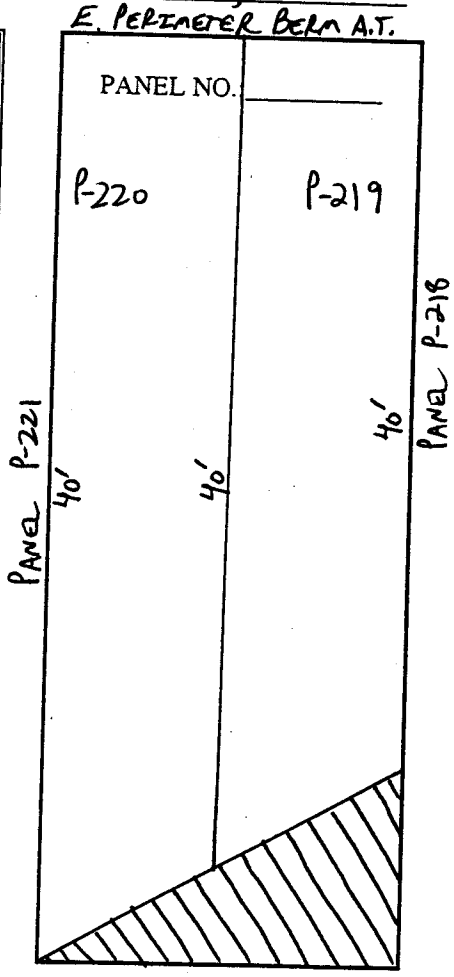
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 40' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 800 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-221, P-222

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

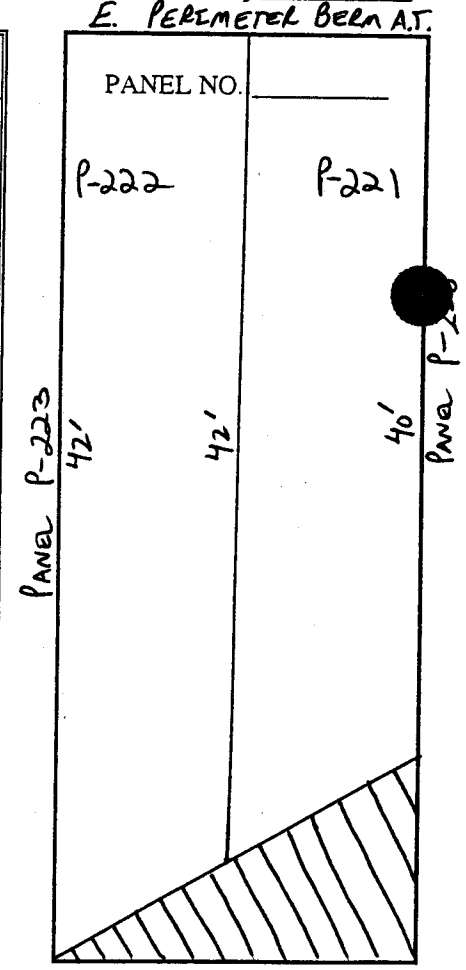
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900205, 2900205

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-222 = 42'; P-221 = 41' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-222 = 420 SF; P-221 = 410 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-223, P-224

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

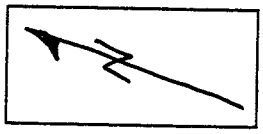
SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

SHOW PROJECT NORTH

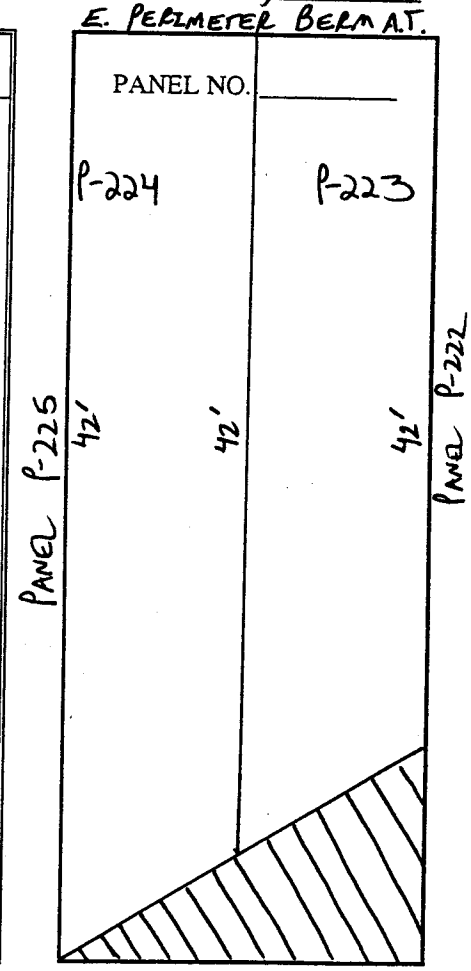
SHOW ALL DIMENSIONS



PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 42' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 840 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-225, P-226

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

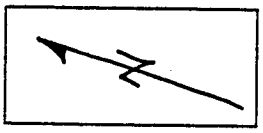
SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

SHOW PROJECT NORTH

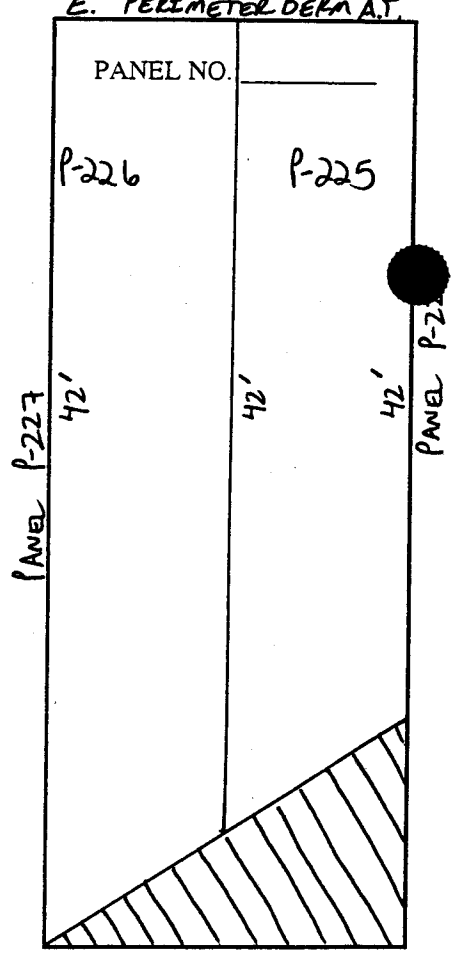
SHOW ALL DIMENSIONS



PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: 42' (EACH)

PANEL WIDTH: 10' (EACH)

PANEL AREA: 840 SF (TOTAL)

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-227, P-228

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

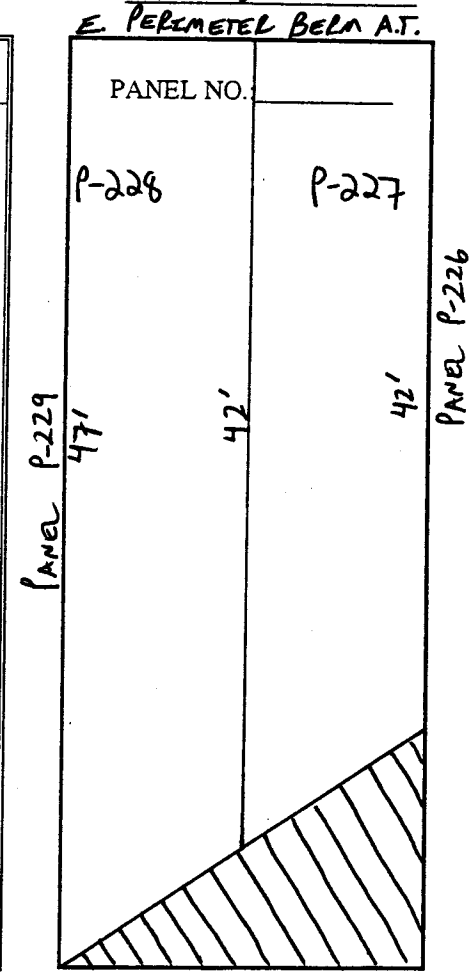
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-228 = 44.5' (AVG); P-227 = 42'

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-228 = 445 SF; P-227 = 420 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-229, P-230

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

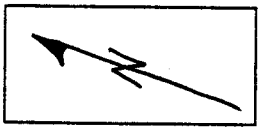
SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

SHOW PROJECT NORTH

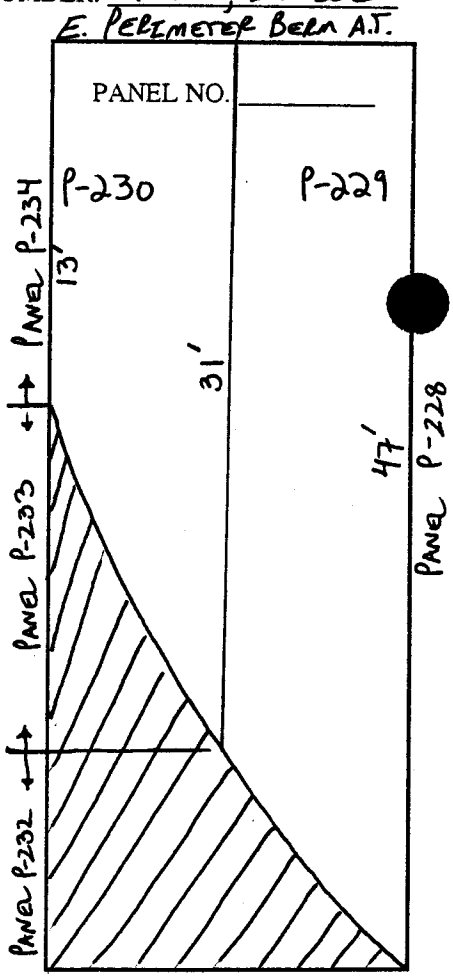
SHOW ALL DIMENSIONS



PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-230 = 22' (TYP); P-229 = 39' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-230 = 220 SF; P-229 = 390 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-231, P-232

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FIRM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED ROLL

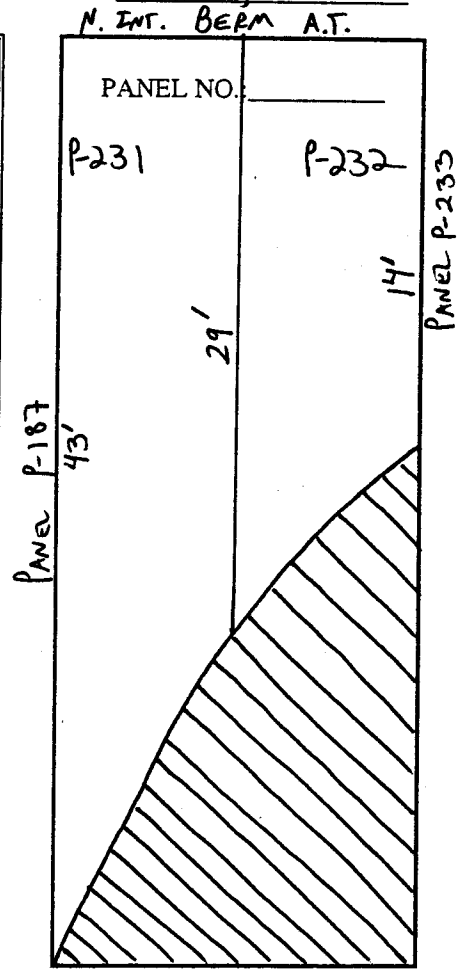
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-231 = 36' (AVG); P-232 = 21.5' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-231 = 360 SF; P-232 = 215 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA GEOMEMBRANE PANEL INSPECTION FORM

PROJECT: HALIFAX CO. COAL ASH MONOFILL – CELL 2

PANEL NO.: P-233, P-234

PROJECT NO.: 3786-004

GEOMEMBRANE TYPE: UNREINF. POLYPROPYLENE

CONTRACTOR: BARNHILL CONTRACTING COMPANY

INSTALLER: MID-AMERICA LINING COMPANY

DATE PLACED: 5/9/99

SUBGRADE CONDITION: FERM

WEATHER CONDITIONS: SUNNY, ~70°

DEPLOYMENT METHOD: MANUAL PULL FROM SUSPENDED POLE

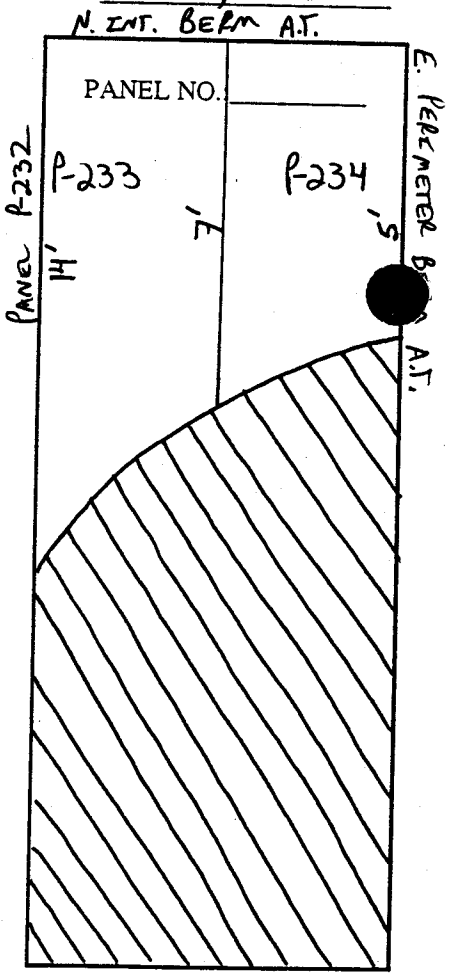
SHOW PROJECT NORTH

SHOW ALL DIMENSIONS

PANEL THICKNESS: 40 (mils)

ROLL NUMBER: 2900222, 2900222

DATE	DEFECT I.D.	DEFECT DESCRIPTION	REPAIR DATE	REPAIR TYPE	APPROVED BY
5/10	NO REPAIRS				



TECHNICIAN COMMENTS:

PANEL LENGTH: P-233 = 10.5' (AVG); P-234 = 6' (AVG)

PANEL WIDTH: 10' (EACH)

PANEL AREA: P-233 = 105 SF; P-234 = 60 SF

HAZEN AND SAWYER
Environmental Engineers & Scientists

APPENDIX 3.8
TRIAL SEAM FORMS

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 4/26/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
12:40	~70°	SB	MM1						750			85	45/37	36/35	36/39	P	47 SHEAR
1:00	~70°	MH	MM2						750			40	32/35	35/34	37/30	P	52 SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 4/27/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
10:45	~60°F	MH	MMZ						750			40	47/53	51/51	54/55	P	60 → SHEAR
11:05	~60°	SB	MX-6	225		225							38	37	31	P	48 → SHEAR
11:10	~60°	KT	MX-10	225		225							31	33	30	P	45 → SHEAR
1:00	~70°	SB	MX-10	225		225							30	33	33	P	38 → SHEAR
4:15	~70°	RH	C-1						750			65	41/46	44/37	40/36	P	46 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R. C. BAKER
Date: 5/3/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
1:50	~65°F	MH	MM2						750			55	41/37	41/42	43/44	P	44 → SHEAR
1:55	~65°	RH	C-1						800			60	39/45	41/42	47/42	P	53 → SHEAR
1:40	~65°	KT	MX-6	225		175							37	36	38	P	51 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/4/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
7:45	~60°F	MH	MM2						750			50	47/51	43/43	45/49	P	61 → SHEAR
8:00	~60°	SB	C-1						800			60	51/49	52/48	51/45	P	69 → SHEAR
12:30	~75°	SB	C-1						800			75	48/42	46/48	43/41	P	56 → SHEAR
12:35	~75°	MH	MM2						750			60	47/44	49/50	46/43	P	54 → SHEAR
1:20	~75°	SB	C-1						750			75	43/44	41/40	40/41	P	50 → SHEAR MACHINE RESTART
8:00	~70°	SB	C-1						750			60	43/49	46/48	55/51	P	62 → SHEAR
8:10	~70°	MH	MM2						750			50	50/52	53/56	53/58	P	71 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/5/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
7:45	~65°F	MH	MMZ						750			60	48/39	43/38	41/43	P	51 → SHEAR
8:00	~65°	SB	C-1						750			70	55/50	44/51	46/41	P	62 → SHEAR
1:30	~75°	SB	C-1						750			80	43/45	40/40	37/41	P	44 → SHEAR
2:20	~75°	MH	MMZ						750			65	34/32	34/33	33/35	P	48 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/6/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
7:50	~60°F	MH	MM2						750			50	47/44	45/45	45/47	P	60 → SHEAR
7:58	~60°	SB	C-1						800			60	42/44	43/46	42/40	P	58 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/7/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
8:45	~65°F	SB	C-1						750			70	41/40	44/41	43/45	P	44 → SHEAR
9:00	~65°	MH	MM2						775			50	41/44	46/46	48/45	P	56 → SHEAR
1:15	~75°	SB	C-1						750			75	35/37	35/36	37/38	P	46 → SHEAR
2:00	~75°	MH	MM2						775			50	36/36	35/37	36/38	P	49 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/8/99
Sheet 1 of

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
9:30	~70°F	MH	MM2						775			45	43/45	50/38	54/45	P	63 → SHEAR
9:25	~70°	SB	MM1						750			60	58/49	52/55	54/63	P	72 → SHEAR
9:40	~70°	MM	MX-10	225		210							40	42	40	P	55 → SHEAR
3:45	~80°	MH	MM2						775			45	37/40	39/39	40/38	P	53 → SHEAR
4:10	~80°	SB	MM1						750			80	41/38	45/45	36/47	P	55 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/10/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
8:30	~70°F	KT	MX-10	250		200							40	40	47	P	54→ SHEAR
8:35	~70°	RH	MX-6	240		175							57	50	47	P	60→ SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/11/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
12:30	~85° F	KT	MX-10	210		110							33	32	33	P	51 → SHEAR
12:35	~85°	RH	MX-6	240		175							35	44	40	P	48 → SHEAR
2:00	~85°	MH	MX-11	225		175							40	32	36	P	50 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid America Lining Company
Geomembrane Type: 40-mil UPP

CQA Technician: R.C. BAKER
Date: 5/12/99
Sheet 1 of 1

CQA GEOMEMBRANE TRIAL SEAM REPORT

TIME	AMBIENT TEMP.	SEAMING TECH.	MACHINE NO.	EXTRUSION WELDS				FUSION WELDS					PEEL/SHEAR VALUES (LBS/INCH)			PASS/ FAIL	COMMENTS
				Barrel Temp.		Preheat Temp.		Nip Roller Spacing	Wedge Temp.		Measured Speed (FT/MIN)	Speed Setting					
				Set	Actual	Set	Actual		Set	Actual							
8:00	~70° F	JB	MX-0	220		190							32	36	38	P	50 → SHEAR
8:30	~70°	KT	MX-10	220		190							34	35	39	P	52 → SHEAR
12:30	~80°	JB	MX-0	220		190							35	37	38	P	51 → SHEAR
12:35	~80°	KT	MX-10	220		190							38	37	30	P	49 → SHEAR

HAZEN AND SAWYER
Environmental Engineers & Scientists

APPENDIX 3.9
SEAM INSPECTION FORMS

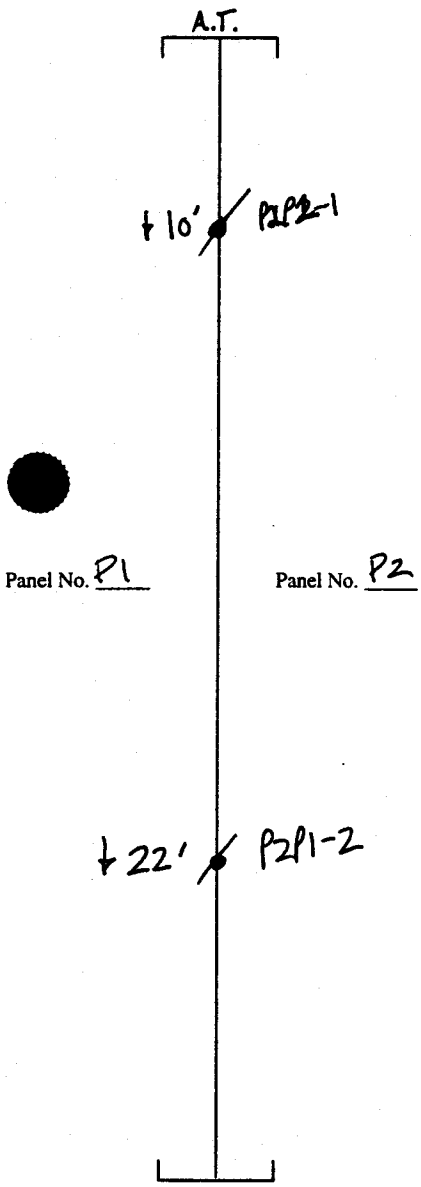
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P2/P1
Seam Length: 31'
Comments:
Welding Unit No.: MM1
Time Welded: 1:05 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P2P1-1	BURN THRU	5/10/99 V.BOX	JC
P2P1-2	BURN THRU	5/10 V.BOX	JC

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

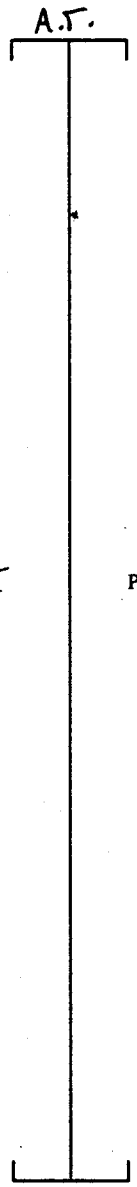
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4-26-99

Seam No.: P3/P2
Seam Length: 35'
Comments:

Welding Unit No.: MM1
Time Welded: 1:12 A.M/P.M

SEAM DETAIL
(Show Dimensions)



Panel No. P2

Panel No. P3

1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

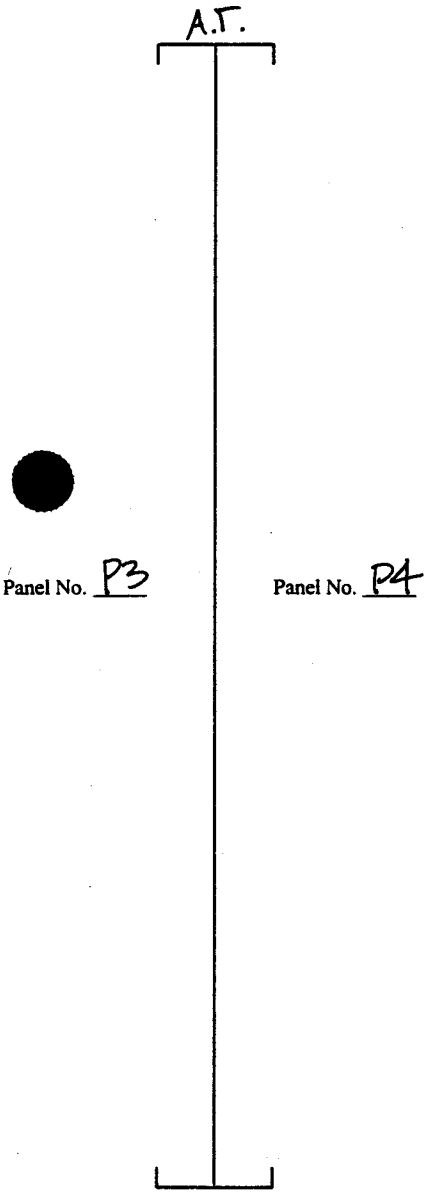
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4-26-99

Seam No.: P4/P3
Seam Length: 36'
Comments:
Welding Unit No.: MM1
Time Welded: 1:19 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

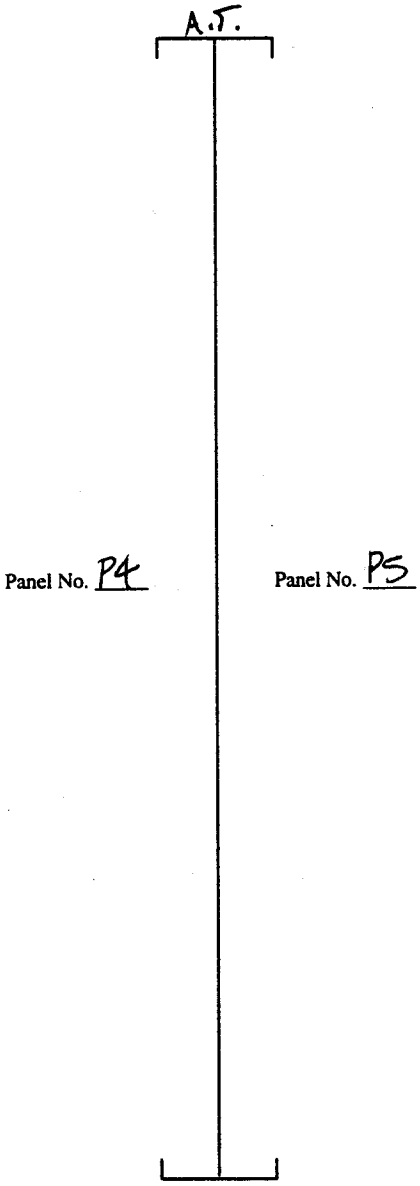
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P5/P4
Seam Length: 36'
Comments:

Welding Unit No.: MM1
Time Welded: 1:25 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P9/P8
Seam Length: 39'
Comments:

Welding Unit No.: MH2
Time Welded: 1:30 A.M./P.M.

SEAM DETAIL
(Show Dimensions)

A.T.

Panel No. P8

Panel No. P9

1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

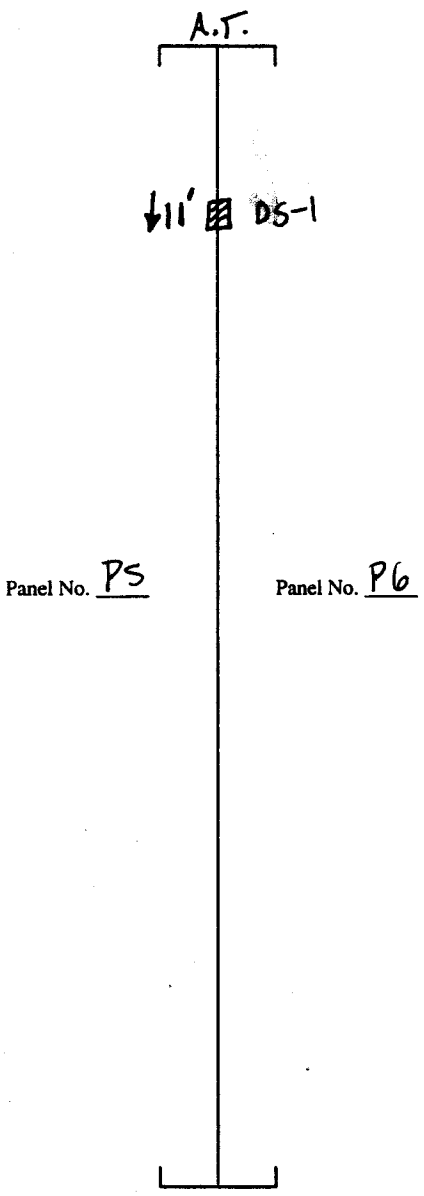
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/09

Seam No.: P6/P5
Seam Length: 37'
Comments:

Welding Unit No.: MM1
Time Welded: 1:34 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			
DS-1	DESTRUCT	4/27 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

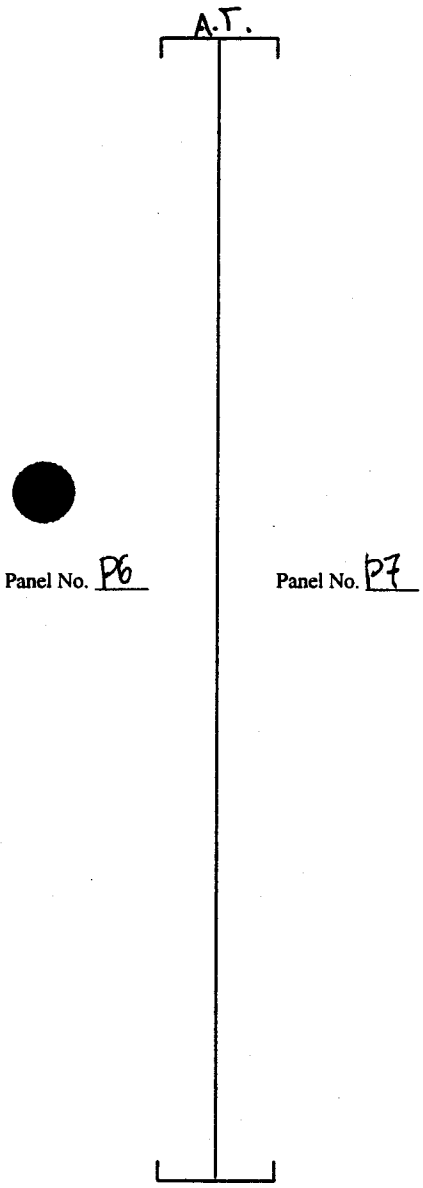
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/09

Seam No.: P7/P6
Seam Length: 37'
Comments:

Welding Unit No.: MM1
Time Welded: 1:40 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

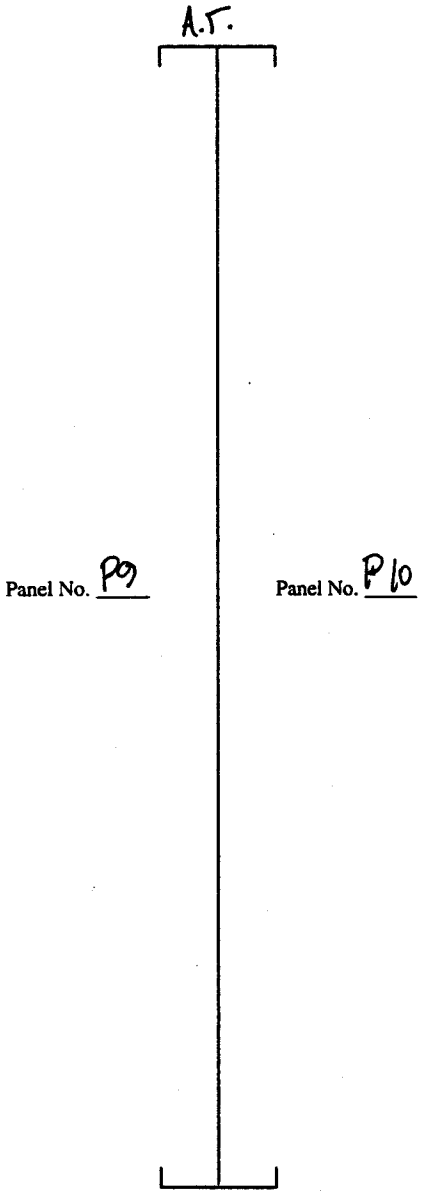
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P10/P9
Seam Length: 40'
Comments:

Welding Unit No.: MM2
Time Welded: 1:42 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

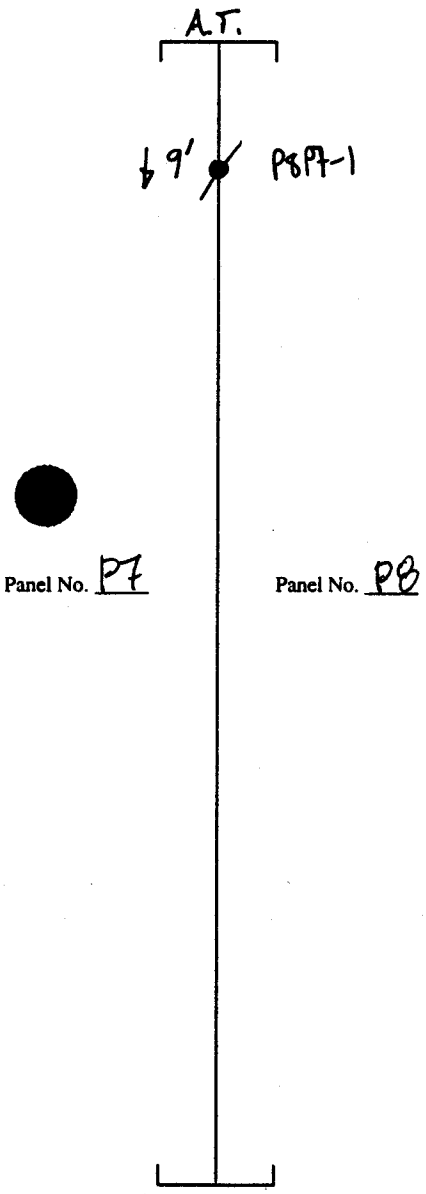
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P8/P7
Seam Length: 39'
Comments:
Welding Unit No.: MM1
Time Welded: 1:46 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	**ZONE 1** Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P8P7-1	Burn Thru	5/3 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

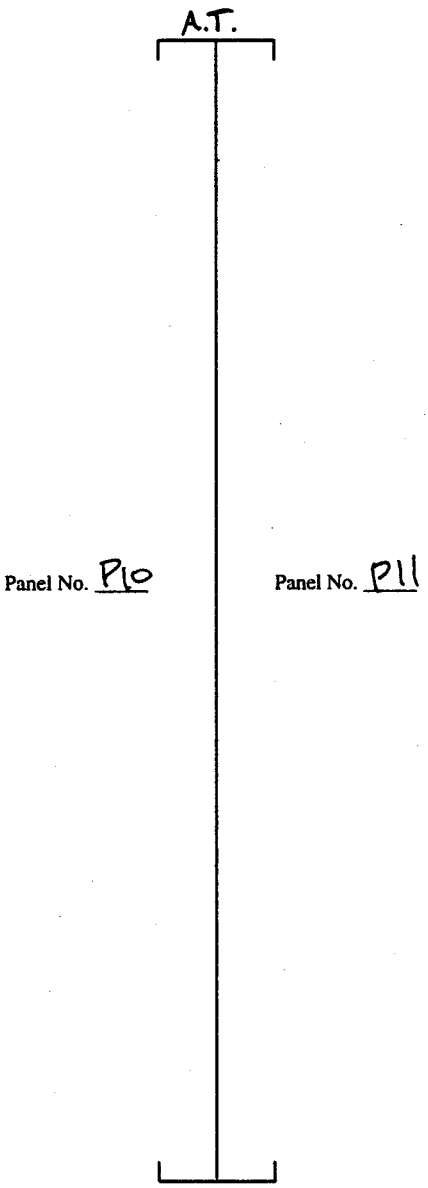
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P11 / P10
Seam Length: 40'
Comments:

Welding Unit No.: MM2
Time Welded: 1:47 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

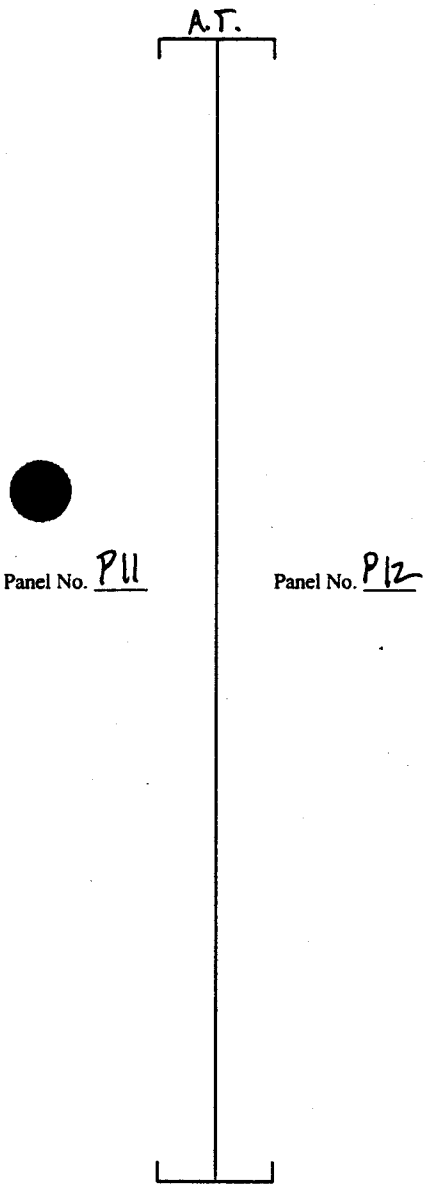
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P12/P11
Seam Length: 40'
Comments:

Welding Unit No.: MM2
Time Welded: 1:50 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

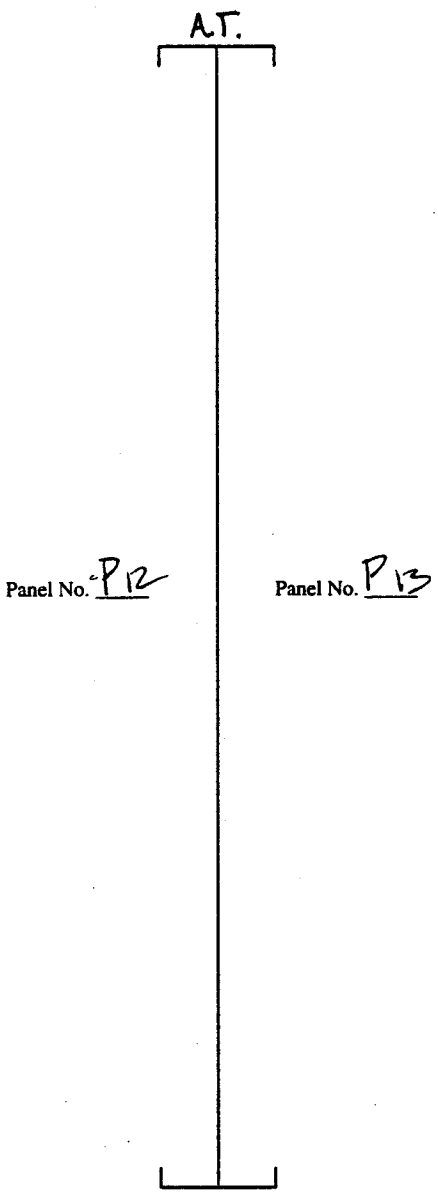
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P13/P12
Seam Length: 41'
Comments:

Welding Unit No.: MM2
Time Welded: 2:00 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

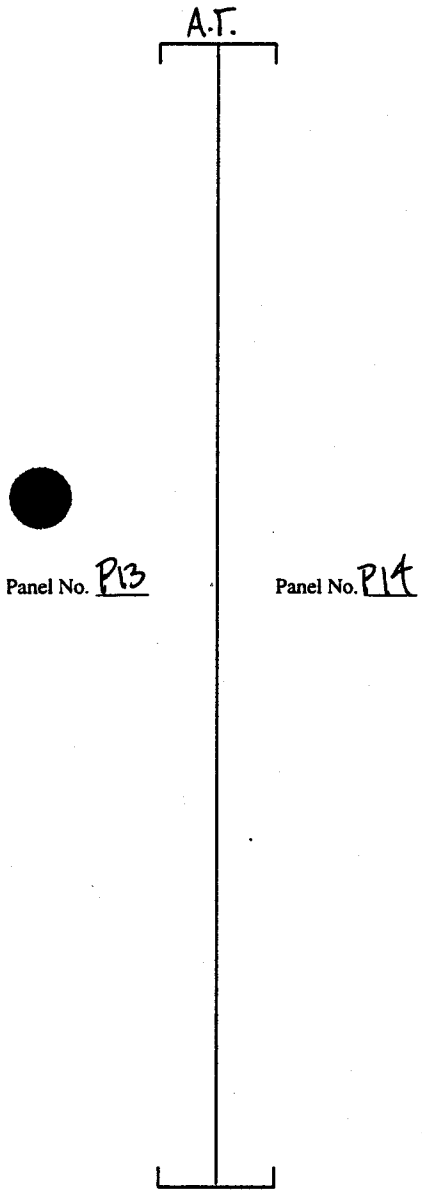
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P14/P13
Seam Length: 39'
Comments:
Welding Unit No.: MM2
Time Welded: 2:10 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

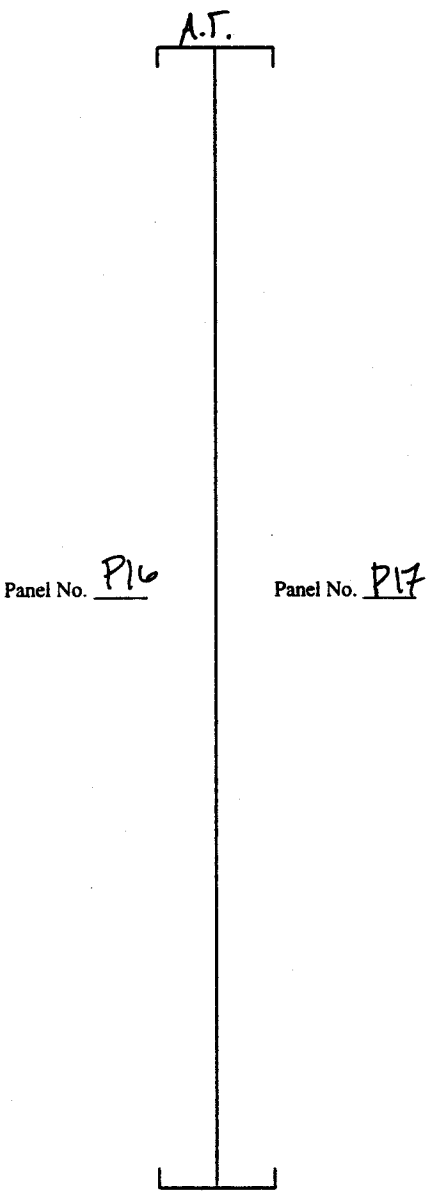
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P17/P16
Seam Length: 41'
Comments:

Welding Unit No.: MM1
Time Welded: 2:10 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

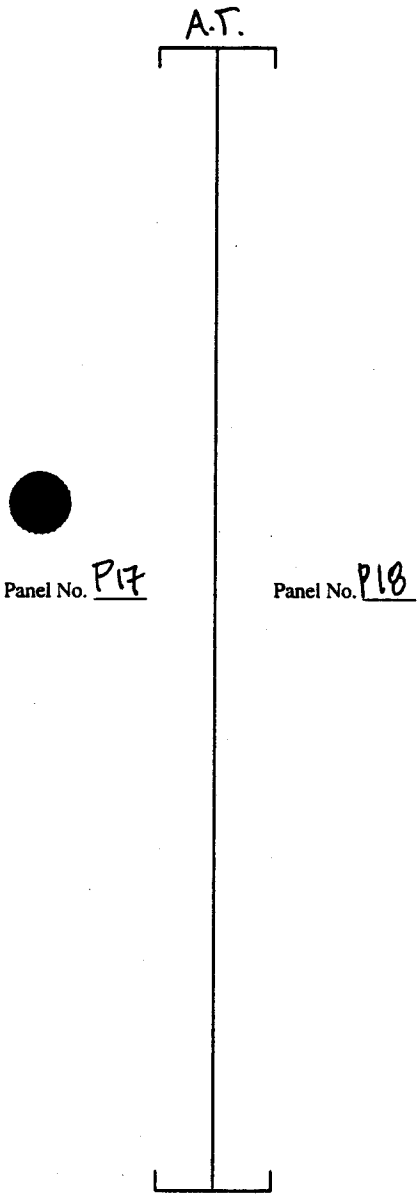
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P18/P17
Seam Length: 42'
Comments:

Welding Unit No.: MM1
Time Welded: 2:17 A.M. P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

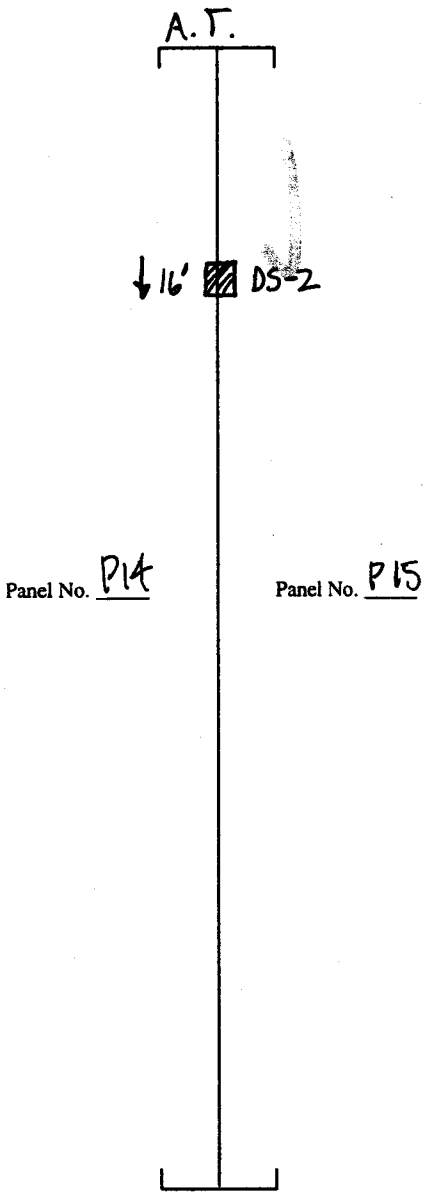
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P15/P14
Seam Length: 39'
Comments:

Welding Unit No.: MM2
Time Welded: 2:20 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-2	DESTRUCT	4/27 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

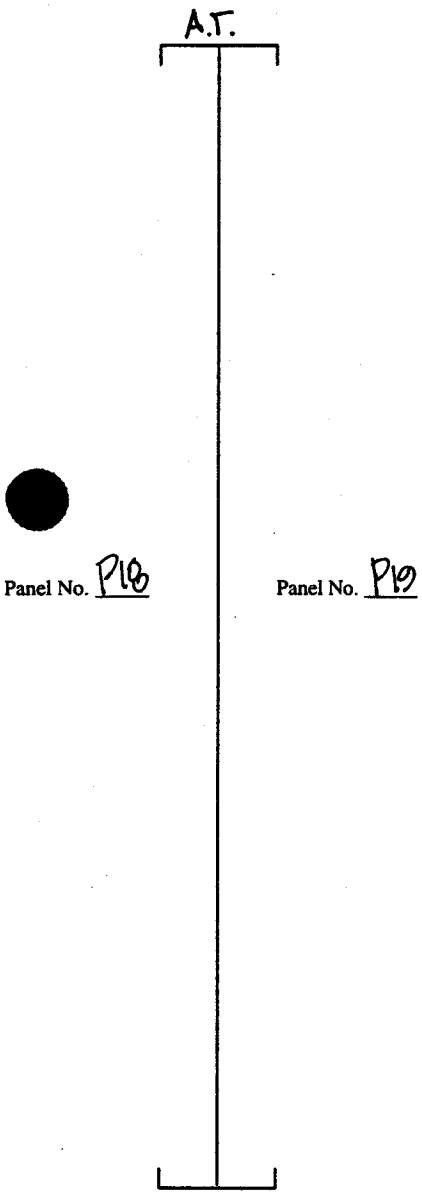
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P19/P18
Seam Length: 41'
Comments:

Welding Unit No.: MM1
Time Welded: 2:25 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

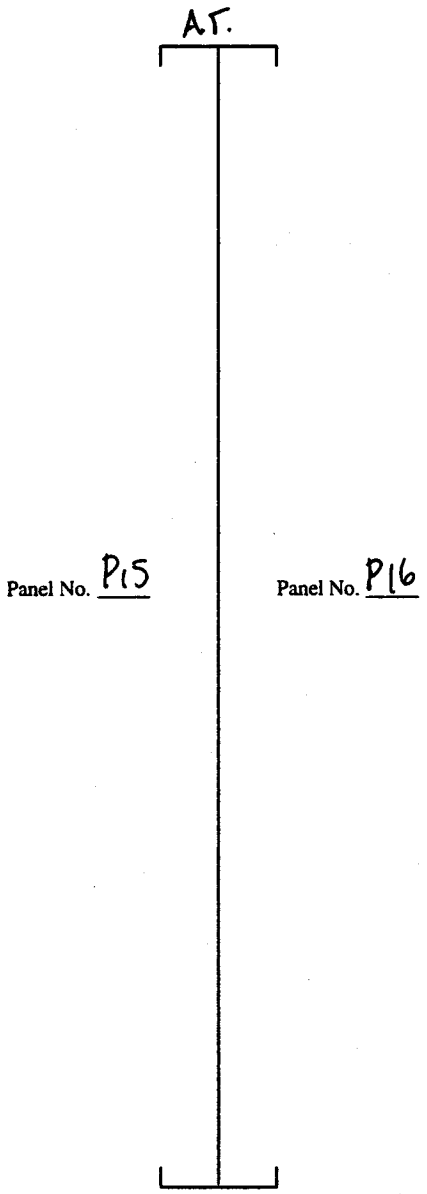
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P16/P15
Seam Length: 41'
Comments:

Welding Unit No.: MM2
Time Welded: 2:27 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

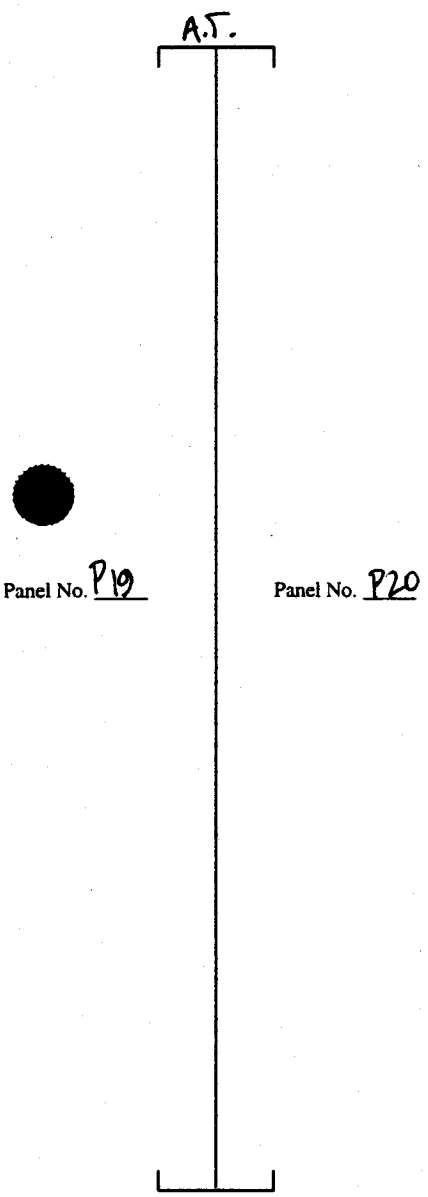
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P20/P19
Seam Length: 41'
Comments:
Welding Unit No.: MM1
Time Welded: 2:32 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

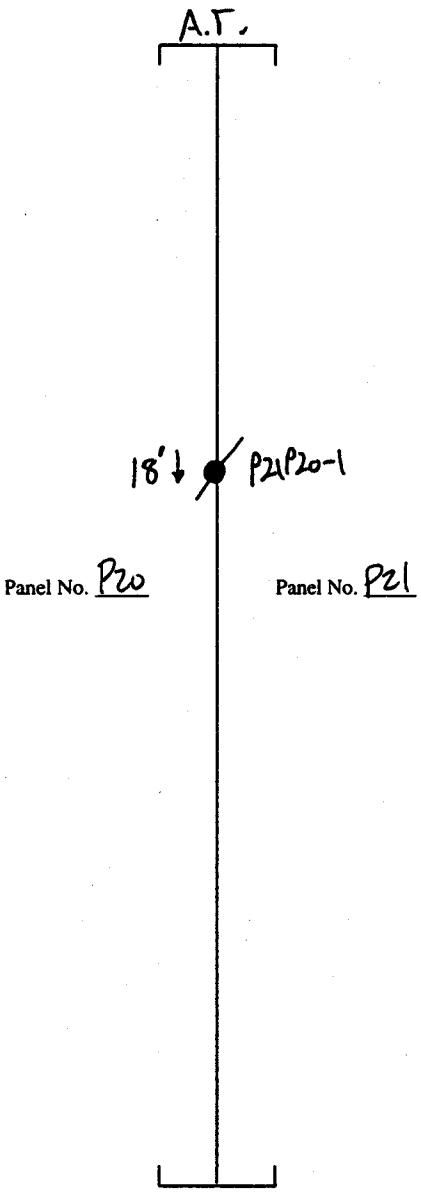
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P21/P20
Seam Length: 43'
Comments:

Welding Unit No.: MM1
Time Welded: 2:38 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P21P20-1	Burn Thru	4/27 V-Box	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

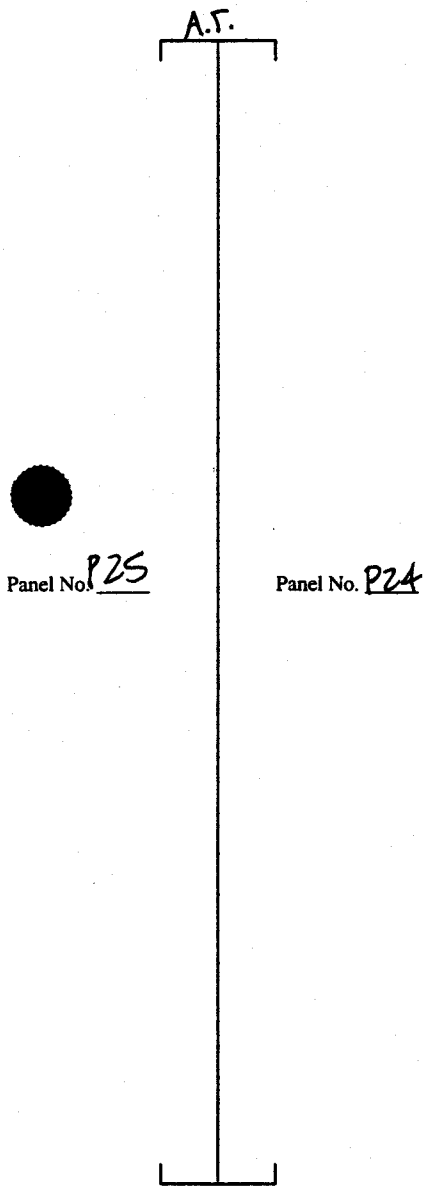
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P25 / P24
Seam Length: 29'
Comments:
Welding Unit No.: MM2
Time Welded: 2:38 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

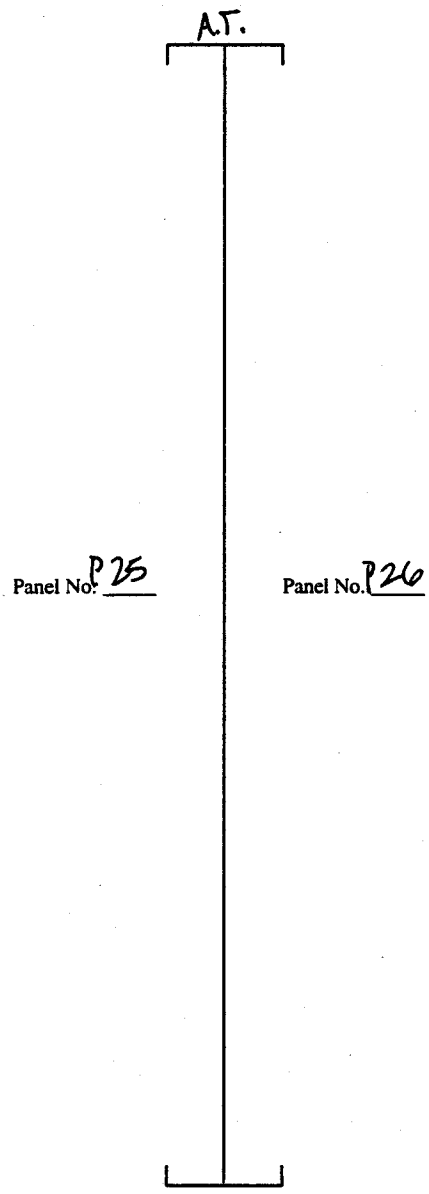
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P26/P25
Seam Length: 21'
Comments:

Welding Unit No.: MM2
Time Welded: 2A2 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

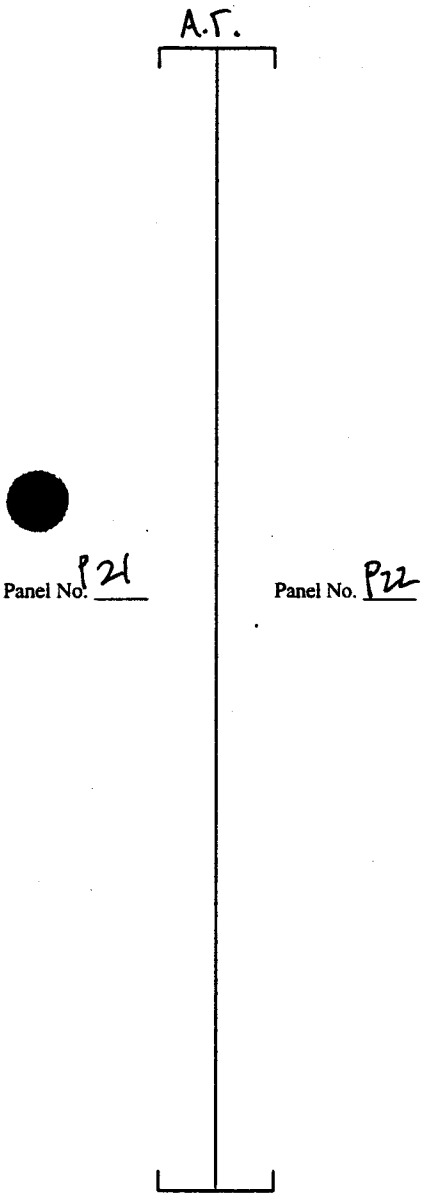
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P22/P21
Seam Length: 43'
Comments:

Welding Unit No.: MM1
Time Welded: 2:45 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

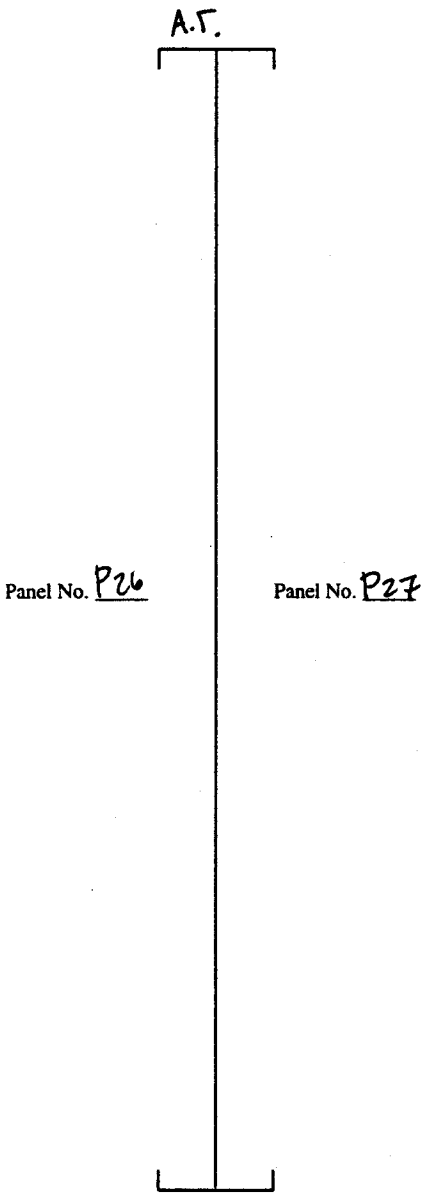
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P27/P26
Seam Length: 17'
Comments:
Welding Unit No.: MM2
Time Welded: 2:50 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

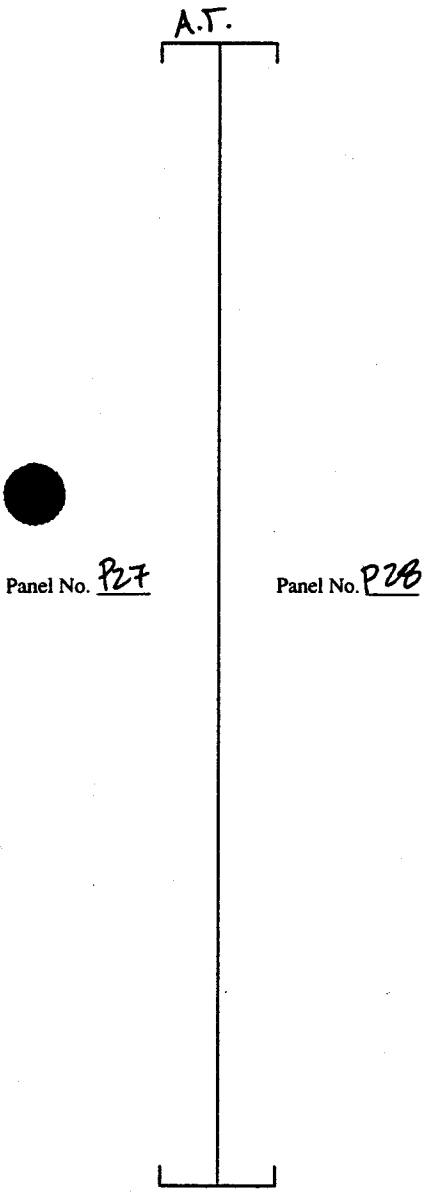
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/09

Seam No.: P28/P27
Seam Length: 15'
Comments:

Welding Unit No.: MM2
Time Welded: 2:53 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

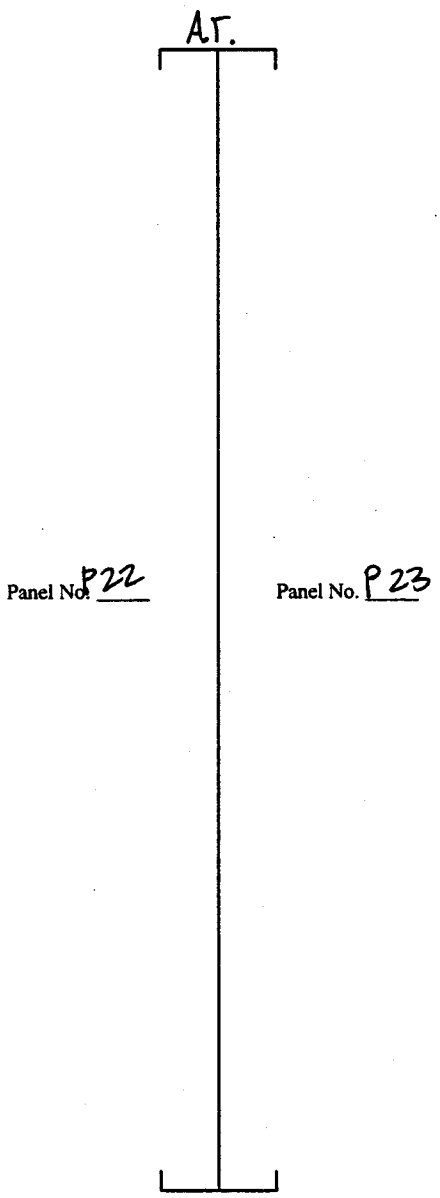
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P23/P22
Seam Length: 39'
Comments:

Welding Unit No.: MM1
Time Welded: 2:55 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

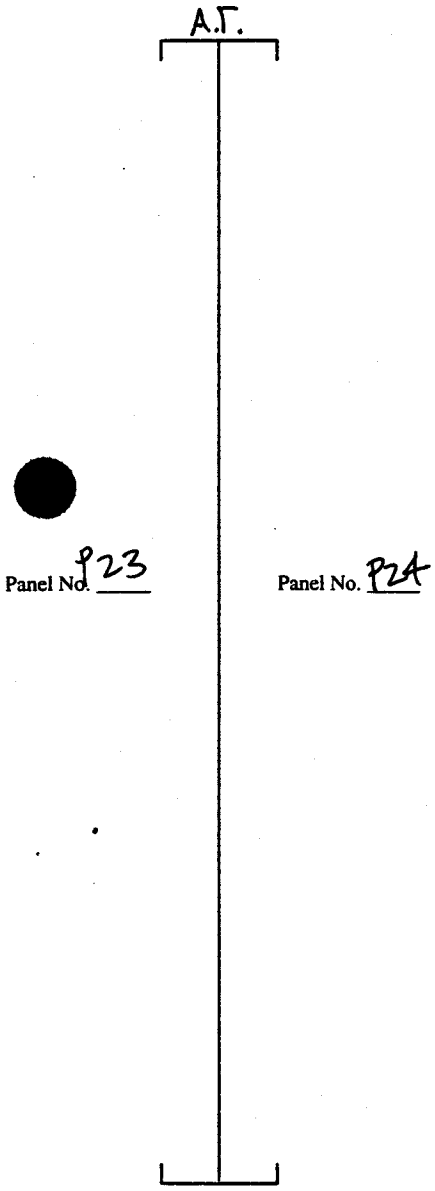
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P24/P23
Seam Length: 34'
Comments:
Welding Unit No.: MM2
Time Welded: 2:56 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

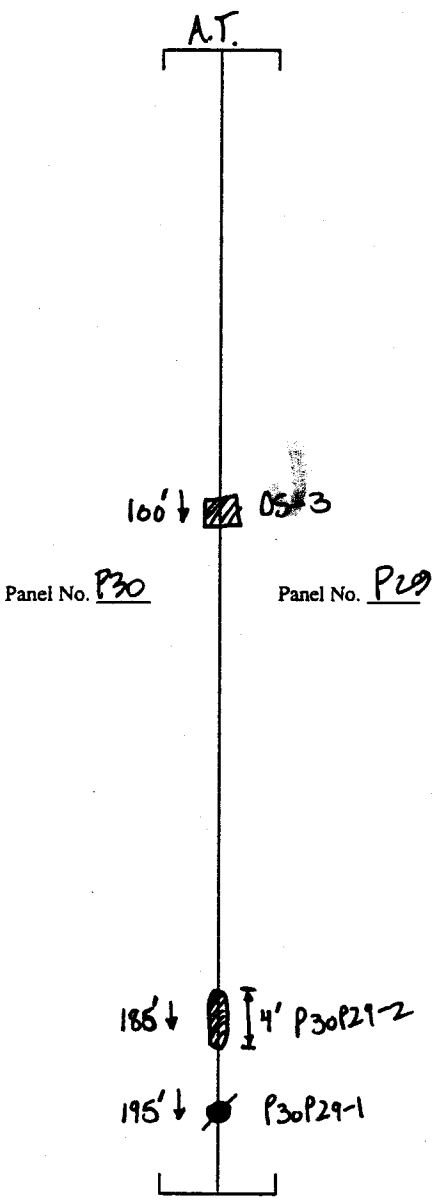
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P30/P29
Seam Length: 205'
Comments:

Welding Unit No.: MM2
Time Welded: 3:33 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P30P29-1	BURN THRU	5/3 V-BOX	RCB
P30P29-2	RESTART	5/3 V-BOX	RCB
DS-3	DESTRUCT	4/27 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

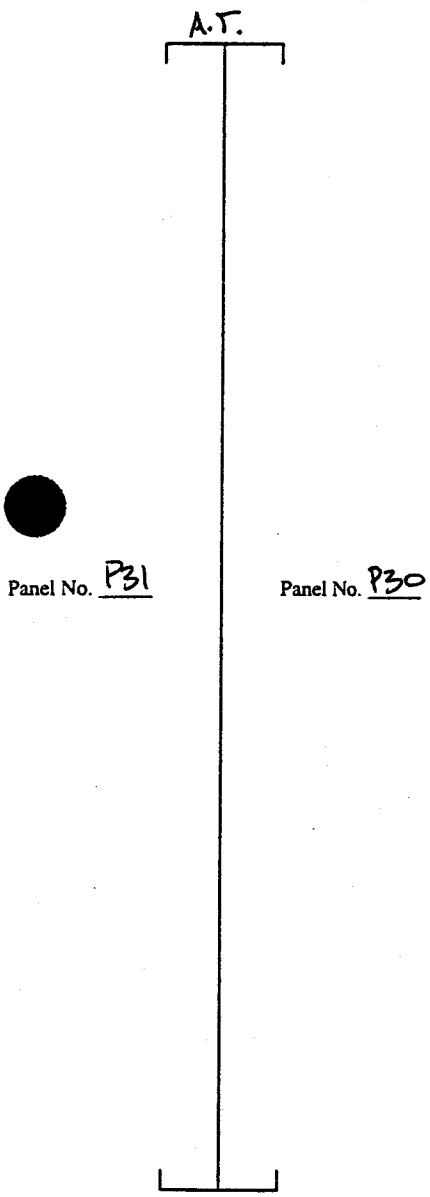
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P31/P30
Seam Length: 181'
Comments:

Welding Unit No.: MM2
Time Welded: 3:57 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

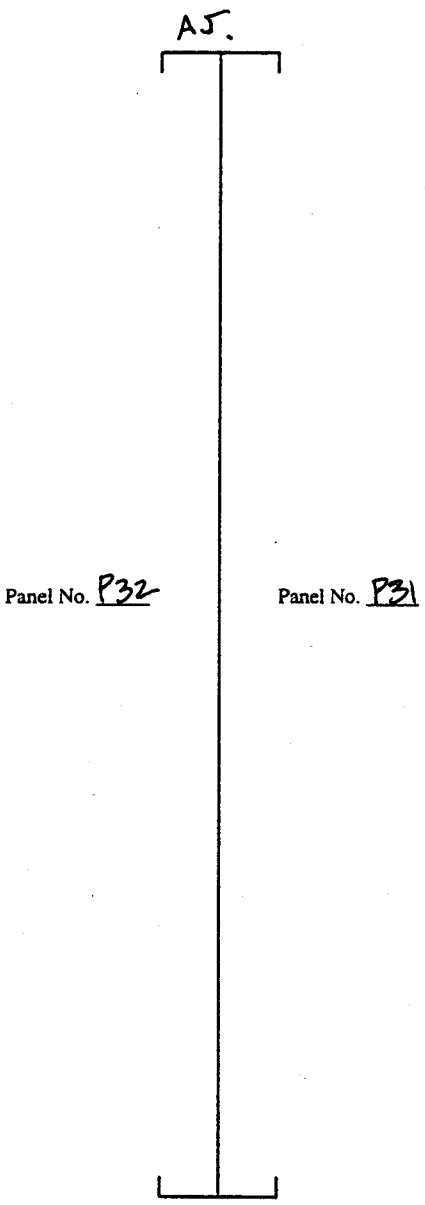
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/26/99

Seam No.: P32/P31
Seam Length: 158'
Comments:

Welding Unit No.: MM2
Time Welded: 4:18 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY

HAZEN AND SAWYER
Environmental Engineers & Scientists

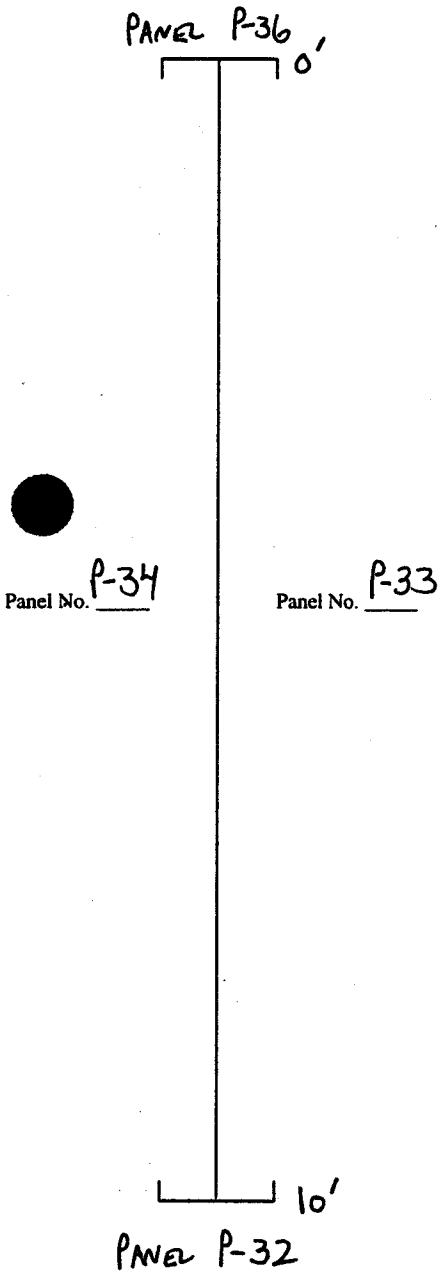
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P34/P33
Seam Length: 10'
Comments: BUTT SEAM
Welding Unit No.: MM2
Time Welded: 11:05 A.M. / P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

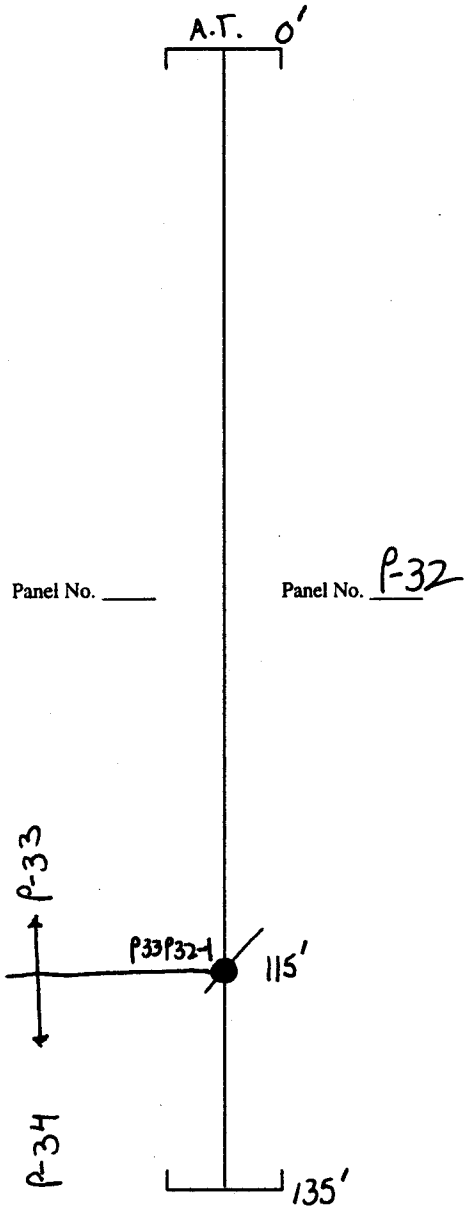
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P33/P32, P34/P32
Seam Length: 115', 20'
Comments:
Welding Unit No.: MM 2
Time Welded: 11:08 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P33P32-1	SEAM JUNC.	5/3 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

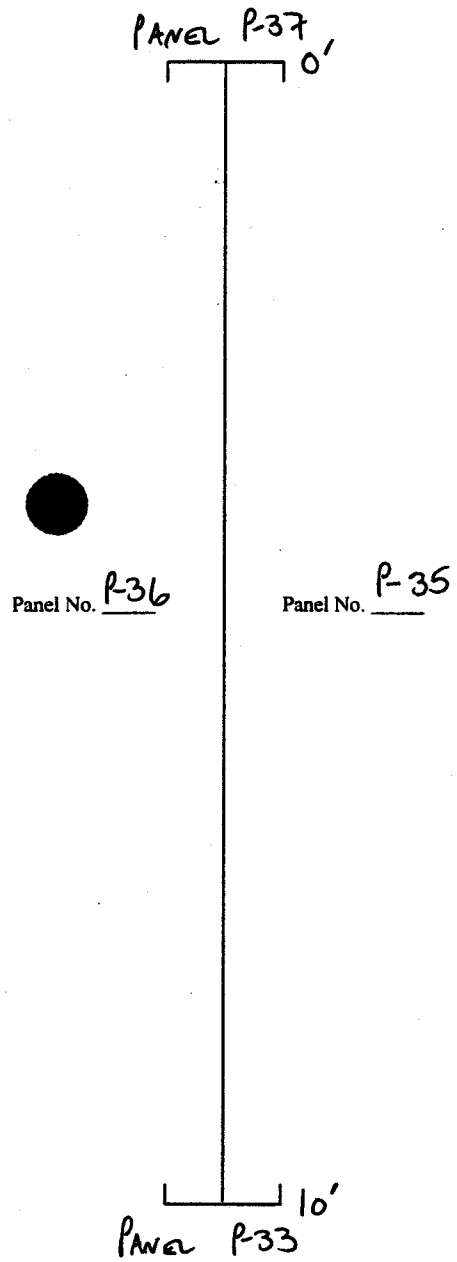
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P35/P36
Seam Length: 10'
Comments: BUTT SEAM
Welding Unit No.: MM2
Time Welded: 11:22 (A.M./P.M.)

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

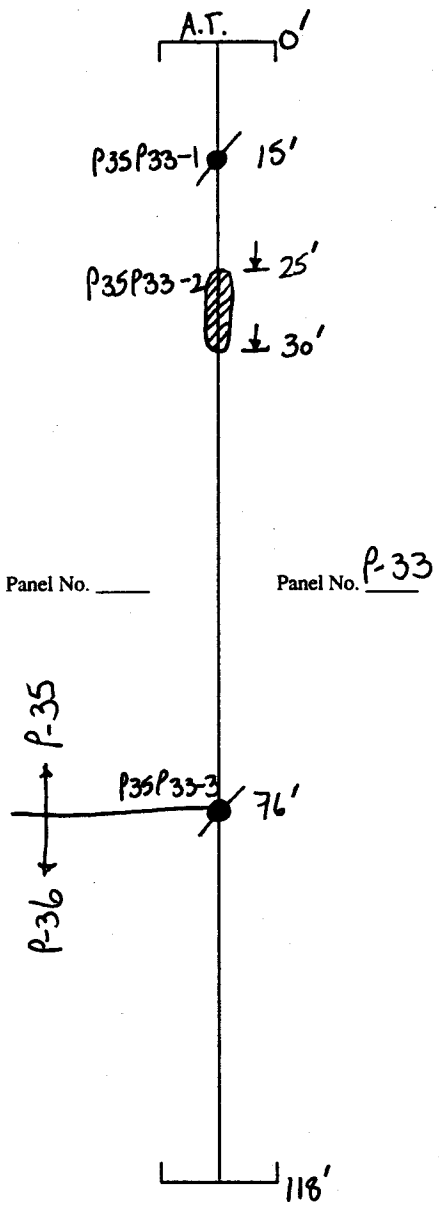
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P35/P33, P36/P33
Seam Length: 76', 42'
Comments:

Welding Unit No.: MM2
Time Welded: 11:25 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P35P33-1	Run out	5/6 V-Box	RCB
P35P33-2	Run out	5/6 V-Box	RCB
P35P33-3	Seam Junc.	5/6 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

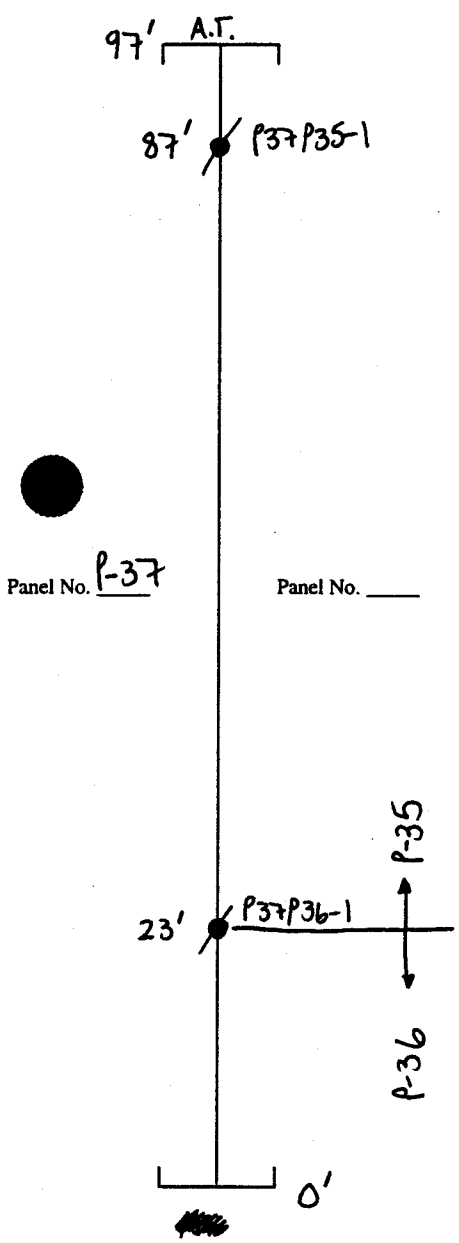
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P37/P36, P37/P35
Seam Length: 23', 74'
Comments:

Welding Unit No.: MM 2
Time Welded: 12:25 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P37P36-1	SEAM JUNC.	5/3 V-BOX	RCB
P37P35-1	FISHMOUTH	5/3 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

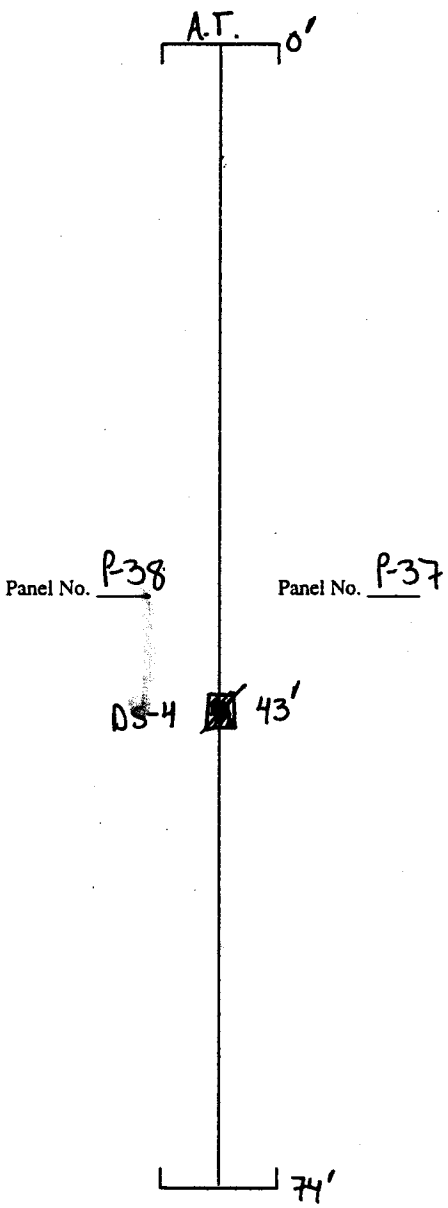
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P38/P37
Seam Length: 74'
Comments:

Welding Unit No.: MM2
Time Welded: 12:40 A.M. P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			
DS-4	Destruct	4/27 V-Box	RcB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

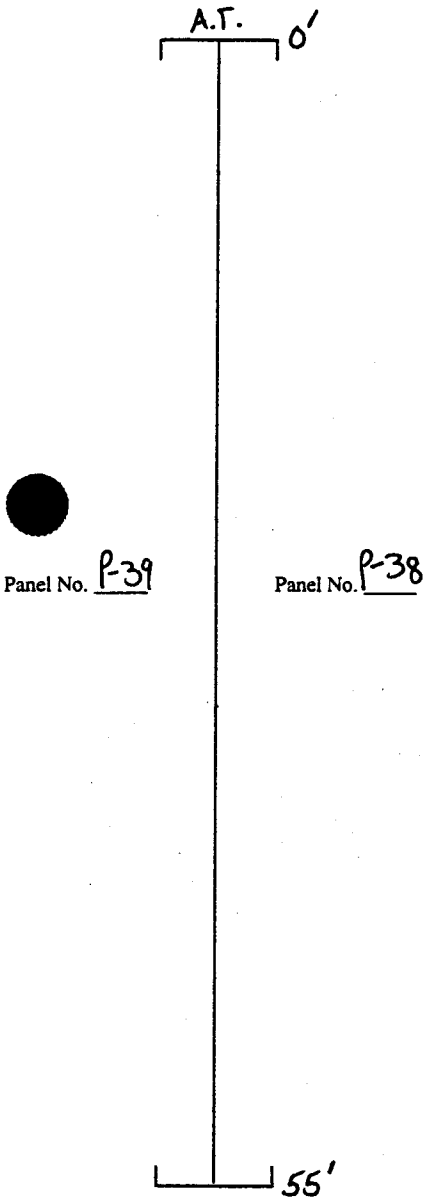
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P39/ P38
Seam Length: 55'
Comments:

Welding Unit No.: MM2
Time Welded: 12:55 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

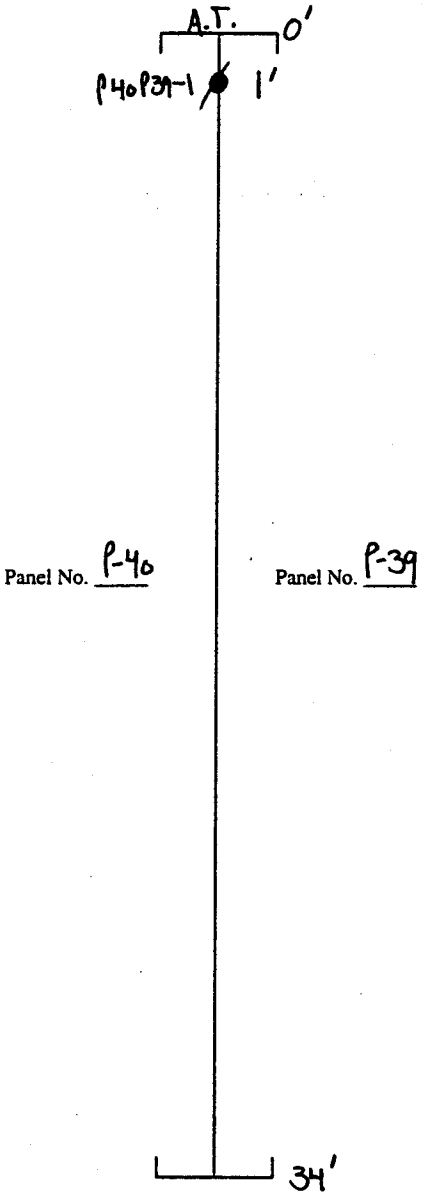
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P46/P39
Seam Length: 34'
Comments:
Welding Unit No.: MM2
Time Welded: 1:05 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P40P39-1	BURN THRU	5/6 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

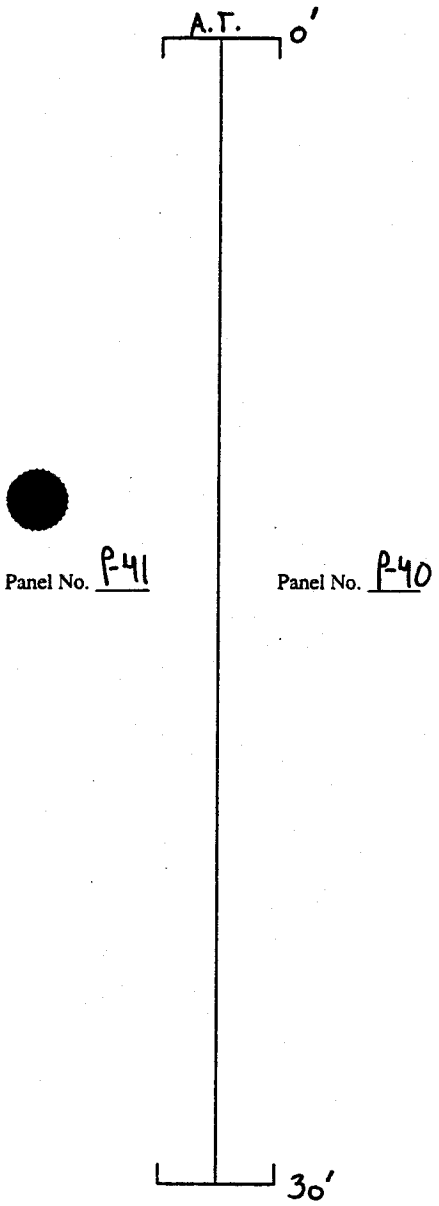
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P41/P40
Seam Length: 30'
Comments:

Welding Unit No.: MM2
Time Welded: 1:08 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

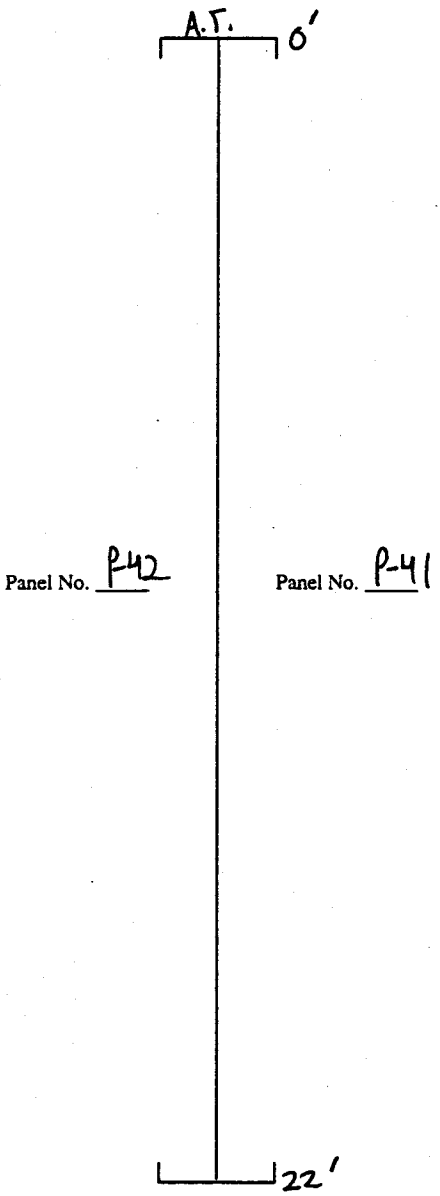
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P42 / P41
Seam Length: 22'
Comments:
Welding Unit No.: MM2
Time Welded: 1:15 A.M. / P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

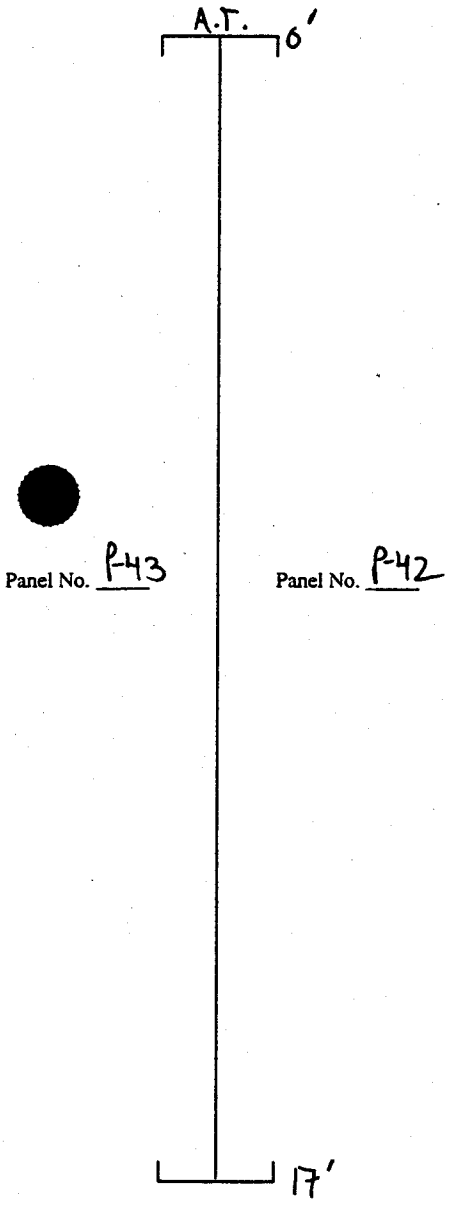
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P43/ P42
Seam Length: 17'
Comments:

Welding Unit No.: MM2
Time Welded: 1:20 A.M. (P.M.)

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

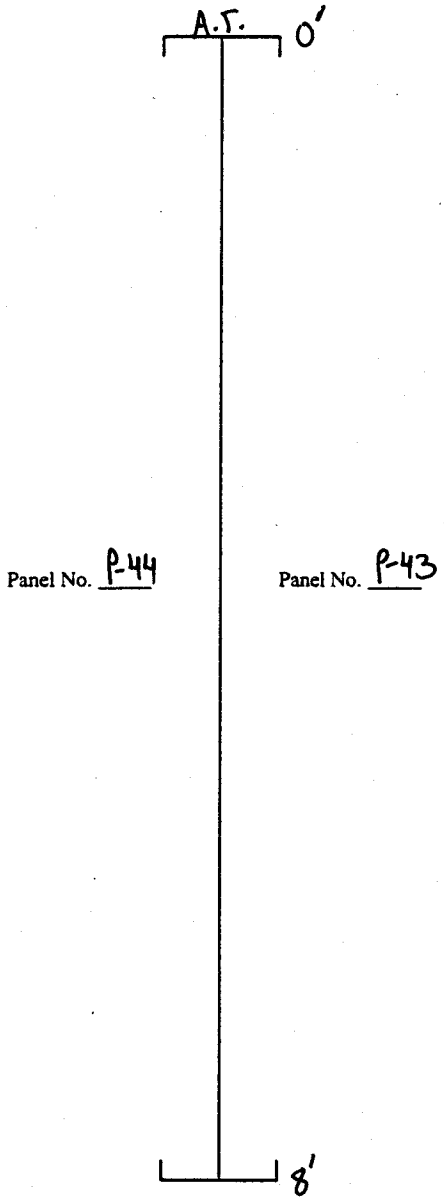
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P44/P43
Seam Length: 8'
Comments:

Welding Unit No.: MM2
Time Welded: 1:23 A.M. (P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

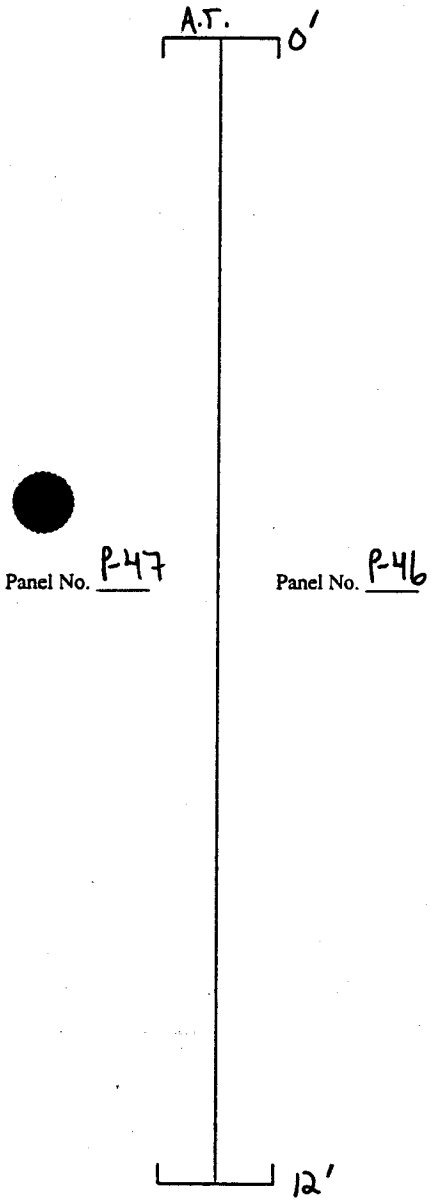
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P46/ P47
Seam Length: 12'
Comments:

Welding Unit No.: MM2
Time Welded: 1:40 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

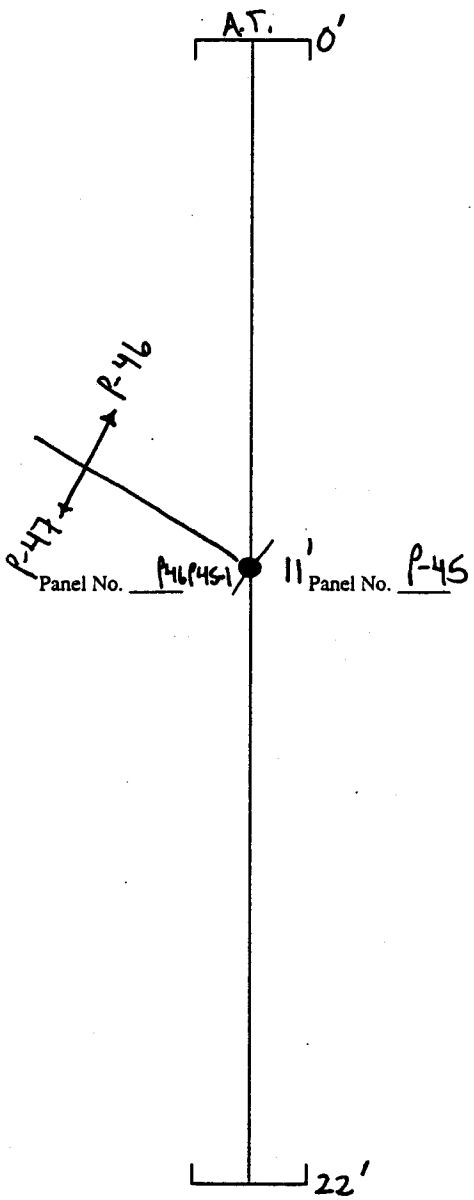
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/00

Seam No.: P46/P45, P47/P45
Seam Length: 11', 11'
Comments:

Welding Unit No.: MM2
Time Welded: 1:45 A.M./(P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P46P45-1	SEAM JUNC.	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

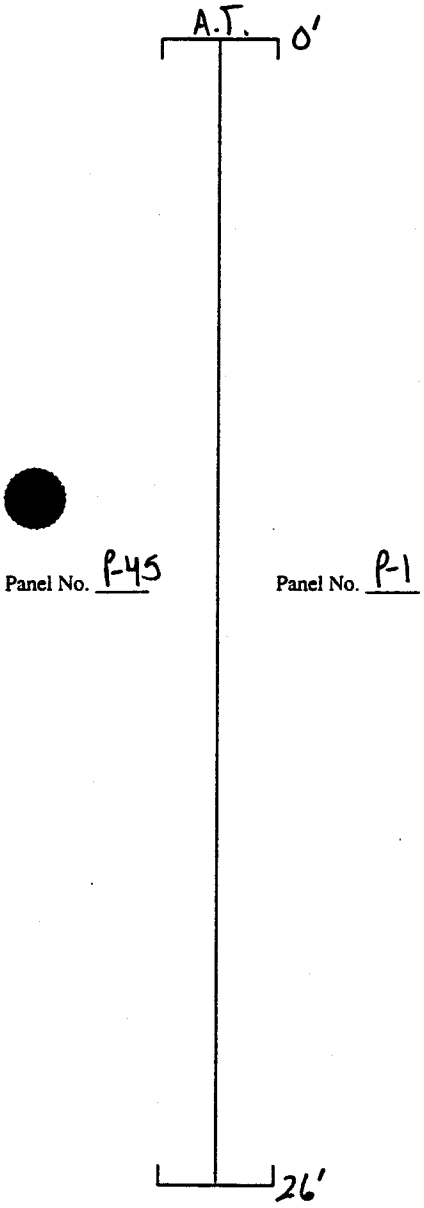
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/99

Seam No.: P45/P1
Seam Length: 26'
Comments:

Welding Unit No.: MM2
Time Welded: 1:55 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

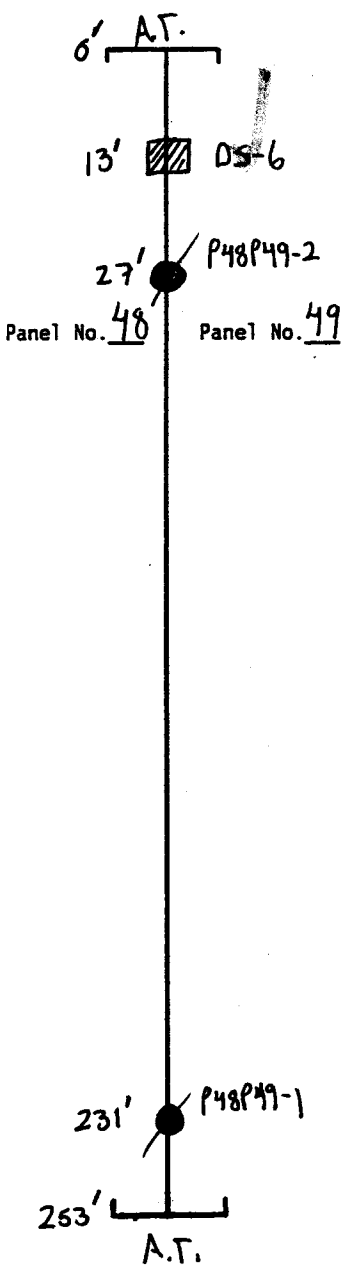
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 4/27/99

SEAM NO.: P48 / P49
SEAM LENGTH: 253'
COMMENTS: FNAT: 13 (DS-6) 27 (2) 231 (1)

WELDING UNIT NO.: MM2
TIME WELDED: 4:30 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-6	DESTRUCT	5/10 V-BOX	RCB
P48P49-1	RUN OUT	5/10 V-BOX	RCB
P48P49-2	FISH MOUTH	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

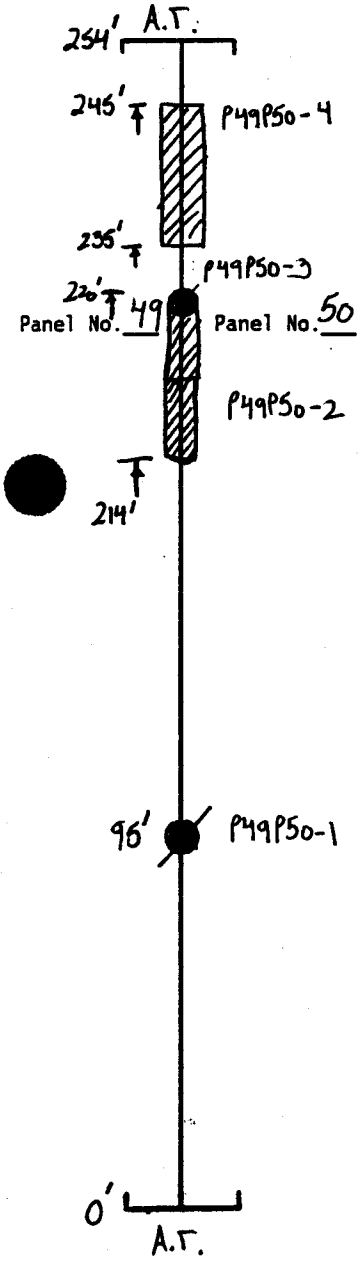
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH RH
TYPE OF WELDER WEDGE
DATE WELDED 4/27/99

SEAM NO. P49/P50
SEAM LENGTH 254'
COMMENTS FSAT: 95(1) 214(2) 220(3) 239(4)

WELDING UNIT NO. C1
TIME WELDED 4:44 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P49P50-1	RUN OUT/ BURN THRU	5/3 V-BOX	RCB
P49P50-2	RUN OUT/ RESTART	5/3 V-BOX	RCB
P49P50-3	RUN OUT	—	—
P49P50-4	RUN OUTS/ WRINKLES	5/3 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

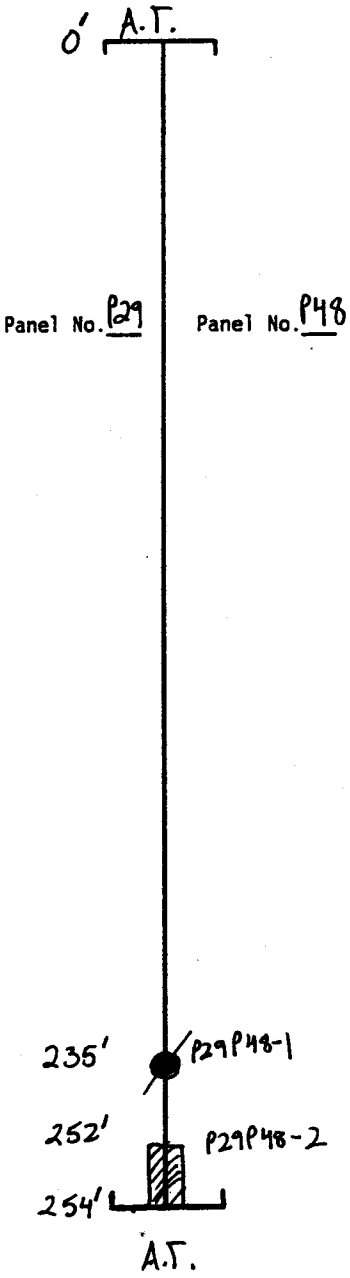
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 4/27/99

SEAM NO.: P29/P48
SEAM LENGTH: 254'
COMMENTS: FSAT: 4 (2) 21 (1)

WELDING UNIT NO.: MM2
TIME WELDED: 5:00 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P29P48-1	RUN OUT	5/3 V-BOX	RLB
P29P48-2	RUN OUT	5/3 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

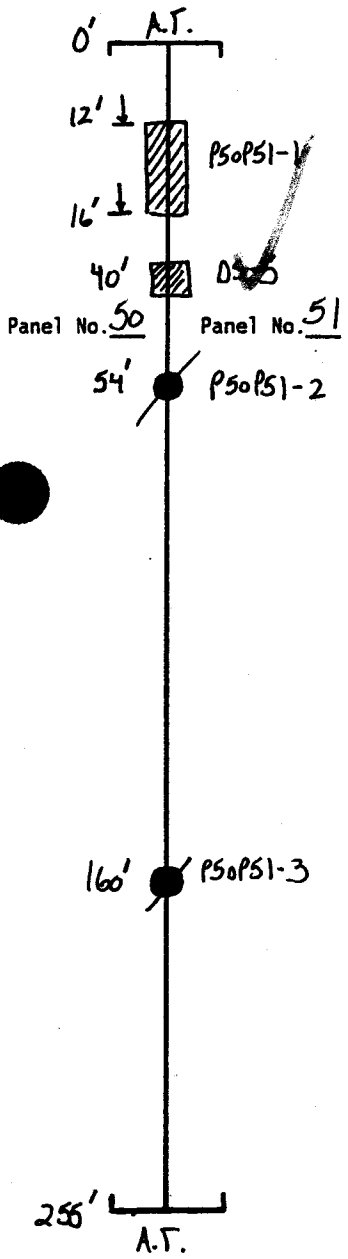
CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH RH
TYPE OF WELDER WEDGE
DATE WELDED 4/27/99

SEAM NO. P50/P51
SEAM LENGTH 255'
COMMENTS FNAT: 14 (1) 40 (DS-5) 54 (2) 160 (3)
WELDING UNIT NO. C1
TIME WELDED 5:10 a.m. / p.m.

SEAM DETAIL
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P50P51-1	RESTART	5/11 V-BOX	RCB
DS-5	DESTRUCT	5/10 V-BOX	RCB
P50P51-2	RUN OUT	5/3 V-BOX	RCB
P50P51-3	RUN OUT	5/3 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

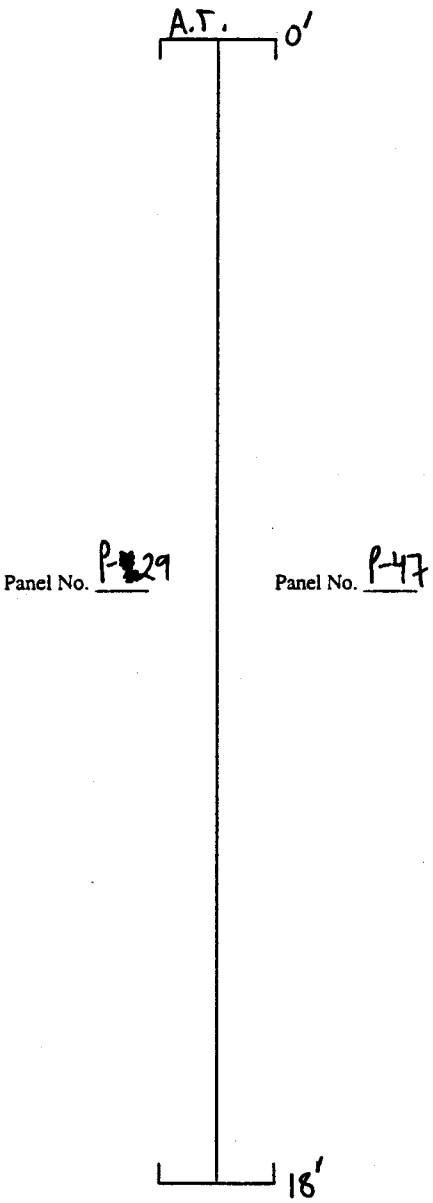
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 4/27/00

Seam No.: P47/P29
Seam Length: 18'
Comments:
Welding Unit No.: MM2
Time Welded: 5:35 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

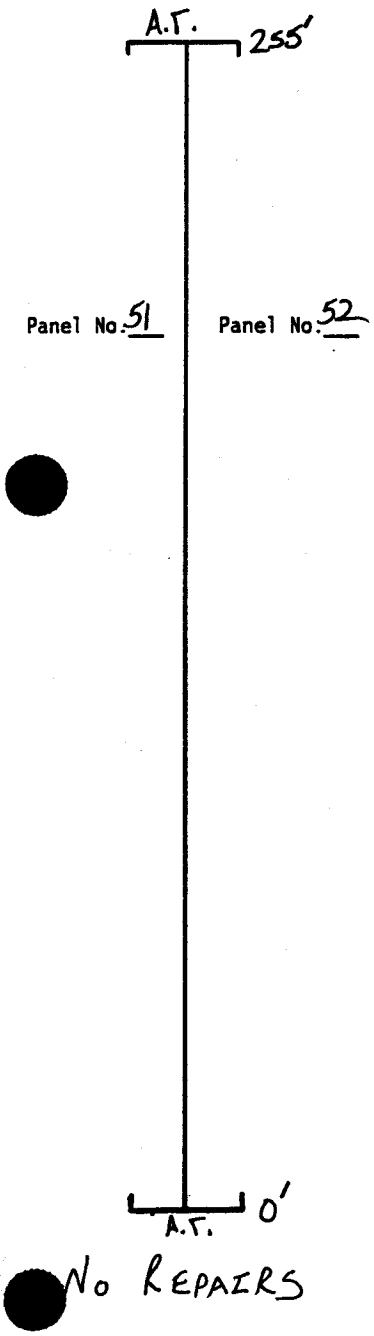
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONO FILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 4/27/99

SEAM NO. P51/P52
SEAM LENGTH 255'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 6:02 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

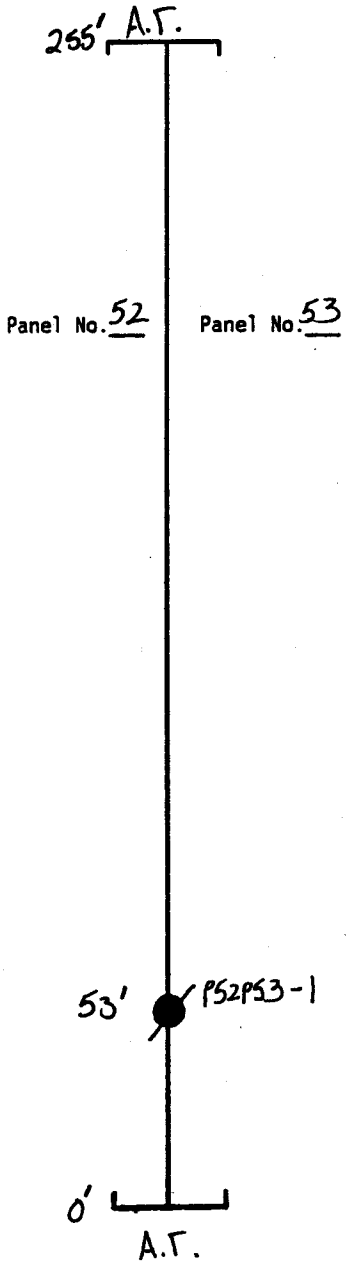
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 4/27/99

SEAM NO.: P52/P53
SEAM LENGTH: 255'
COMMENTS: FSAT: 53 (1)

WELDING UNIT NO.: C1
TIME WELDED: 6:10 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P52P53-1	Run out	5/3 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

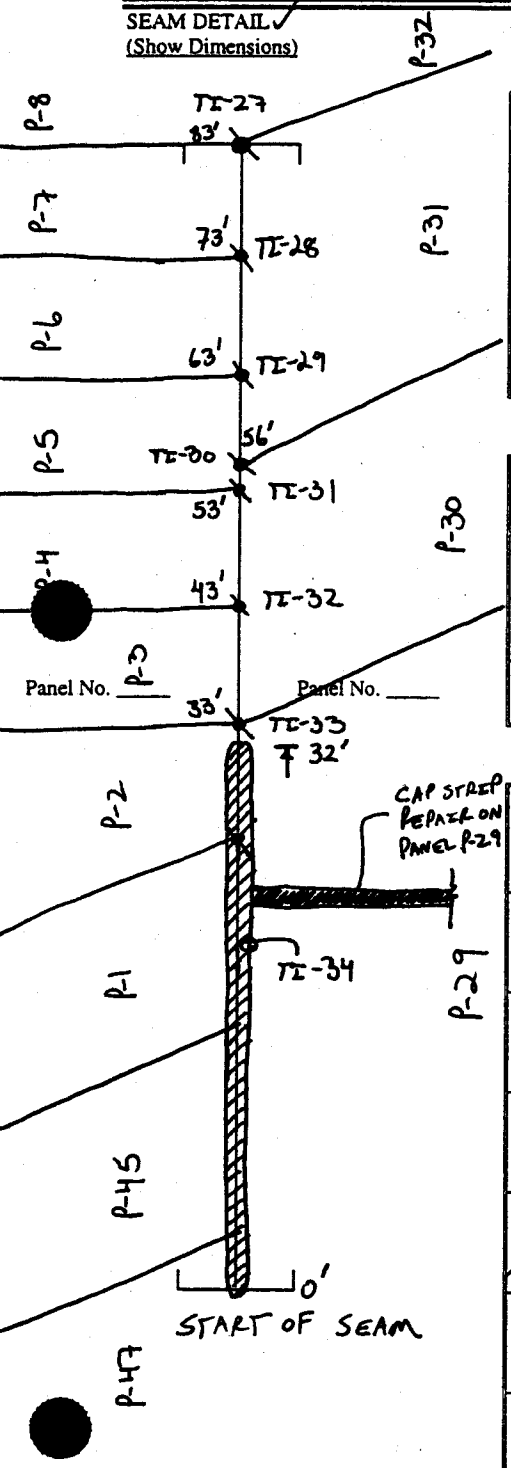
CQA SEAM INSPECTION FORM

Sheet 1 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH, SB, KT
Type of Welder: WEDGE, EXTRUSION, EXTRUSION
Date Welded: 4/27/99 AND 5/3/99

Seam No.: W. PERIMETER BERM TIE-IN
Seam Length: 304' (TOTAL)
Comments: MH WELDED 0' TO 33' ON 4/27/99
SB WELDED 33' TO 204' ON 4/27/99
KT WELDED 204' TO ON 5/3/99
Welding Unit No.: MM2, MX-6, MX-6
Time Welded: 5:40, 1:00, 2:00 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
□	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-28 THRU	SEAM	5/3	RLB
TI-33	JUNCS.	V-BOX	
TI-34	SUBGRADE REPAIR CUT	5/3 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

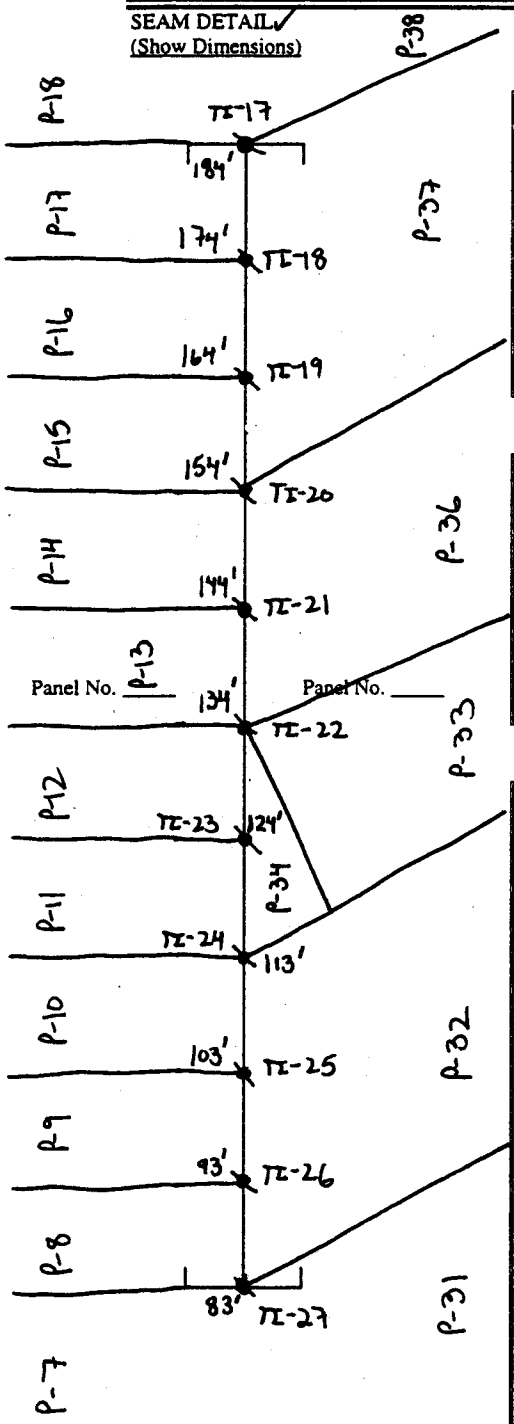
CQA SEAM INSPECTION FORM

Sheet 2 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH, SB, KT
Type of Welder: WEDGE, EXTRUSION, EXTRUSION
Date Welded: 4/27/99 AND 5/3/99

Seam No.: W. PERIMETER BERM TIE-IN
Seam Length: 304' (TOTAL)
Comments: MH WELDED 0' TO 33' ON 4/27/99
SB WELDED 33' TO 204' ON 4/27/99
KT WELDED 204' TO 304' ON 5/3/99
Welding Unit No.: MM2, MK-6, MK-6
Time Welded: 5:40, 1:00, 2:00 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-18 THRU	SEAM	5/3	fcb
TI-27	JUNCS.	V-BOX	

HAZEN AND SAWYER
Environmental Engineers & Scientists

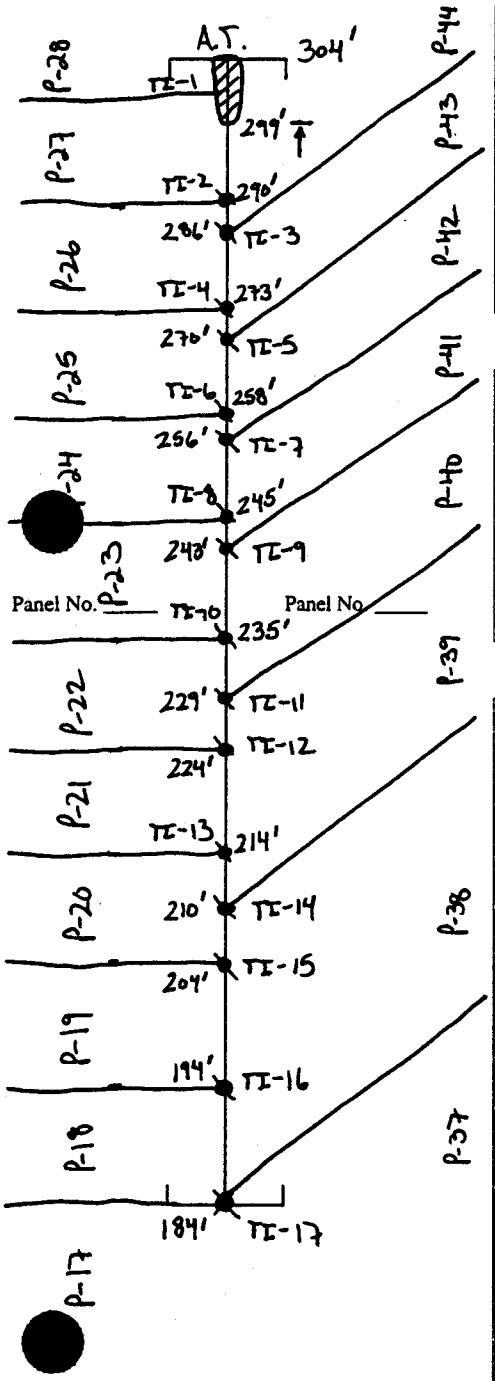
CQA SEAM INSPECTION FORM

Sheet 3 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH, SB, KT
Type of Welder: WEDGE, EXTRUSION, EXTRUSION
Date Welded: 4/27/99 AND 5/3/99

Seam No.: W. PERIMETER BERM TIE-IN
Seam Length: 304' (TOTAL)
Comments: MH WELDED 0' TO 33' ON 4/27/99
SB WELDED 33' TO 204' ON 4/27/99
KT WELDED 204' TO 304' ON 5/3/99
Welding Unit No.: MM2, MX-6, MX-6
Time Welded: 5:40, 1:00, 2:00 A.M./(P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-1	SEAM JUNC/ START	5/3 V-BOX	RCB
TI-2 THRU	SEAM	5/3	RCB
TI-17	JUNCS.	V-BOX	

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

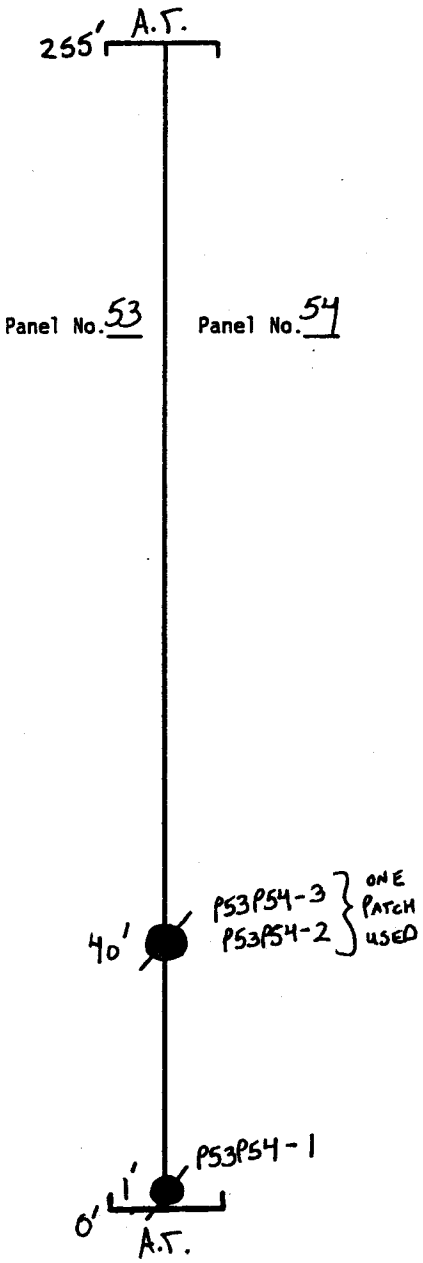
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P53/P54
SEAM LENGTH: 255'
COMMENTS: FSAT: 1 (1) 40 (2/3)

WELDING UNIT NO.: MM2
TIME WELDED: 4:00 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P53P54-1	Run out	5/6 V-Box	RCB
P53P54-2/3	Restart	5/6 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

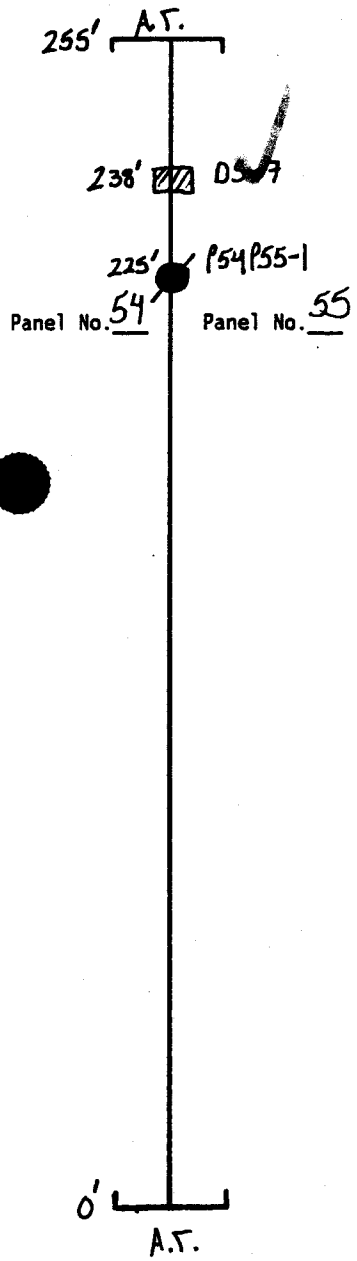
Sheet 1 of 1

PROJECT NAME HALIFAX COUNTY COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH RH
TYPE OF WELDER WEDGE
DATE WELDED 5/3/99

SEAM NO. P54/P55
SEAM LENGTH 255'
COMMENTS FSAT: 225 (1) 238 (DS-7)

WELDING UNIT NO. C1
TIME WELDED 4:07 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P54/P55-1	RUN OUT	5/6 V-BOX	RCB
DS-7	DESTRUCT	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

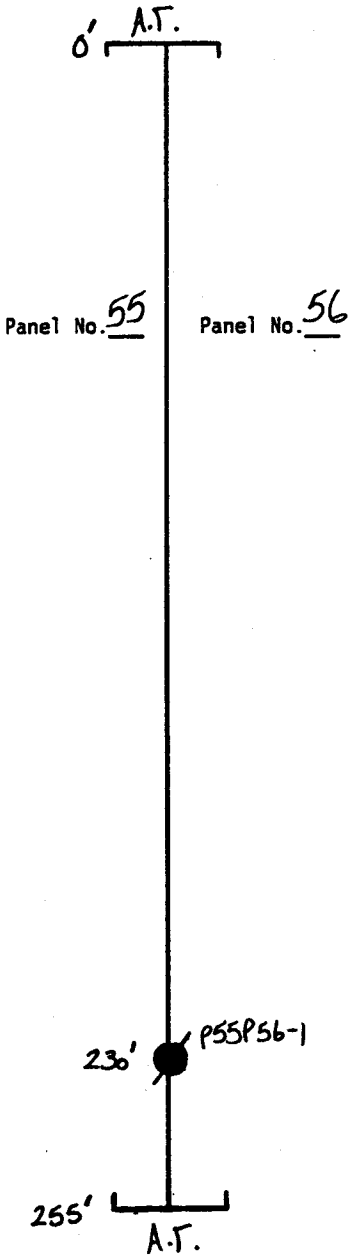
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P55/P56
SEAM LENGTH: 255'
COMMENTS: FNAT: 230 (1)

WELDING UNIT NO.: MM 2
TIME WELDED: 4:27 a.m./p.m.

SEAM DETAIL
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P55P56-1	Run out	5/10 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

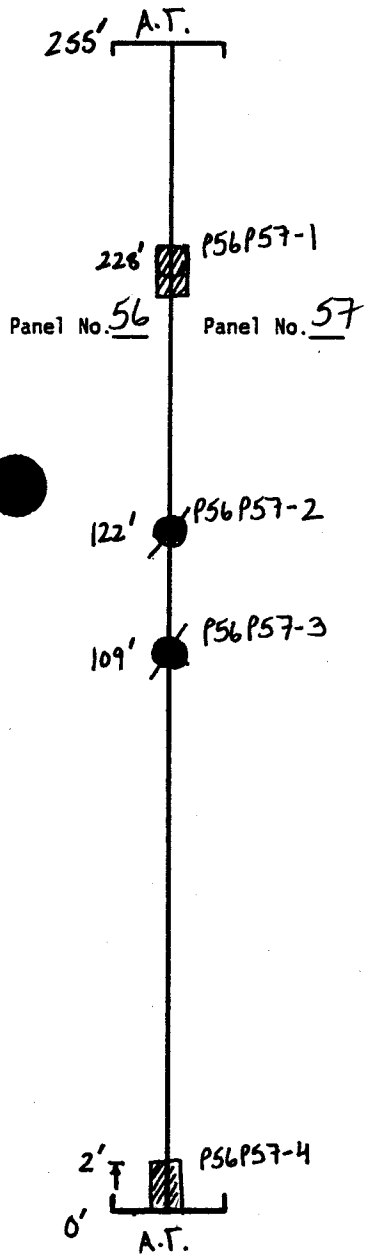
CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P56/P57
SEAM LENGTH: 255'
COMMENTS: FSAT: 2(4) 109(3) 122(2) 228(1)
WELDING UNIT NO.: C1
TIME WELDED: 4:35 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
	Repair Approved
	Destructive Sample
	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P56P57-1	FISH MOUTHS	5/6 V-BOX	RCB
P56P57-2	RUN OUT/BURN THRU	5/6 V-BOX	RCB
P56P57-3	RUN OUT/BURN THRU	5/6 V-BOX	RCB
P56P57-4	RUN OUT	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

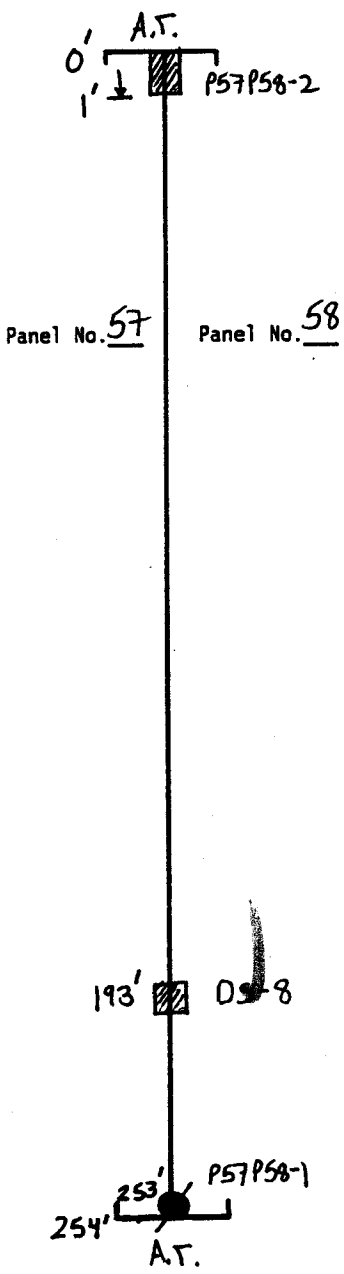
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P57/P58
SEAM LENGTH: 254'
COMMENTS: FNAT: 1 (2) 193 (DS-8) 253 (1)

WELDING UNIT NO.: MM 2
TIME WELDED: 4:54 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P57P58-1	BURN THRU	5/6 V-BOX	RCB
P57P58-2	SEAM PULLED APART	5/6 V-BOX	RCB
DS-8	DESTRUCT	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

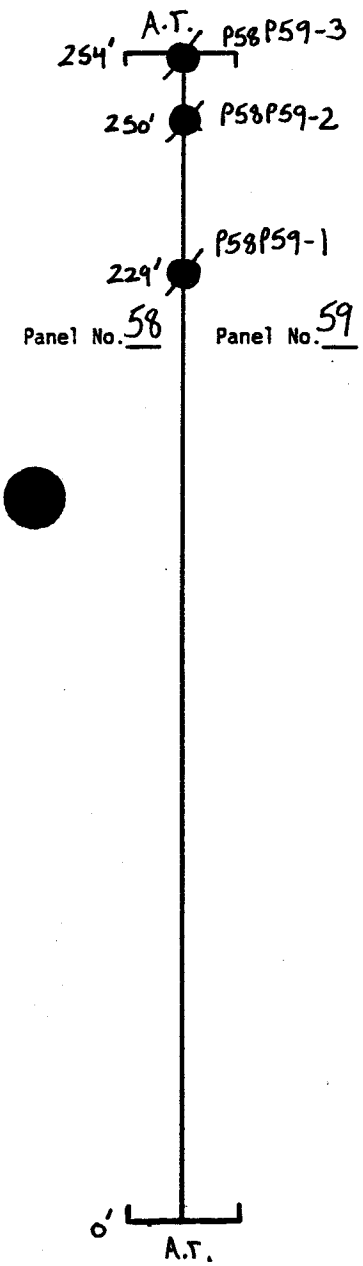
CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P58/P59
SEAM LENGTH: 254'
COMMENTS: FSAT: 229 (1) 250 (2) 254 (3)
WELDING UNIT NO.: C1
TIME WELDED: 5:10 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P58P59-1	FISH MOUTH	5/6 V-BOX	RCB
P58P59-2	WRINKLES	5/6 V-BOX	RCB
P58P59-3	FISH MOUTH	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

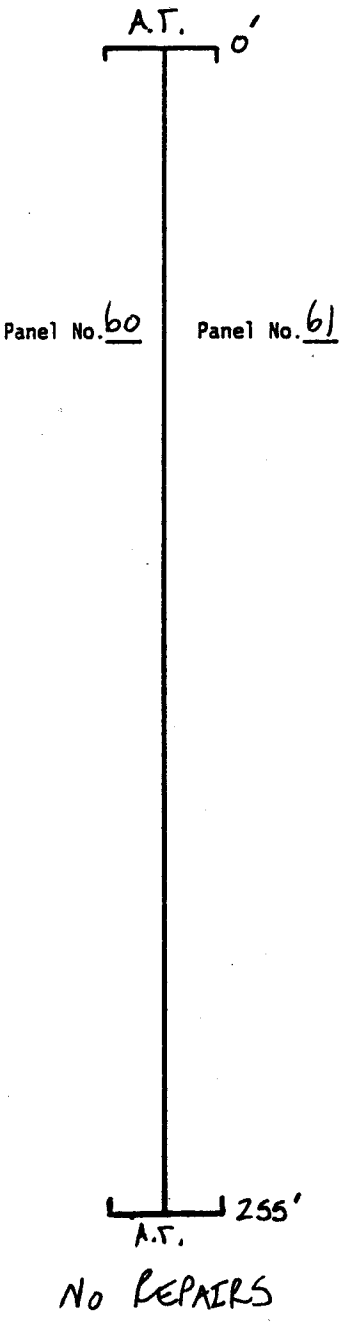
Sheet 1 of 1

PROJECT NAME HALIFAX CO: COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/3/99

SEAM NO. P60/P61
SEAM LENGTH 255'
COMMENTS FSAT: —

WELDING UNIT NO. MM2
TIME WELDED 5:29 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



NO REPAIRS

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

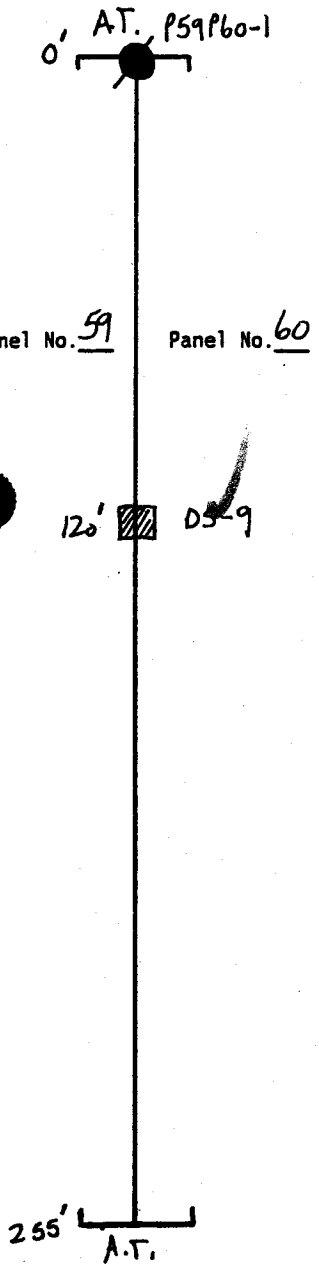
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P59/P60
SEAM LENGTH: 255'
COMMENTS: FNAT: 0 (1) 120 (DS-9)

WELDING UNIT NO.: C1
TIME WELDED: 5:42 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P59P60-1	FISH MOUTH	5/6 V-BOX	RCB
DS-9	DESTRUCT	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

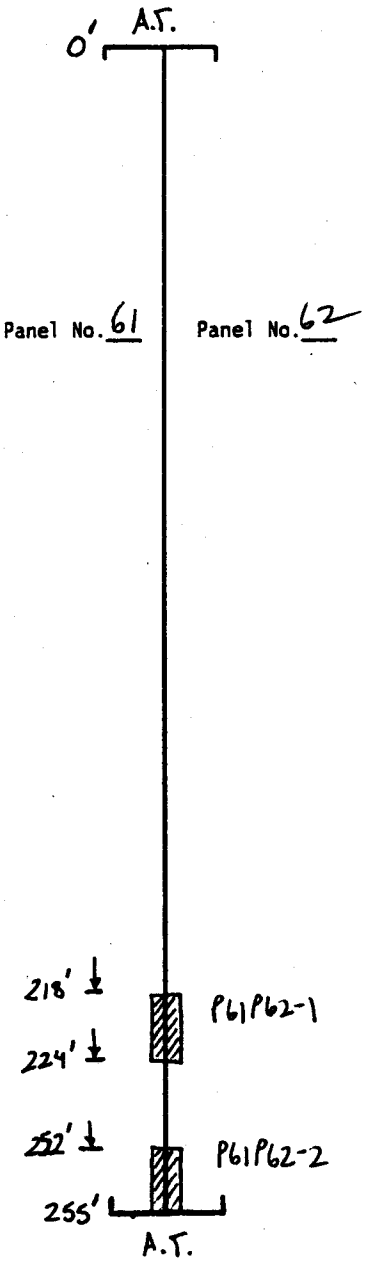
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL CONTRACTING
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P61/P62
SEAM LENGTH: 255'
COMMENTS: FNAT: 221 (1) 252

WELDING UNIT NO.: MM2
TIME WELDED: 5:58 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P61P62-1	RUN OUT	5/10 V-BOX	RCB
P61P62-2	SEAM PULLED APART	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

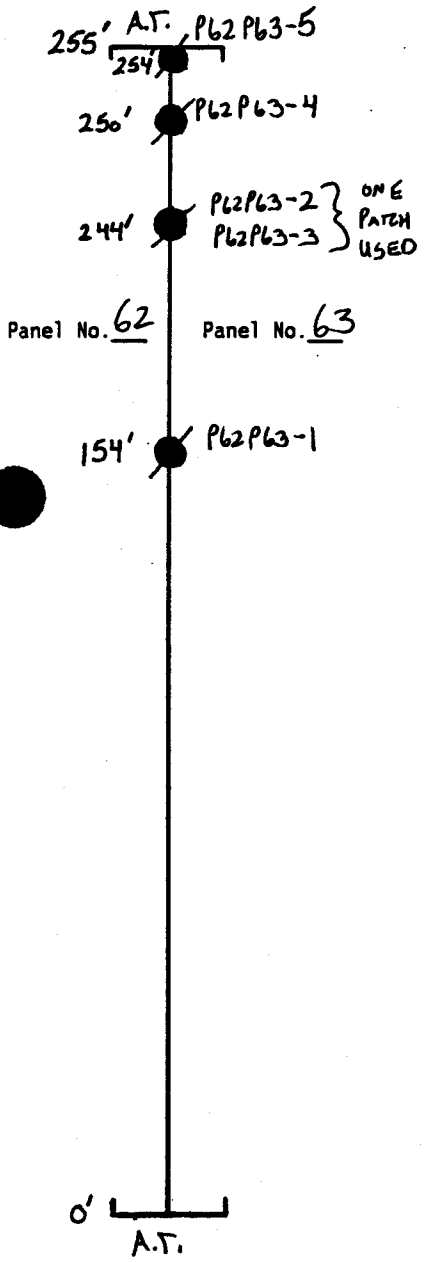
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P62/P63
SEAM LENGTH: 255'
COMMENTS: FSAT: 154(1) 244 (2/3) 250 (4) 254

WELDING UNIT NO.: C1
TIME WELDED: 6:14 a.m. / p.m.

SEAM DETAIL
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P62P63-1	RUN OUT / BURN THRU	5/6 V-BOX	RCB
P62P63-2/3	CREASE THRU SEAM	5/6 V-BOX	RCB
P62P63-4	CREASE THRU SEAM	5/6 V-BOX	RCB
P62P63-5	BURN THRU	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

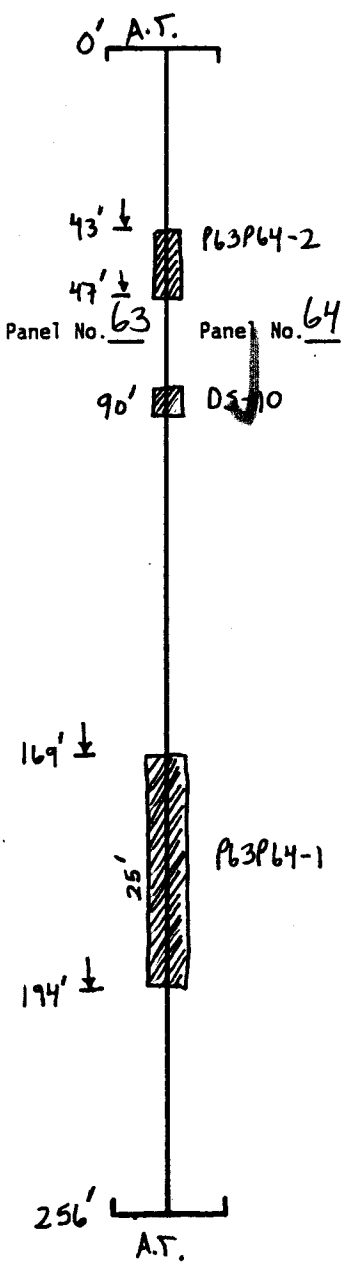
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/3/99

SEAM NO. P63/P64
SEAM LENGTH 256'
COMMENTS FNAT: 45 (2) 90 (DS-10) 185 (1)

WELDING UNIT NO. MM2
TIME WELDED 6:33 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P63P64-2	RUN OUT	5/6 V-BOX	RCB
DS-10	DESTRUCT	5/10 V-BOX	RCB
P63P64-1	HEAT OFF (NO WELD)	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

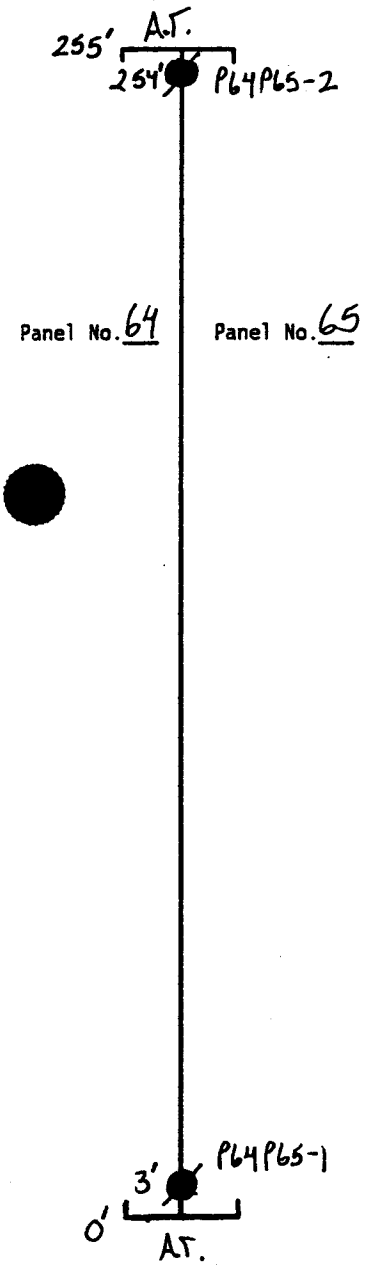
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P64/P65
SEAM LENGTH: 255'
COMMENTS: FSAT: 3 (1) 254 (2)

WELDING UNIT NO.: C1
TIME WELDED: 6:51 a.m. / p.m.

SEAM DETAIL
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P64P65-1	FISH MOUTH	5/6 V-BOX	RCB
P64P65-2	WRINKLES	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

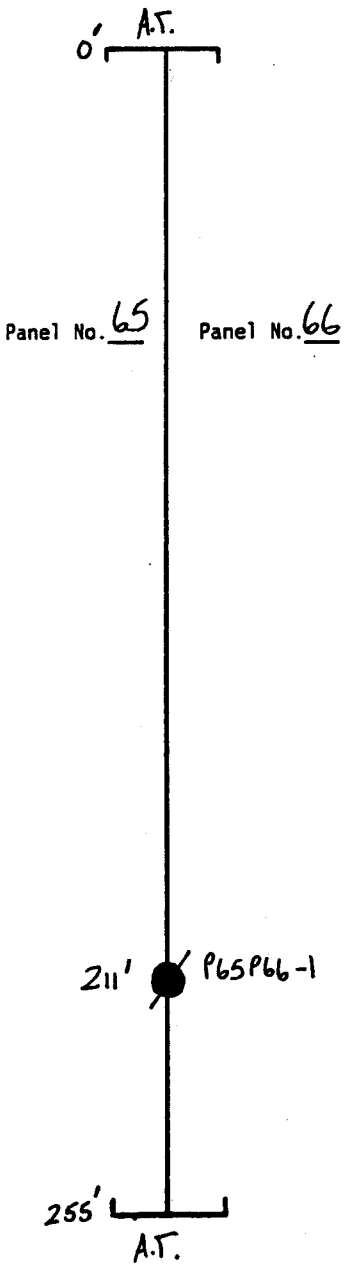
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/3/99

SEAM NO.: P65/P66
SEAM LENGTH: 255'
COMMENTS: FNAT: 211 (1)

WELDING UNIT NO.: C1
TIME WELDED: 7:27 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P65P66-1	RUN OUT	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

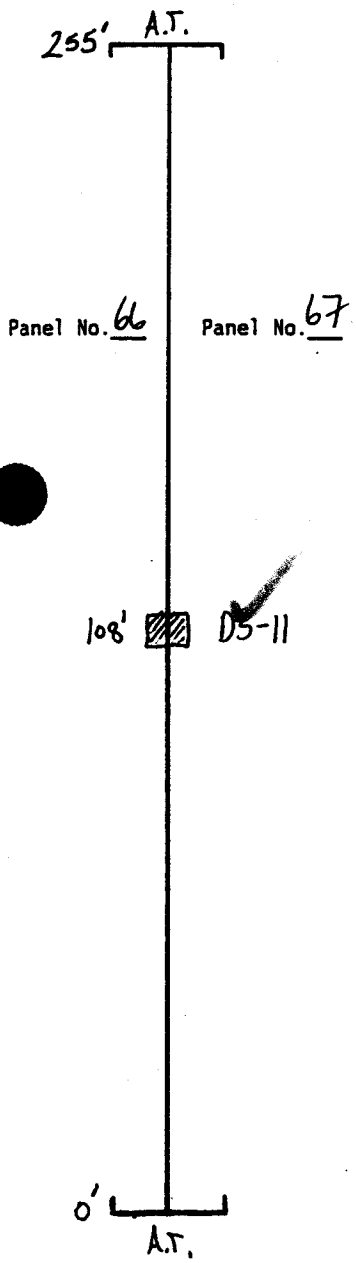
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 37006-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/3/99

SEAM NO. P66/P67
SEAM LENGTH 255'
COMMENTS FSAT: 108 (DS-11)

WELDING UNIT NO. MM2
TIME WELDED 7:41 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-11	DESTRUCT	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

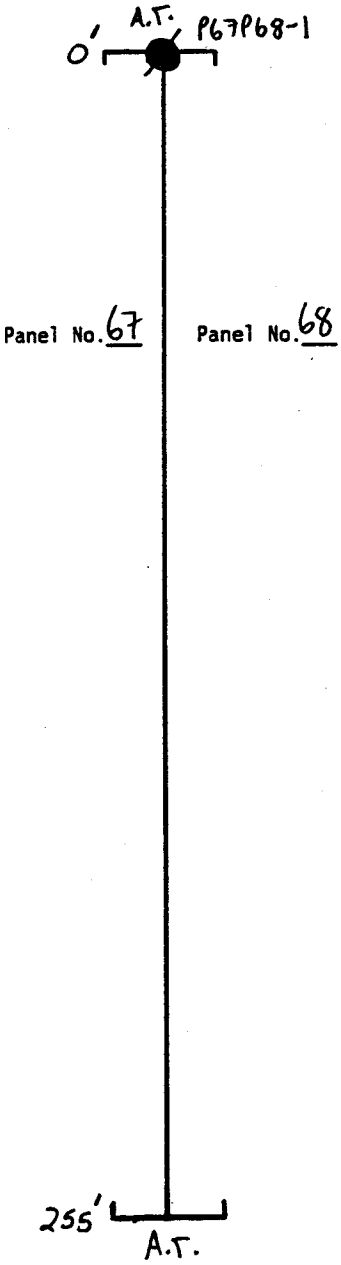
Sheet 1 of 1

PROJECT NAME HALIFAX COCOAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P67/P68
SEAM LENGTH 255'
COMMENTS FNAT: 0 (1)

WELDING UNIT NO. C1
TIME WELDED 8:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P67P68-1	RUNOUT/BURN THRU	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

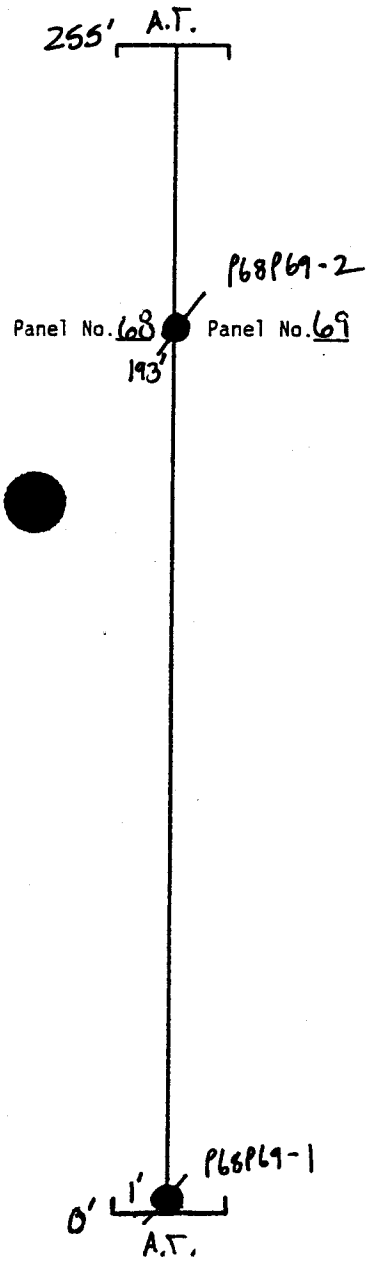
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P68/P69
SEAM LENGTH: 255'
COMMENTS: FSAT: 1 (1) 193 (2)

WELDING UNIT NO.: MM2
TIME WELDED: 8:42 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P68P69-1	BURN THRU	5/6 V-Box	RCB
P68P69-2	RUN OUT	5/6 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

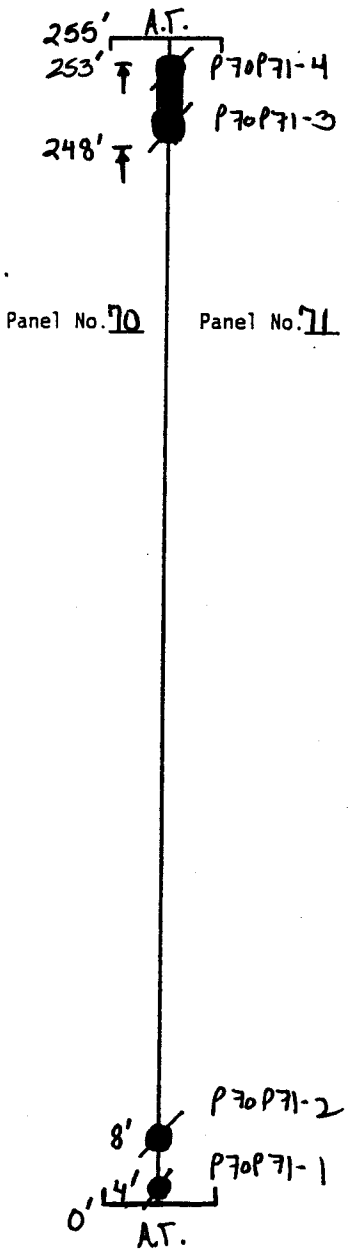
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P70/P71
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 8:49 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P70P71-1	FISH MOUTH	5/6 V-BOX	RCB
P70P71-2	FISH MOUTH	5/6 V-BOX	RCB
P70P71-3	RUN OUT	5/6 V-BOX	RCB
P70P71-4	BURN THRU	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

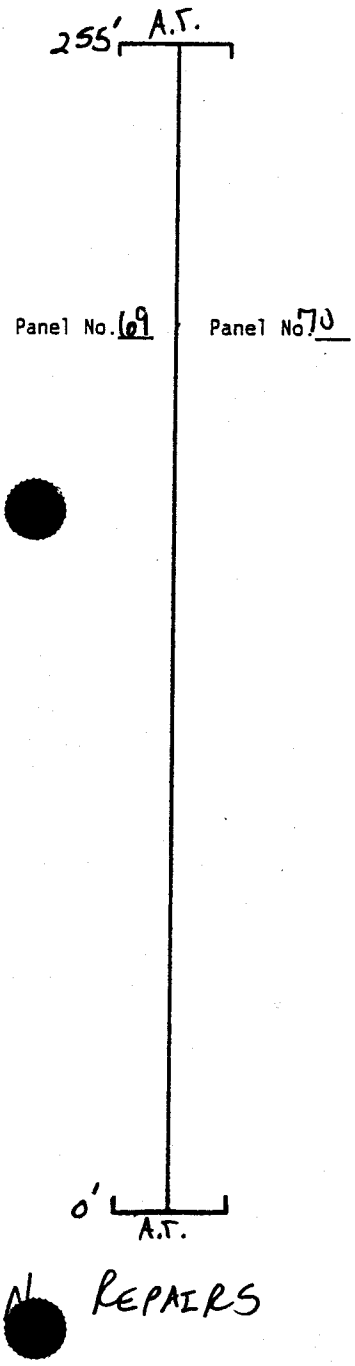
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P69/P70
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 9:09 (a.m./p.m.)

SEAM DETAIL ✓
(Show Dimensions)



NO REPAIRS

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

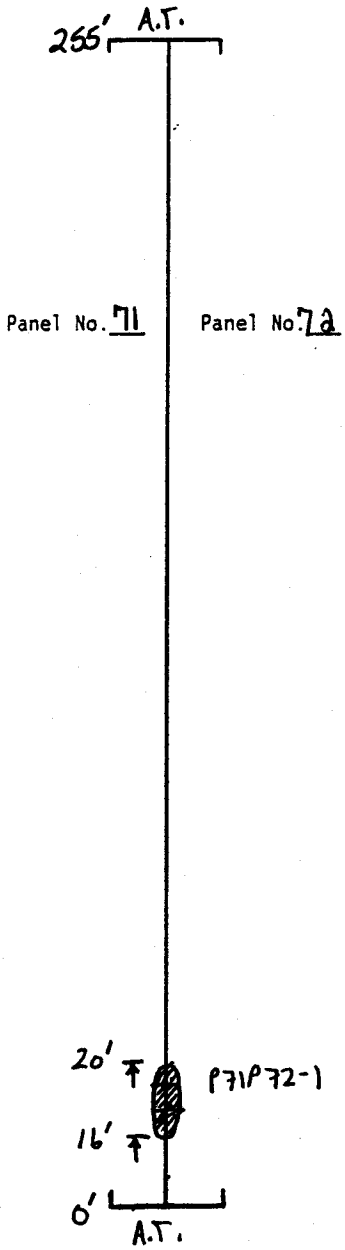
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P71/P72
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 9:22 (a.m./p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P71P72-1	BURN THRUS	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

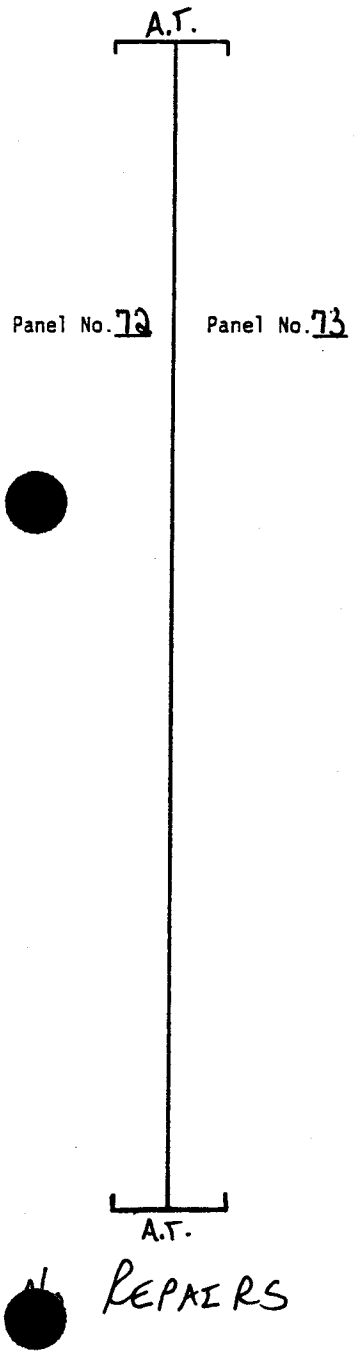
Sheet 1 of 1

PROJECT NAME Halifax Co. Coal Ash Monofill
PROJECT NO. 3786-004
CONTRACTOR Barnhill
INSTALLER Mid-America
WELDING TECH MH
TYPE OF WELDER Wedge
DATE WELDED 5/4/99

SEAM NO. P72/P73
SEAM LENGTH 255'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 9:25 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



No Repairs

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

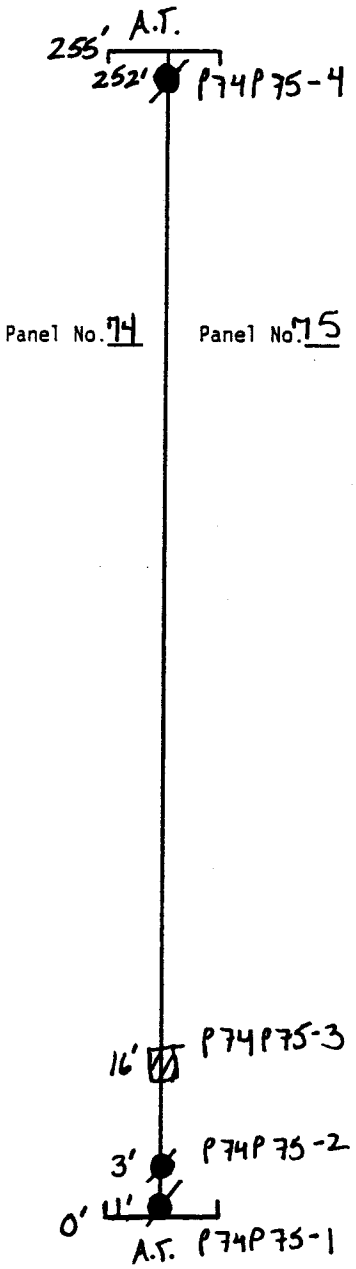
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P74/P75
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 9:56 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P74P75-1	FISH MOUTH	5/6 V-BOX	RCB
P74P75-2	FISH MOUTH	5/6 V-BOX	RCB
P74P75-3	BURN THRU/ TEAR	5/6 V-BOX	RCB
P74P75-4	RUN OUT	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

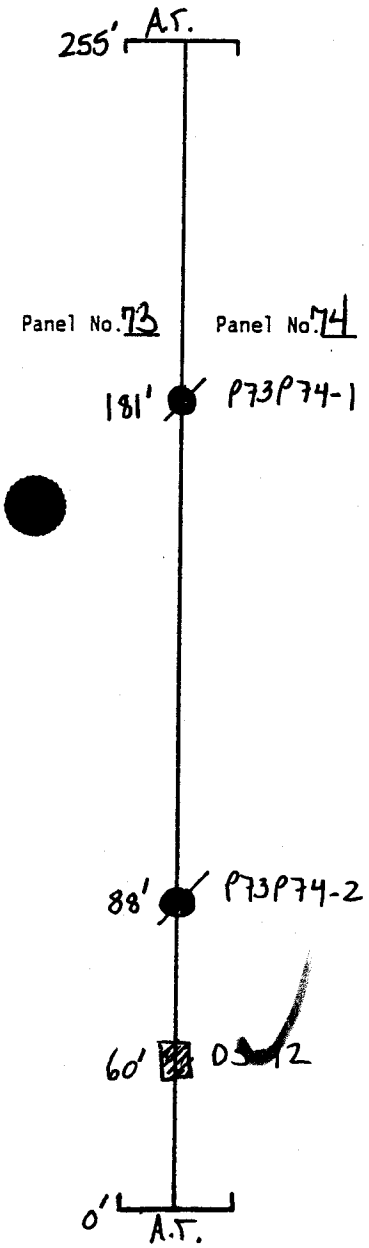
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P73/P74
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 9:59 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P73P74-1	BURN THRU	5/12 V-BOX	RCB
P73P74-2	RUN OUT	5/11 V-BOX	RCB
DS-12	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

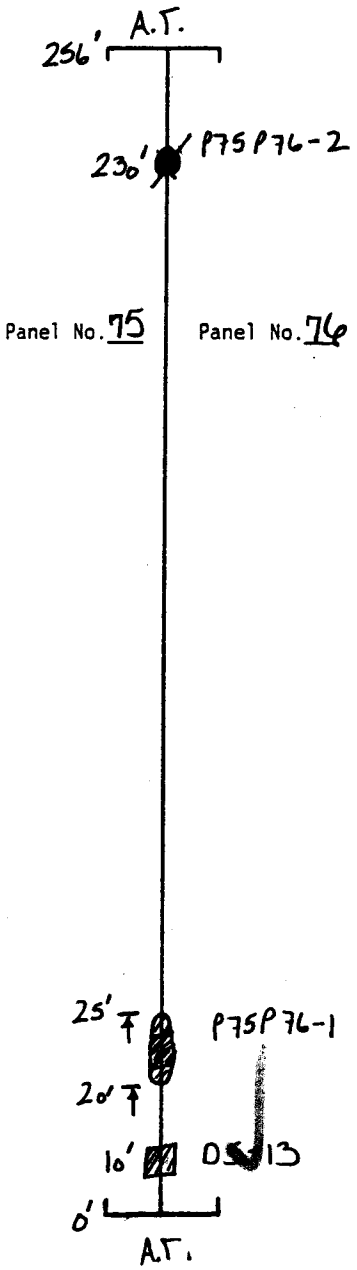
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P75/P76
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 10:22 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P75P76-1	Run out	5/6 V-Box	RCB
P75P76-2	Run out	5/12 V-Box	RCB
DS-13	Destruct	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

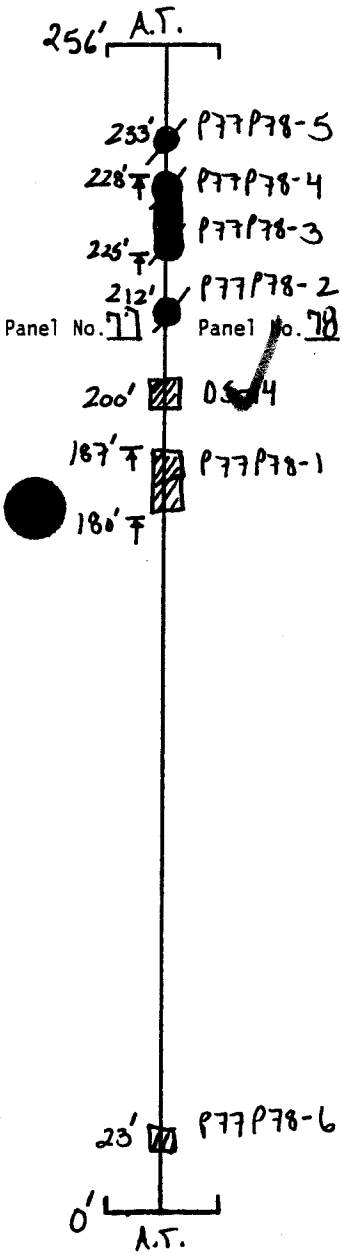
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P77/P78
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 10:42 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
▯	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P77P78-1	RUN OUT/ RESTART	5/10 V-BOX	RCB
P77P78-2	BURN THRU	5/6 V-BOX	RCB
P77P78-3	RUN OUT	5/6 V-BOX	RCB
P77P78-4	BURN THRU	5/6 V-BOX	RCB
P77P78-5	BURN THRU	5/6 V-BOX	RCB
DS-14	DESTRUCT	5/12 V-BOX	RCB
P77P78-6	RESTART	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

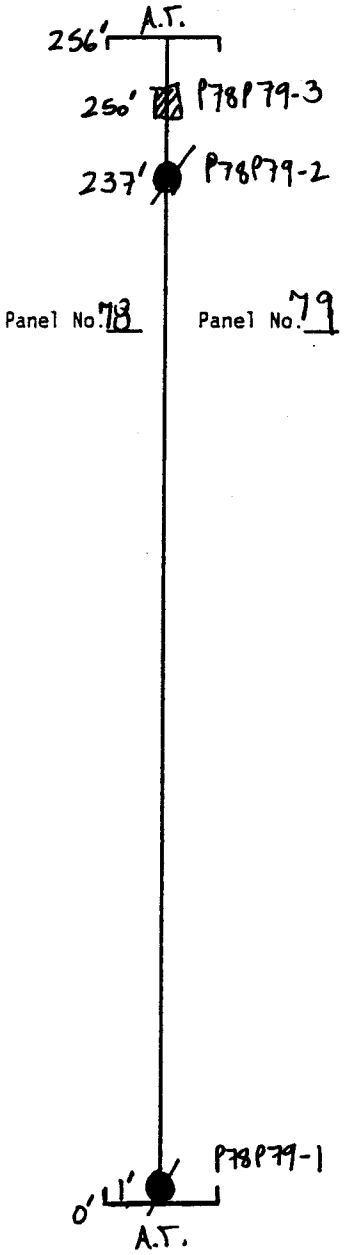
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P78/P79
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 10:50 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊞	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P78P79-1	WRINKLES	5/6 V-BOX	RCB
P78P79-2	BURN THRU	5/10 V-BOX	RCB
P78P79-3	RUN IN	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

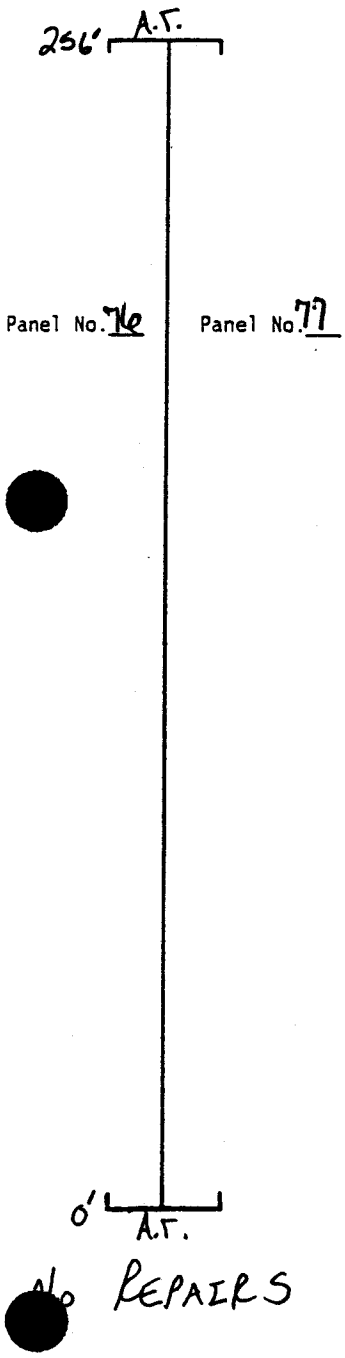
Sheet 1 of 1

PROJECT NAME HALIFAX COUNTY COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P76/P77
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 10:52 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

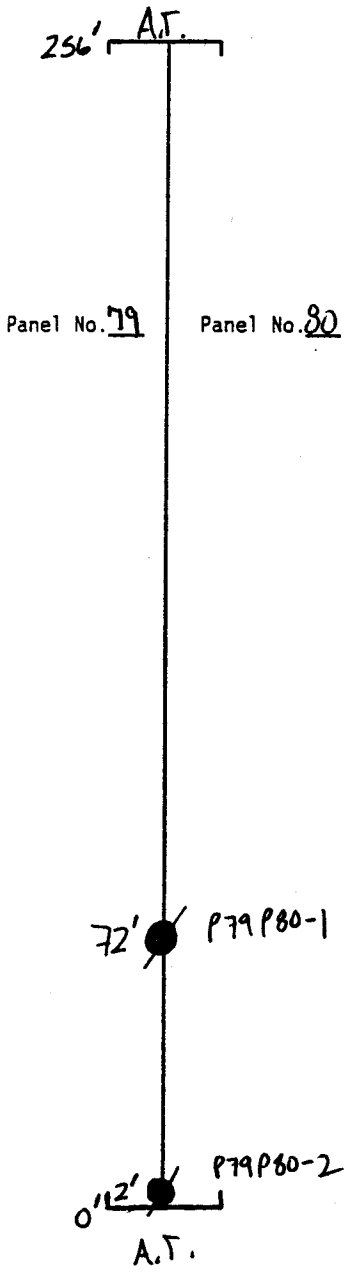
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P79/P80
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 1:20 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P79P80-1	RUN OUT	5/6 V-BOX	RCB
P79P80-2	BURN THRU	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

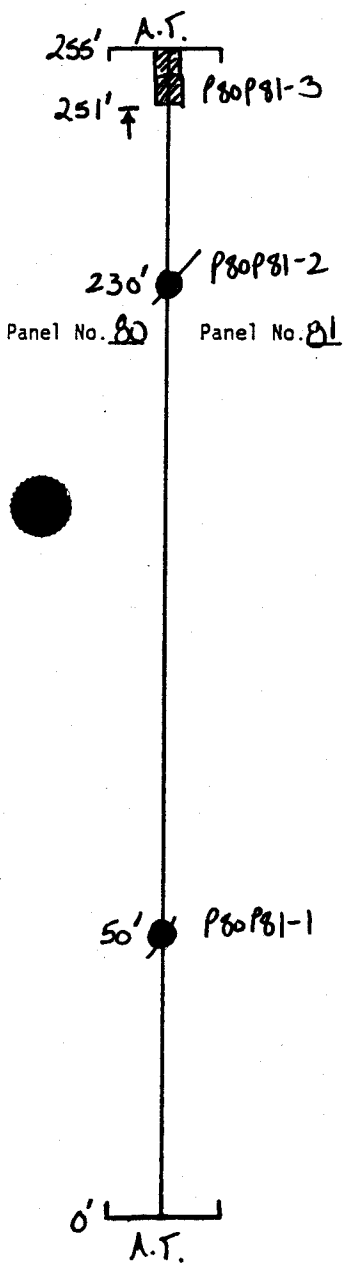
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P80/P81
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 1:30 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P80P81-1	RUN OUT	5/6 V-BOX	RCB
P80P81-2	RUN OUT	5/10 V-BOX	RCB
P80P81-3	FESH MOUTH/ WRINKLES	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

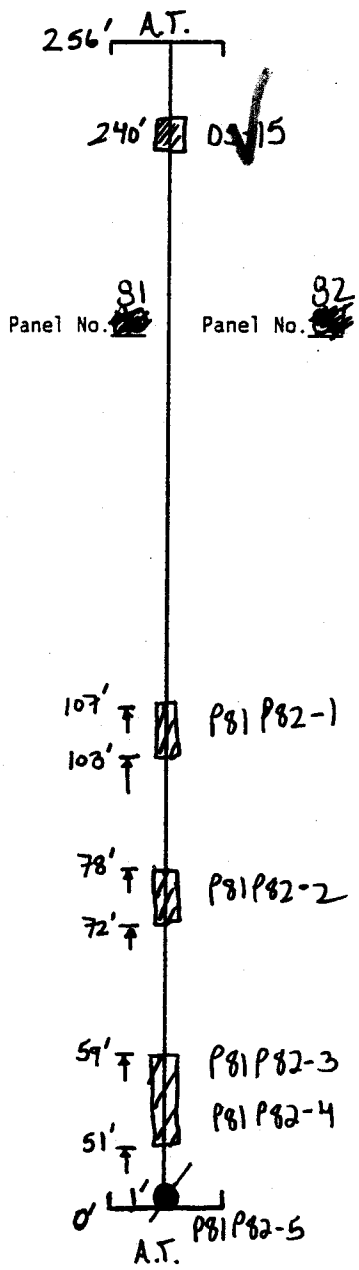
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P81/P82
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 1:45 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P81P82-1	RUN OUT	5/6 V-BOX	RCB
P81P82-2	RUN IN	5/6 V-BOX	RCB
P81P82-3	RUN IN	5/6 V-BOX	RCB
P81P82-4	RUN IN	5/6 V-BOX	RCB
DS-15	DESTRUCT	5/11 V-BOX	RCB
P81P82-5	WRINKLES	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

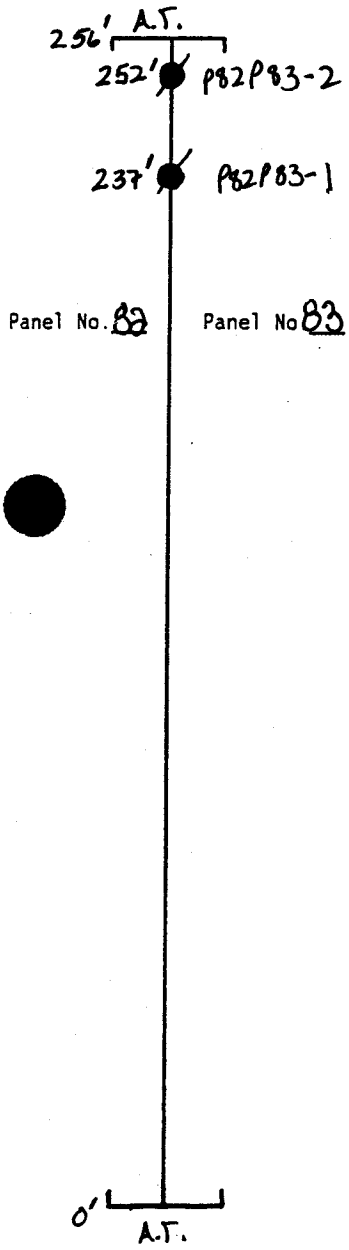
Sheet 1 of 1

PROJECT NAME: HALIFAX Co COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL CONTRACTING
INSTALLER: MID AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P82/P83
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 1:55 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P82P83-1	Run out	5/11 V-Box	RCB
P82P83-2	Fish Mouth	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL CONTRACTING
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P83/P84
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM 2
TIME WELDED 2:20 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)

A.T.

Panel No. 83 | Panel No. 84

A.T.

No REPAIRS

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

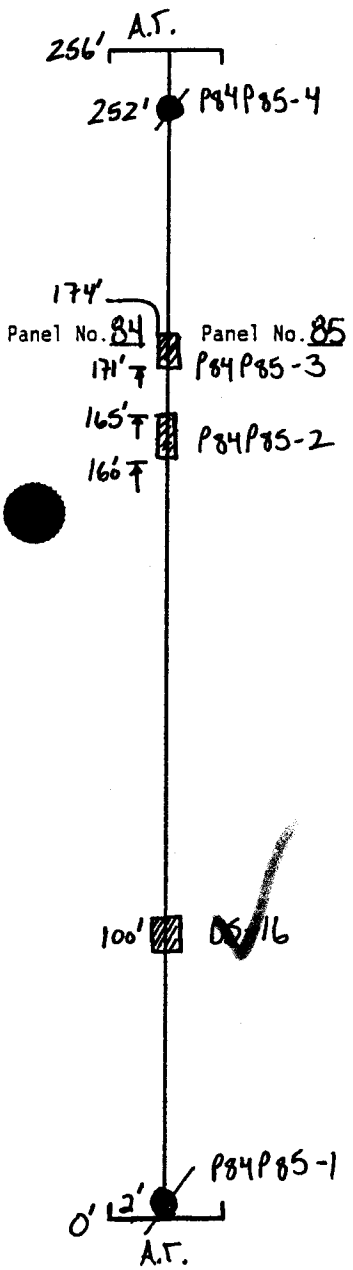
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL CONTRACTING
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P84/ P85
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 2:42 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P84P85-1	WRINKLES	5/10 V-BOX	RCB
P84P85-2	RUN OUT	5/11 V-BOX	RCB
P84P85-3	RUN OUT	5/11 V-BOX	RCB
P84P85-4	WRINKLES	5/11 V-BOX	RCB
DS-16	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

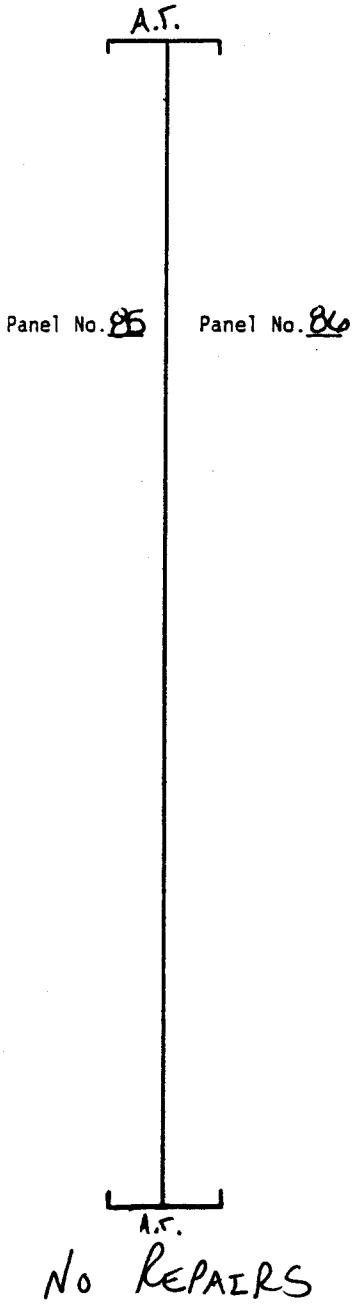
CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL CONTRACTING
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P85/P86
SEAM LENGTH 256'
COMMENTS
WELDING UNIT NO. MM2
TIME WELDED 3:00 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
● ✓	Repair Approved
⊞	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

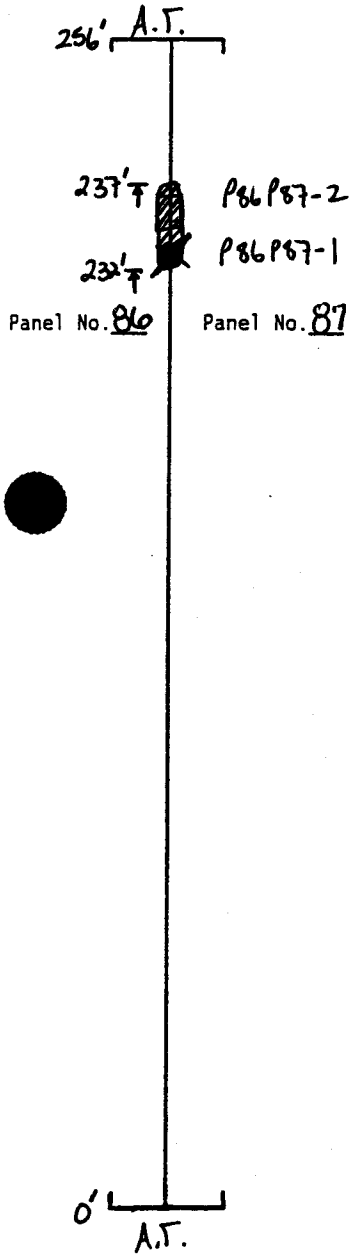
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL CONTRACTING
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P86/P87
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 3:20 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P86P87-1	Run out	5/11 V-Box	RCB
P86P87-2	Run out	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

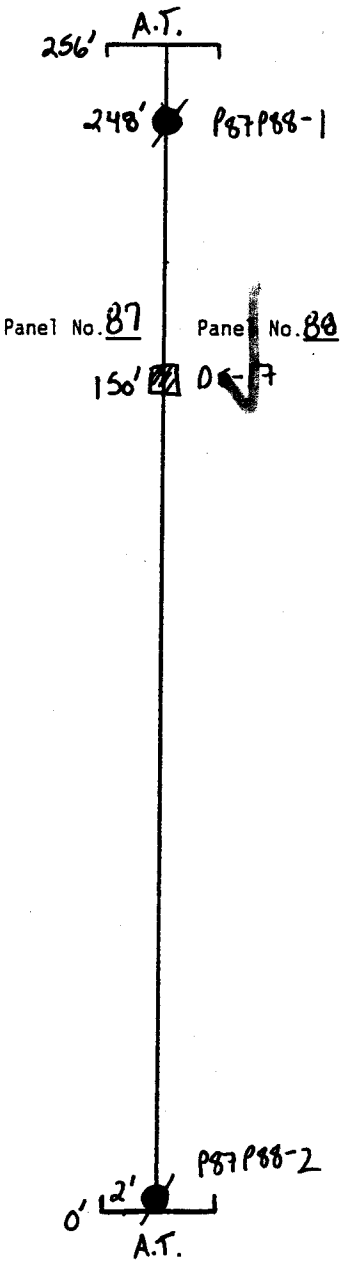
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P87/P88
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 4:07 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P87P88-1	RUN OUT	5/11 V-BOX	RCB
P87P88-2	BURN THRU	5/11 V-BOX	RCB
DS-17	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

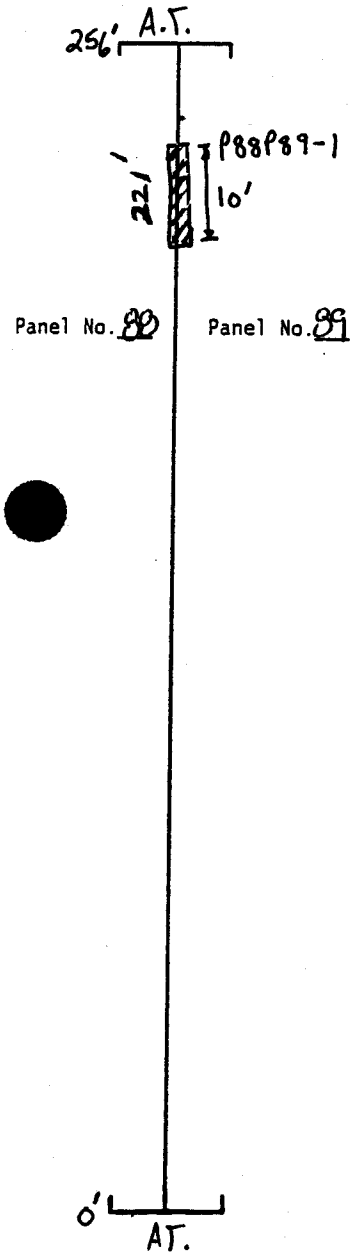
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P88/P89
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 5:11 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P88P89-1	SEAM PULLED APART	5/11 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

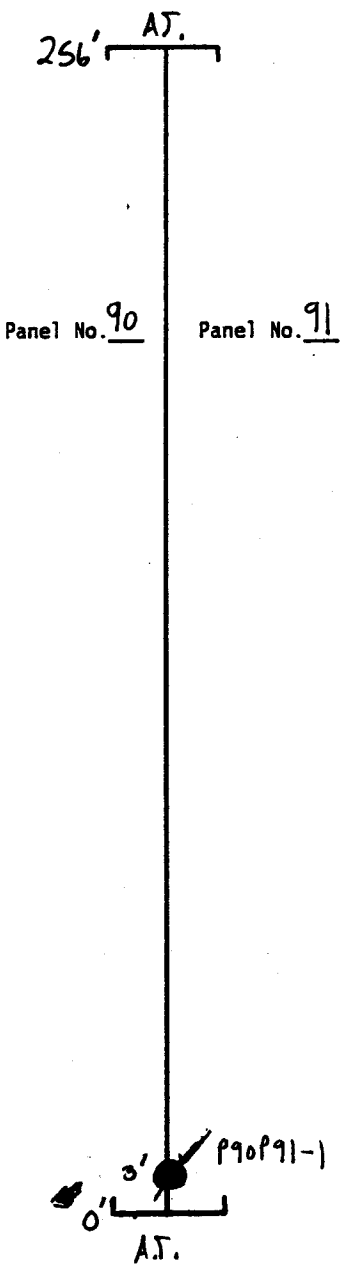
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3706-004
CONTRACTOR: BARNHILL CONTRACTING
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P90 / P91
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C1
TIME WELDED: 5:30 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P90P91-1	WRINKLES	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

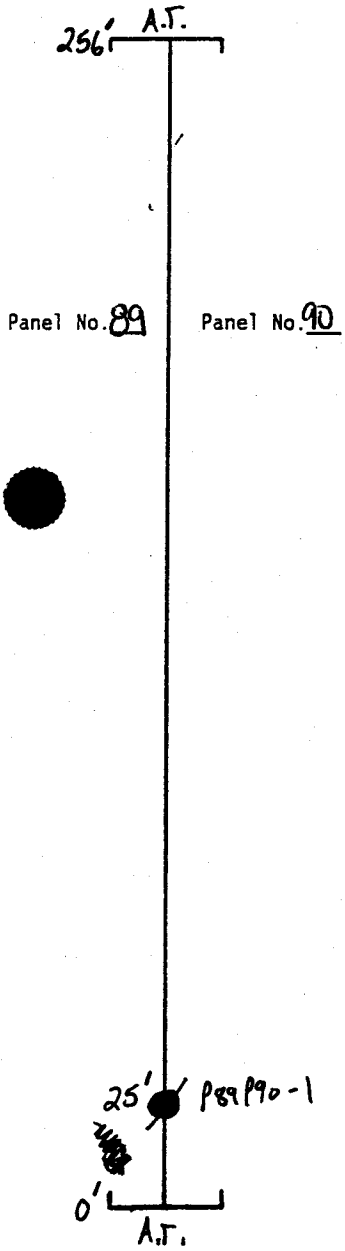
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL CONTRACTING
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99

SEAM NO.: P89/P90
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 5:40 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P89P90-1	Run out	5/6 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

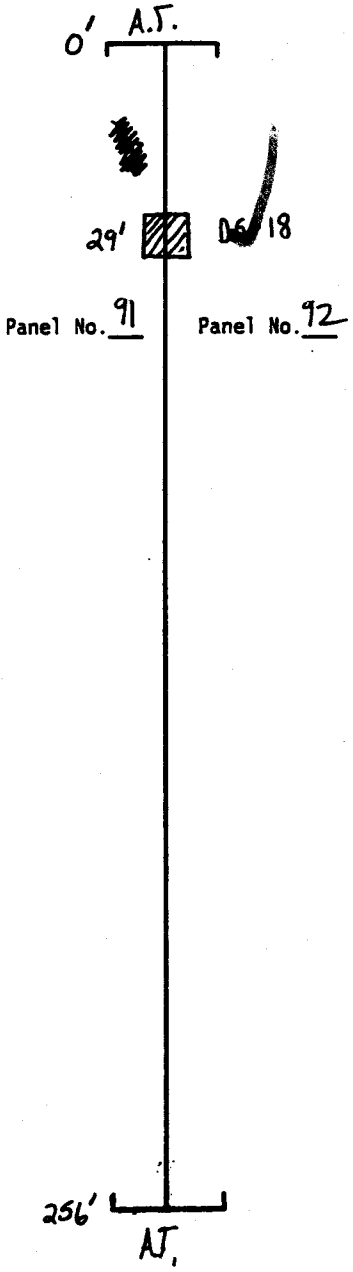
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P91/P92
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. C1
TIME WELDED 6:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-18	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

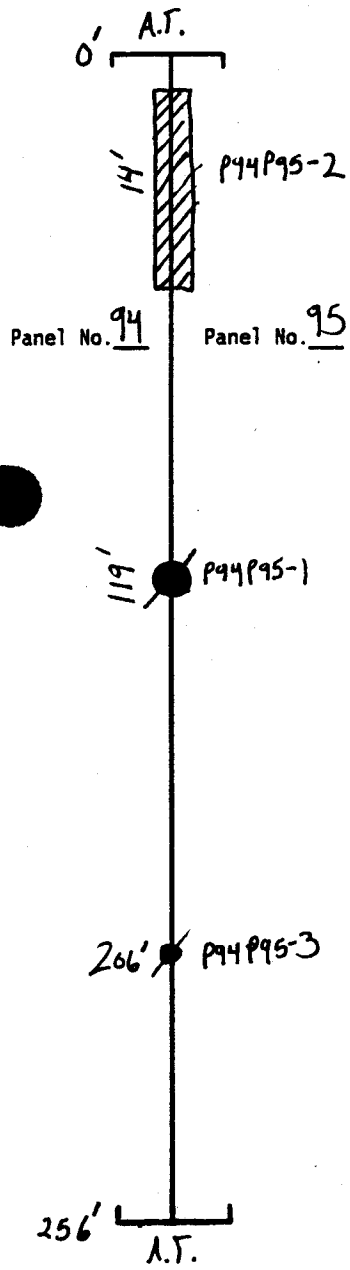
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB / MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99 AND 5/5/99

SEAM NO.: P94/P95
SEAM LENGTH: 256'
COMMENTS: SB WELDED 0' TO 206' ON 5/4/99
MH WELDED 206' TO EOS ON 5/5/99

WELDING UNIT NO.: C1 / MM2
TIME WELDED: 6:04 / 2:50 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P94P95-1	RUN OUT	5/11 V-BOX	RCB
P94P95-2	WRINKLES	5/11 V-BOX	RCB
P94P95-3	RESTART	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

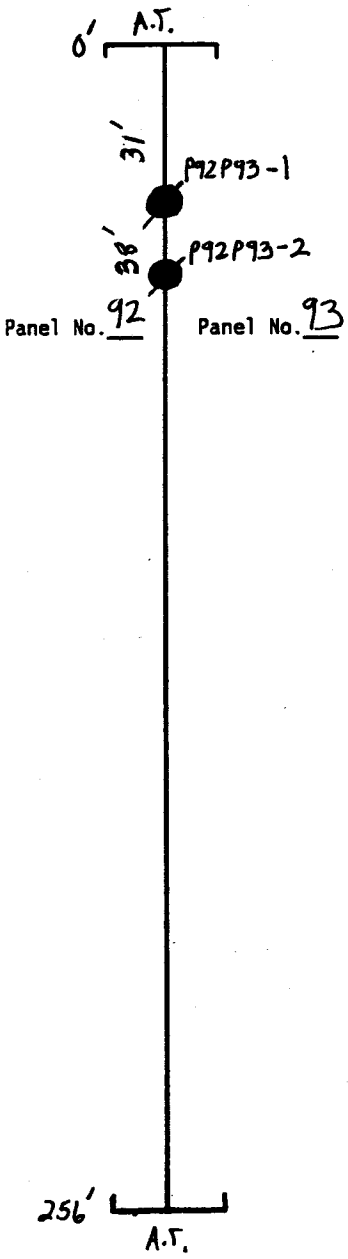
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P92/P93
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 6:05 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P92P93-1	BURN THRU	5/11 V-BOX	RCB
P92P93-2	RUN OUT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

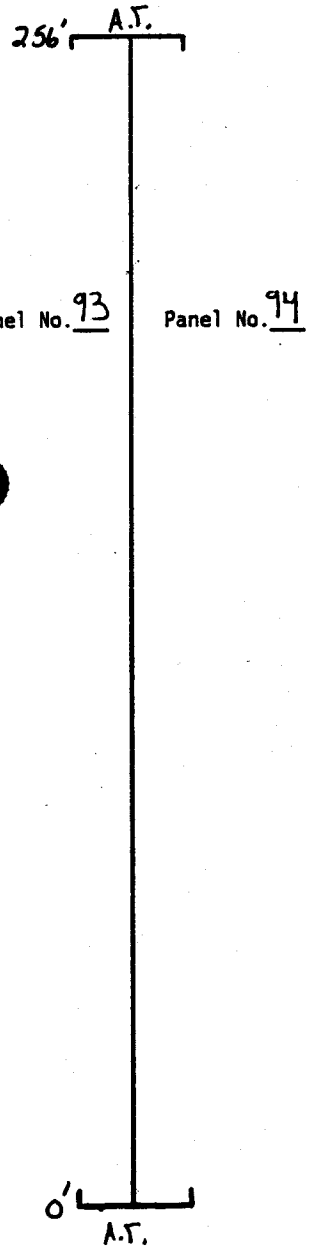
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99

SEAM NO. P93/P94
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 6:35 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



No REPAIRS

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

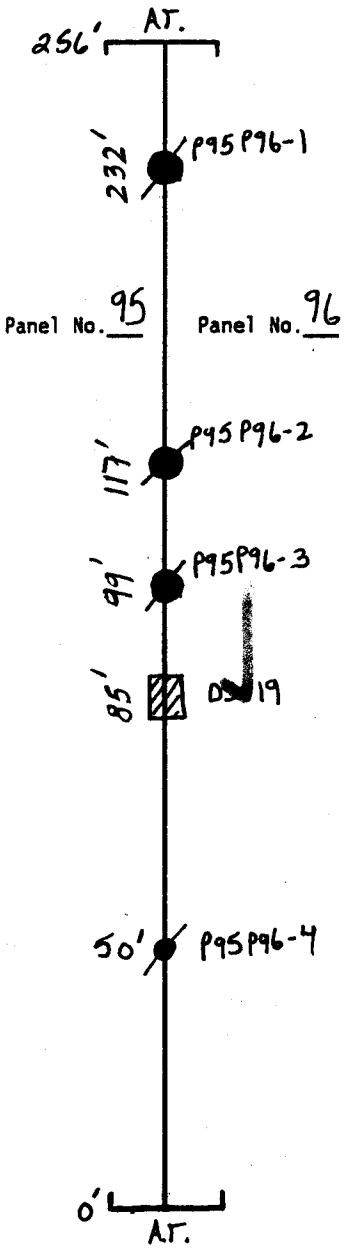
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99 AND 5/5/99

SEAM NO. P95/P96
SEAM LENGTH 256'
COMMENTS MH WELDED 50' TO 256' ON 5/4/99
MH WELDED 0' TO 50' ON 5/5/99

WELDING UNIT NO. MM 2
TIME WELDED 8:00 a.m. / p.m.
5/5/99 → 10:26 A.M.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P95P96-1	RUN OUT/BURN THRU	5/12 V-BOX	RCB
P95 P96-2	RUN OUT/RESTART	5/11 V-BOX	RCB
P95P96-3	RUN OUT	5/11 V-BOX	RCB
DS-19	DESTRUCT	5/11 V-BOX	RCB
P95P96-4	RESTART	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

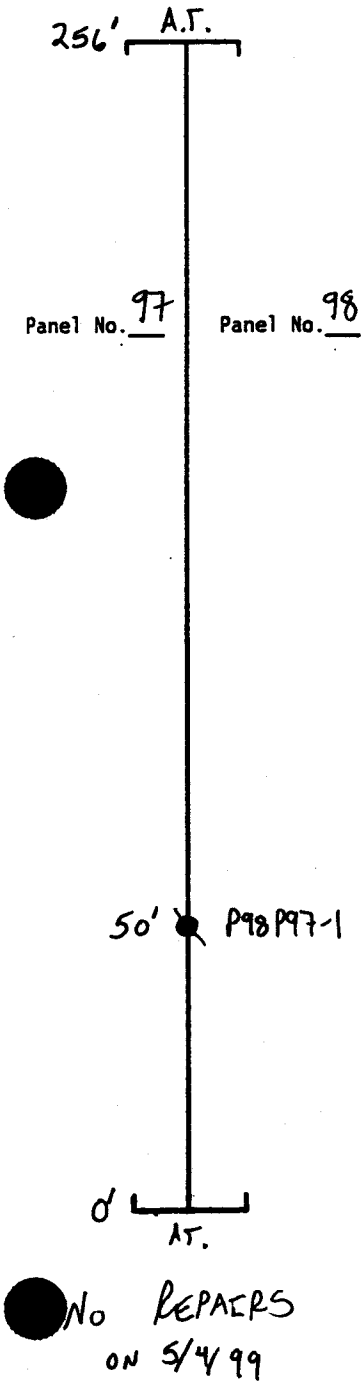
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB / MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99 AND 5/5/99

SEAM NO.: P98 / P97
SEAM LENGTH: 256'
COMMENTS: SB WELDED 50' TO 256' ON 5/4/99
MH WELDED 0' TO 50' ON 5/5/99

WELDING UNIT NO.: C1 / MM2
TIME WELDED: 8:00 a.m. / p.m.
5/5/99 → 10:02 A.M.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS ON		5/4/99	
P98 P97-1	RESTARS	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

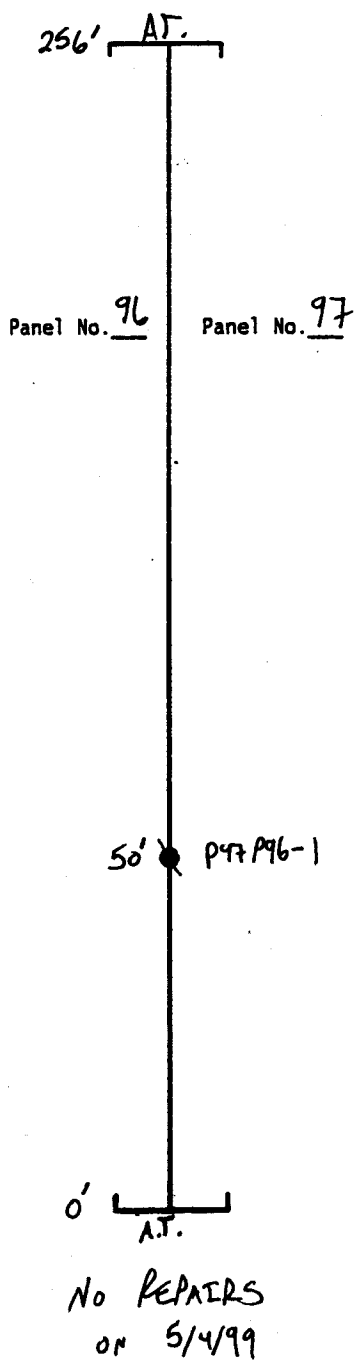
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB / MH
TYPE OF WELDER WEDGE
DATE WELDED 5/4/99 AND 5/5/99

SEAM NO. P97/P96
SEAM LENGTH 256'
COMMENTS SB WELDED 50' TO 256' ON 5/4/99
MH WELDED 0' TO 50' ON 5/5/99

WELDING UNIT NO. C1/MM2
TIME WELDED 8:30 a.m./p.m.
5/5/99 → 10:15 AM.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS ON		5/4/99	
P97 P96-1	RESTART	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

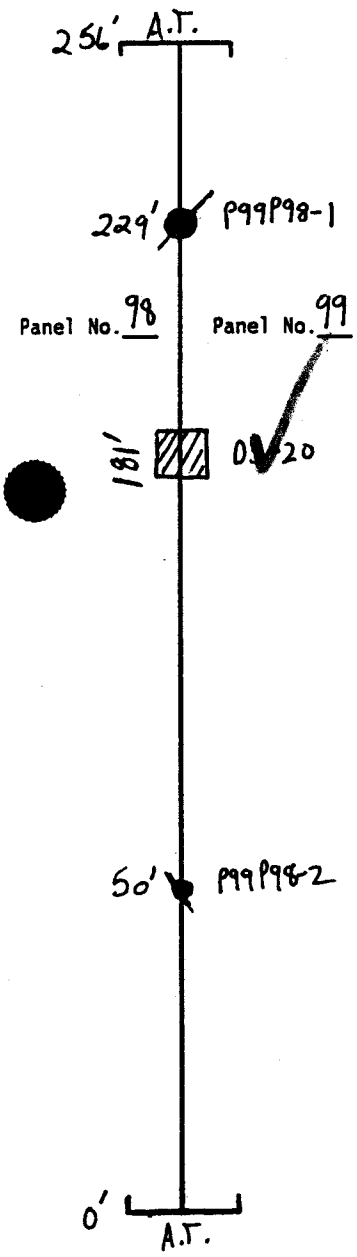
Sheet 1 of 1

PROJECT NAME: HALIFAX Co COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB / MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/4/99 AND 5/5/99

SEAM NO.: P99/P98
SEAM LENGTH: 256'
COMMENTS: SB WELDED 50' TO 256' ON 5/4/99
MH WELDED 0' TO 50' ON 5/5/99

WELDING UNIT NO.: C1 / MM2
TIME WELDED: 9:08 a.m./p.m.
5/5/99 → 9:53 A.M.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-20	DESTRUCT	5/11 V-BOX	RCB
P99P98-1	RUN OUT	5/12 V-BOX	RCB
P99P98-2	RESTART	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

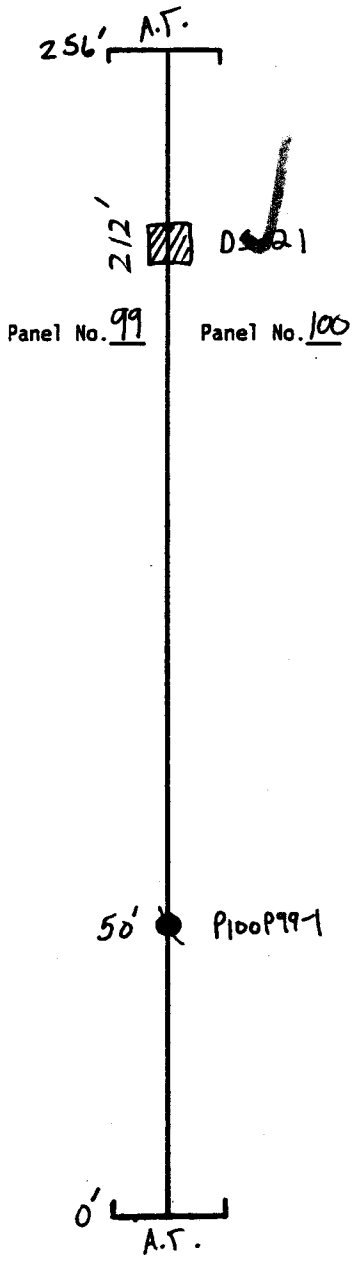
CQA SEAM INSPECTION FORM

Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/~~13~~5/99

SEAM NO. P100/P99
SEAM LENGTH 256'
COMMENTS
WELDING UNIT NO. MM2
TIME WELDED 9:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-21	DESTRUCT	5/11 V-BOX	RCB
P100P99-1	RESTART	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

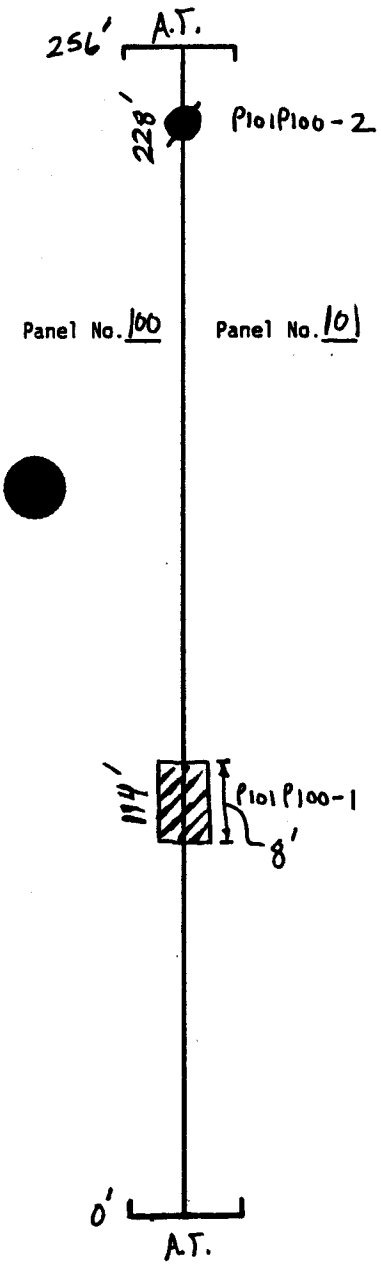
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH S.B.
TYPE OF WELDER WEDGE
DATE WELDED 5/~~6~~5/99

SEAM NO. P101/P100
SEAM LENGTH 256'
COMMENTS 750/75

WELDING UNIT NO. C-1
TIME WELDED 9:03 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P101P100-1	Run out	5/12 V-BOX	RCB
P101P100-2	Run out	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

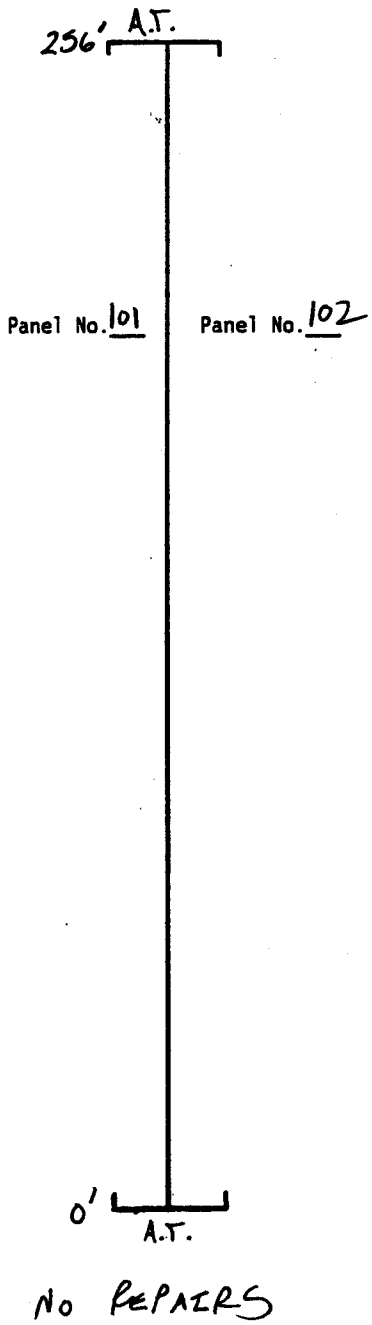
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P102 / P101
SEAM LENGTH 256'
COMMENTS 750/40

WELDING UNIT NO. MM2
TIME WELDED 9:22 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



No REPAIRS

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

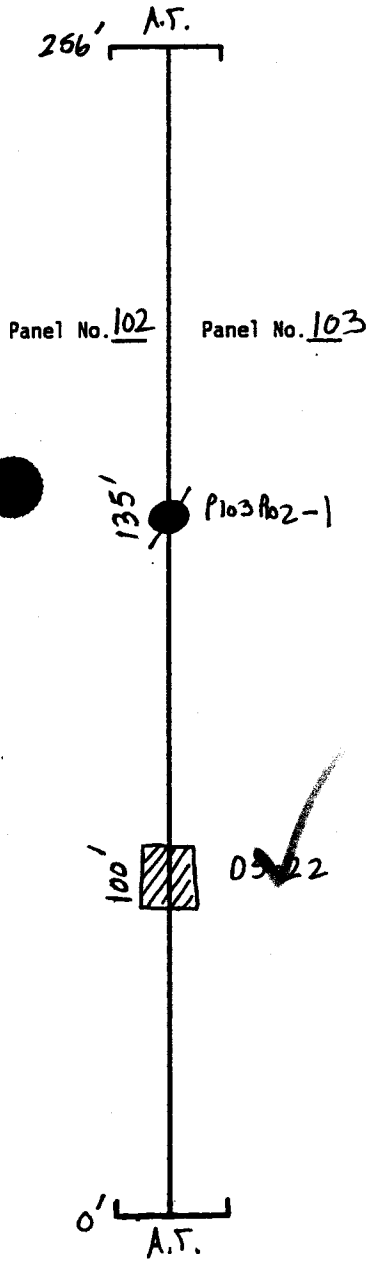
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P103/P102
SEAM LENGTH 256'
COMMENTS 750/75

WELDING UNIT NO. C-1
TIME WELDED 9:25 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-22	DESTRUCT	5/11 V-BOX	RLB
P103P102-1	RUN OUT	5/11 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

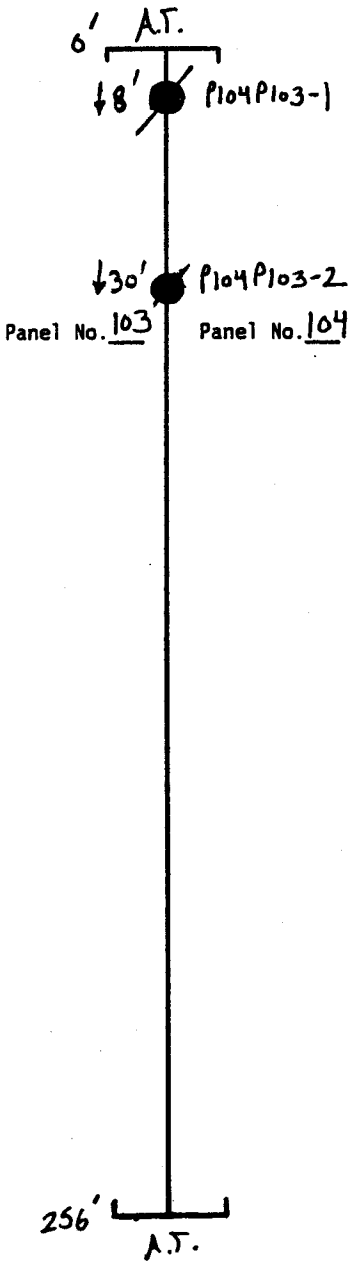
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/11/99

SEAM NO.: P104/ P103
SEAM LENGTH: 256'
COMMENTS: 750/75

WELDING UNIT NO.: C-1
TIME WELDED: 958 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P104P103-1	WRINKLES	5/11 V-BOX	RCB
P104P103-2	Run out	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

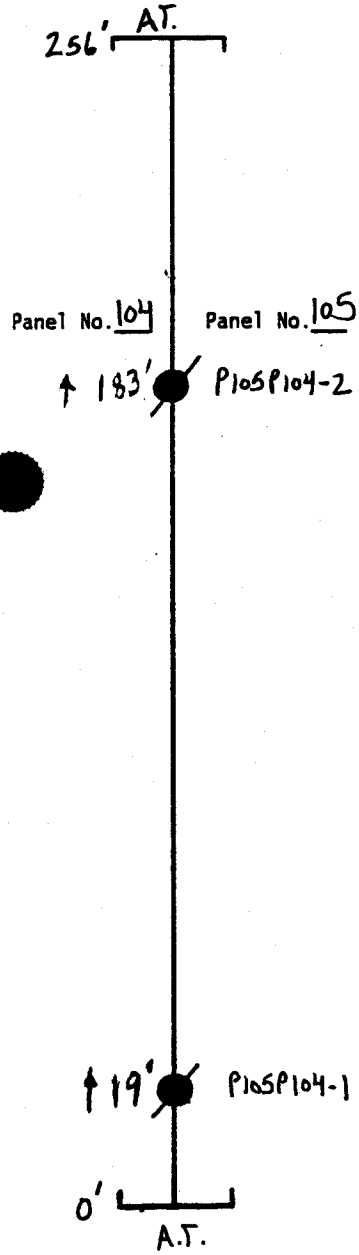
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/~~5~~5/99

SEAM NO. P105/ P104
SEAM LENGTH 256'
COMMENTS 750/75

WELDING UNIT NO. C-1
TIME WELDED 10:26 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P105P104-1	Burn thru	5/10 V-Box	RCB
P105P104-2	Run out	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

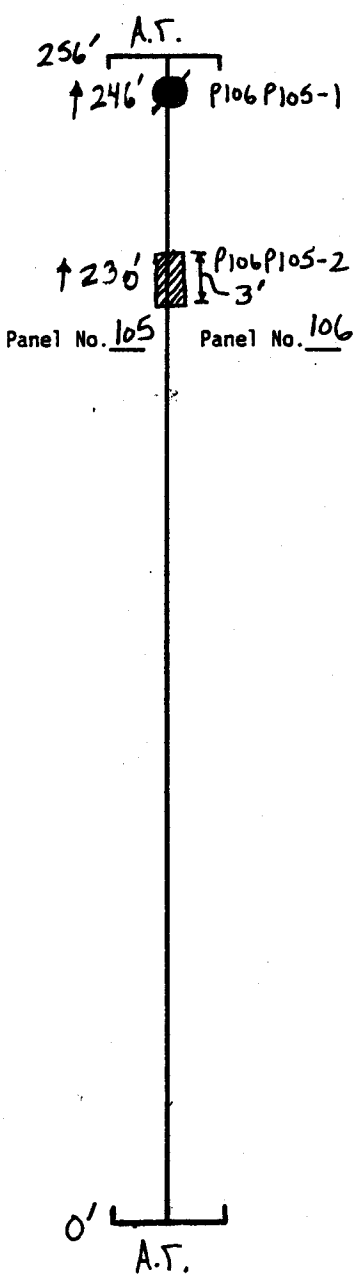
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/~~6~~5/99

SEAM NO.: P106/P105
SEAM LENGTH: 256'
COMMENTS: 750/40

WELDING UNIT NO.: MM2
TIME WELDED: 10:44 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P106P105-1	WRINKLES	5/11 V-BOX	RLB
P106P105-2	BURN THRU/ RESTART	5/11 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

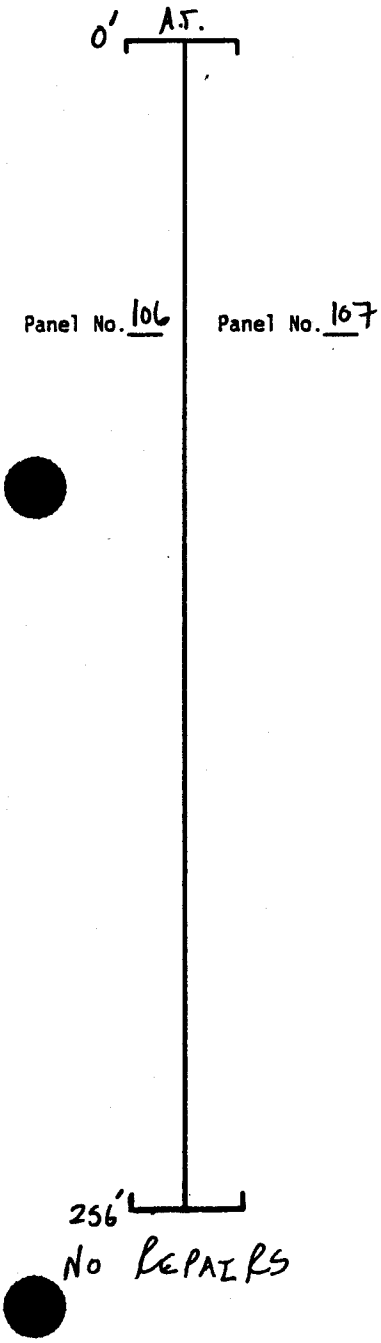
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3796-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P107/ P106
SEAM LENGTH 256'
COMMENTS 750/75

WELDING UNIT NO. C-1
TIME WELDED 10:50 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

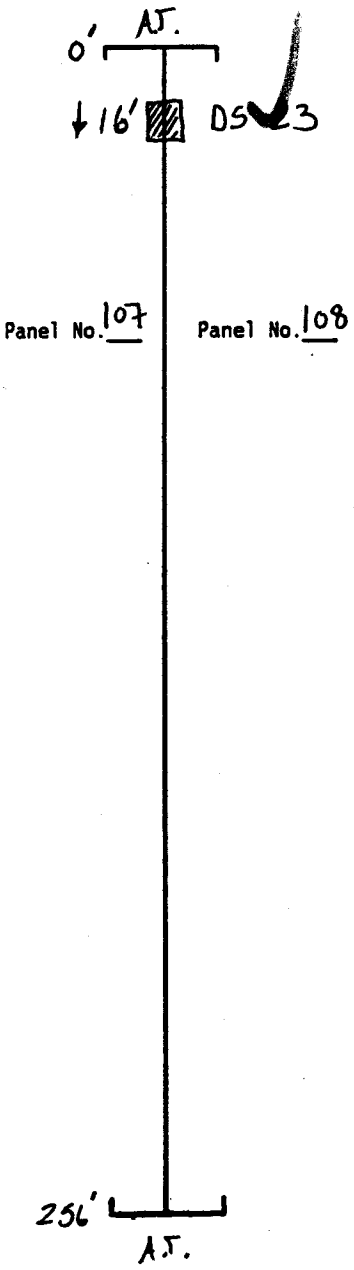
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/~~5~~ 5/99

SEAM NO.: P108 / P107
SEAM LENGTH: 256'
COMMENTS: 750/40

WELDING UNIT NO.: MM2
TIME WELDED: 11:15 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-23	DESTRUCT	5/11 V-Box	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

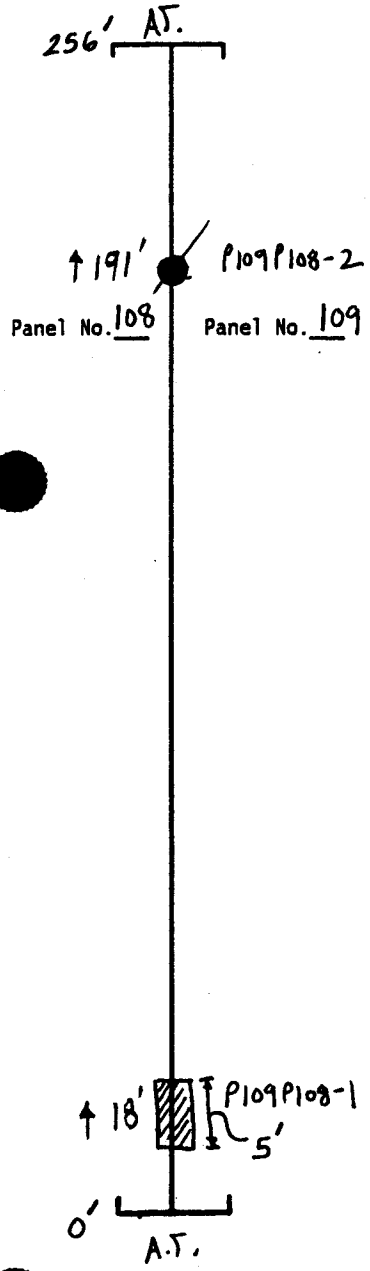
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/~~13~~ 5/99

SEAM NO.: P109/ P108
SEAM LENGTH: 256'
COMMENTS: 750/75

WELDING UNIT NO.: C-1
TIME WELDED: 11:15 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P109P108-1	BURN THRU/ RESTART	5/10 V-BOX	RCB
P109P108-2	RUN OUT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

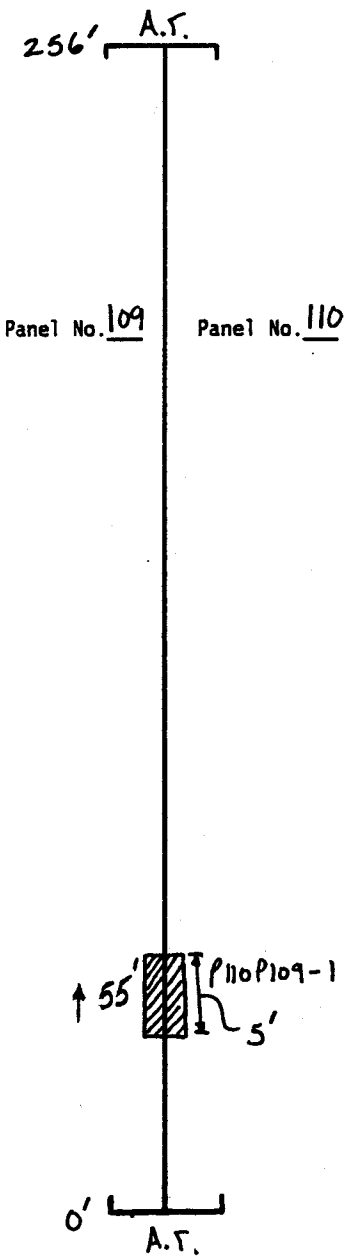
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3766-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P110/ P109
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C-1
TIME WELDED: 2:40 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P110P109-1	RESTART	5/10 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

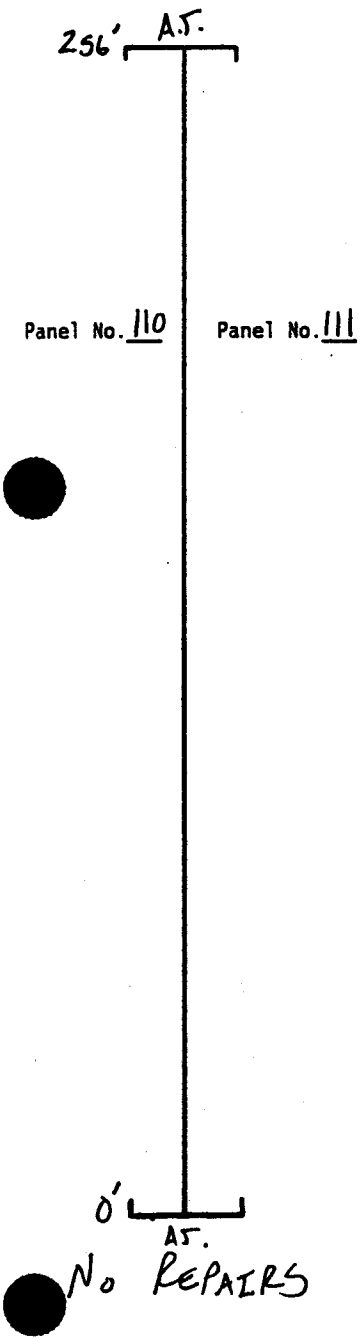
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P111/P110
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 3:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

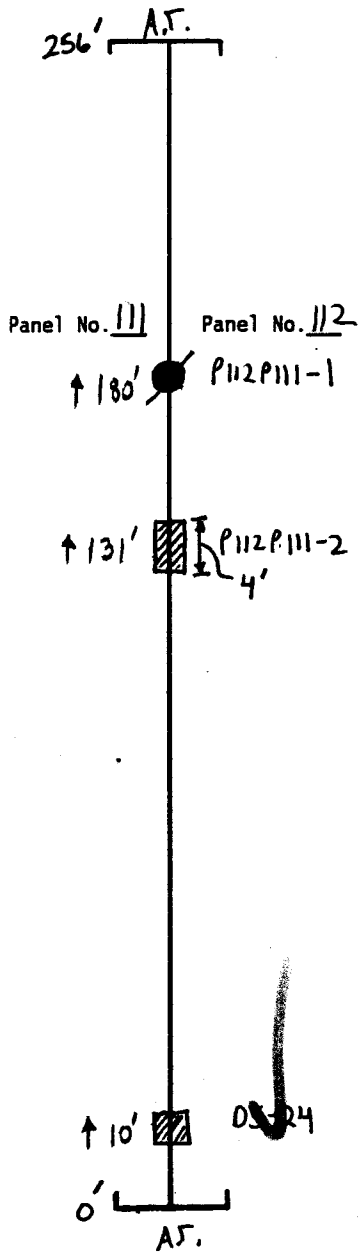
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P112/P111
SEAM LENGTH: 256'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 3:20 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊞	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P112P111-1	Run out	5/12 V-Box	RCB
P112P111-2	Run out/restart	5/11 V-Box	RCB
DS-24	DESTRUCT	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

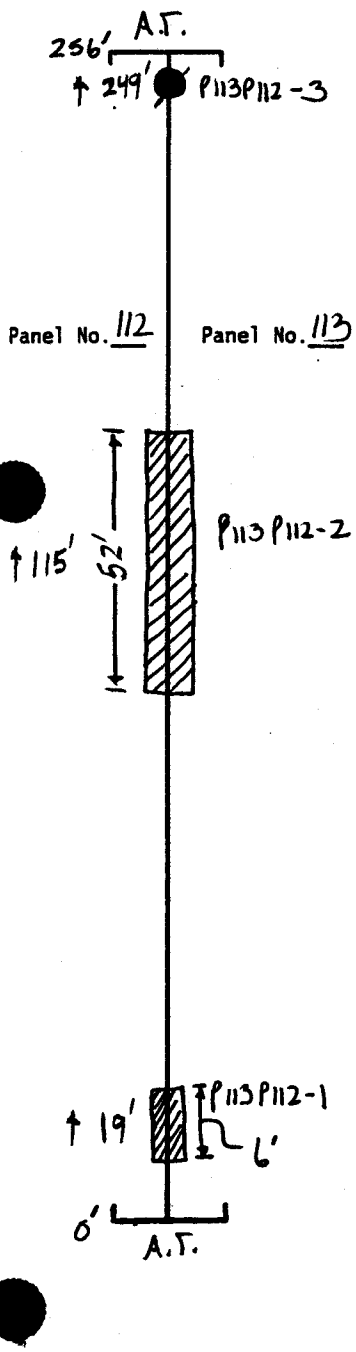
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P113/P112
SEAM LENGTH: 256'
COMMENTS: 750/45

WELDING UNIT NO.: MM2
TIME WELDED: 3:25 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P113P112-1	BURN THRU/ RESTART	5/10 V-BOX	RCB
P113P112-2	HEATING ELEMENT OFF	5/11 V-BOX	RCB
P113 P112-3	WRINKLES	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

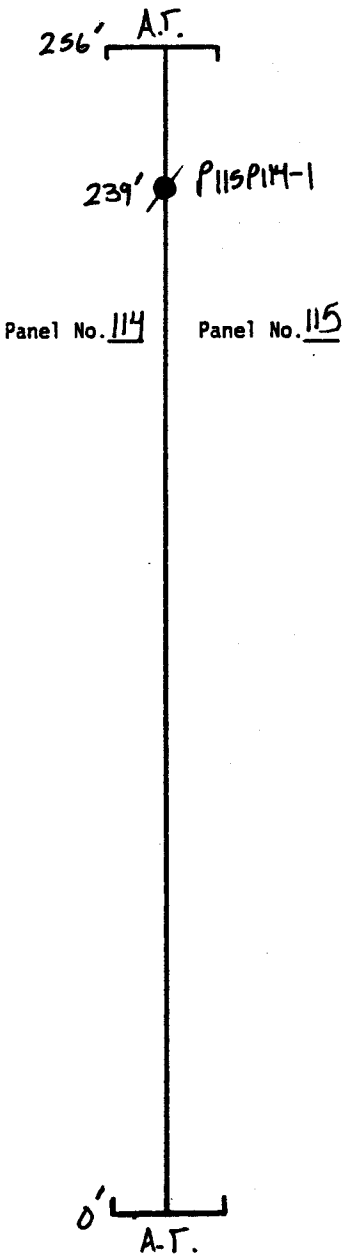
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P115/P114
SEAM LENGTH: 256'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 3:45 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P115P114-1	BURN THRU	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

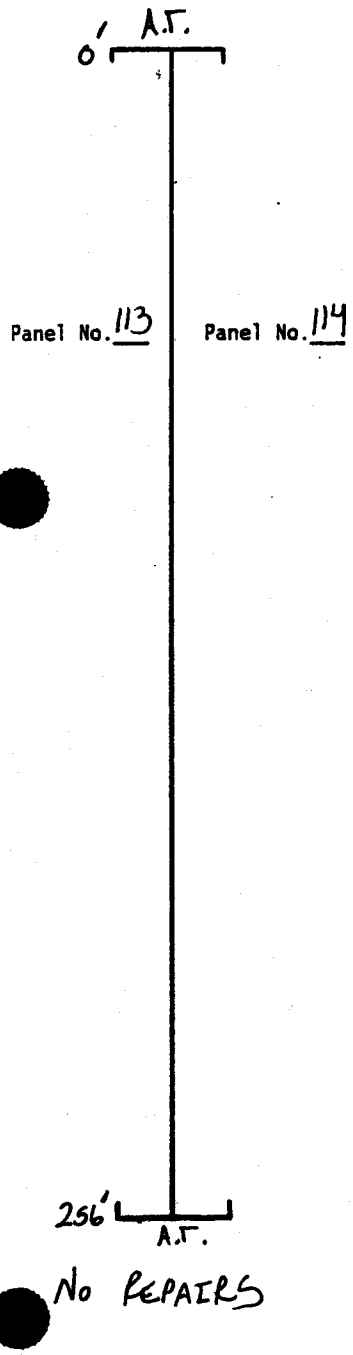
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P114/P113
SEAM LENGTH 256'
COMMENTS 750/45

WELDING UNIT NO. MM-2
TIME WELDED 4:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

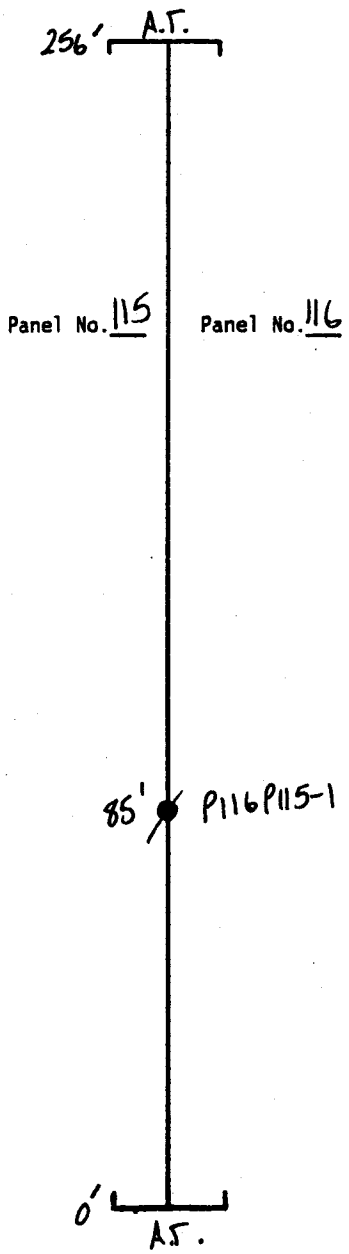
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P116/P115
SEAM LENGTH: 256'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 4:30 ~~a.m.~~ p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P116P115-1	FESH MOUTHS	5/11 V-BOX	RaB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

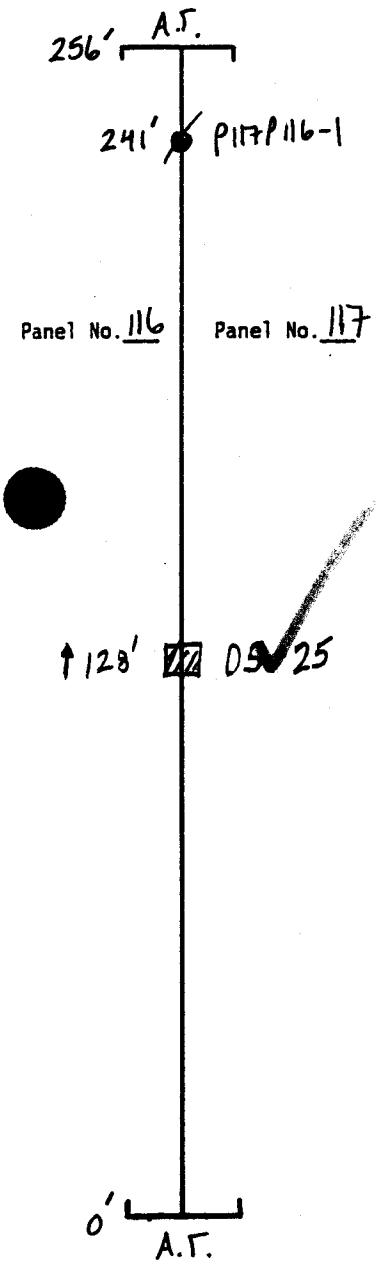
Sheet 1 of 1

PROJECT NAME Halifax Co Coal Ash Monofill
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P117 P116
SEAM LENGTH 256'
COMMENTS 750/45

WELDING UNIT NO. MM2
TIME WELDED 4:30 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P117P116-1	WRINKLES	5/11 V-Box	RCB
DS-25	DESTRUCT	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

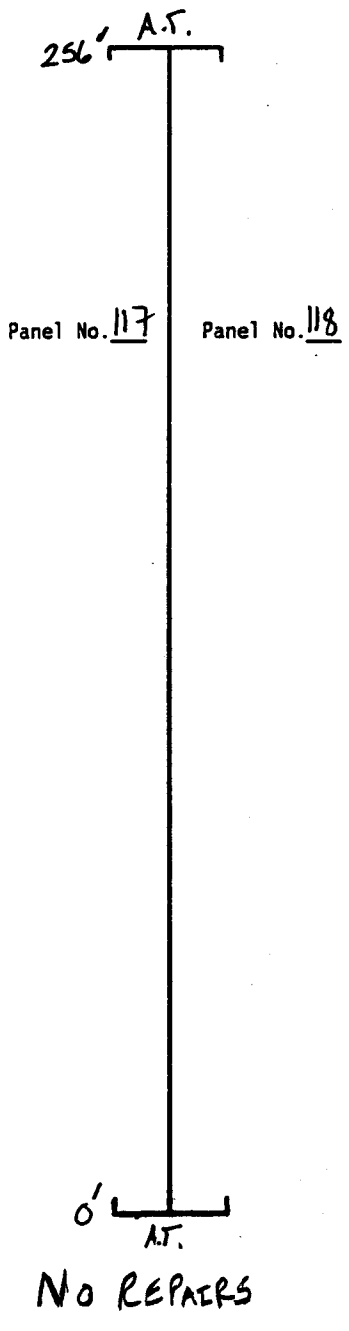
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P118/P117
SEAM LENGTH: 256'
COMMENTS: 750/45

WELDING UNIT NO.: MM2
TIME WELDED: 5:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

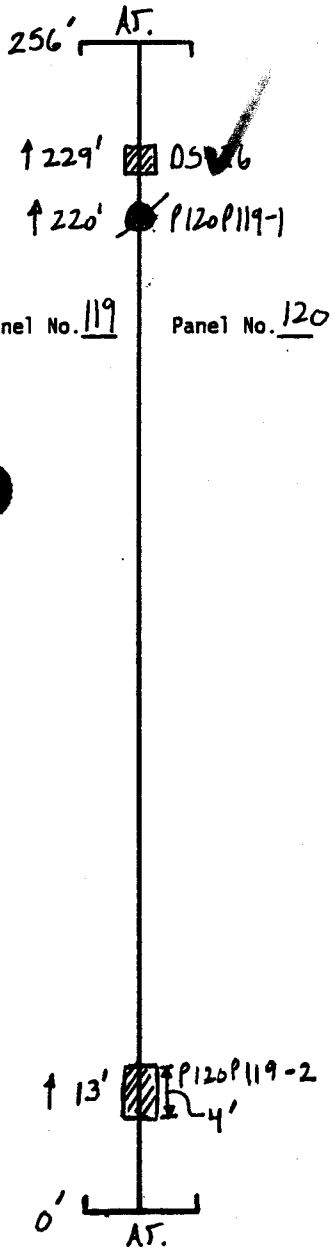
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P120/P119
SEAM LENGTH: 256'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 5:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊞	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P120P119-1	RUN OUT	5/12 V-BOX	RCB
P120P119-2	BURN THRU/ RESTART	5/11 V-BOX	RCB
DS-26	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

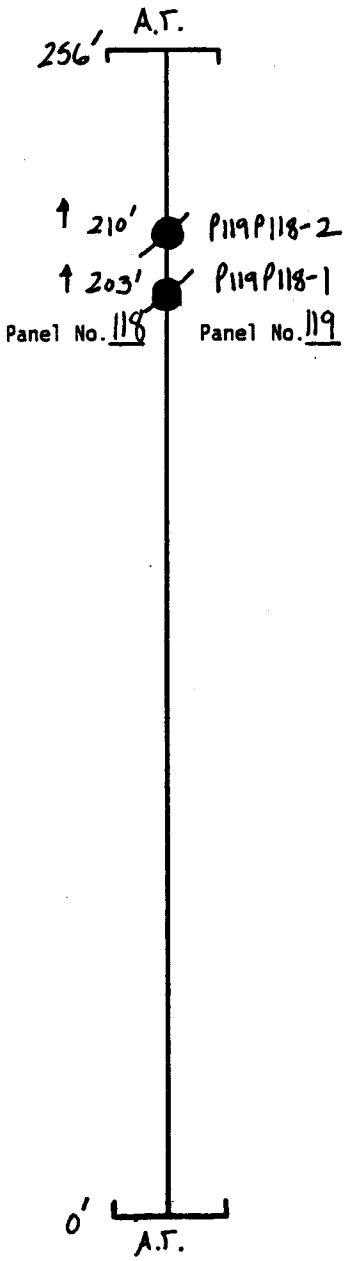
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/5/99

SEAM NO.: P119/P118
SEAM LENGTH: 256'
COMMENTS: 750/45

WELDING UNIT NO.: MM 2
TIME WELDED: 5:35 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P119P118-1	WRINKLES	5/12 V-BOX	RLB
P119P118-2	WRINKLES	5/12 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

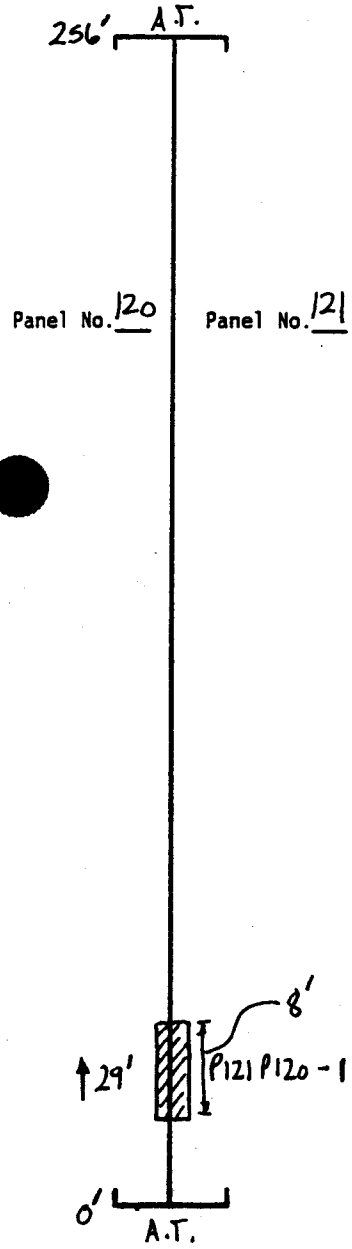
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/5/99

SEAM NO. P121/P120
SEAM LENGTH 256'
COMMENTS 790 / 80

WELDING UNIT NO. C-1
TIME WELDED 5:40 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P121P120-1	RESTART	5/6 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

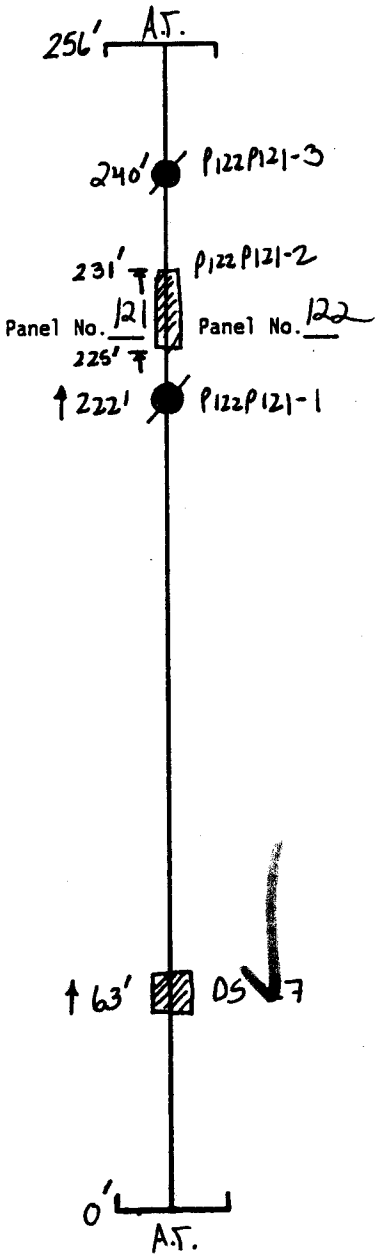
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: # 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/6/99

SEAM NO.: P122/P121
SEAM LENGTH: 256'
COMMENTS: 750/50

WELDING UNIT NO.: MM2
TIME WELDED: 8:20 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P122P121-1	OVERHEATED AREA	5/11 V-BOX	RCB
P122P121-2	RUN OUT	5/11 V-BOX	RCB
P122P121-3	RUN IN	5/11 V-BOX	RCB
DS-27	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

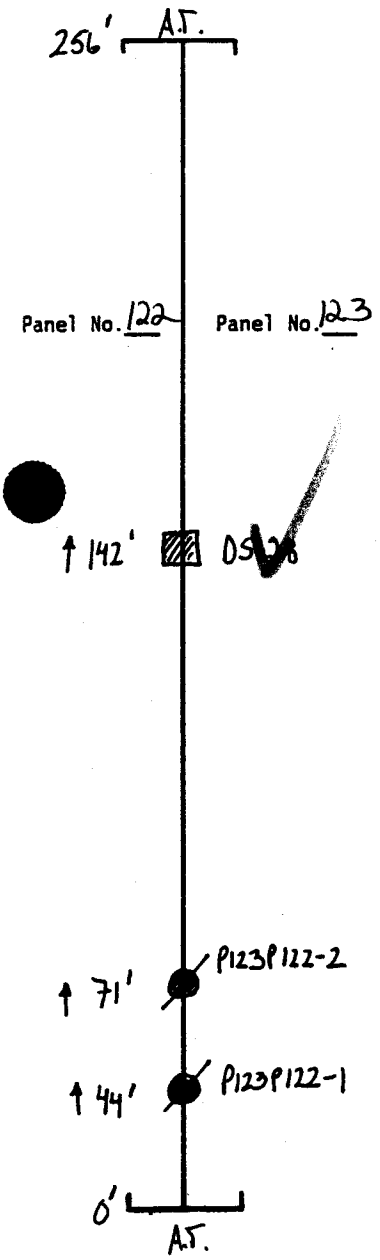
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: RH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/6/99

SEAM NO.: P123/P122
SEAM LENGTH: 256'
COMMENTS: 800/60

WELDING UNIT NO.: C-1
TIME WELDED: 8:20 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P123P122-1	BURN THRU	5/11 V-BOX	RCB
P123P122-2	RUN IN	5/11 V-BOX	RCB
DS-28	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

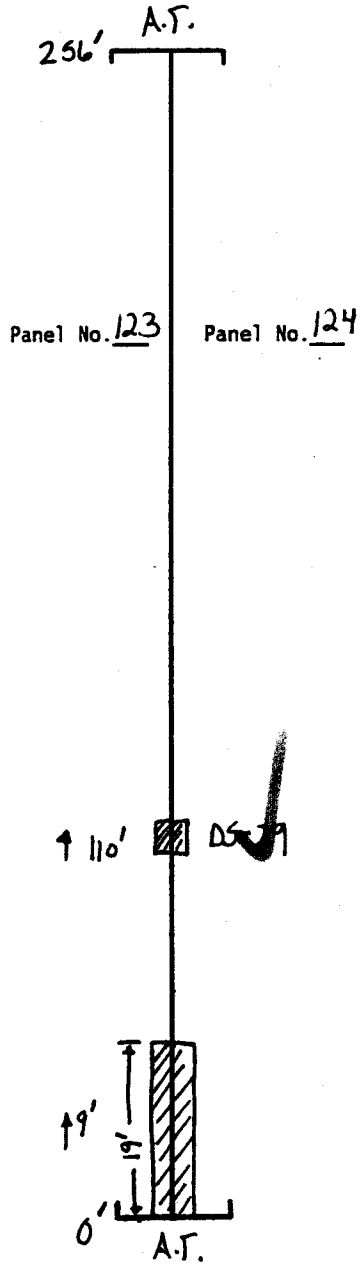
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P124/P123
SEAM LENGTH: 256'
COMMENTS:

WELDING UNIT NO.: C-1
TIME WELDED: 8:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P124P123-1	RESTART	5/11 V-BOX	RCB
DS-29	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

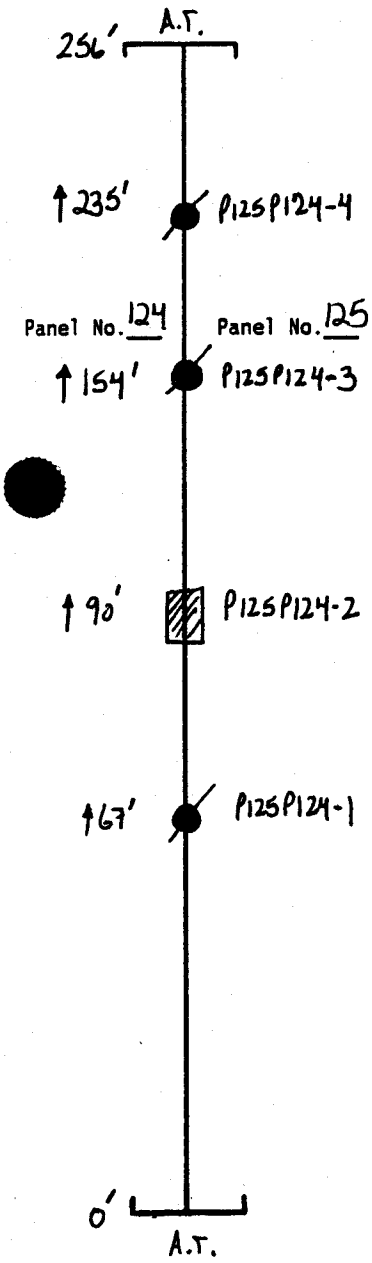
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P125/P124
SEAM LENGTH 256'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 8:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P125P124-1	RUN OUT	5/12 V-BOX	RCB
P125P124-2	RESTART	5/12 V-BOX	RCB
P125P124-3	BURN THRU	5/11 V-BOX	RCB
P125P124-4	RUN IN	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

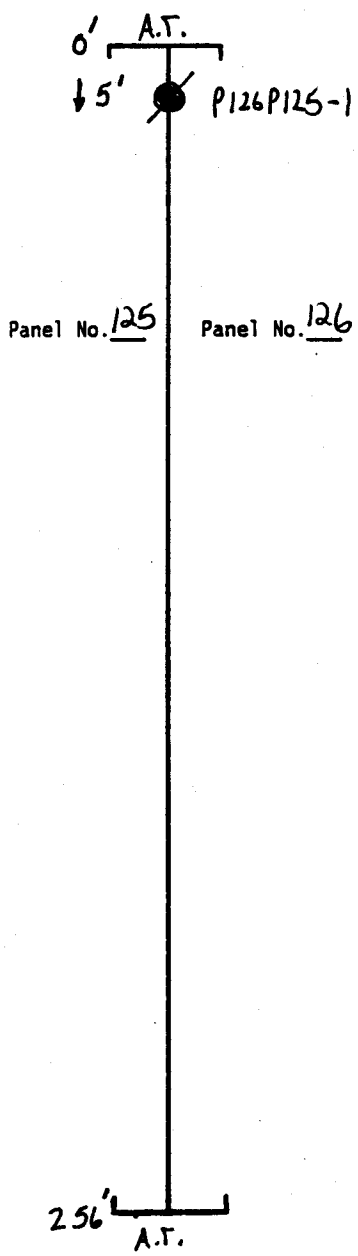
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 37816-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P126/P125
SEAM LENGTH 256'
COMMENTS 750/70

WELDING UNIT NO. C-1
TIME WELDED 9:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P126P125-1	WRINKLE/BURN THRU	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

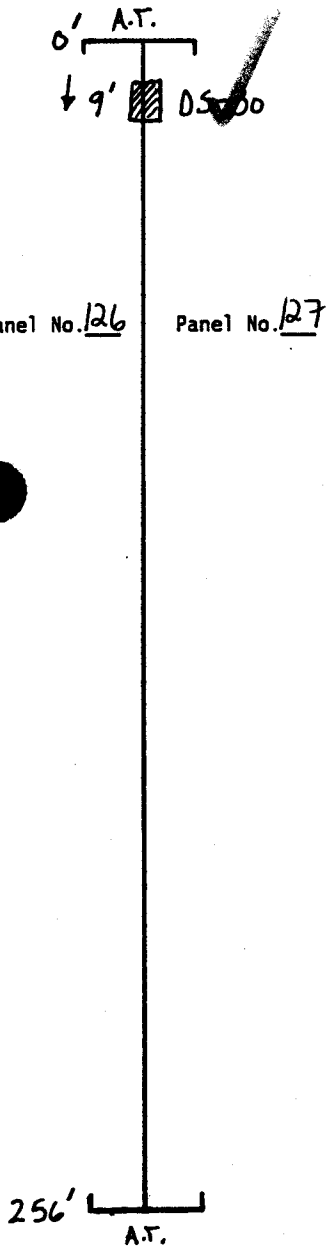
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P127/P126
SEAM LENGTH: 256'
COMMENTS: 775/50

WELDING UNIT NO.: MM-2
TIME WELDED: 9:35 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-30	DESTRUCT	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

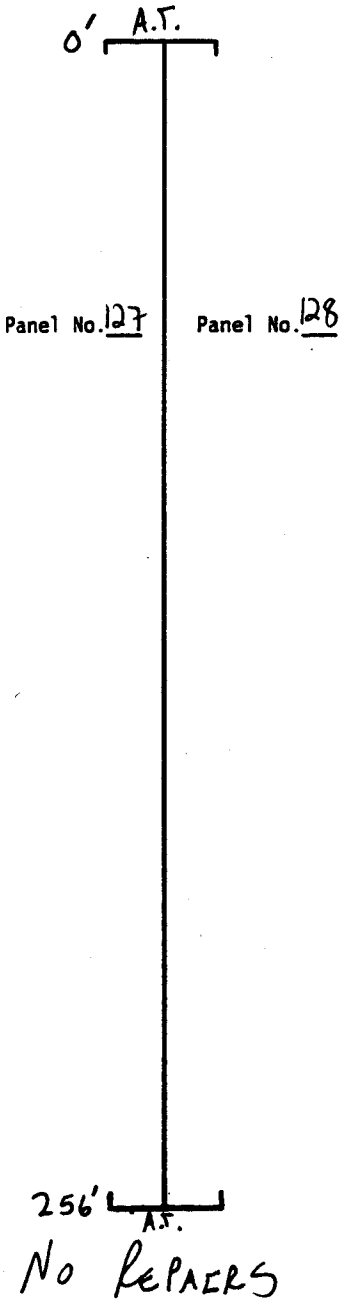
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P128/P127
SEAM LENGTH 256'
COMMENTS 775/50

WELDING UNIT NO. MM-2
TIME WELDED 9:50 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

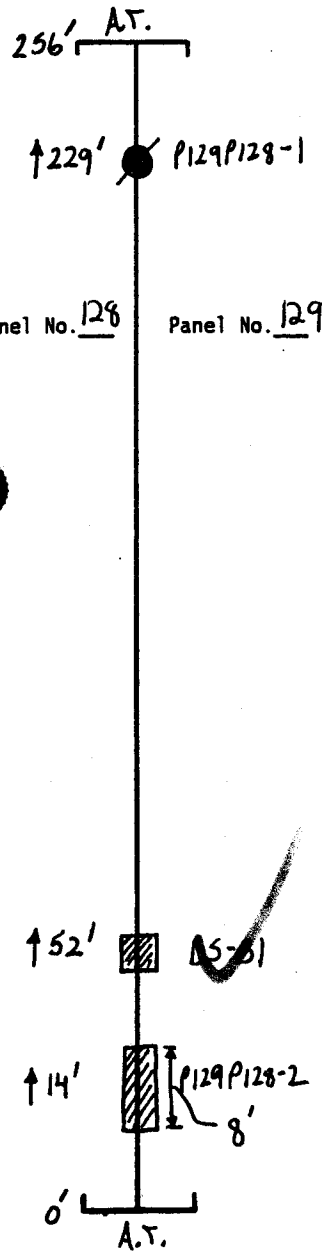
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P129/P128
SEAM LENGTH 256'
COMMENTS 750/70

WELDING UNIT NO. C-1
TIME WELDED 9:50 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-31	DESTRUCT	5/11 V-Box	RCB
P129P128-1	RUN OUT	5/12 V-Box	RCB
P129P128-2	RUN OUT	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

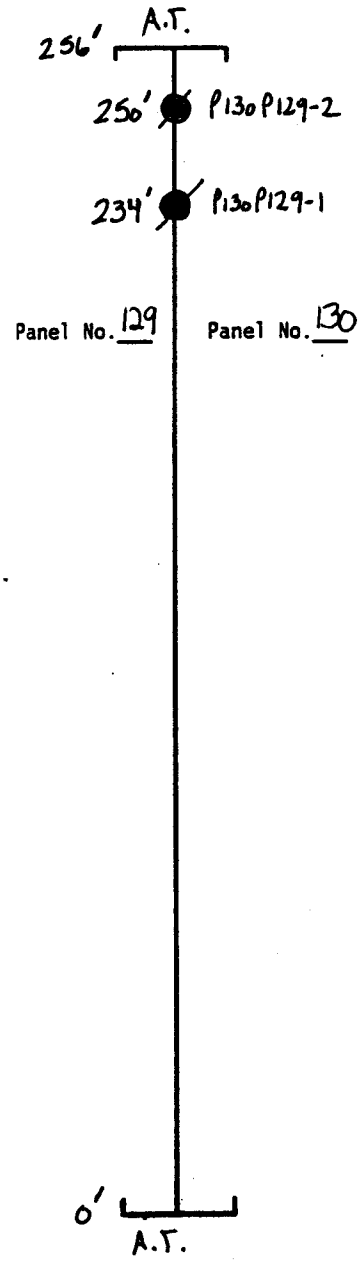
Sheet 1 of 1

PROJECT NAME Halifax Co. Coal Ash Mon-Fill
PROJECT NO. 3786-004
CONTRACTOR Barnhill
INSTALLER Mid-America
WELDING TECH SB
TYPE OF WELDER Wedge
DATE WELDED 5/7/99

SEAM NO. P130/P129
SEAM LENGTH 256'
COMMENTS 750/70

WELDING UNIT NO. C-1
TIME WELDED 10:30 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P130P129-1	Burn Thru	5/11 V-Box	RCB
P130P129-2	Run out	5/11 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

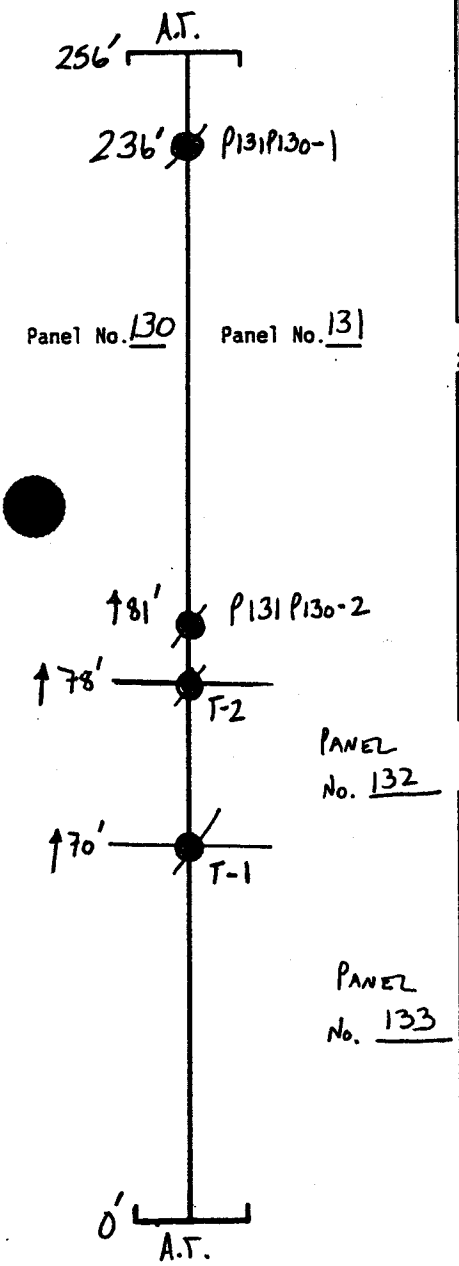
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P131/P130 P132/P130 P133/P130
SEAM LENGTH: 256' (TOTAL)
COMMENTS: 775/50

WELDING UNIT NO.: MM 2
TIME WELDED: 10:30, 10:55, 10:57 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P131P130-1	HOLE	5/11 V-BOX	RCB
P131P130-2	BURN THRU	5/11 V-BOX	RCB
T-1	"T" SEAM	5/11 V-BOX	RCB
T-2	"T" SEAM	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

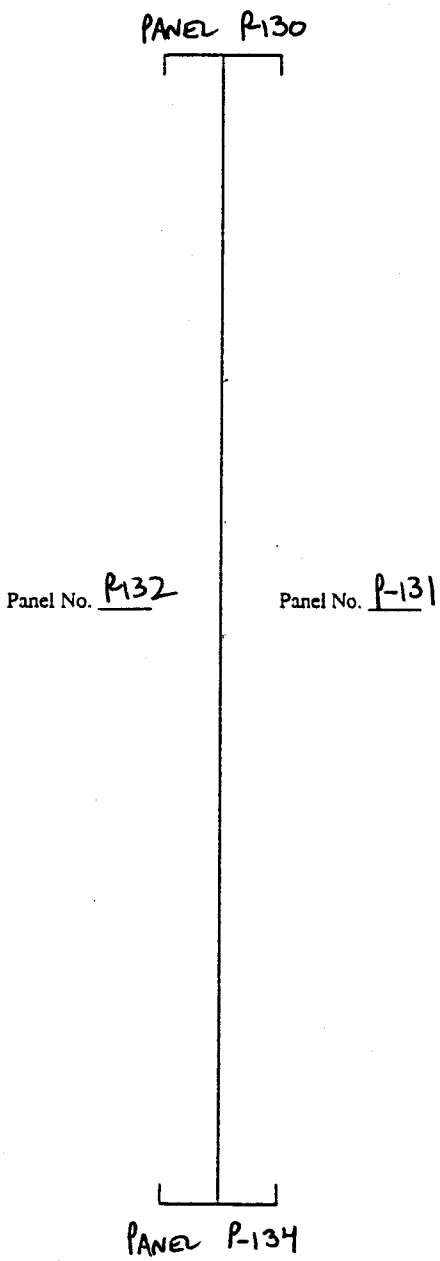
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/7/99

Seam No.: P131/ P132
Seam Length: 10'
Comments: BUTT SEAM

Welding Unit No.: MM2
Time Welded: 10:45 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

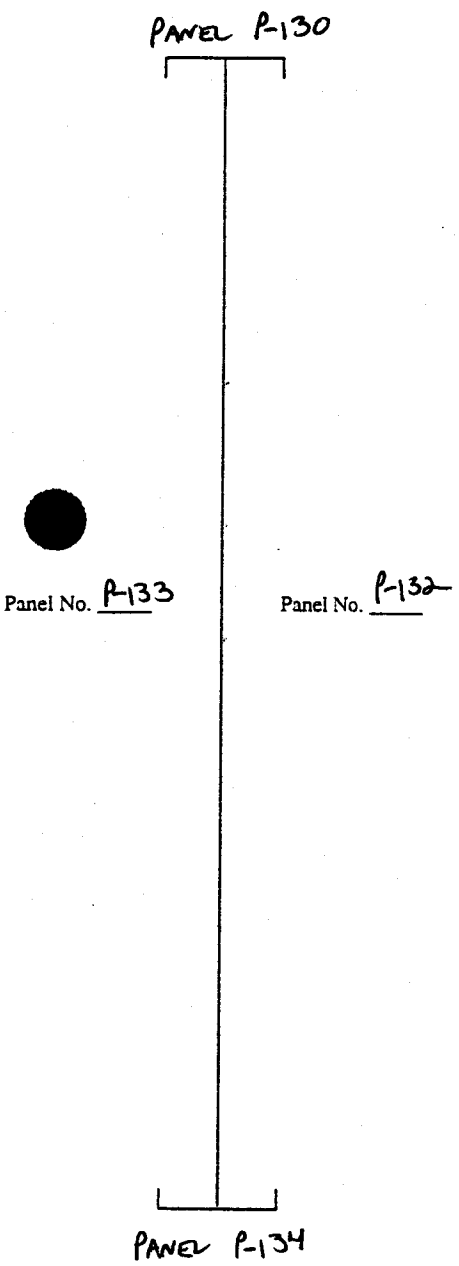
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/7/99

Seam No.: P132/P133
Seam Length: 10'
Comments: BUTT SEAM
Welding Unit No.: MM2
Time Welded: 10:50 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

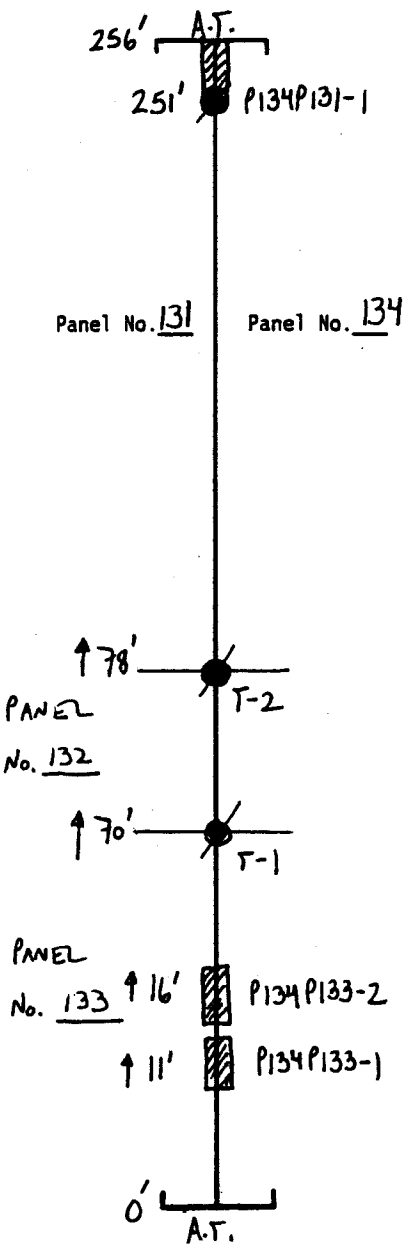
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P134/P131 P134/P133 P134/P132
SEAM LENGTH: 256' (TOTAL)
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 12:15, 12:32 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P134P133-1	RUN OUT	5/11 V-BOX	RCB
P134P133-2	BURN THRU	5/11 V-BOX	RCB
P134P131-1	WRINKLES/BURN THRU	5/11 V-BOX	RCB
T-1	"T" SEAM	5/11 V-BOX	RCB
T-2	"T" SEAM	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

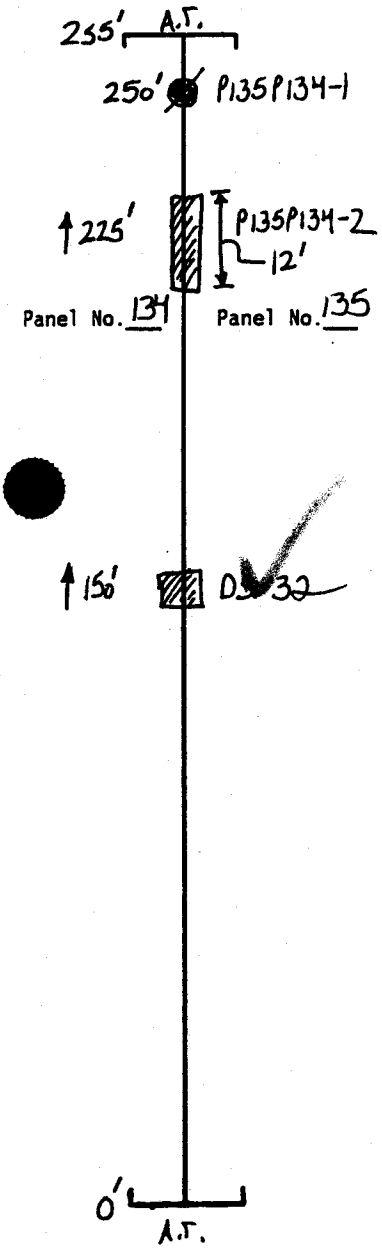
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P135P134
SEAM LENGTH: 255'
COMMENTS: 775/50

WELDING UNIT NO.: MM2
TIME WELDED: 12:30 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-32	DESTRUCT	5/12 V-BOX	RCB
P135P134-1	BURN THRU	5/11 V-BOX	RCB
P135P134-2	POOR BOND	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

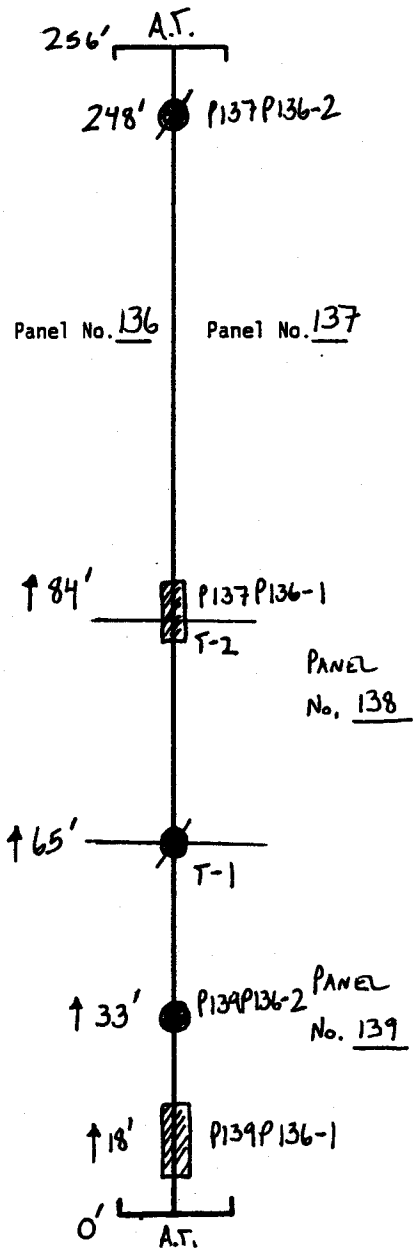
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P137P136 P138P136 P139P136
SEAM LENGTH 256' (TOTAL)
COMMENTS

WELDING UNIT NO. C-1
TIME WELDED 12:45, 1:17 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P139P136-1	RESTART	5/10 V-BOX	RCB
P139P136-2	RUN IN	5/11 V-BOX	RCB
P137P136-1	OVERHEATED AREA	5/11 V-BOX	RCB
P137P136-2	BURN THRU	5/11 V-BOX	RCB
T-1	"T" SEAM	5/11 V-BOX	RCB
T-2	"T" SEAM	5/11 V-BOX	RCB

CAP STRIP USED FOR BOTH

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

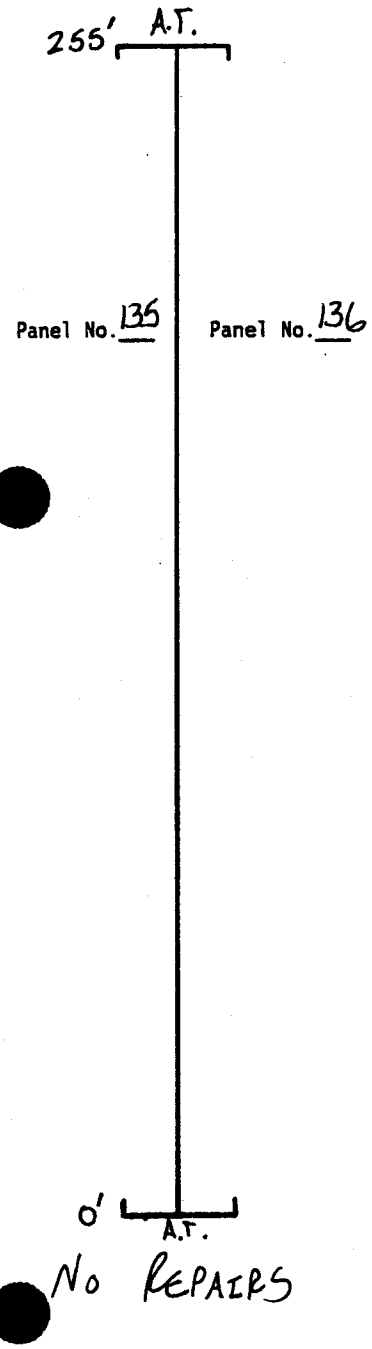
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P136 P135
SEAM LENGTH: 255'
COMMENTS: 775/50

WELDING UNIT NO.: MM2
TIME WELDED: 1:00 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

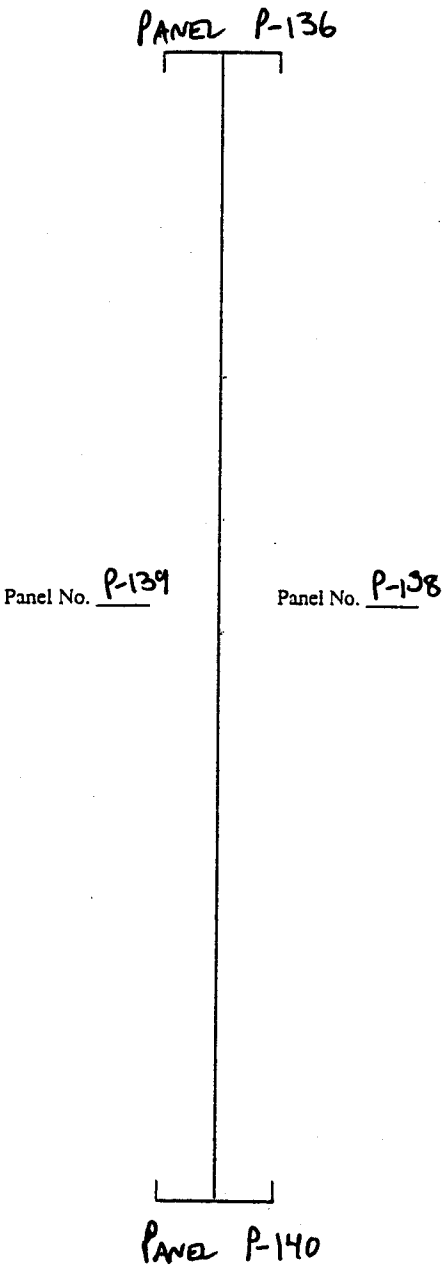
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 5/7/99

Seam No.: P138/ P139
Seam Length: 10'
Comments: BUTT SEAM

Welding Unit No.: C-1
Time Welded: 1:05 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

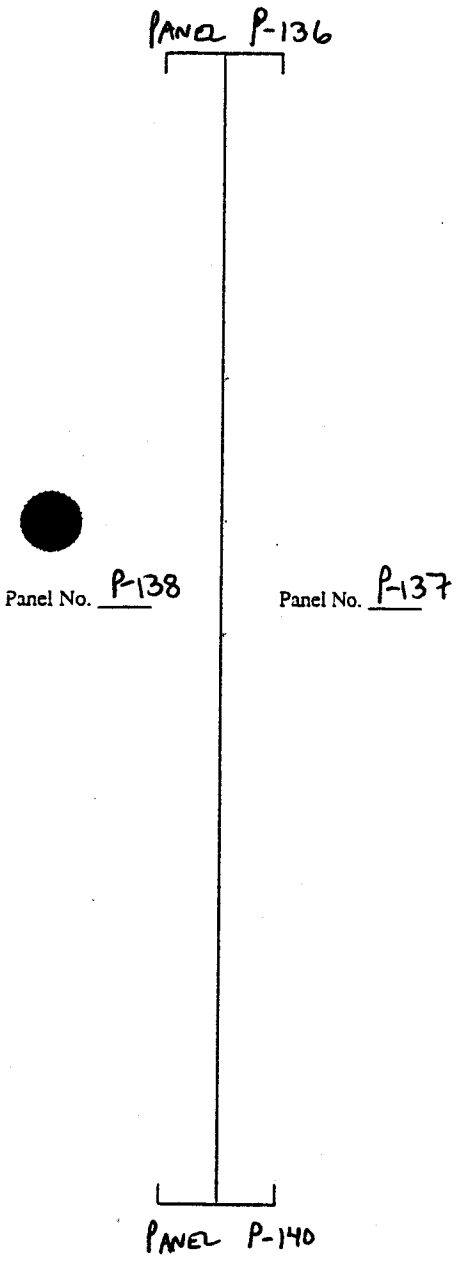
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: SB
Type of Welder: WEDGE
Date Welded: 5/7/99

Seam No.: P137/ P138
Seam Length: 10'
Comments: BUTT SEAM

Welding Unit No.: C-1
Time Welded: 1:10 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

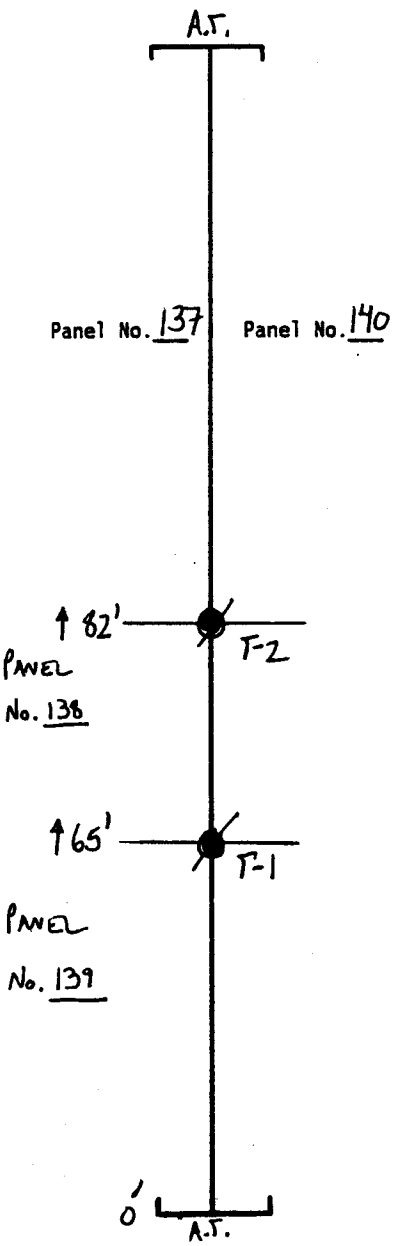
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P140P137 P140P138 P140P139
SEAM LENGTH: 256' (TOTAL)
COMMENTS: 775/50

WELDING UNIT NO.: MM-2
TIME WELDED: 1:30 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



NO REPAIRS ON SEAM

QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
T-1	"T" SEAM	5/12 V-BOX	RCB
T-2	"T" SEAM	5/11 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

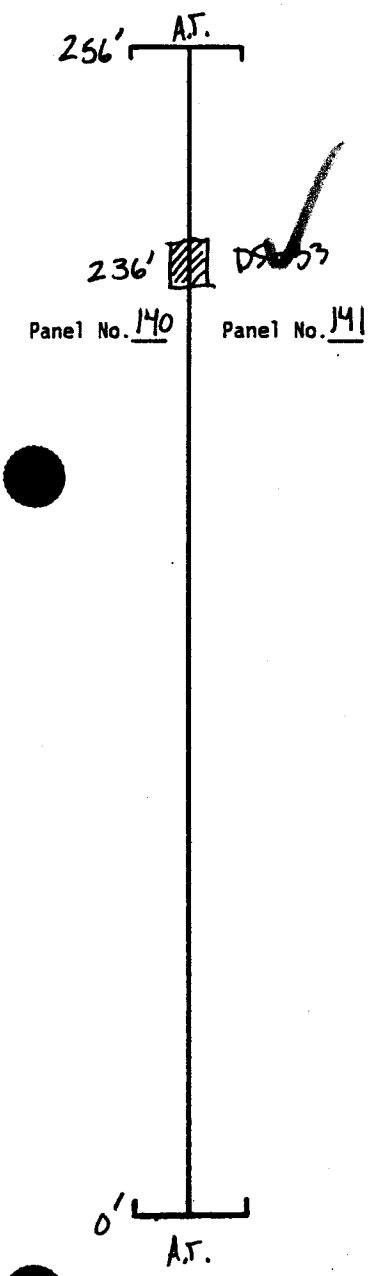
Sheet 1 of 1

PROJECT NAME HALIFAX Co COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P141 P140
SEAM LENGTH 256'
COMMENTS 750/80

WELDING UNIT NO. C-1
TIME WELDED 1:44 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-33	DESTRUCT	5/12 V-Box	RcB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

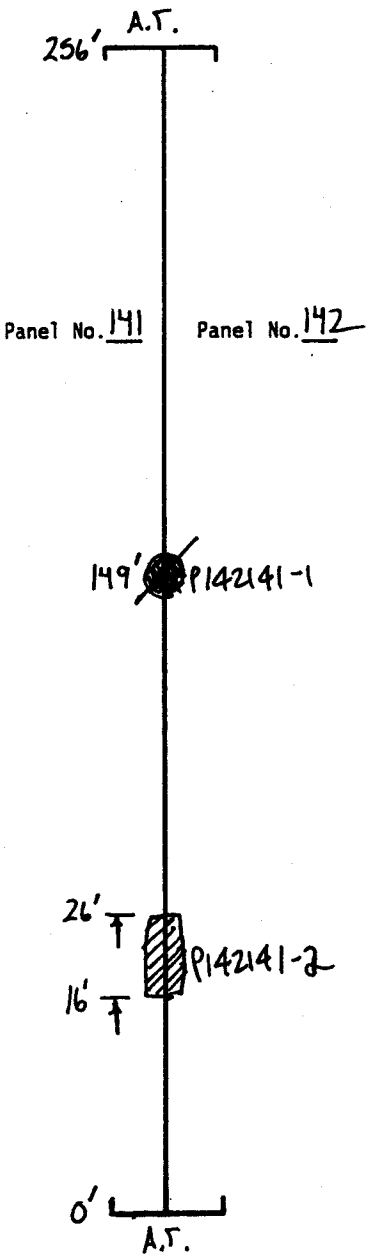
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P142P141
SEAM LENGTH 256'
COMMENTS 750/80

WELDING UNIT NO. C-1
TIME WELDED 2:05 a.m./(p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P142P141-1	INSUFF SEAM WID	5/12/99 V.BOX	JC
P142P141-2	RUNOUT	5/12/99 V.BOX	JC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

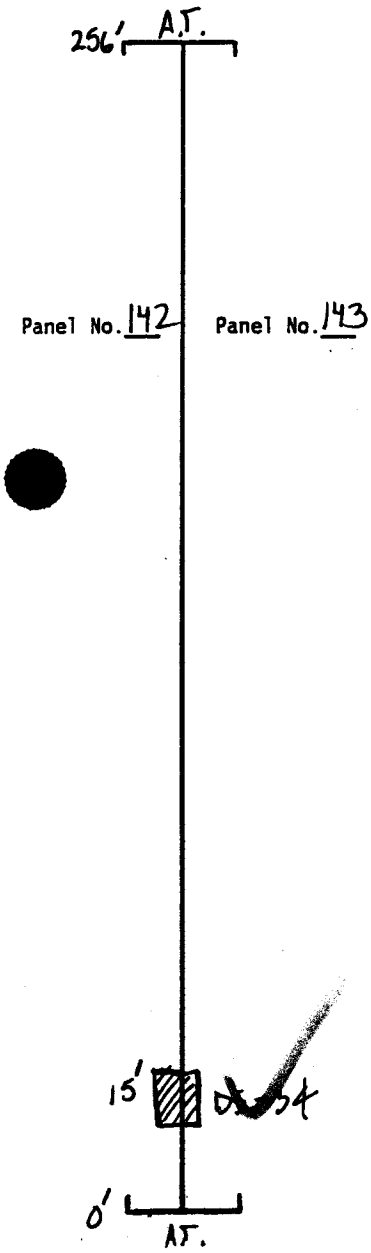
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P143P142
SEAM LENGTH 256'
COMMENTS 775/50

WELDING UNIT NO. MM 2
TIME WELDED 2:25 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-34	DESTRUCT	5/12/99 V. BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

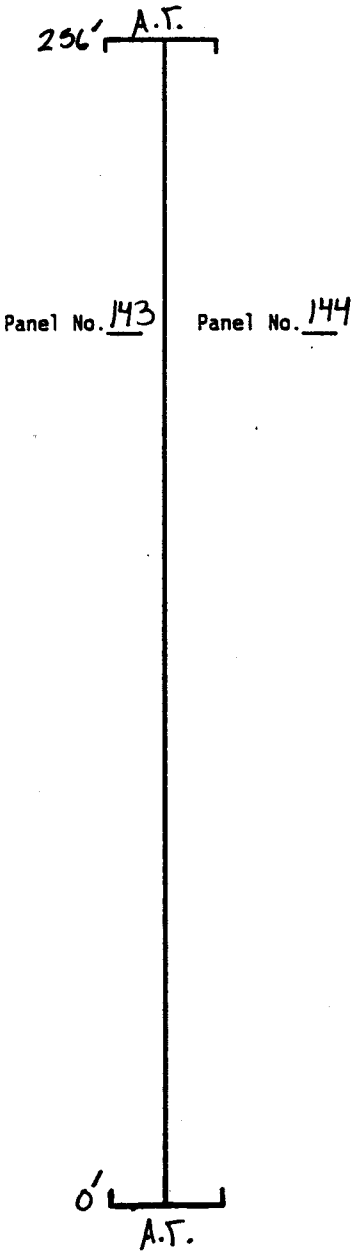
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P144 P143
SEAM LENGTH 256'
COMMENTS 750/80

WELDING UNIT NO. C-1
TIME WELDED 2:40 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

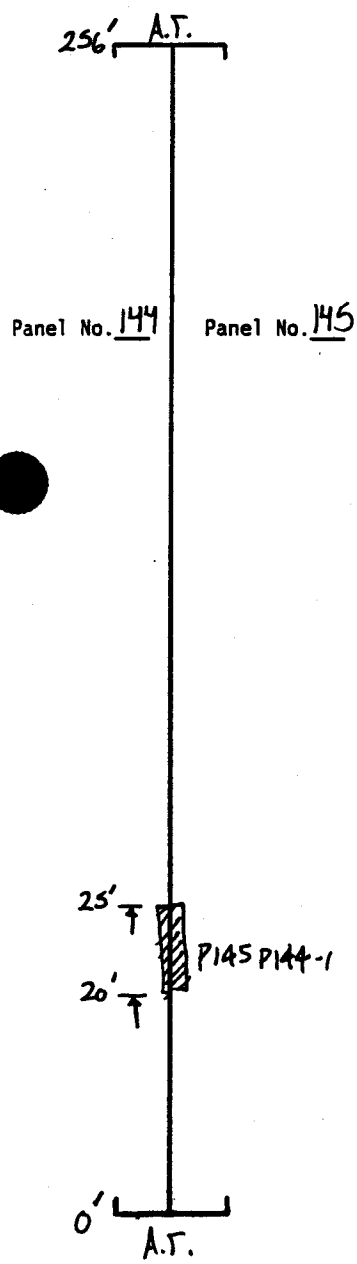
Sheet 1 of 1

PROJECT NAME HALIFAX CO COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P145P144
SEAM LENGTH 256'
COMMENTS 750/80

WELDING UNIT NO. C-1
TIME WELDED 3:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P145P144-1	INSUFF SEAM WIDTH	5/12/99 V. BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

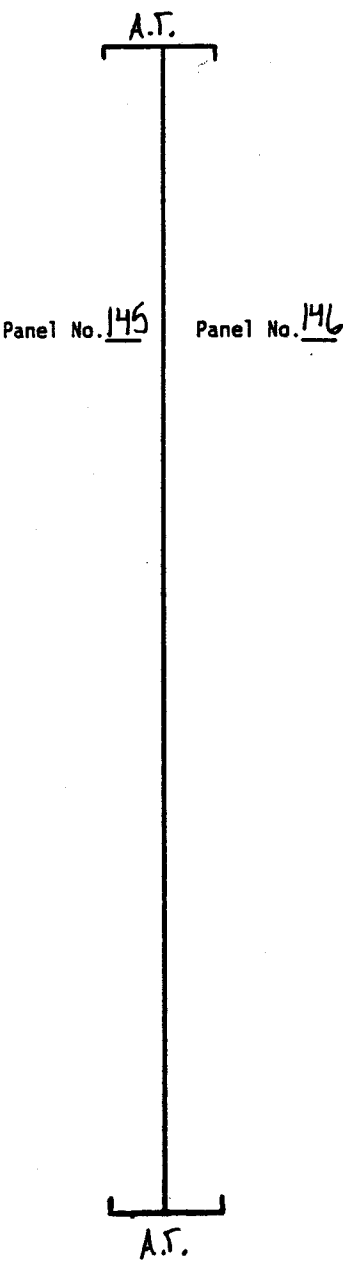
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P146 P145
SEAM LENGTH 255'
COMMENTS 775 / 50

WELDING UNIT NO. MM2
TIME WELDED 3:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

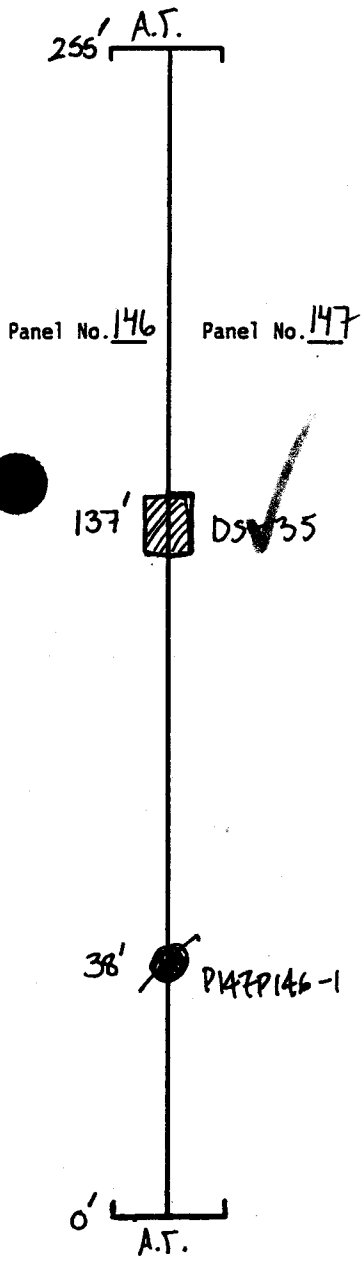
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P147 P146
SEAM LENGTH: 255'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 3:35 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P147P146-1	BURN THRU	5/12/99 V BOX	JTC
DS-35	DESTRUCT	5/12/99 V BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

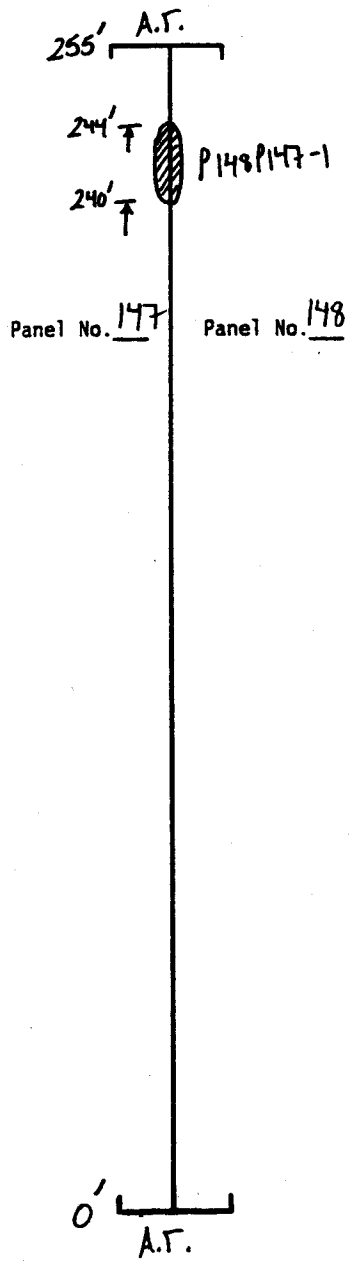
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P148 P147
SEAM LENGTH 255'
COMMENTS 775/50

WELDING UNIT NO. MM-2
TIME WELDED 3:55 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P148P147-1	Runout	5/12 V-Box	RcB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

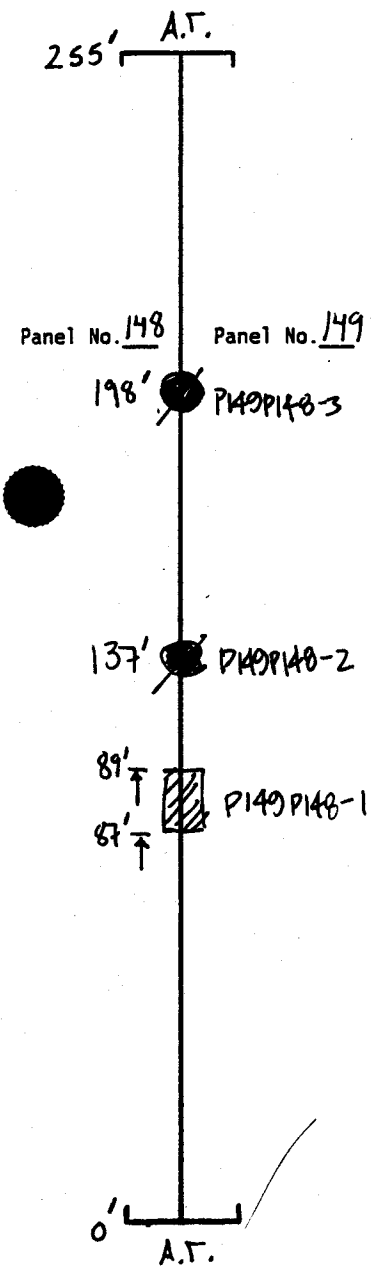
Sheet 1 of 1

PROJECT NAME: HALIFAX Co COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P149 P148
SEAM LENGTH: 255'
COMMENTS: 750/80

WELDING UNIT NO.: C-1
TIME WELDED: 4:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P149P148-1	RUNOUT	5/12/99 V. BOX	JK
P149P148-2	MAT'L. SCORED	5/12/99 V.BOX	JK
P149P148-3	MAT'L. SCORED	5/12/99 V.BOX	JK

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

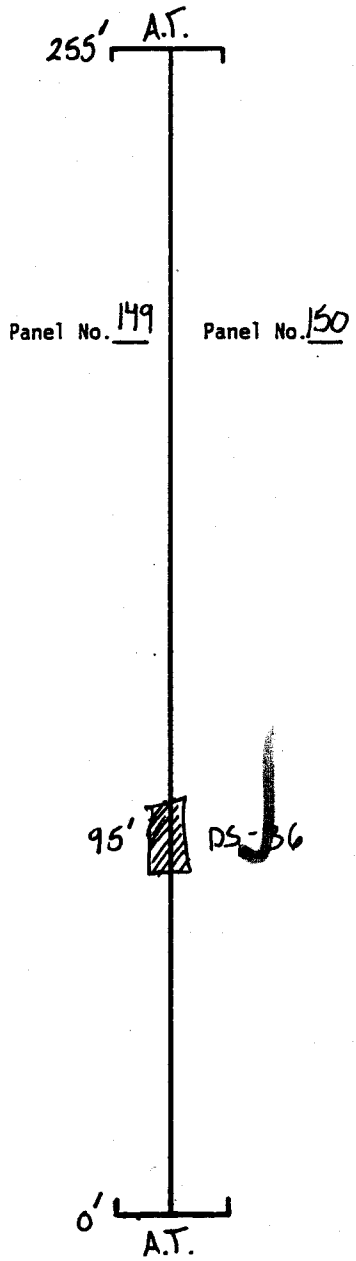
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P150/ P149
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: MAZ
TIME WELDED: 4:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-36	Destruct	5/12/99 V. Box	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

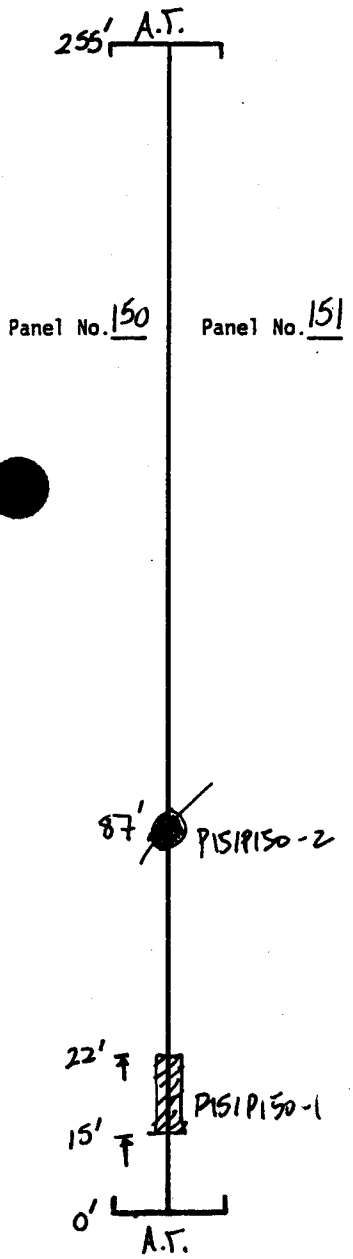
Sheet 1 of 1

PROJECT NAME: HALIFAX Co. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P151/ P150
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C-1
TIME WELDED: 4:30 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P151/P150-1	RESTART	5/12/99 V BOX	JC
P151/P150-2	WRINKLES - BURN	5/12/99 V BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

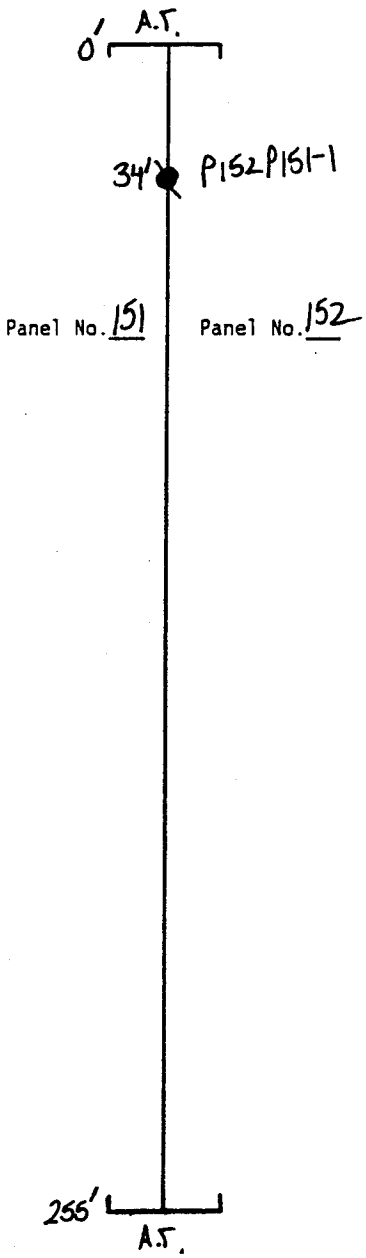
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P152/P151
SEAM LENGTH 255'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 4:45 a.m. p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P152P151-1	BURN THRU	5/12 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

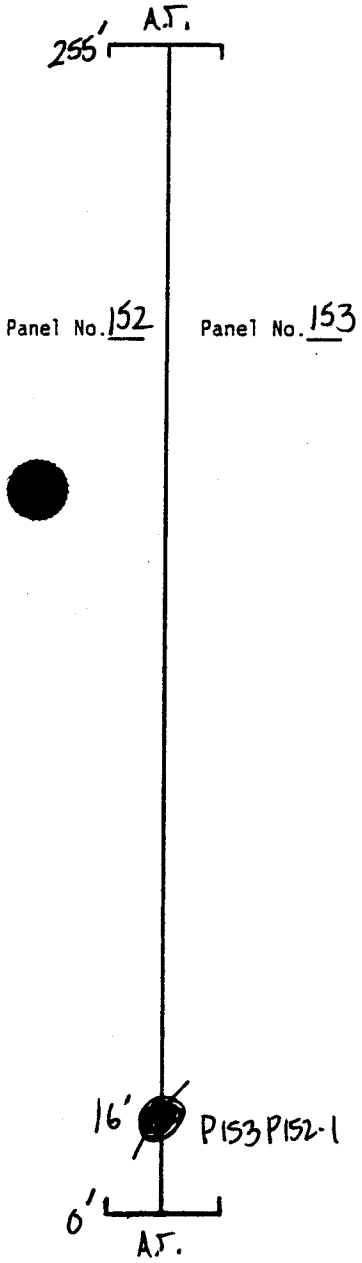
Sheet 1 of 1

PROJECT NAME Halifax Co. Coal Ash Monofill
PROJECT NO. 3786-004
CONTRACTOR Barnhill
INSTALLER Mid-America
WELDING TECH SB
TYPE OF WELDER Wedge
DATE WELDED 5/7/99

SEAM NO. P153/P152
SEAM LENGTH 255'
COMMENTS

WELDING UNIT NO. C-1
TIME WELDED 5:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P153P152-1	BURN THRU	5/12/99 V.Box	JK

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

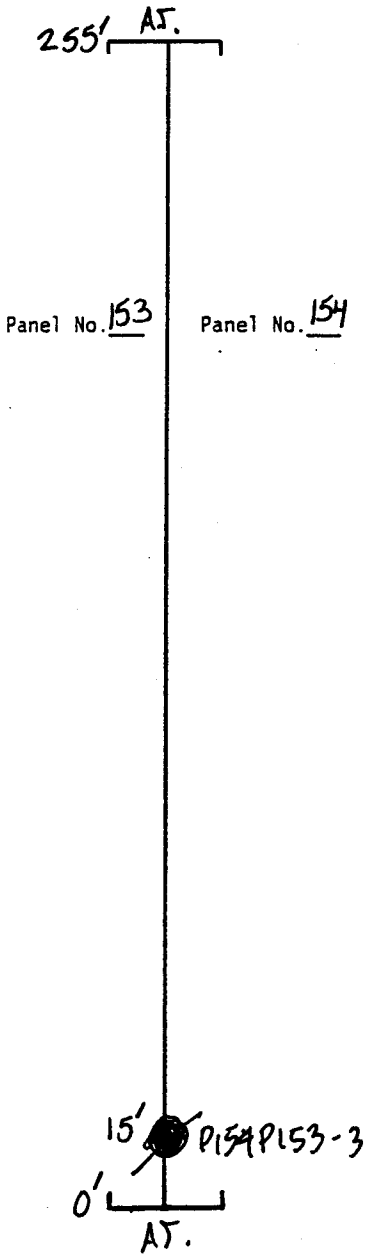
Sheet 1 of 1

PROJECT NAME: HALIFAX CO COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: MH
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P154/P153
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: MM2
TIME WELDED: 5:15 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P154P153-3	FISH MOUTH	5/12/99 V.BOX	JC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

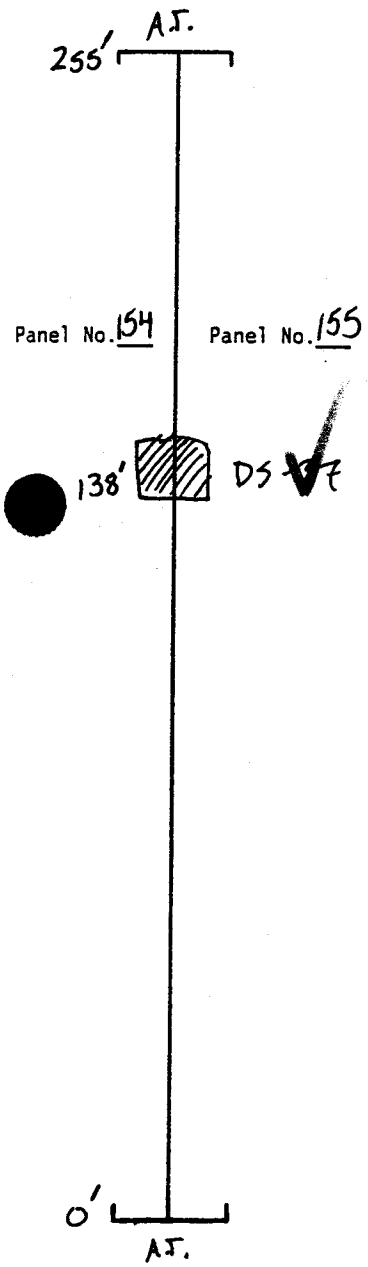
Sheet 1 of 1

PROJECT NAME: HALIFAX Co COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: ~~MID~~ BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P155/P154
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C-1
TIME WELDED: 5:30 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-37	DESTRUCT	5/12/99 V.BOX	JK

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

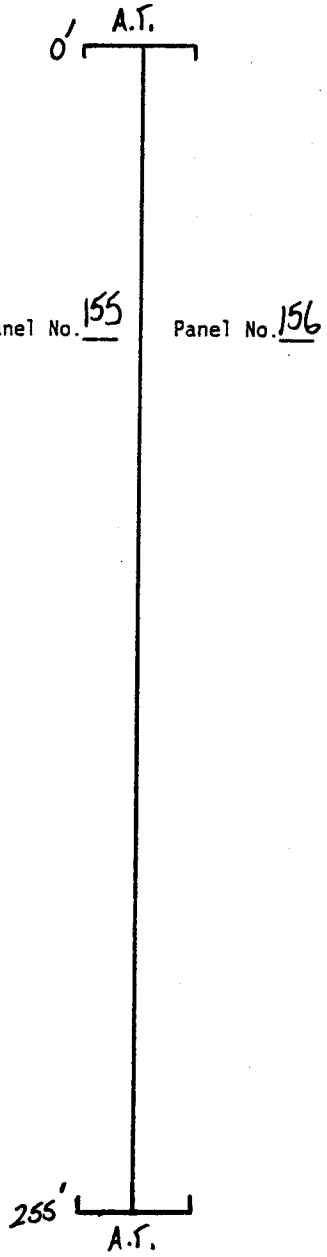
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/7/99

SEAM NO. P156/ P155
SEAM LENGTH 255'
COMMENTS

WELDING UNIT NO. MM2
TIME WELDED 6:00 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

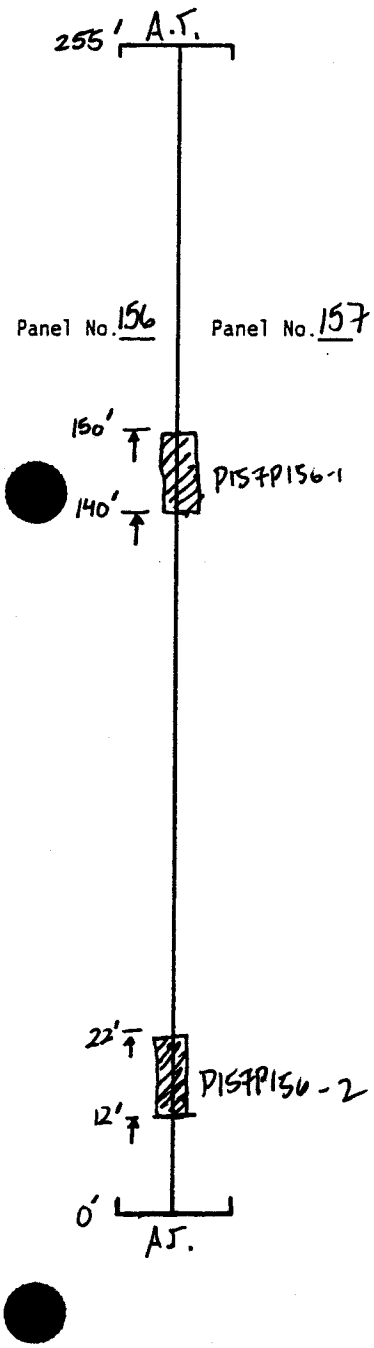
Sheet 1 of 1

PROJECT NAME: HALIFAX Co COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/7/99

SEAM NO.: P157/P156
SEAM LENGTH: 255'
COMMENTS:

WELDING UNIT NO.: C-1
TIME WELDED: 6:00 a.m. (p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P157P156-1	Poor Bond	5/12/99 V.BOX	JTC
P157P156-2	Poor Bond	5/12/99 V.BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

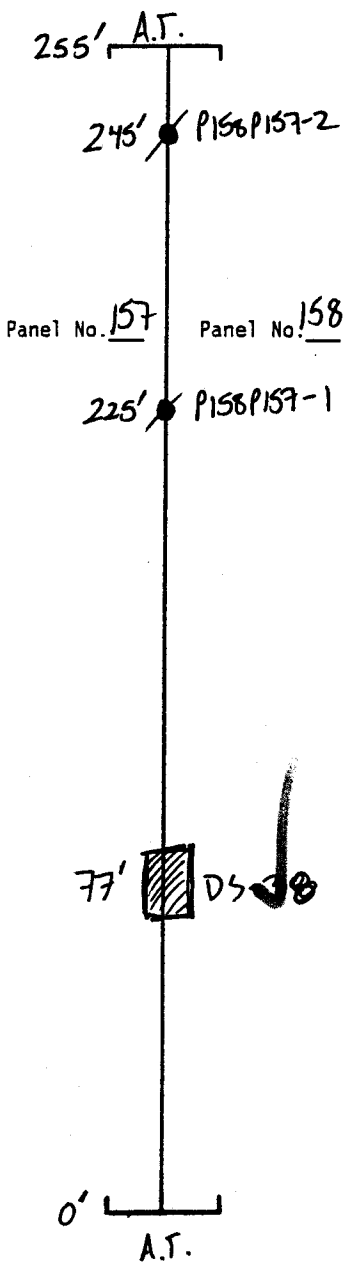
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P158/P157
SEAM LENGTH 255'
COMMENTS 750/60

WELDING UNIT NO. MM1
TIME WELDED 9:58 (a.m.) p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS 38	DESTRUCT	5/12/99 V-BOX	JK
P158P157-1	FISH MOUTH	5/12 V-BOX	RCB
P158P157-2	WRINKLES	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

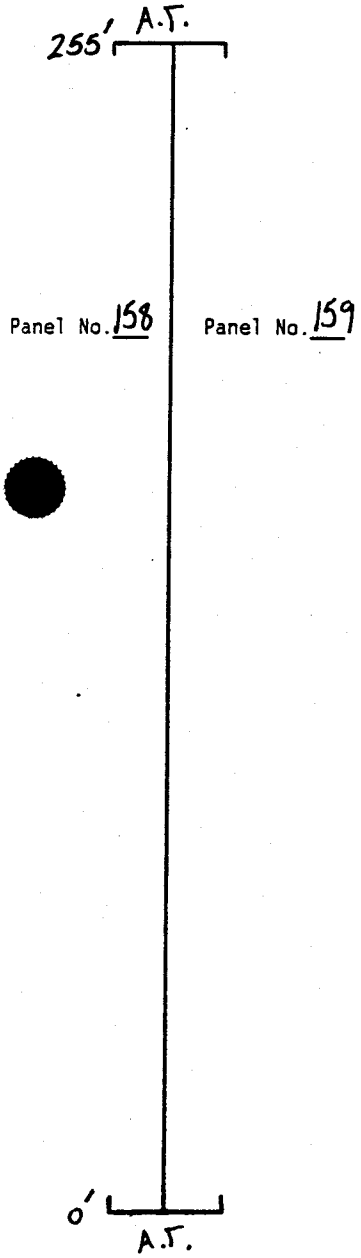
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P159/P158
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM2
TIME WELDED 10:02 (a.m./p.m.)

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
NO REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

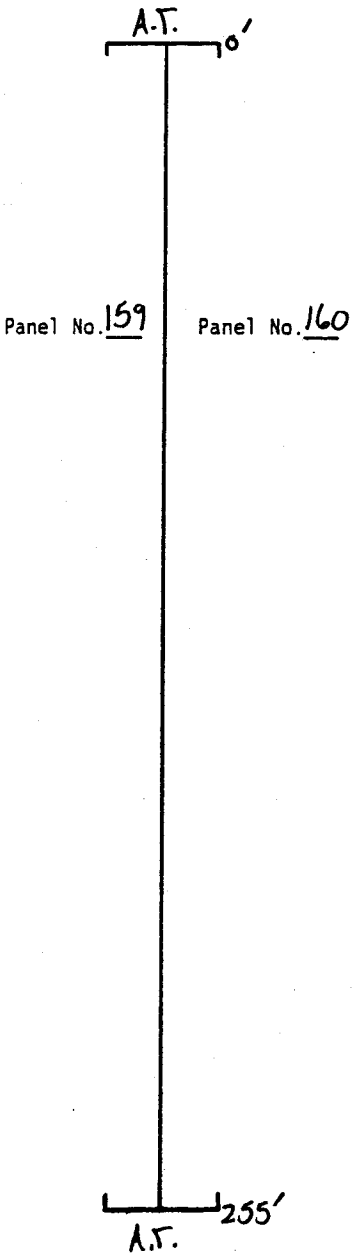
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5-8-99

SEAM NO. P160/P159
SEAM LENGTH 255'
COMMENTS 750/75

WELDING UNIT NO. MM1
TIME WELDED 12:55 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

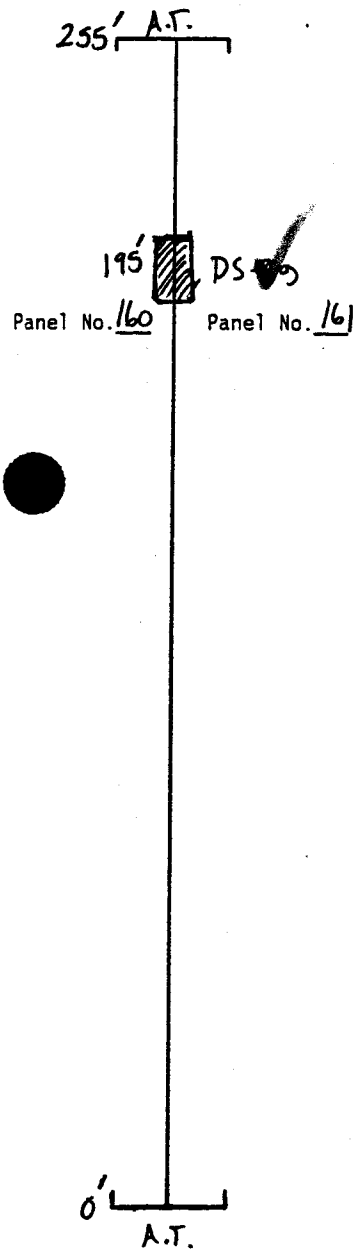
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P161/P160
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM-2
TIME WELDED 1:03 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-39	DESTRUCT	5/12/99 V.BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

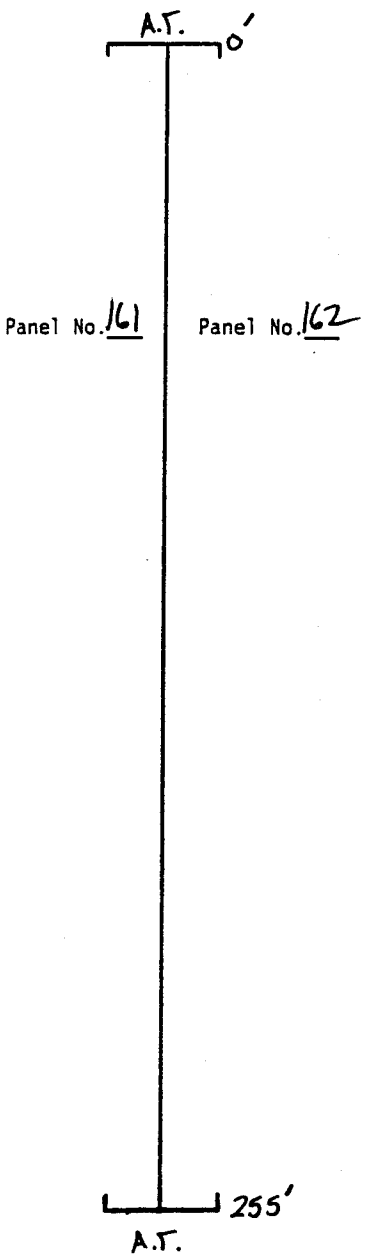
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P162/P161
SEAM LENGTH 255'
COMMENTS 750/70

WELDING UNIT NO. MM-1
TIME WELDED 1:35 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

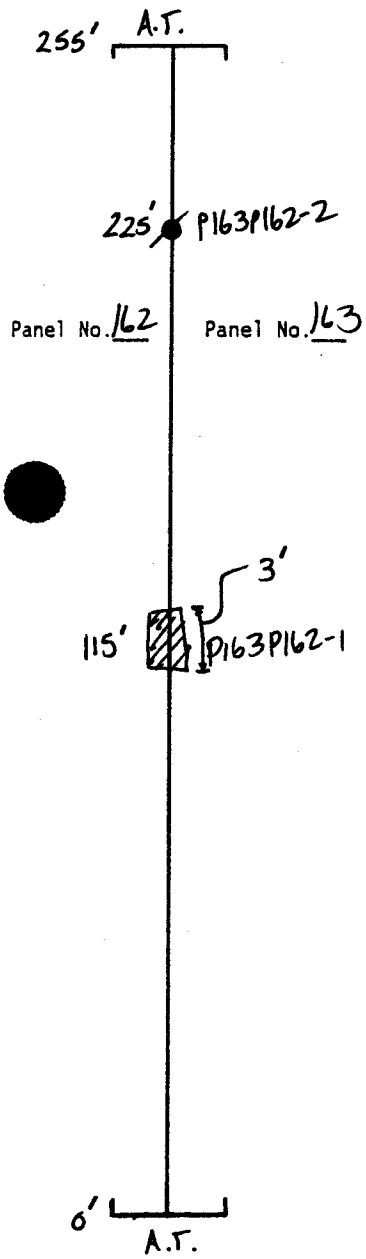
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P163/P162
SEAM LENGTH 255'
COMMENTS 750/70

WELDING UNIT NO. MM-2
TIME WELDED 1:45 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
▯	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P163P162-2	BURN THRU	5/12/99 V-BOX	JK
P163P162-1	RUNOUT	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

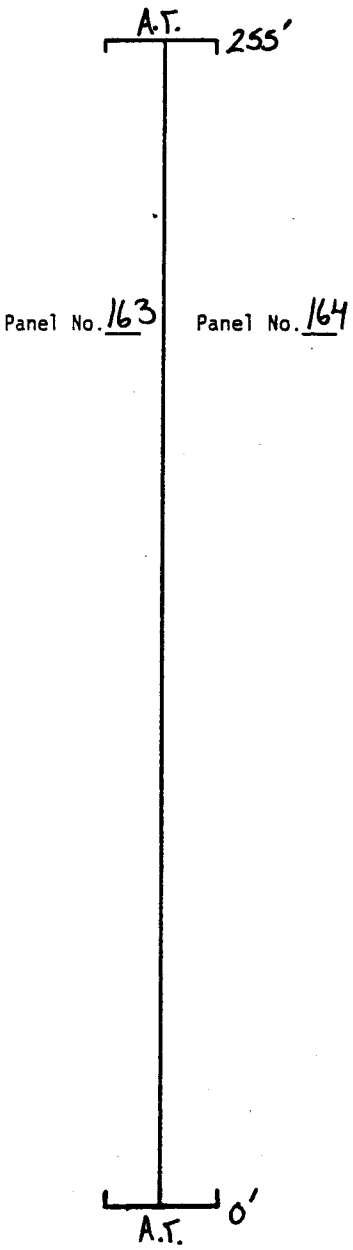
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P164/P163
SEAM LENGTH 255'
COMMENTS 750/70

WELDING UNIT NO. MM-1
TIME WELDED 2:15 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

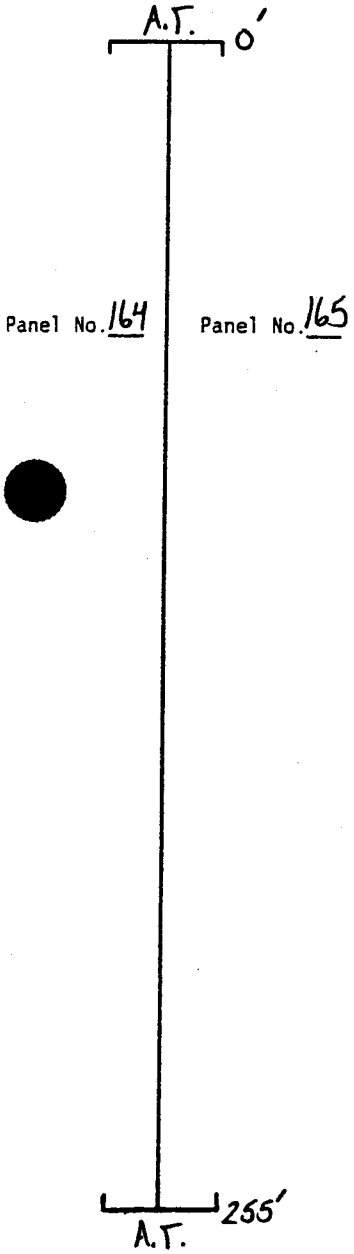
Sheet 1 of 1

PROJECT NAME Halifax Co Coal Ash Monofill
PROJECT NO. 3786-004
CONTRACTOR Barnhill
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P165/P164
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM2
TIME WELDED 2:40 a.m. / p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

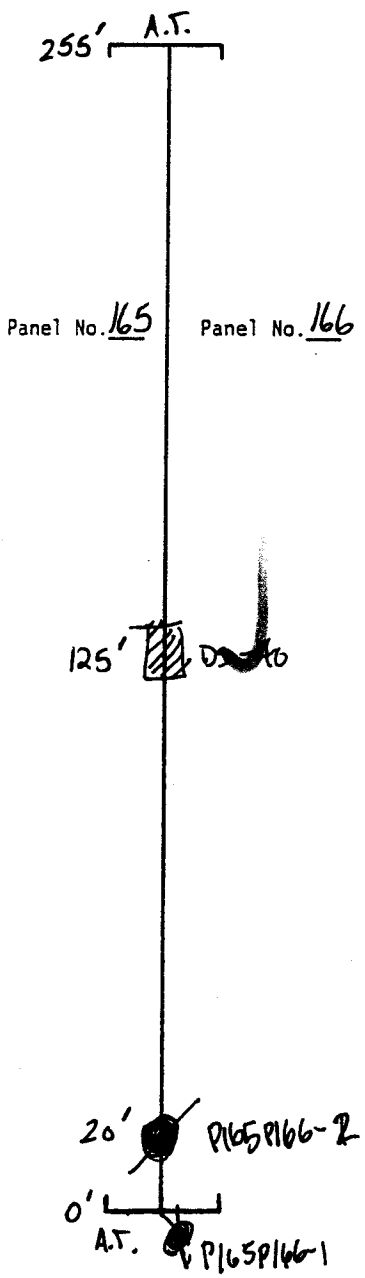
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARN HILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/8/99

SEAM NO.: P166/P165
SEAM LENGTH: 255'
COMMENTS: 750/80

WELDING UNIT NO.: MM1
TIME WELDED: 2:50 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS40	DESTRUCT	5/12/99 V BOX	JTC
P165P166-2	PATCH	5/12/99 V.BOX	JTC
P165P166-1	HOLE	5/12/99 V.BOX	

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

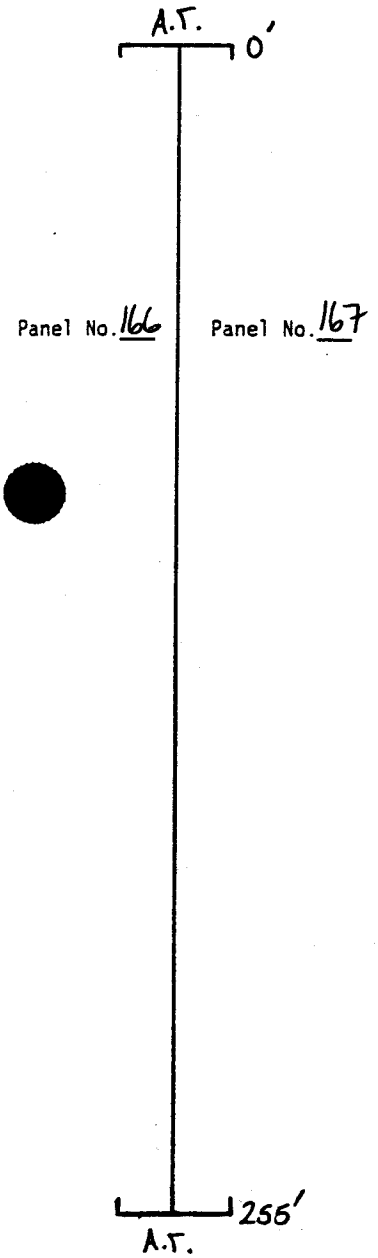
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P167/P166
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM-2
TIME WELDED 3:05 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

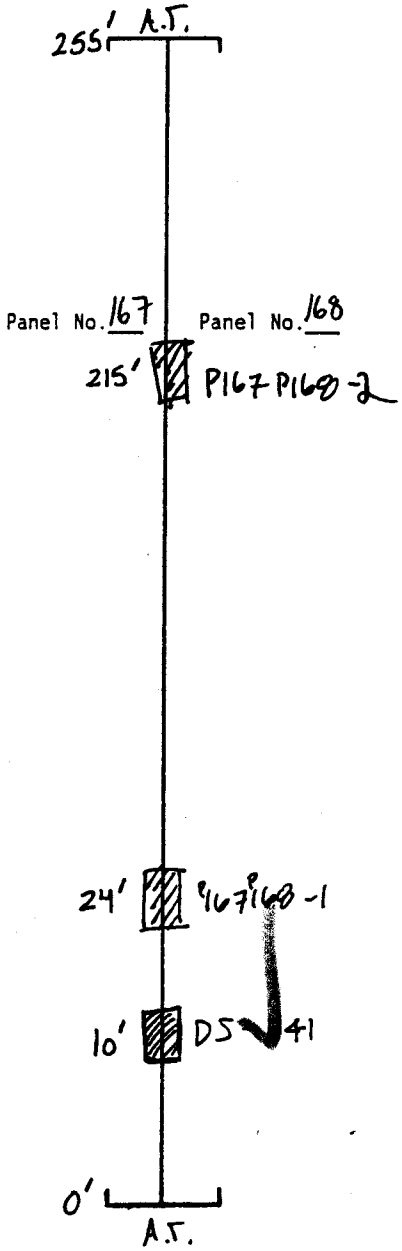
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5-8-99

SEAM NO.: P168/P167
SEAM LENGTH: 255'
COMMENTS: 750/80

WELDING UNIT NO.: MM1
TIME WELDED: 320 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊟	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS41	DESTRUCT	5/12/99 V. BOX	JTC
P167P168-1	FISH MOUTH	5/12/99 V BOX	JTC
P167P168-2	FISH MOUTH	5/12/99 V. BOX	JTC

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

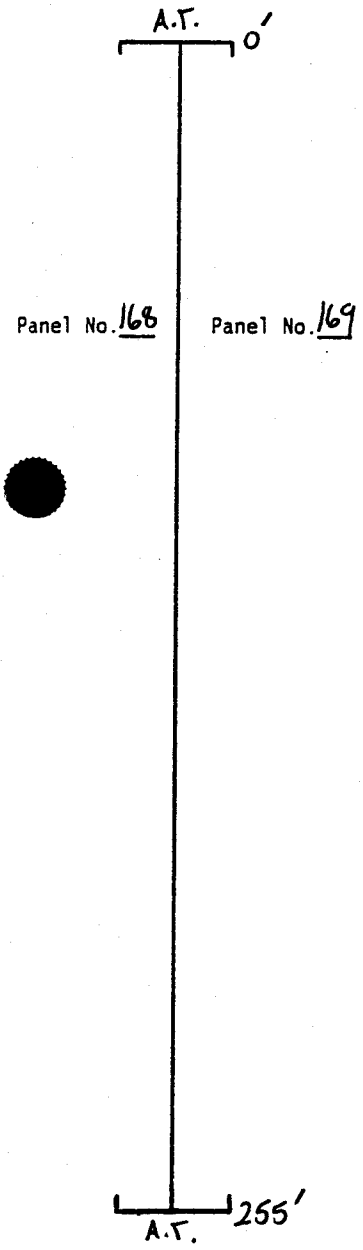
Sheet 1 of 1

PROJECT NAME HALIFAX Co COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P169/P168
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM2
TIME WELDED 4:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

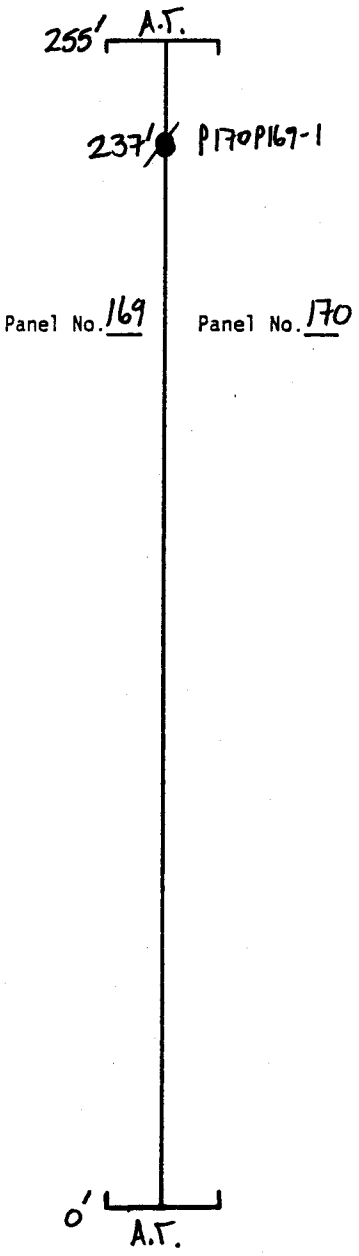
Sheet 1 of 1

PROJECT NAME: HALIFAX CO. COAL ASH MONOFILL
PROJECT NO.: 3786-004
CONTRACTOR: BARNHILL
INSTALLER: MID-AMERICA
WELDING TECH: SB
TYPE OF WELDER: WEDGE
DATE WELDED: 5/8/99

SEAM NO.: P170/P169
SEAM LENGTH: 255'
COMMENTS: 750/80

WELDING UNIT NO.: MM1
TIME WELDED: 4:16 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P170P169-1	Runout	5/12 V-Box	RGB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

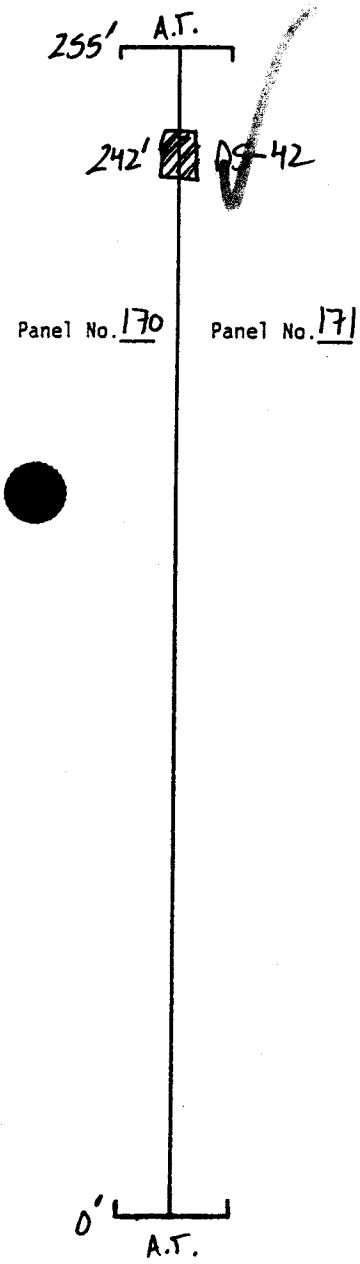
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARN HILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P171/P170
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM-2
TIME WELDED 4:40 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-42	Destruct	5/12 V-Box	RLB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

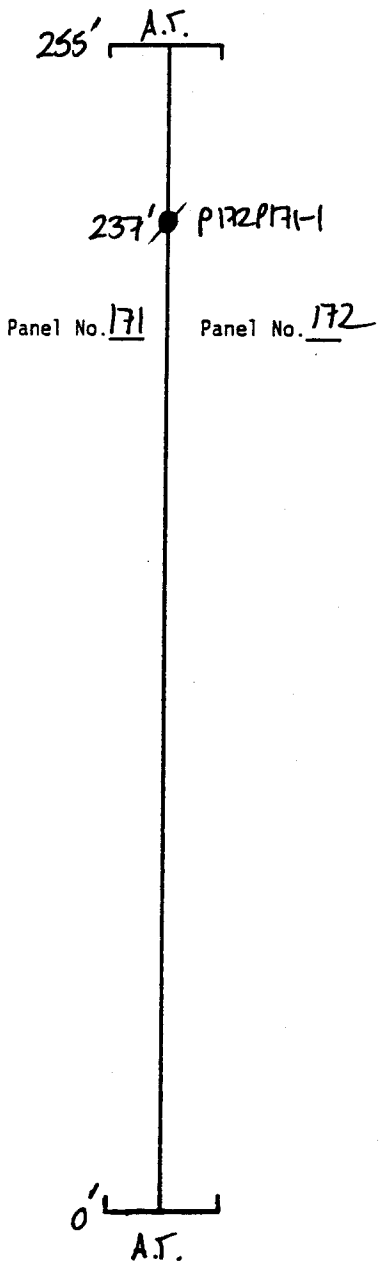
Sheet 1 of 1

PROJECT NAME HALIFAX CO. COAL ASH MONOFILL
PROJECT NO. 3786-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH SB
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P172/P171
SEAM LENGTH 255'
COMMENTS 750/80

WELDING UNIT NO. MM-1
TIME WELDED 4:45 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊞	Destructive Sample
▨	CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P172P171-1	HOLE	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

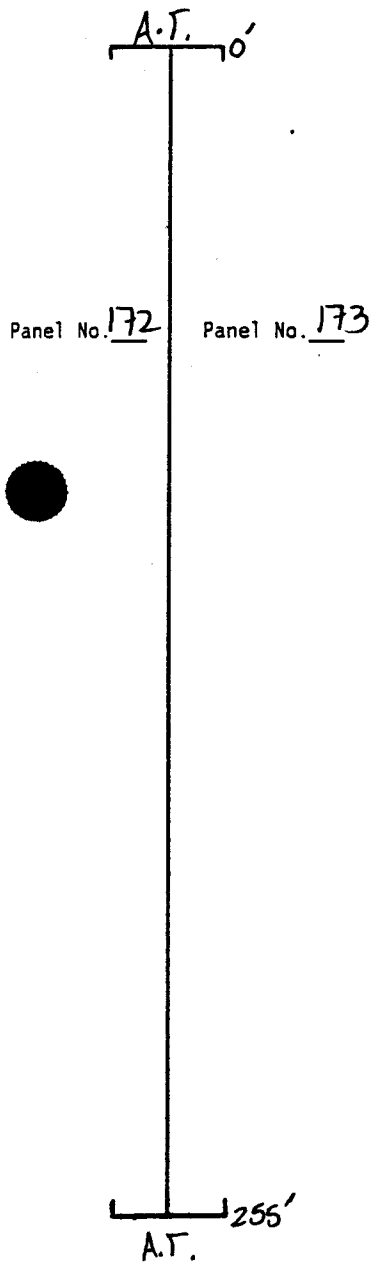
Sheet 1 of 1

PROJECT NAME HALIFAX Co. COAL ASH MONOFILL
PROJECT NO. 3766-004
CONTRACTOR BARNHILL
INSTALLER MID-AMERICA
WELDING TECH MH
TYPE OF WELDER WEDGE
DATE WELDED 5/8/99

SEAM NO. P173/P172
SEAM LENGTH 255'
COMMENTS 775/45

WELDING UNIT NO. MM-2
TIME WELDED 5:00 a.m./p.m.

SEAM DETAIL ✓
(Show Dimensions)



QUALITY ASSURANCE SUMMARY

1. Vacuum Box Test

ZONE	LENGTH	
		Date Tested
		QC Technician's Initials
		No. of Defects Found
		Date Repairs Made
		Date Retested
		Dated Inspected and Approved

2. Air Pressure Testing

START TIME	START PRESSURE (psi)	END TIME	END PRESSURE (psi)	ZONE	LENGTH (ft)	PRESSURE LOSS (psi)	APPROVED (Y/N)	IF NO, CORRECTIVE ACTION	APPROVED BY

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- CAP Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers and Scientists

CQA SEAM INSPECTION FORM

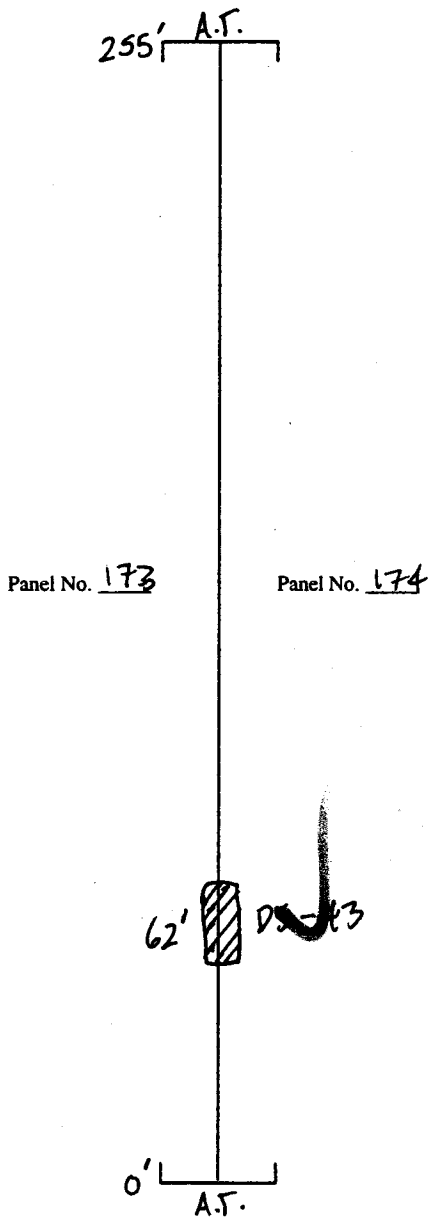
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P174/P173
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 7:45 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS43 [redacted]	DESTRUCT	5/12/99 V.BOX	JK

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

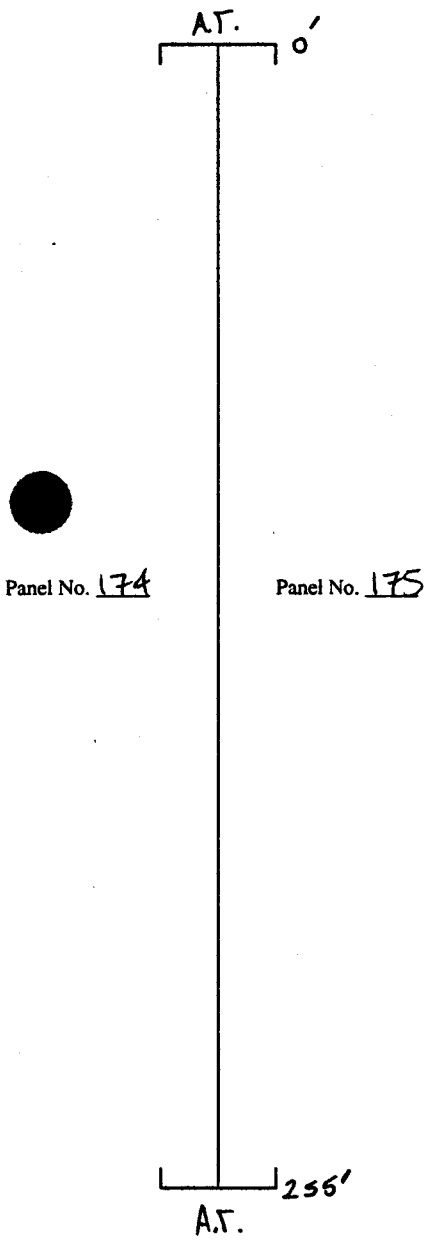
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P175 / P174
Seam Length: 255'
Comments: 750 / 60

Welding Unit No.: MM1
Time Welded: 7:50 (A.M./P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

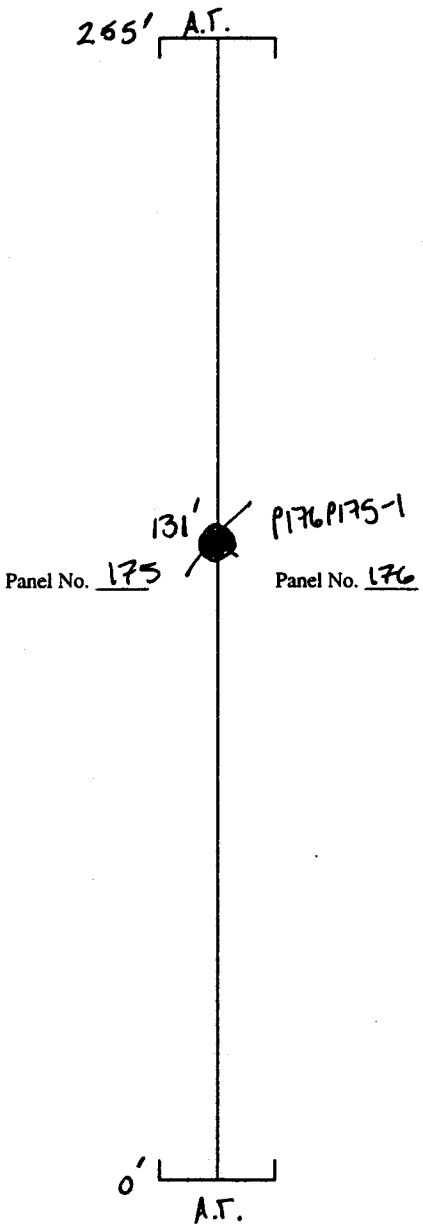
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P176/P175
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 820 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P176P175-1	BURN-THRU	5/12/99 V. Box	JR

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

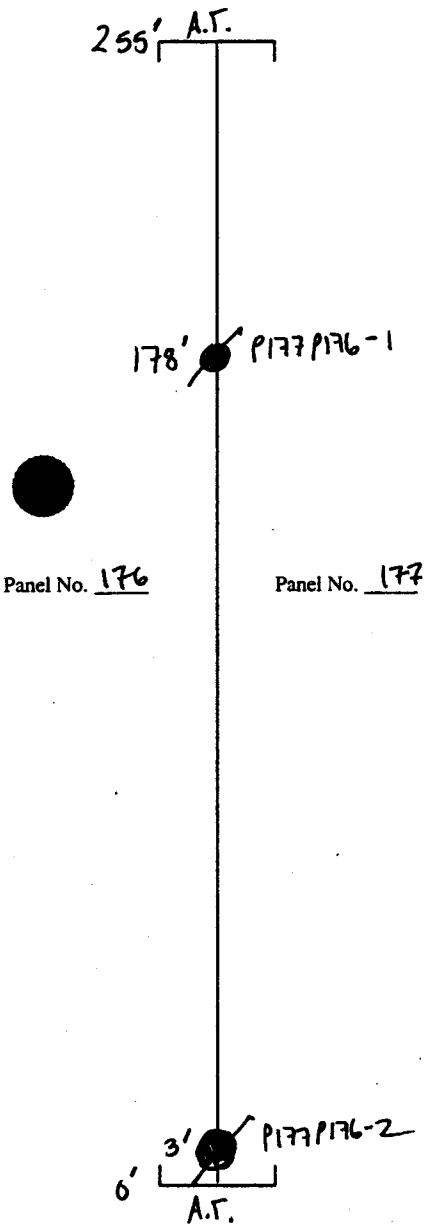
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P177/P176
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 8:25 A.M. / P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
● /	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P177 P176-1	MAT'L SCORED	5/12/99 V.Box	JTC
P177 P176-2	INSUFF SEAM WIDTH	5/12/99 V. Box	JTC

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

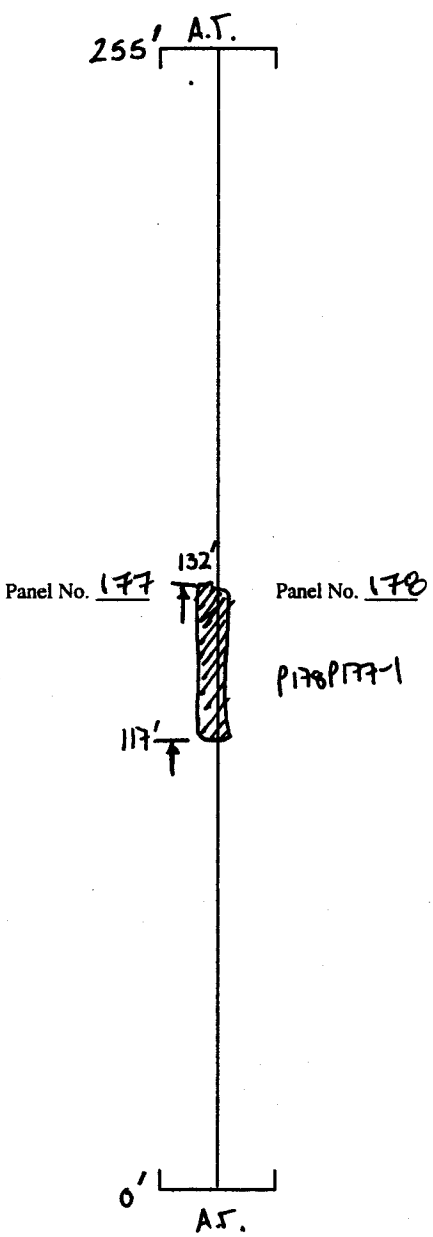
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P178/P177
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 8:50 (A.M.) P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P178P177-1	CAP-STRIP	5/12/99 V.BOX	JTC

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

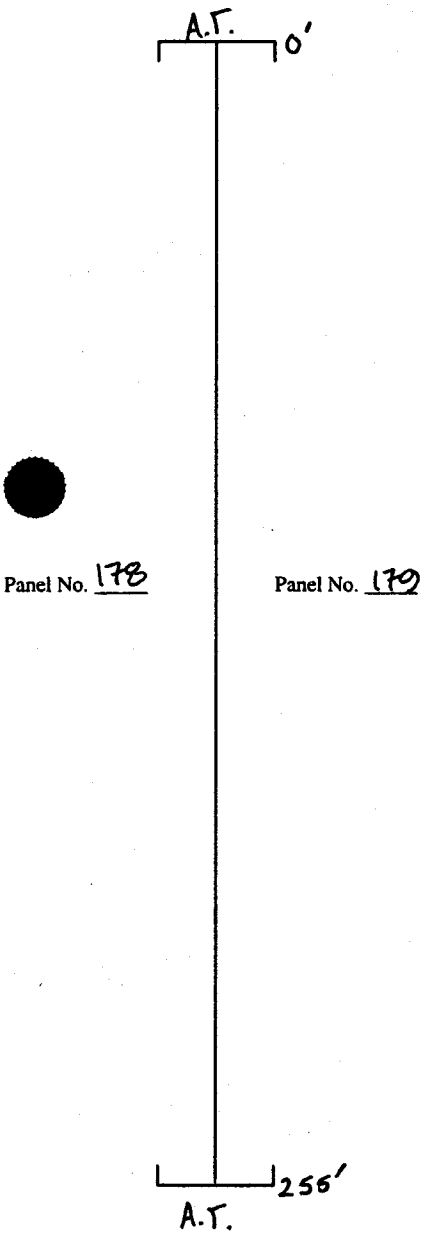
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P179/P178
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 9:01 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

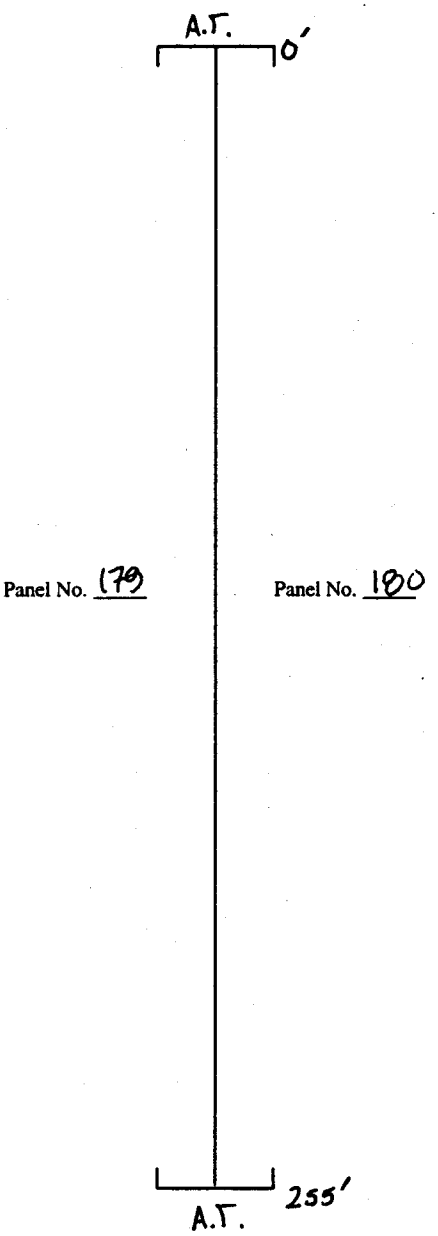
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P180 / P179
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 9:30 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

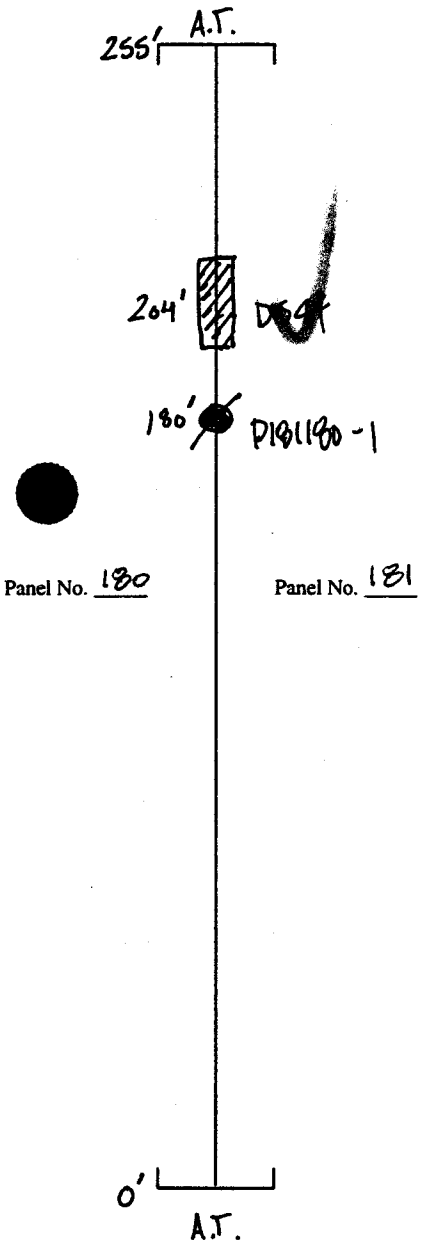
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/09

Seam No.: P181/P180
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 09:35 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P181/P180-1	INSUFF SEAM WIDTH	5/12/09 VBOX	JC
DS44 ~~[illegible]~~	~~[illegible]~~ DESTRUCT	5/12/09 VBOX	JR

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

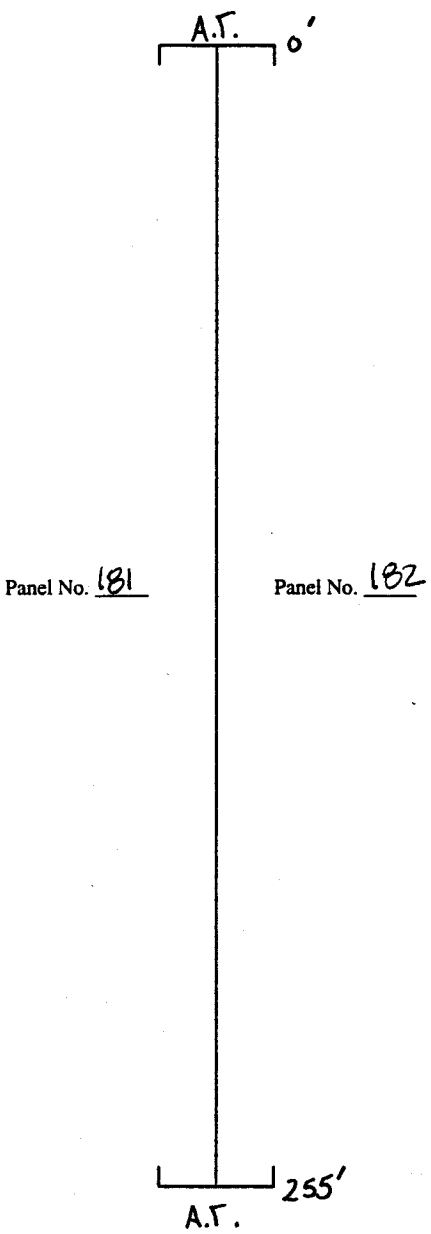
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P182/P181
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 10:00 (A.M./P.M.)

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	**ZONE 1** Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

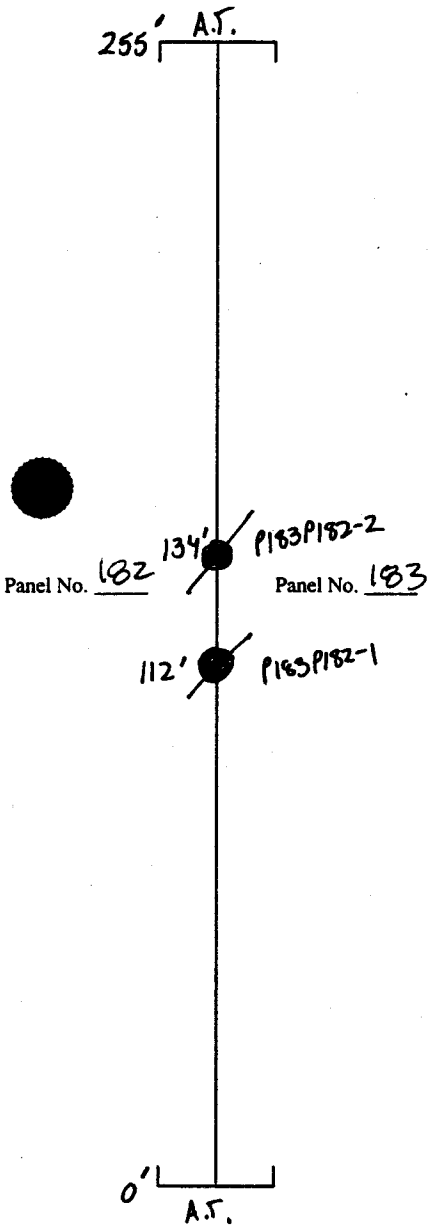
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P183/P182
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 10:05 (A.M./P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P183P182-1	INSUFF SEAM WIDTH	5/12/99 ✓ BOX	JK
P183P182-2	INSUFF SEAM WIDTH	5/12/99 ✓ BOX	JK

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

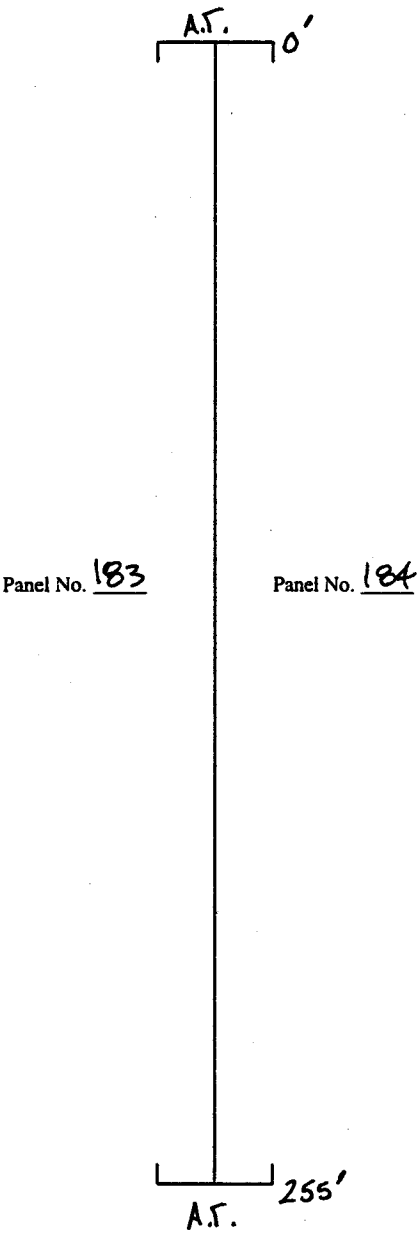
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P184/P183
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 10:30 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

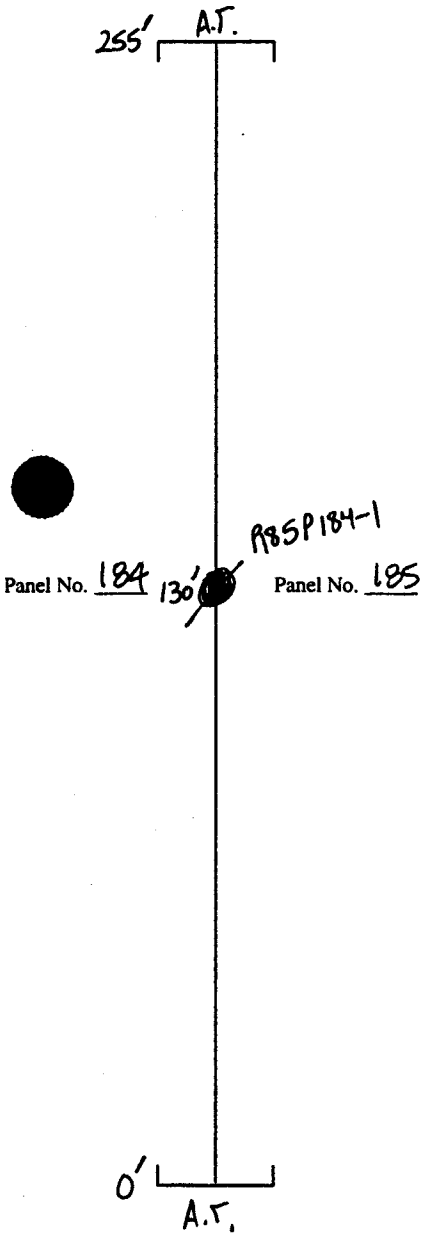
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P185/P184
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 10:40 (A.M./P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P185P184-1	HOLE	5/12 V-BOX	JFC
[redacted]	[redacted]	[redacted]	[redacted]

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

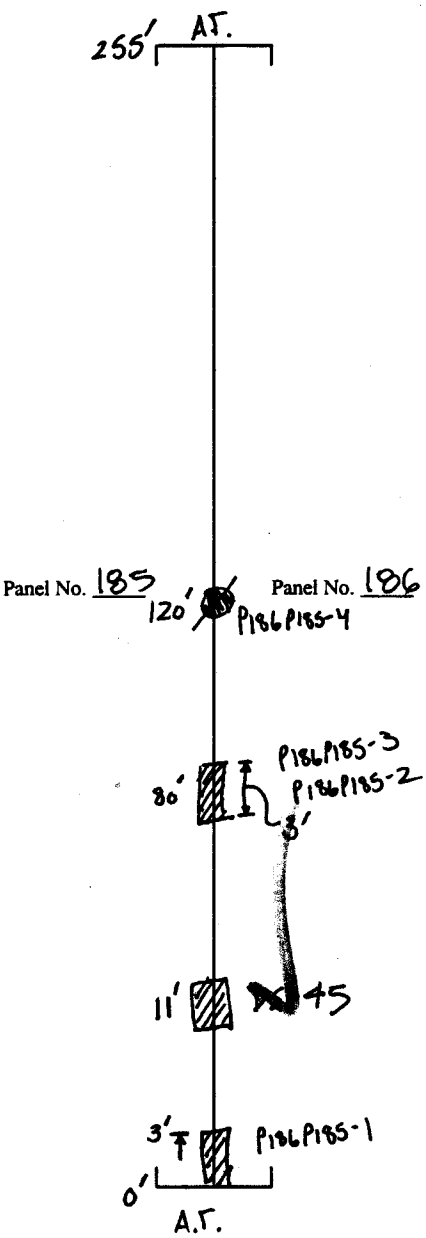
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P186/P185
Seam Length: 255'
Comments: 775/45

Welding Unit No.: MM 2
Time Welded: 11:05 A.M. / P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

- ZONE 1 Air Pressure Zone
- Repair Needed
- Repair Completed
- Repair Tested
- Repair Approved
- Destructive Sample
- Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P186-P185-1	CAP STRIP	5/12/99 V. Box	JRC
P186P185-2	INSUFF SEAM WIDTH	5/12/99 V. Box	JR
P186P185-3	INSUFF SEAM WIDTH	5/12/99 V. Box	JRC
P186 P185-4	MATL THIN WRINKLE	5/12/99 V. Box	JRC
DS-45	DESTRUCT	5/12/99 V. Box	JRC

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

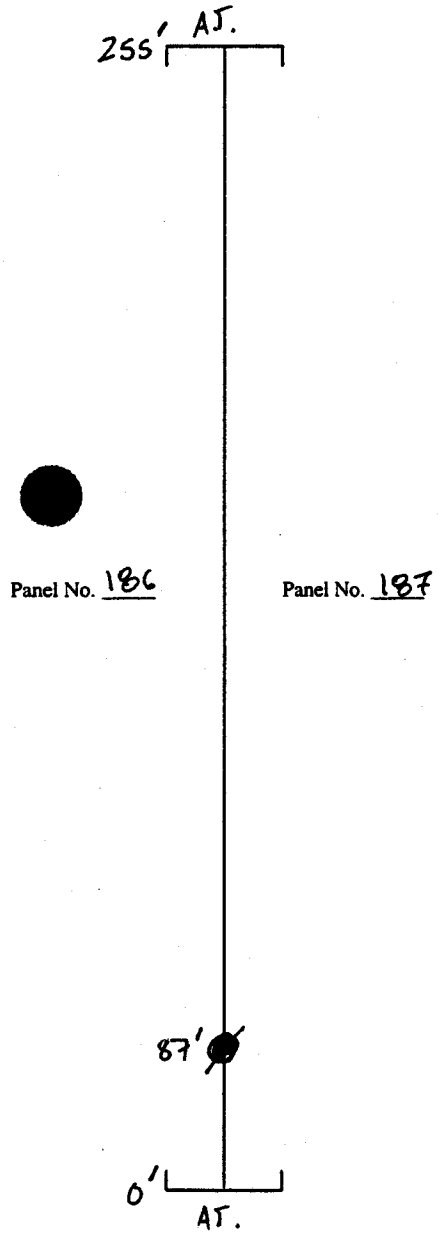
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P187/P186
Seam Length: 255'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 11:12 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P187P186-1	BURN THRU	5/11/99 VBOX	JIC

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

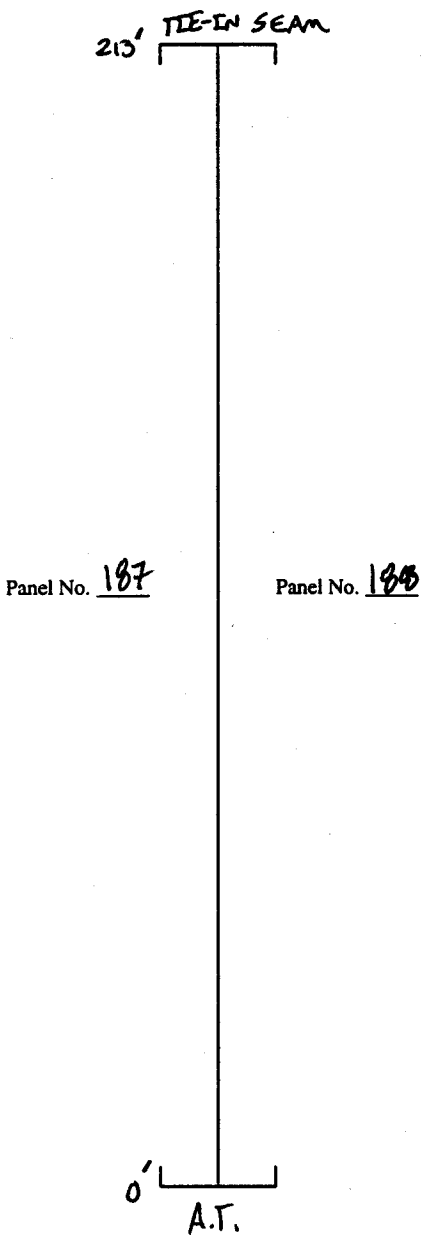
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P188 P187
Seam Length: 213'
Comments: 775/45

Welding Unit No.: MM-2
Time Welded: 1:15 A.M/P.M

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

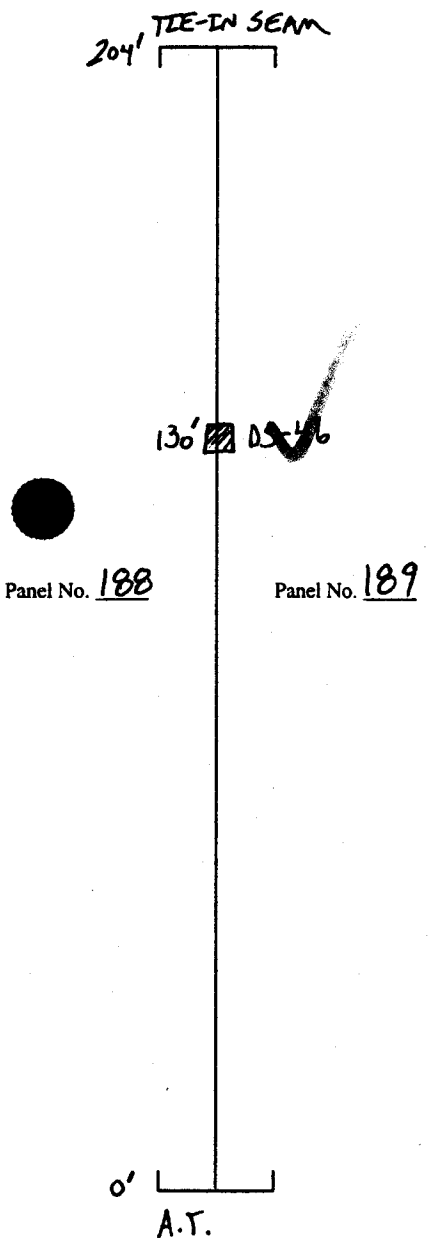
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P189/P188
Seam Length: 204'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 1:30 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-46	Destruct	5/12 V-Box	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

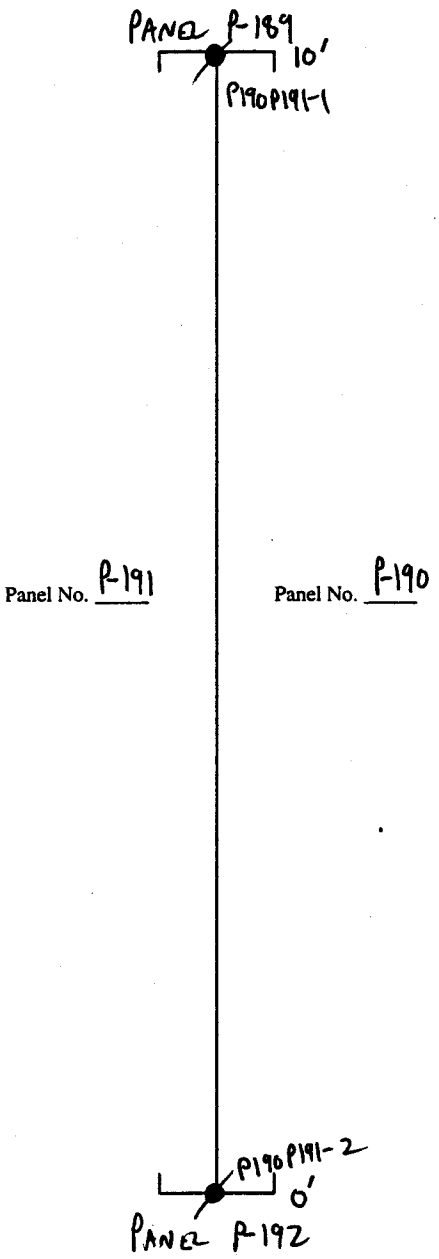
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P190/P191
Seam Length: 10'
Comments: 775/45 BUTT SEAM
Welding Unit No.: MM-2
Time Welded: 1:40 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			
P190P191-1	SEAM JUNC.	5/12 V-BOX	RCB
P190P191-2	SEAM JUNC.	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

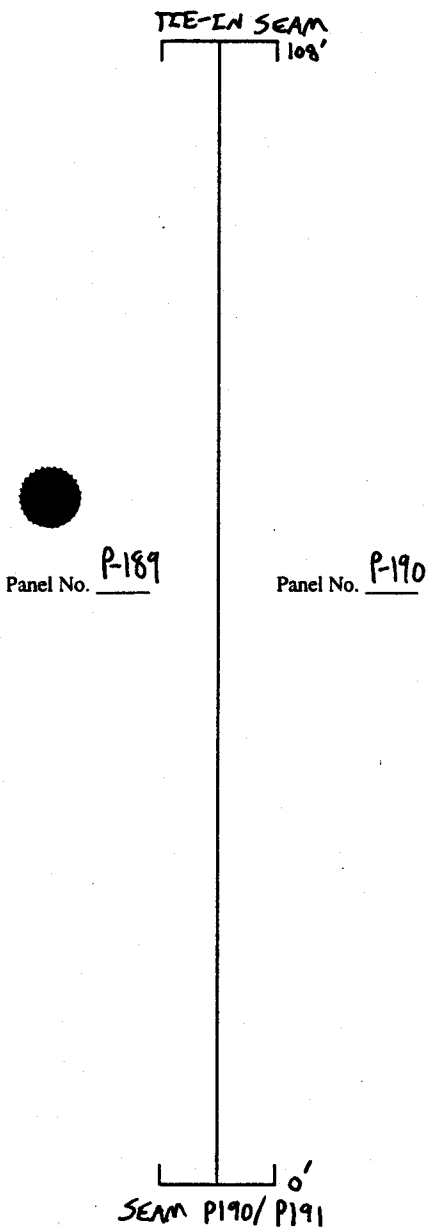
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P190 / P189
Seam Length: 108'
Comments: 775/45
Welding Unit No.: MM-2
Time Welded: 1:50 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

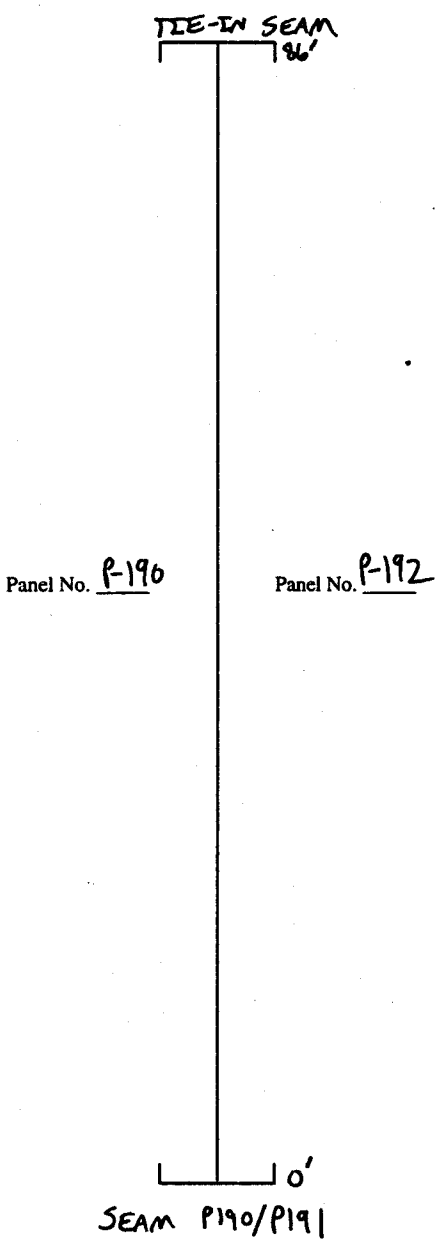
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P192/P190
Seam Length: 86'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 1:55 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

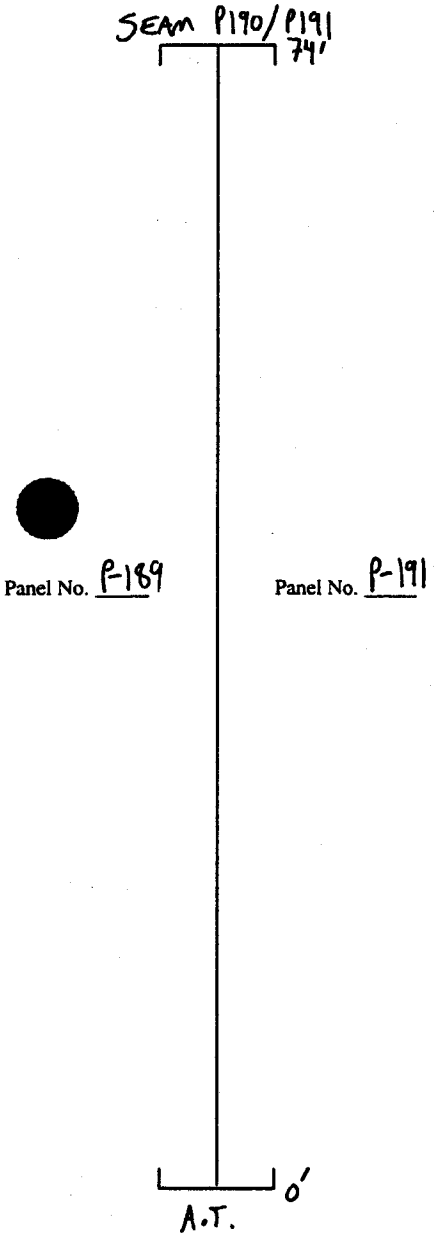
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P191/P189
Seam Length: 74'
Comments: 775/45

Welding Unit No.: MM-2
Time Welded: 2:00 A.M. / P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
N. REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

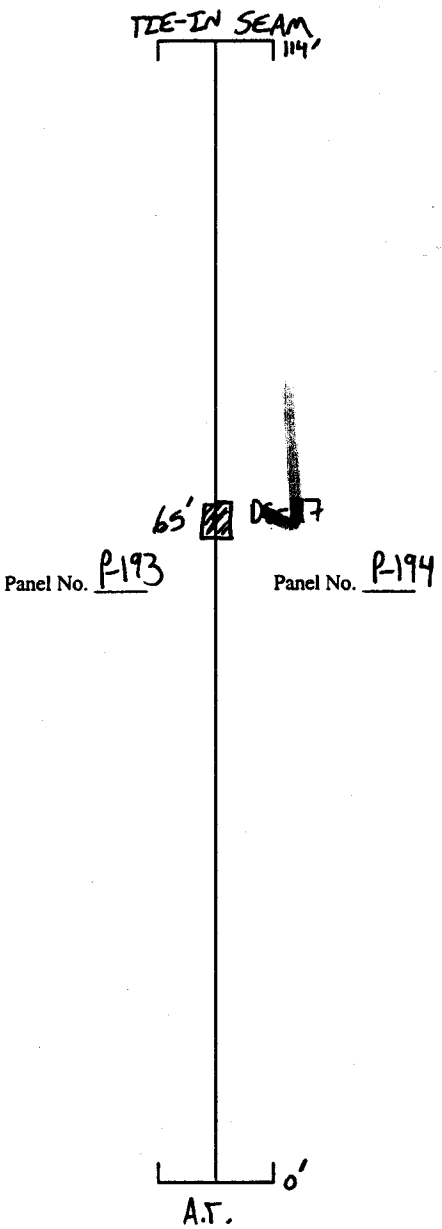
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P194/P193
Seam Length: 114'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 2:05 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			
DS-47	Destruct	5/12 V-Box	RB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

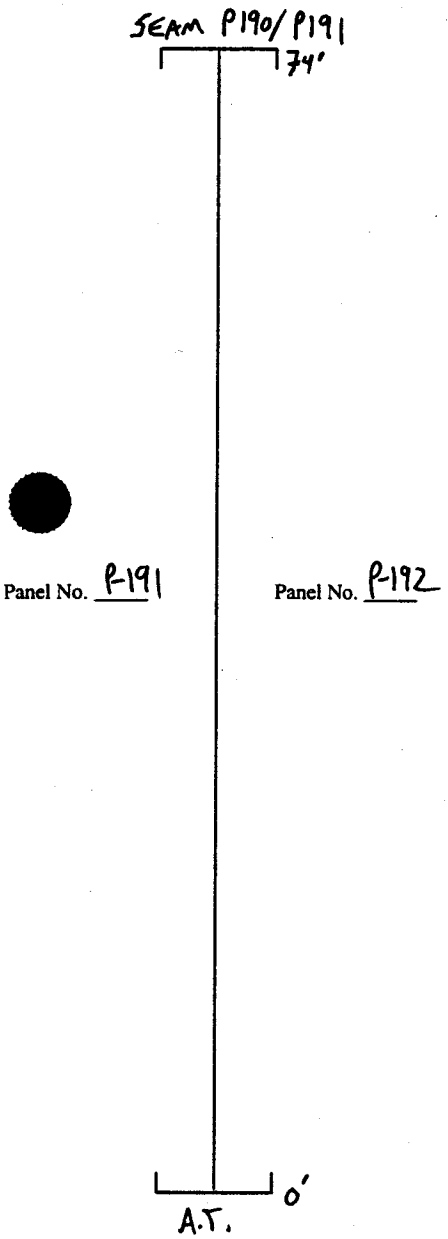
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P192/P191
Seam Length: 74'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 2:10 A.M. (P.M.)

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

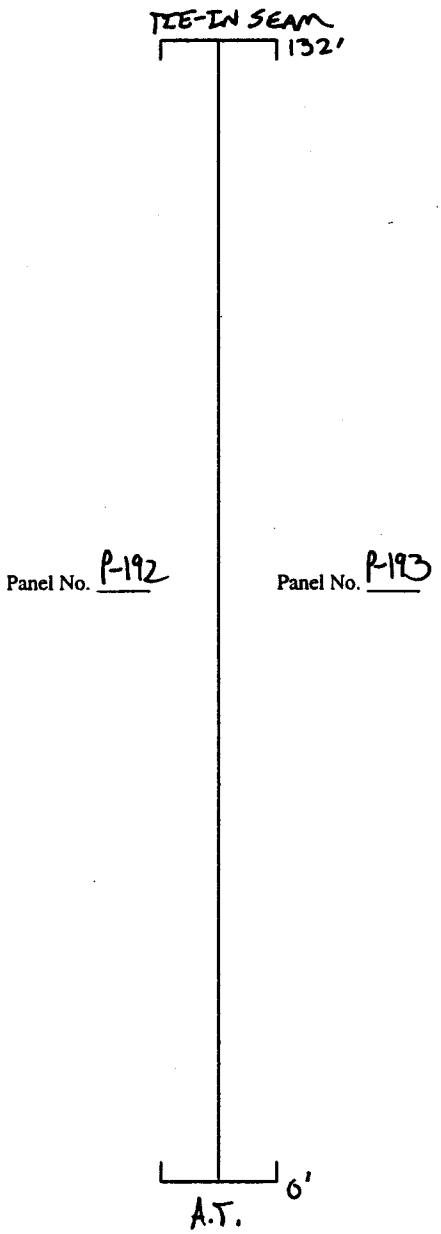
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P193/P192
Seam Length: 132'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 2:20 A.M. (P.M.)

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

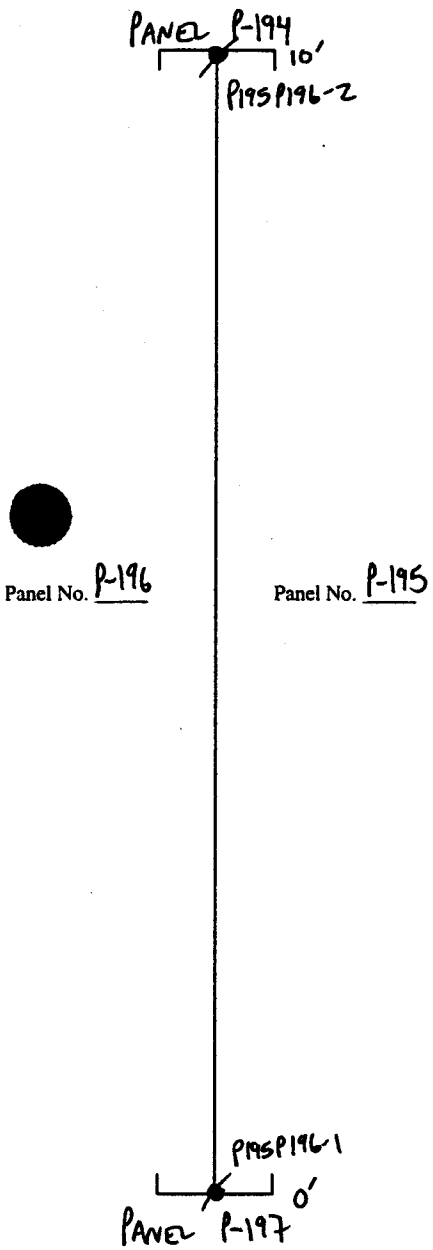
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P195/P196
Seam Length: 10'
Comments: 775/45 BUTT SEAM
Welding Unit No.: MM2
Time Welded: 2:20 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P195P196-1	SEAM JUNC.	5/12 V-BOX	RCB
P195P196-2	SEAM JUNC.	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

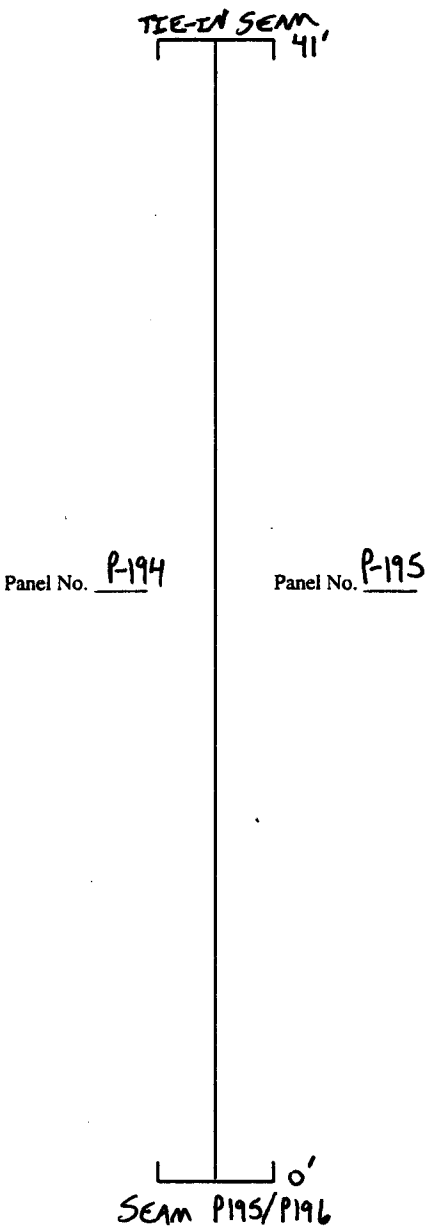
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P195/P194
Seam Length: 41'
Comments: 775/45

Welding Unit No.: MM-2
Time Welded: 2:22 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

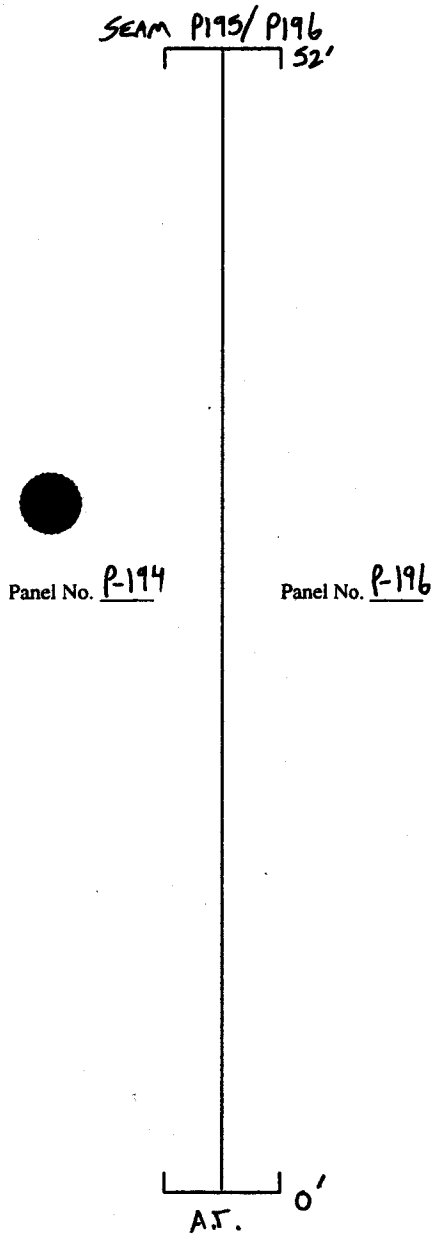
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P196 / P194
Seam Length: 52'
Comments: 775 / 45
Welding Unit No.: MM-2
Time Welded: 2:26 A.M. / P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

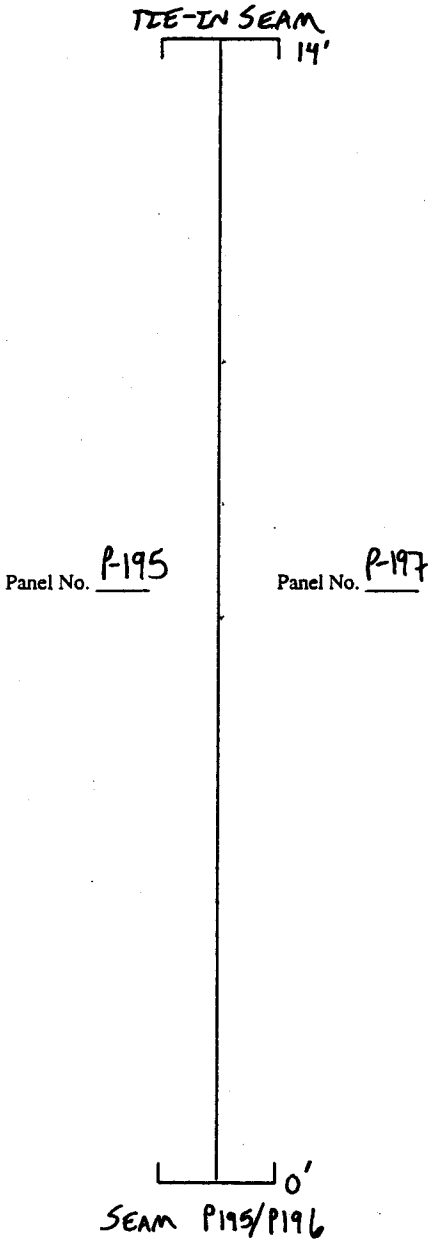
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P197/ P195
Seam Length: 14'
Comments: 775/45
Welding Unit No.: MM2
Time Welded: 2:32 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

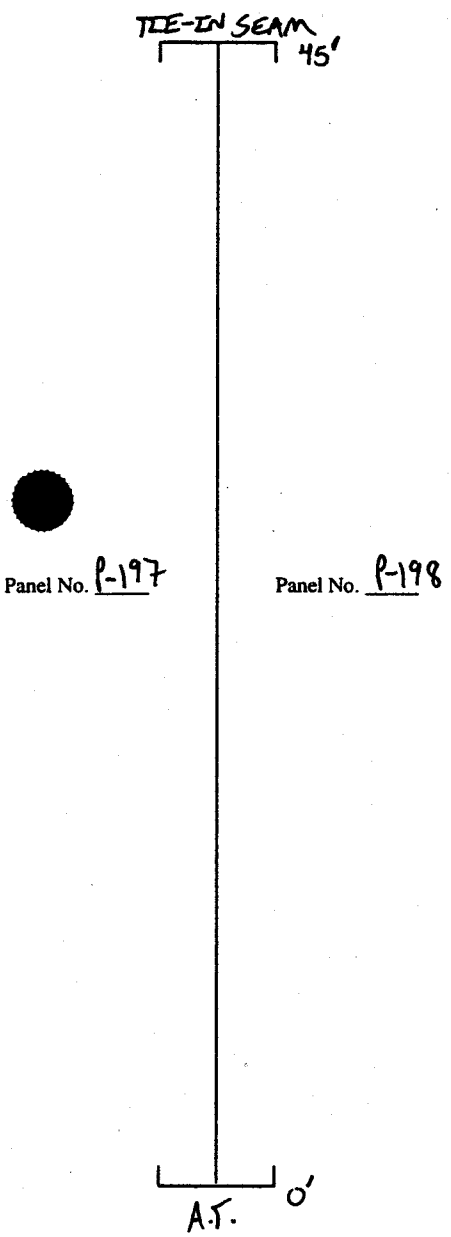
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P198/P197
Seam Length: 45'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 2:34 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

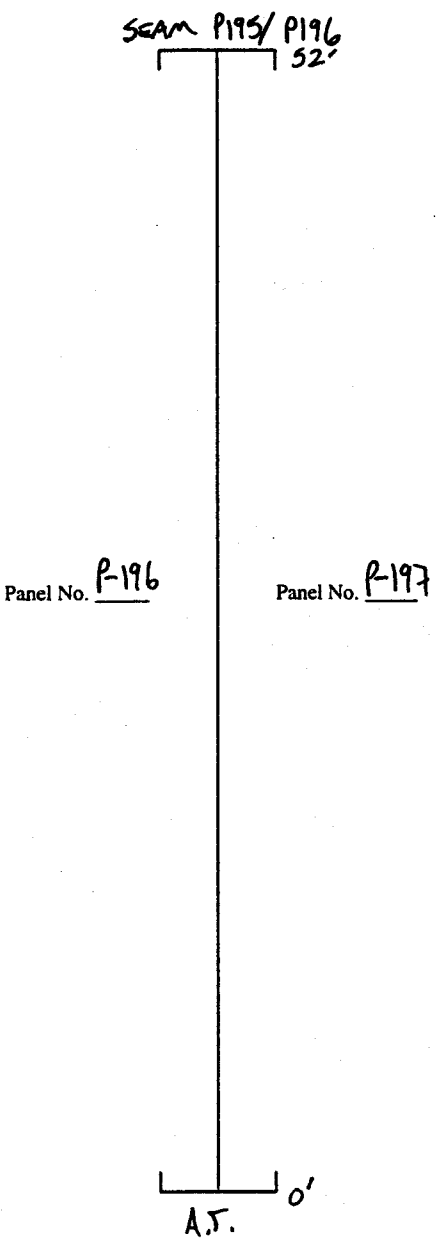
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P197/P196
Seam Length: 52'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 2:35 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

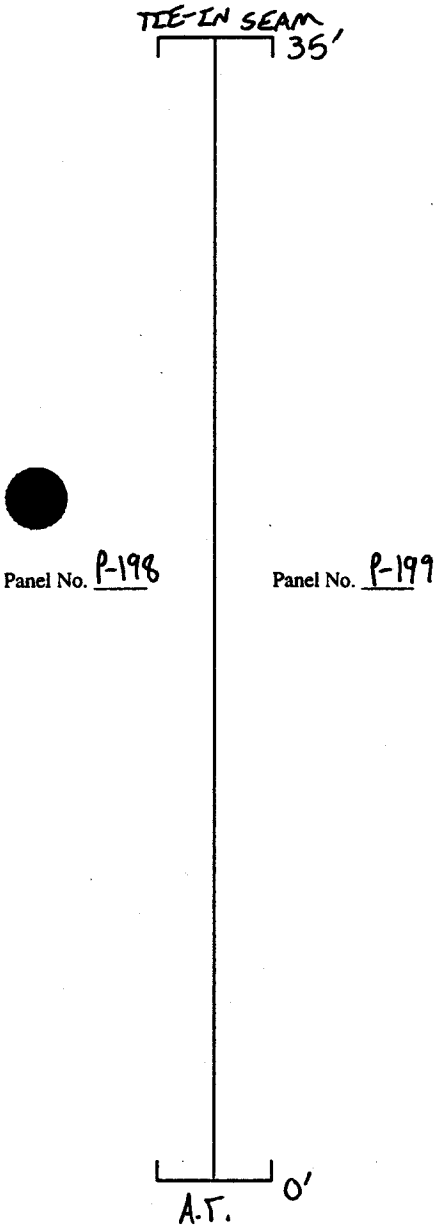
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P199/P198
Seam Length: 35'
Comments: 775/45

Welding Unit No.: MM-2
Time Welded: 2:40 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

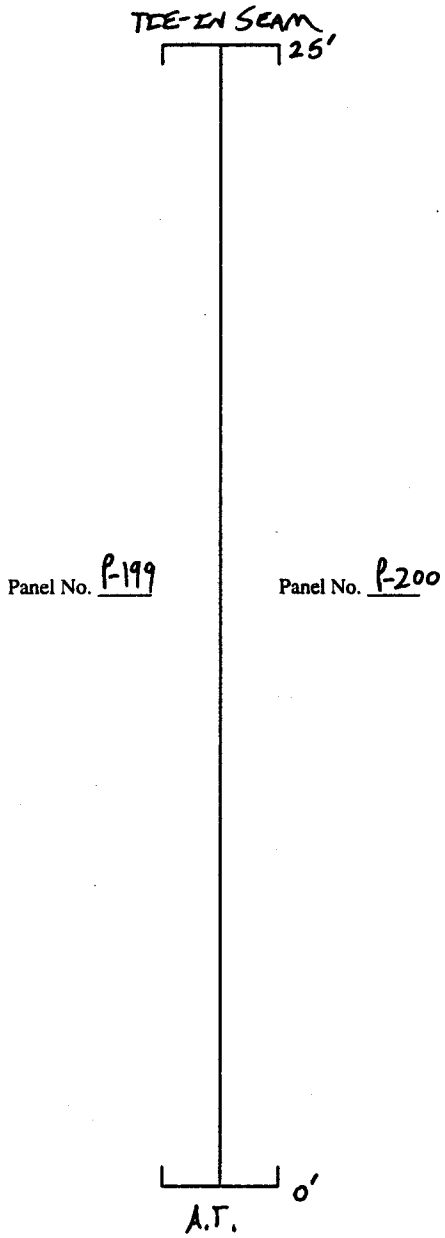
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P200/P199
Seam Length: 25'
Comments: 750/60

Welding Unit No.: MM 1
Time Welded: 2:41 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

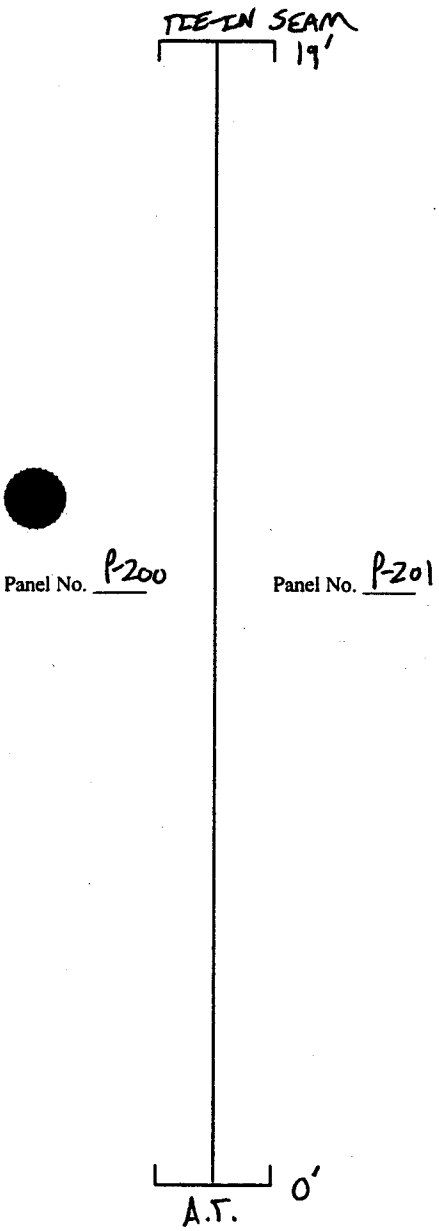
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P201 / P200
Seam Length: 19'
Comments: 775/45

Welding Unit No.: [redacted] MM1
Time Welded: 2:44 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

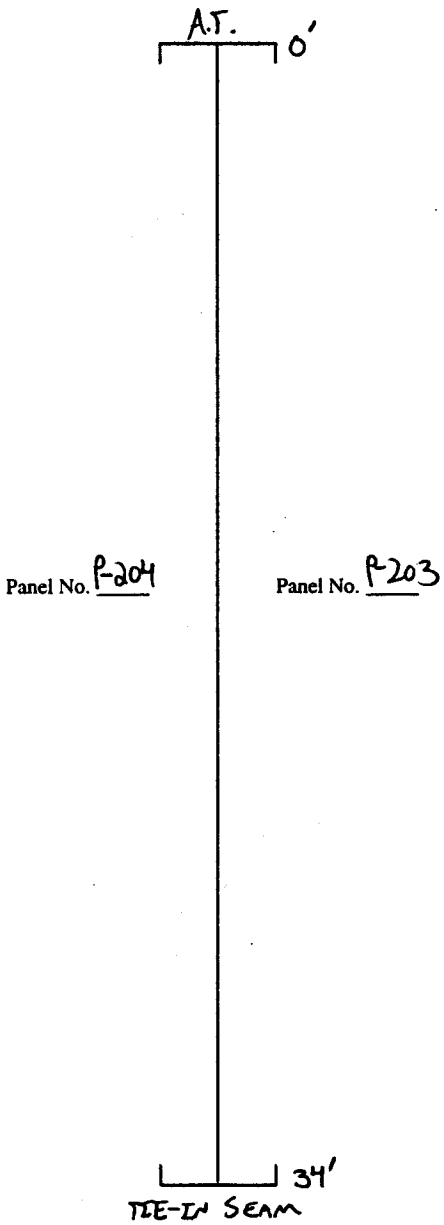
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P204/P203
Seam Length: 34'
Comments: 775/45

Welding Unit No.: MM-2
Time Welded: 2:45 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●	Repair Approved
⊡	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

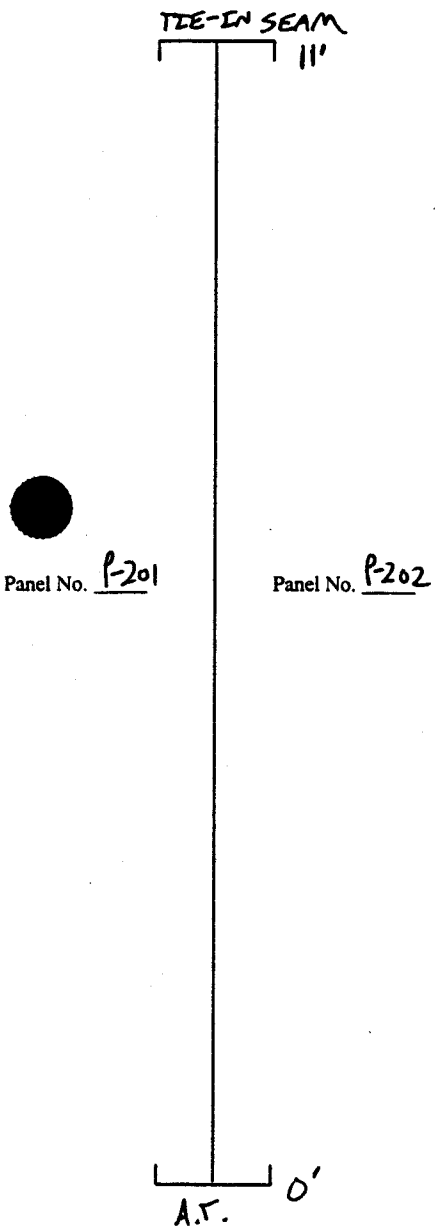
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P202/P201
Seam Length: 11'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 2:50 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

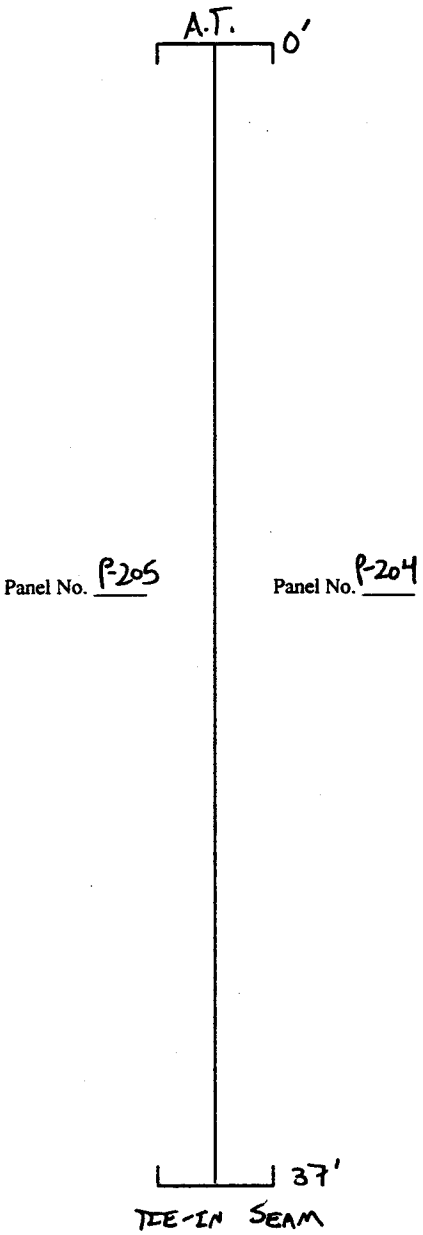
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P205/P204
Seam Length: 37'
Comments: 775/45

Welding Unit No.: MM2
Time Welded: 2:50 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

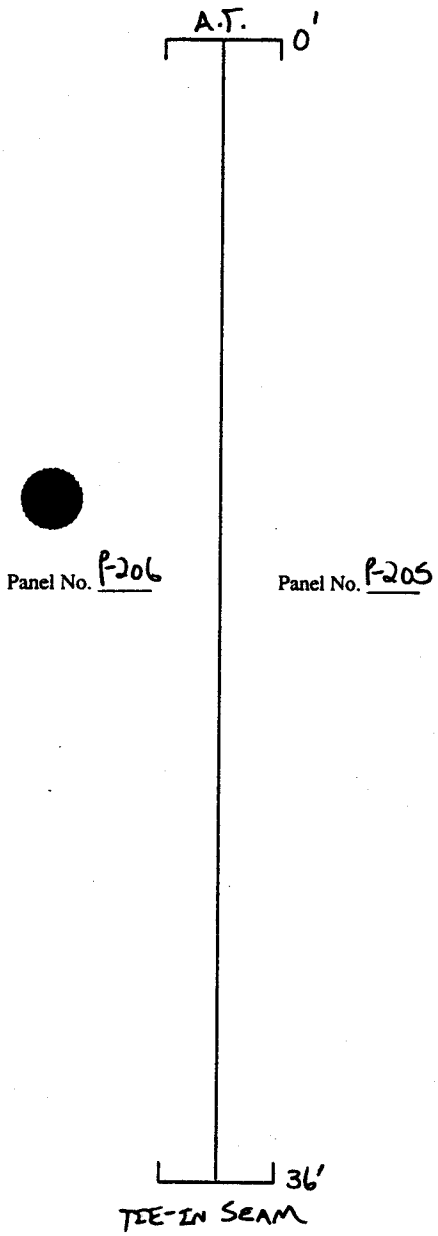
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P206/P205
Seam Length: 36'
Comments: 775/50

Welding Unit No.: MM-2
Time Welded: 3:00 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

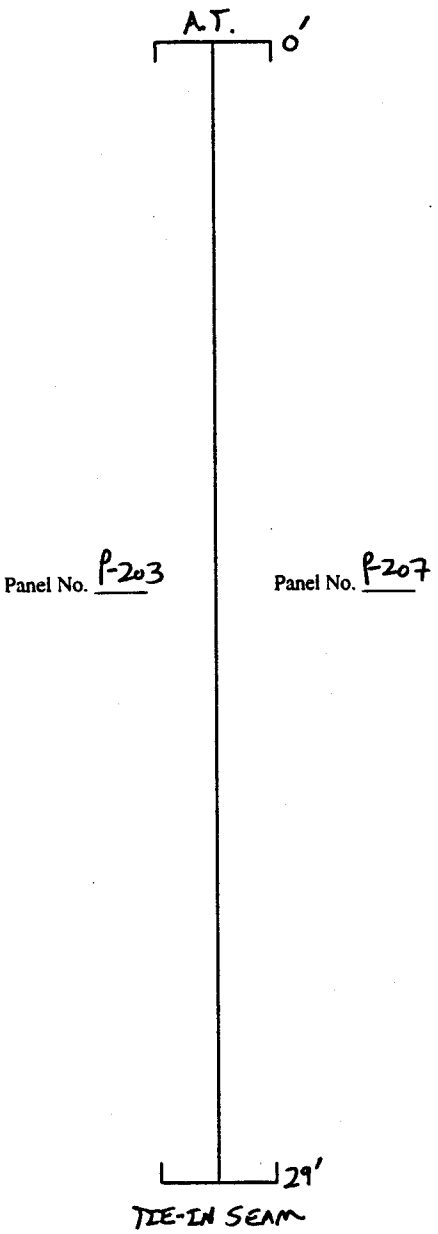
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P203/P207
Seam Length: 29'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 3:00 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

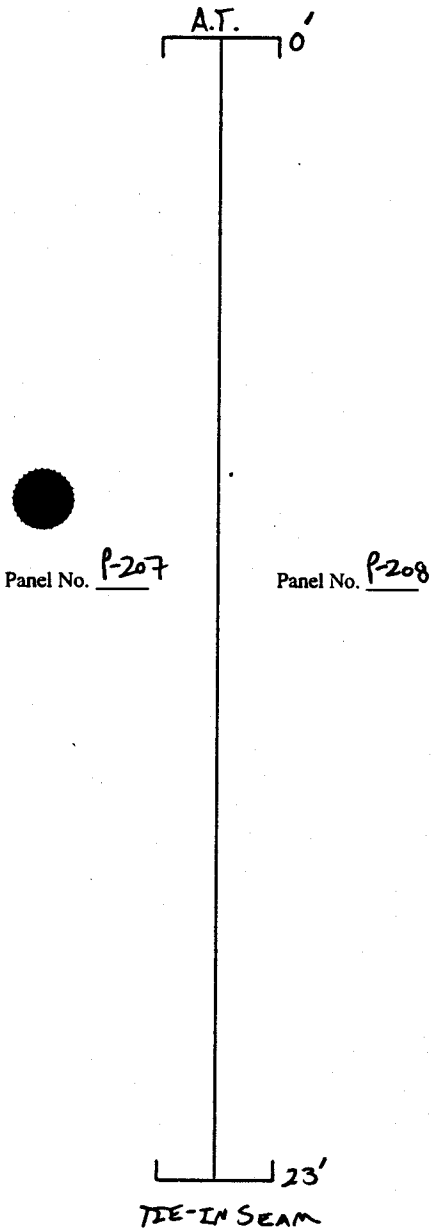
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P207/P208
Seam Length: 23'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 3:05 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

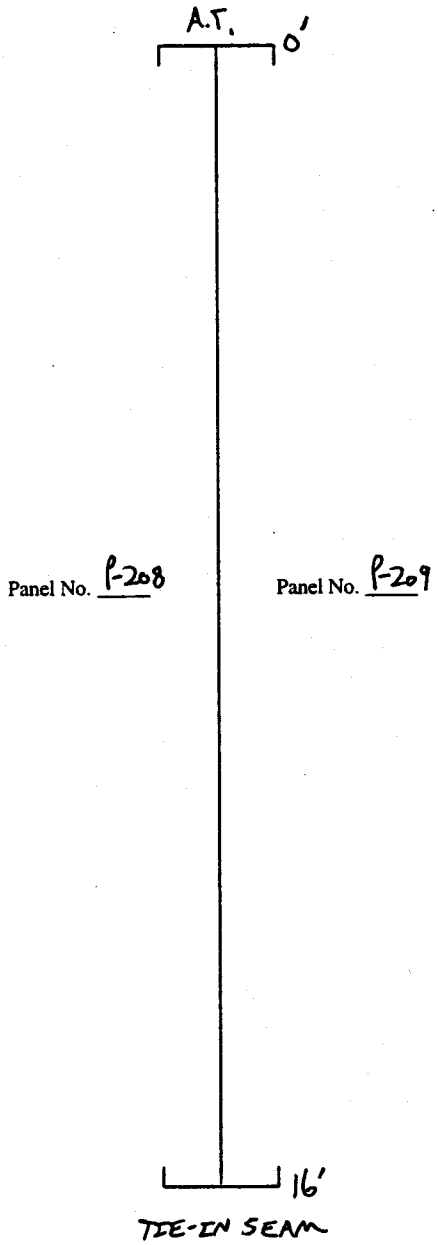
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P208/P209
Seam Length: 16'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 3:10 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

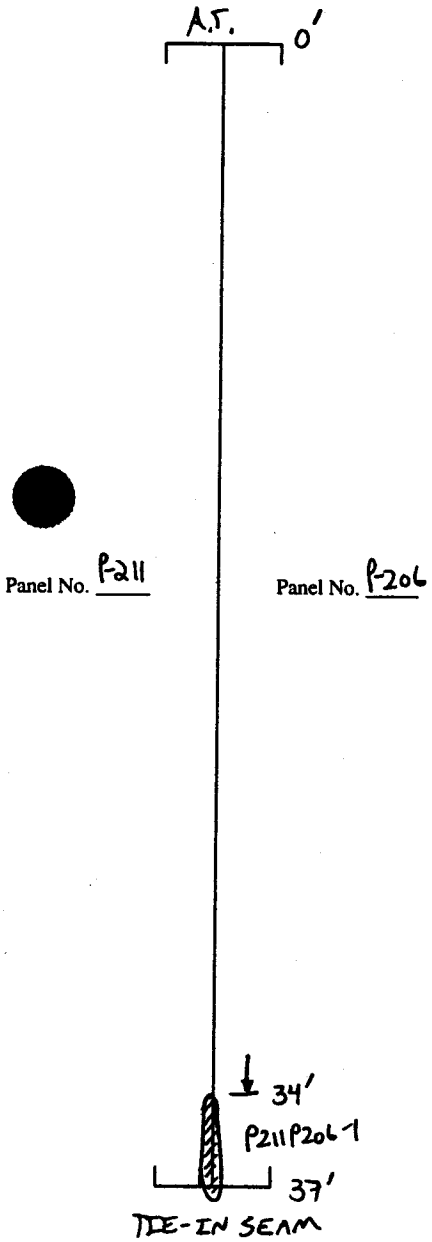
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P211/P206
Seam Length: 37'
Comments: 775/50

Welding Unit No.: MM2
Time Welded: 3:10 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P211P206-1	RESTART	5/12 V-BOX	RLB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

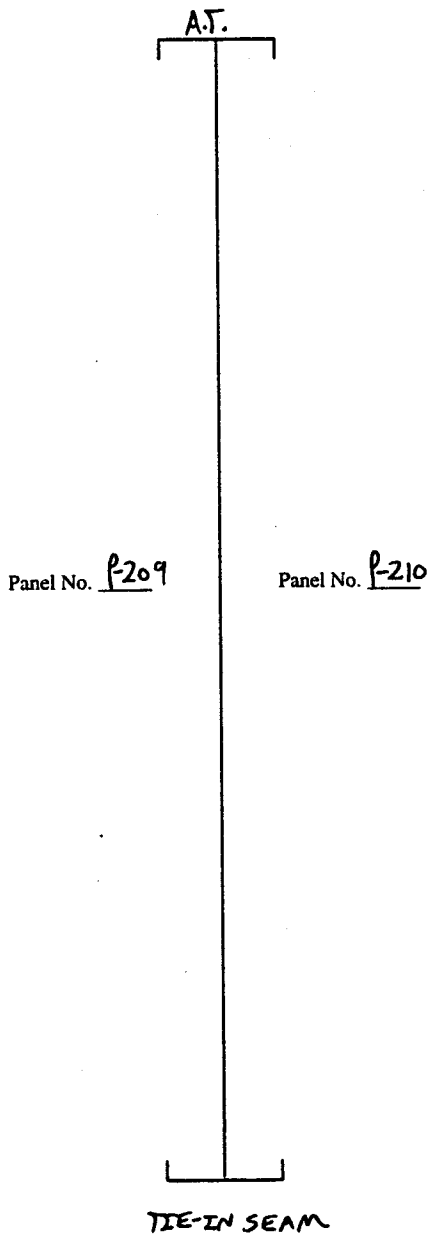
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: BH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P209 / P210
Seam Length: 6'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 3:15 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

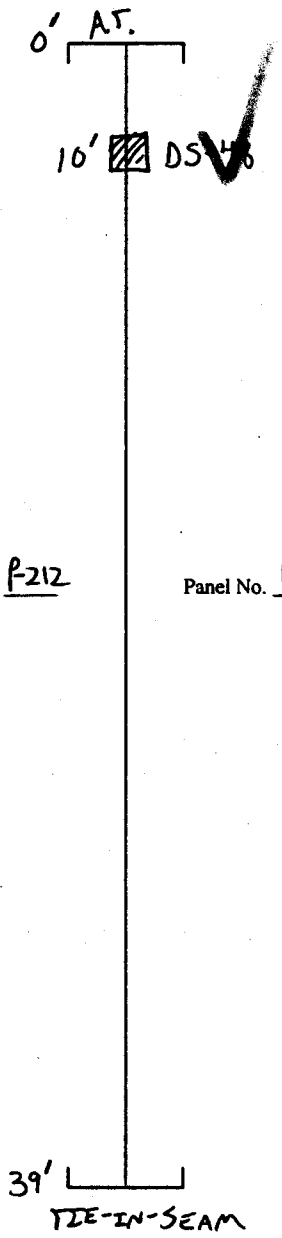
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P212/P211
Seam Length: 39'
Comments: 775/80

Welding Unit No.: MM2-
Time Welded: 3:15 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



Panel No. P-212 Panel No. P-211

1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
DS-48	Destruct	5/12 V-Box	PCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

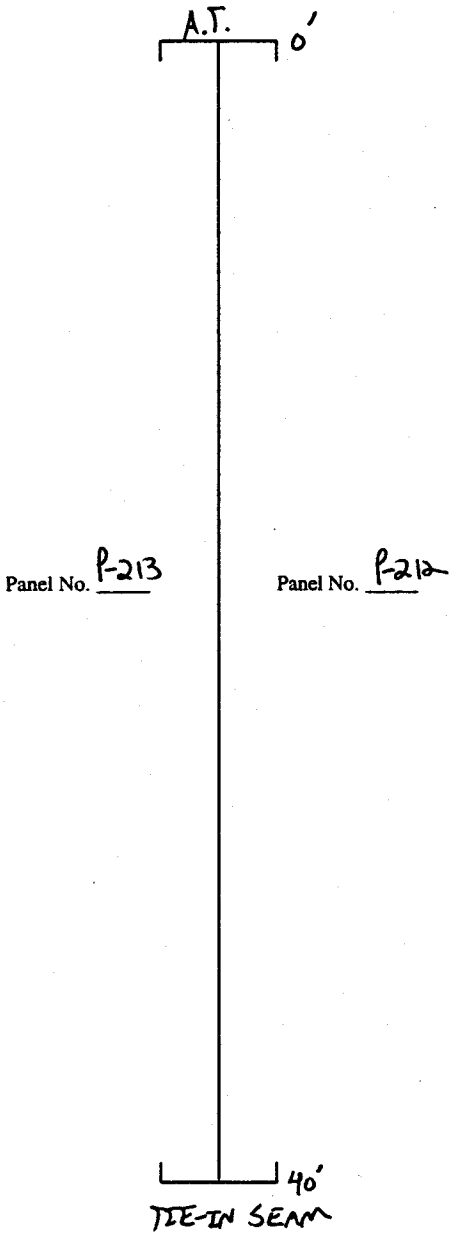
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P213/P212
Seam Length: 40'
Comments: 775/50

Welding Unit No.: MM-2
Time Welded: 3:20 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

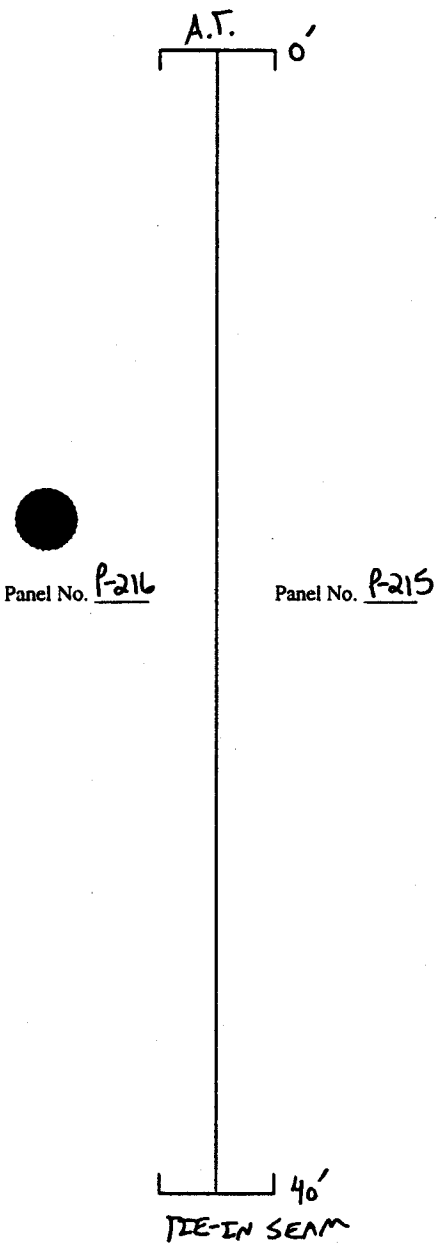
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P216/P215
Seam Length: 40'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 3:20 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

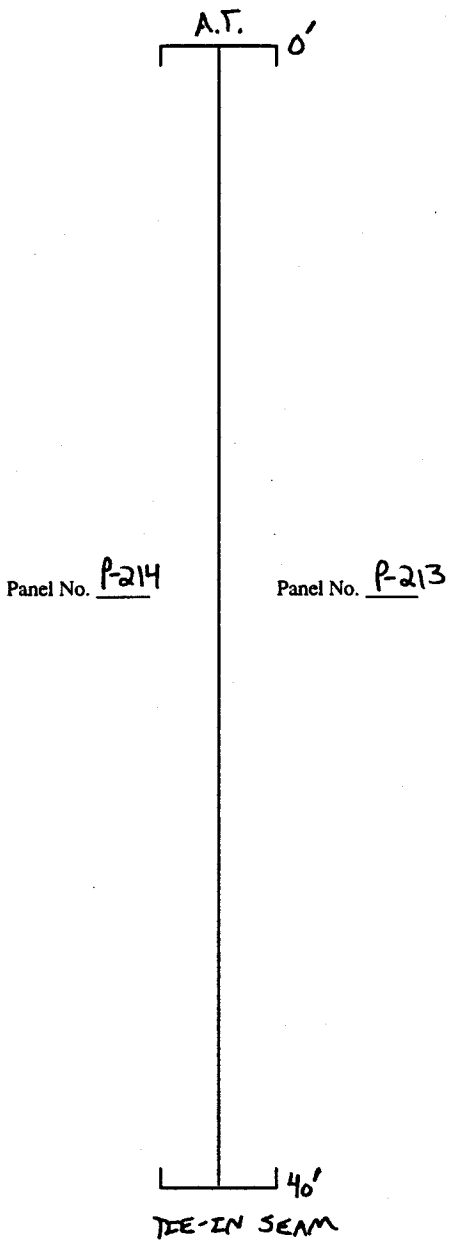
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P214/P213
Seam Length: 40'
Comments: 775/50

Welding Unit No.: MM-2
Time Welded: 3:25 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

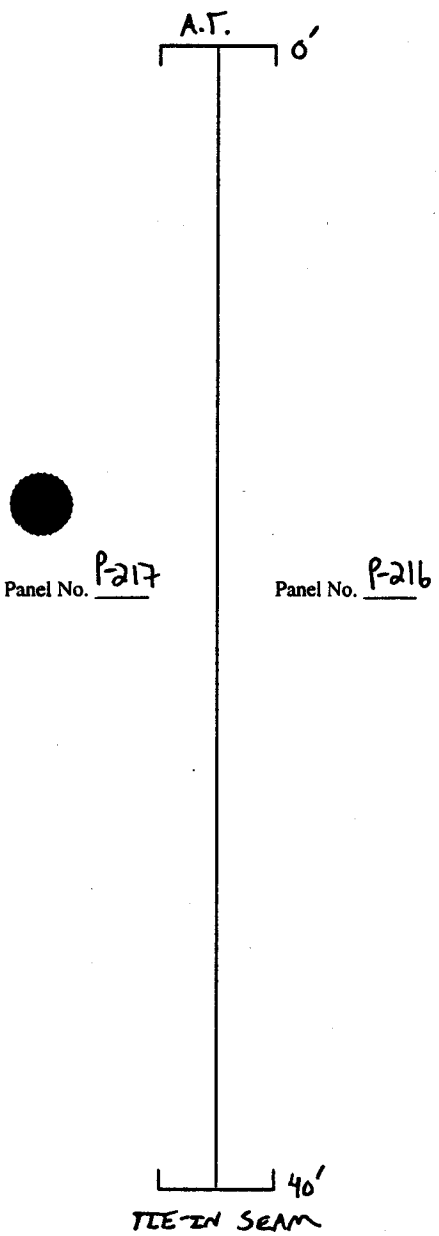
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P217 P216
Seam Length: 40'
Comments: 750/60

Welding Unit No.: MM 1
Time Welded: 3:25 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

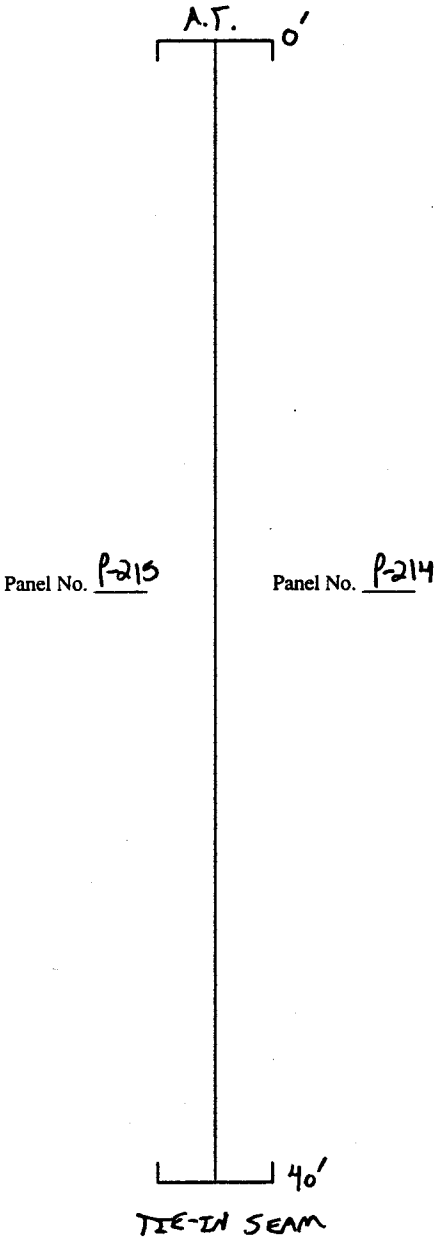
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P215/P214
Seam Length: 40'
Comments: 775/50

Welding Unit No.: MM-2
Time Welded: 3:30 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

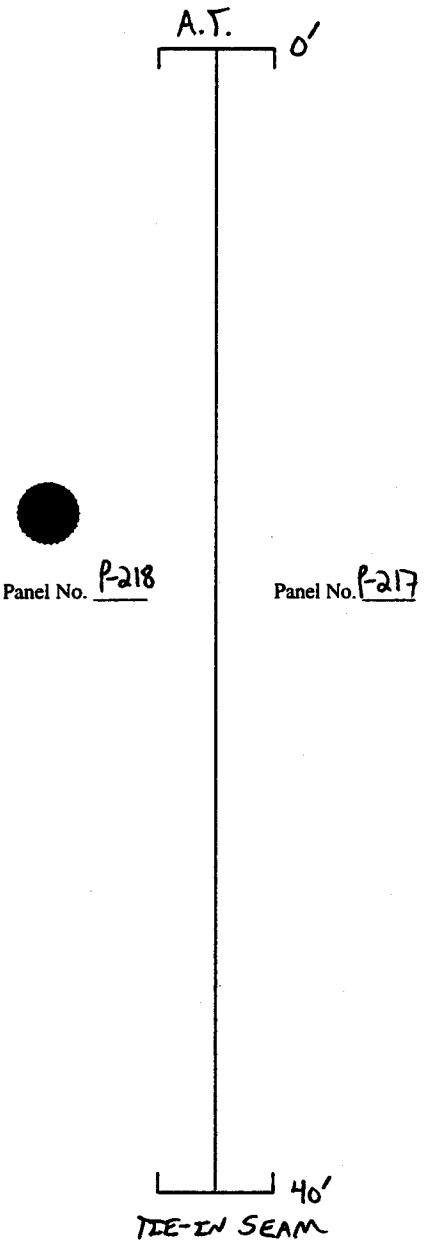
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P218/P217
Seam Length: 40'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 3:30 A.M. / P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

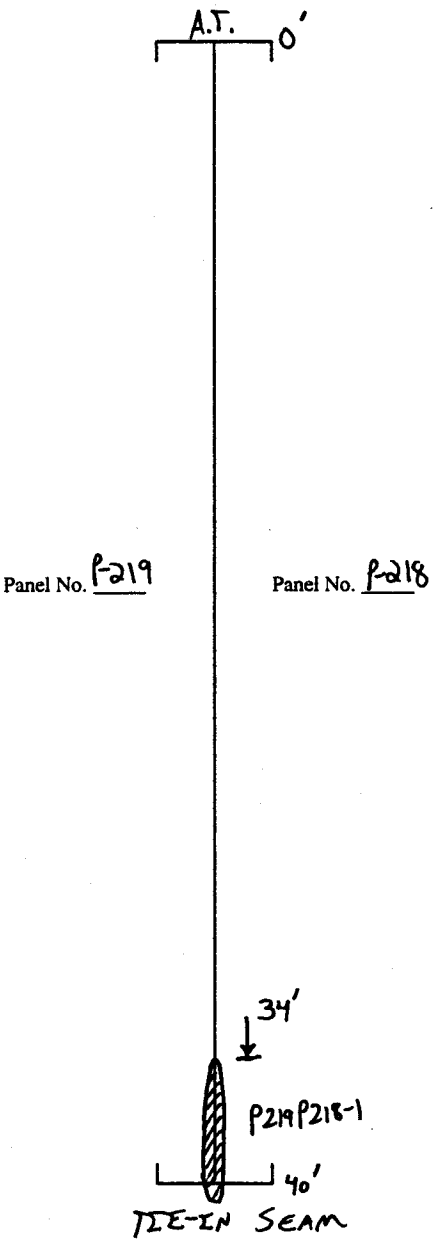
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P219/P218
Seam Length: 40'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 3:35 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P219P218-1	DISBOND	5/12 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

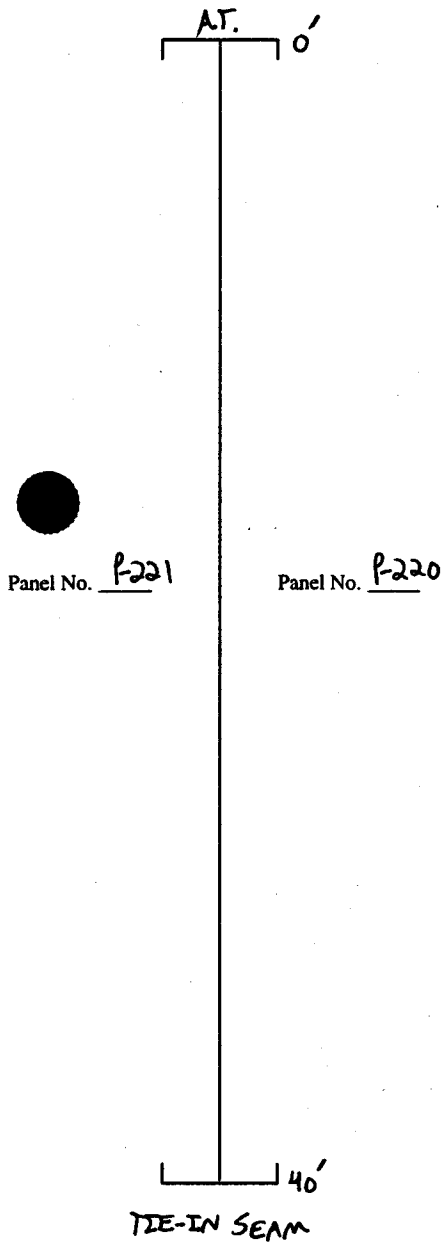
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P221 / P220
Seam Length: 40'
Comments: 775 / 50

Welding Unit No.: MM2
Time Welded: 3:40 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

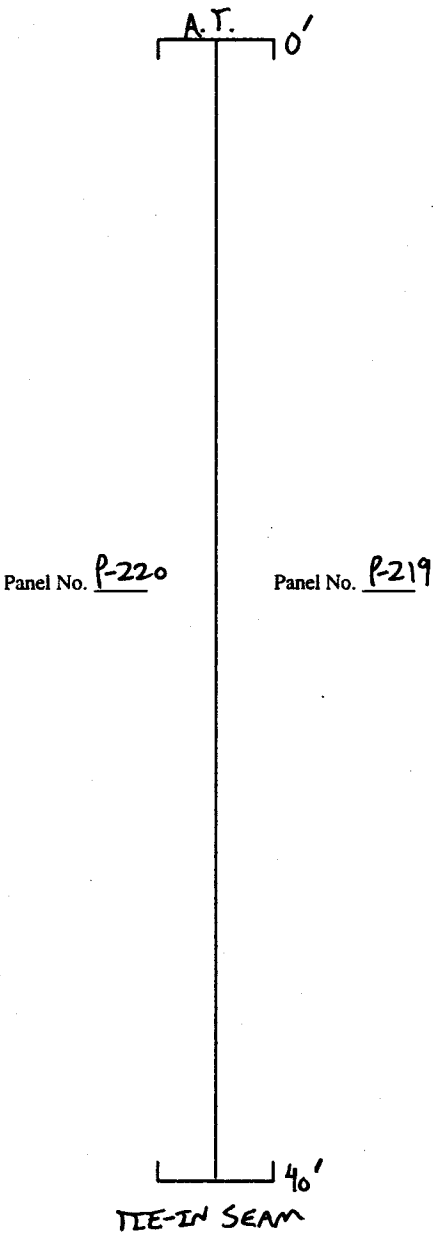
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P220/P219
Seam Length: 40'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 3:45 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

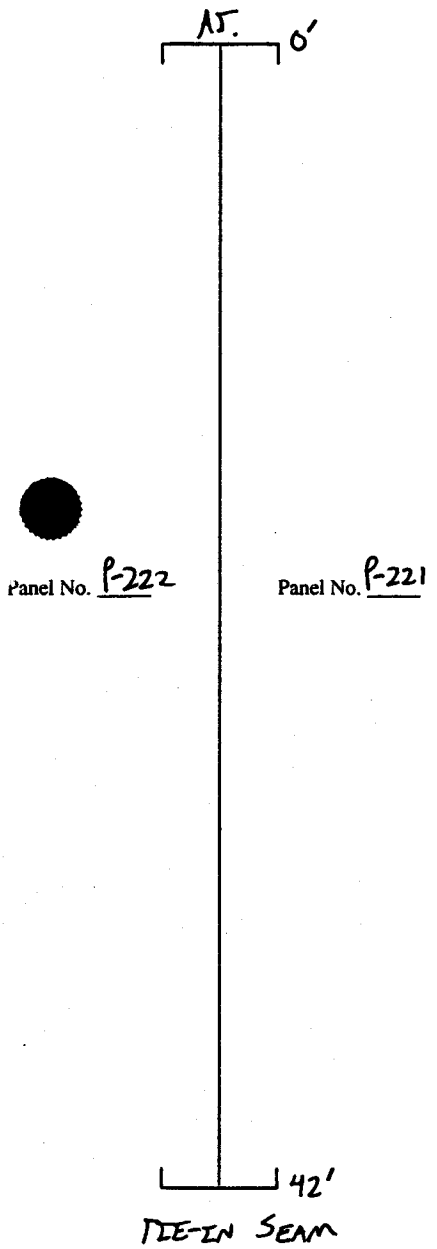
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P222/P221
Seam Length: 42'
Comments: 775/50

Welding Unit No.: MM2
Time Welded: 3:48 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

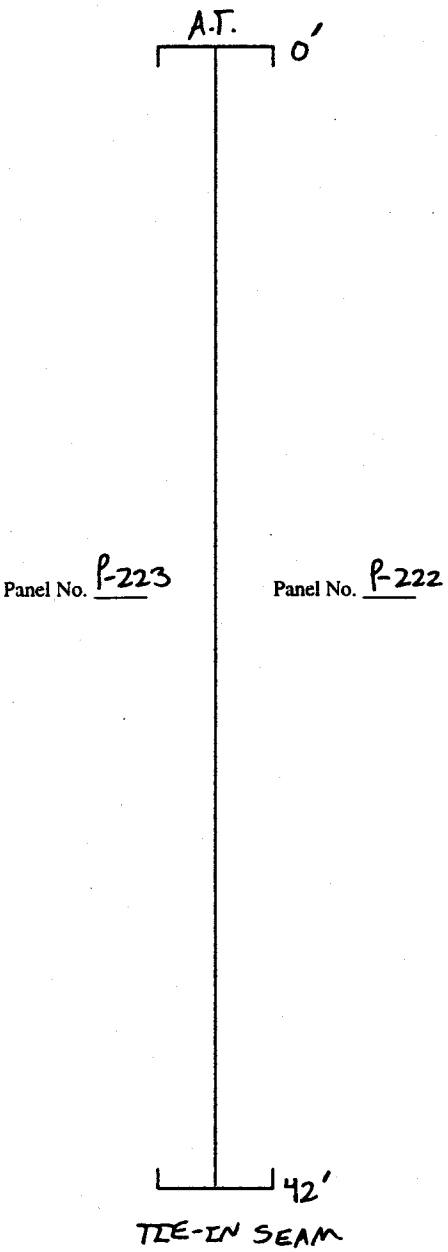
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P223 P222
Seam Length: 42'
Comments: 775/50
Welding Unit No.: MM2
Time Welded: 3:56 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

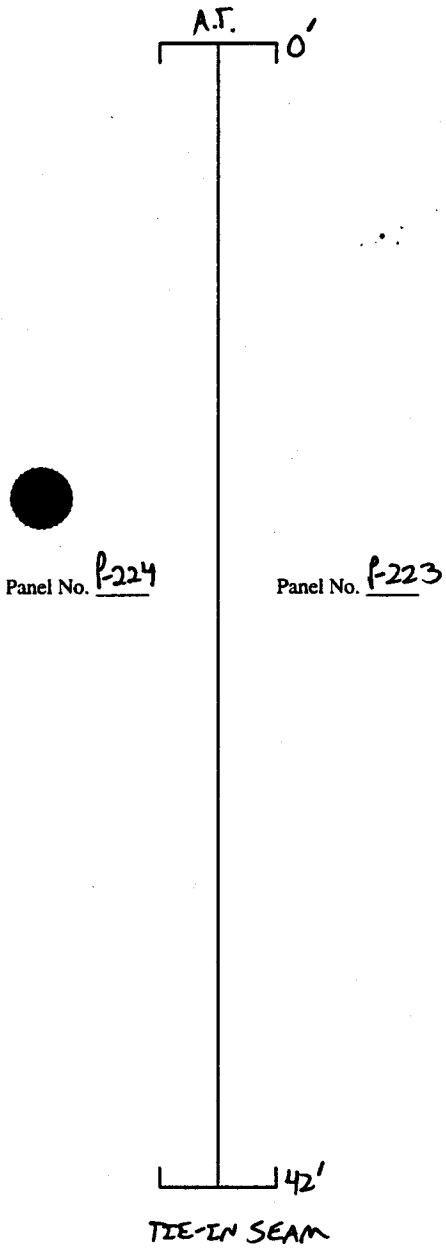
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P224/P223
Seam Length: 42'
Comments: 775/50

Welding Unit No.: MM2
Time Welded: ~~[illegible]~~ 4:02 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

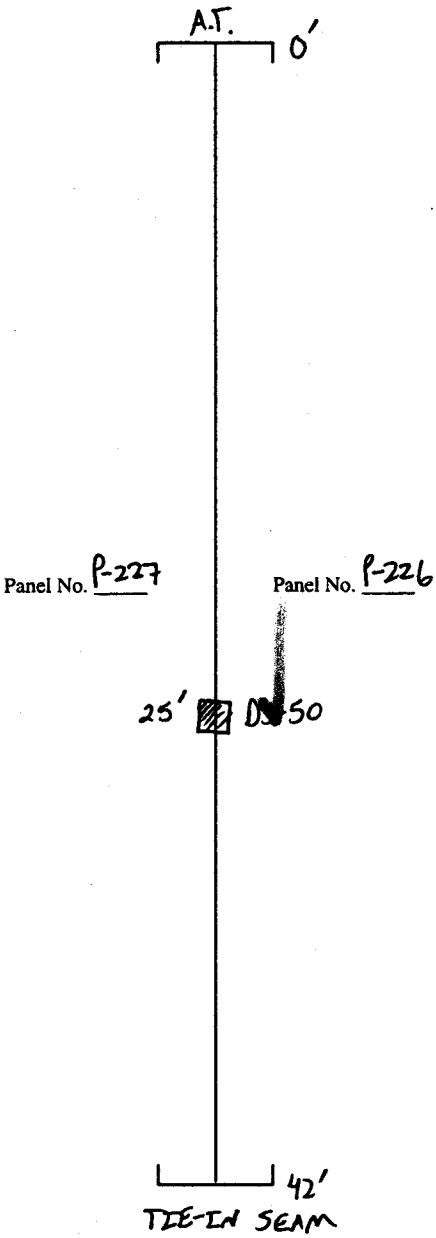
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P227/P226
Seam Length: 42'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 4:05 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			
DS-50	DESTRUCT	5/12 V-Box	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

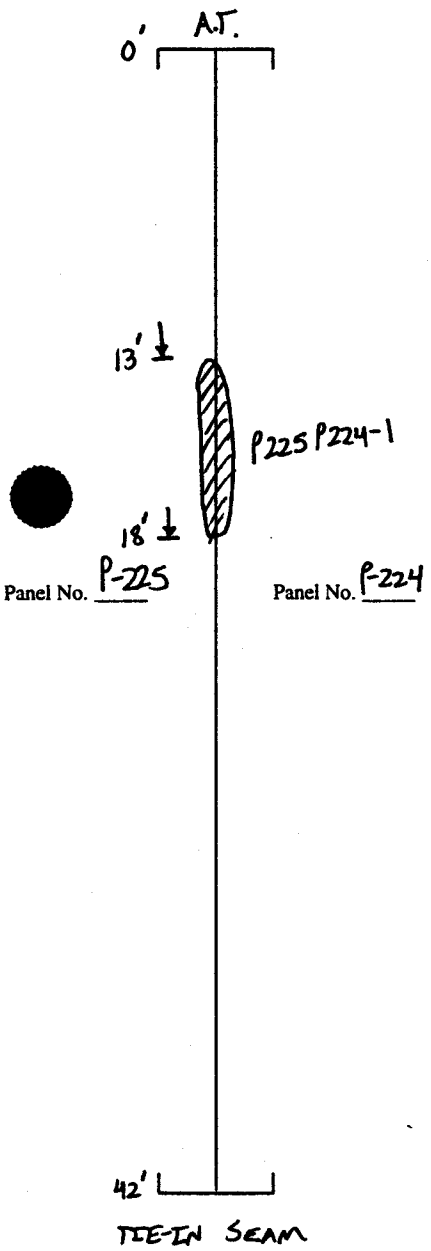
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P225/P224
Seam Length: 42'
Comments: 775/50

Welding Unit No.: MM-2
Time Welded: 4:10 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P225 P224-1	RESTART	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

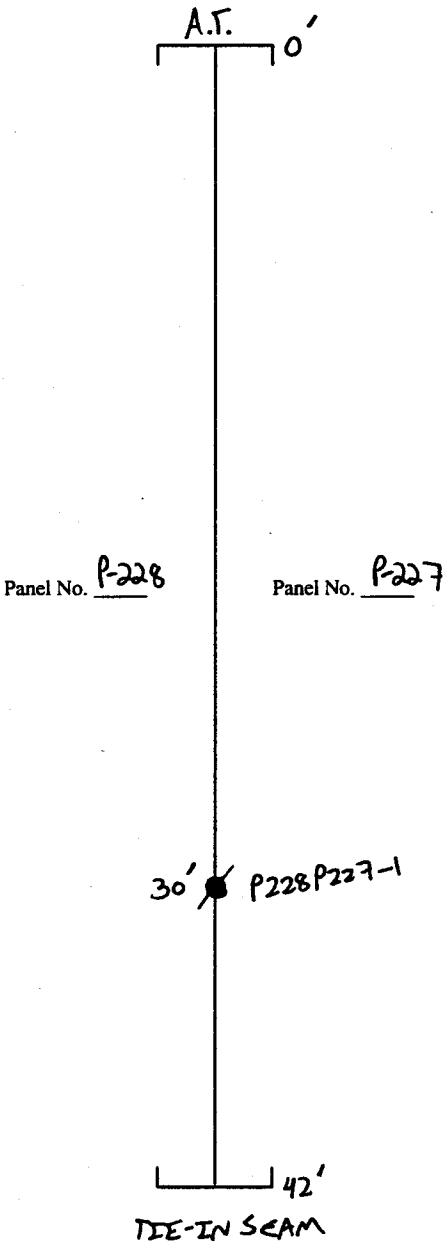
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P228 P227
Seam Length: 42'
Comments: 750/60

Welding Unit No.: MM1
Time Welded: 4:10 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P228P227-1	BURN THRU	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

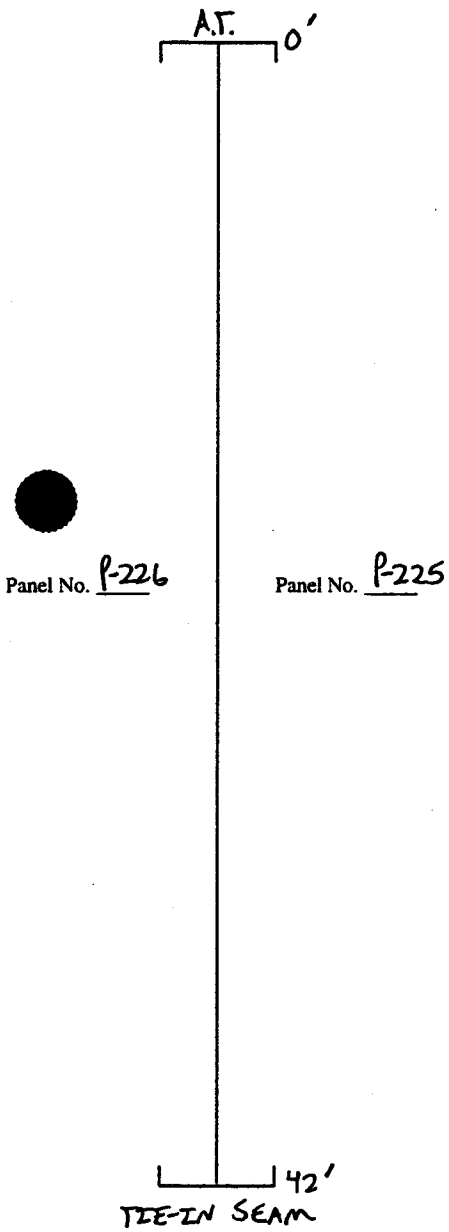
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P226/P225
Seam Length: 42'
Comments: 775/50
Welding Unit No.: MMZ
Time Welded: 4:12 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

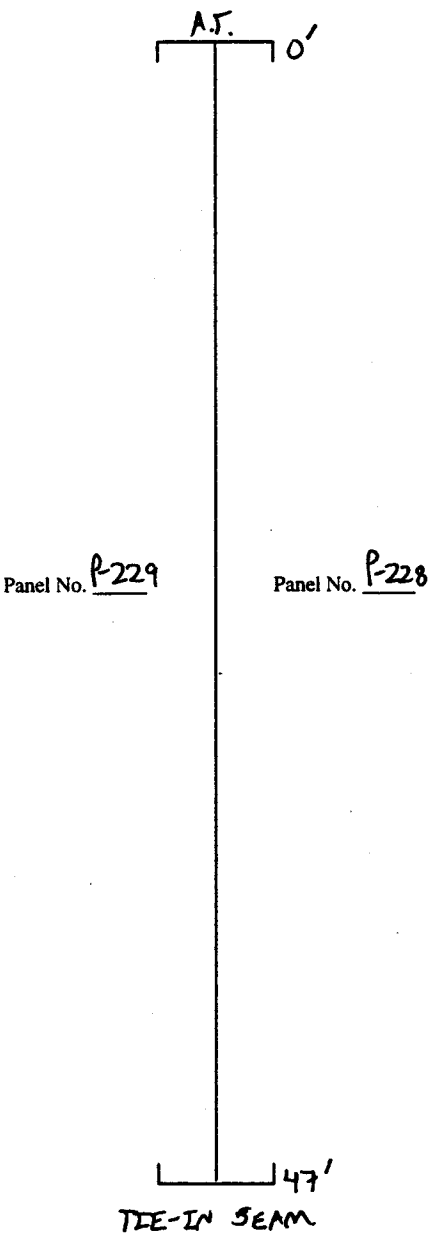
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P229 / P228
Seam Length: 47'
Comments: 750/60

Welding Unit No.: MM-1
Time Welded: 4:16 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

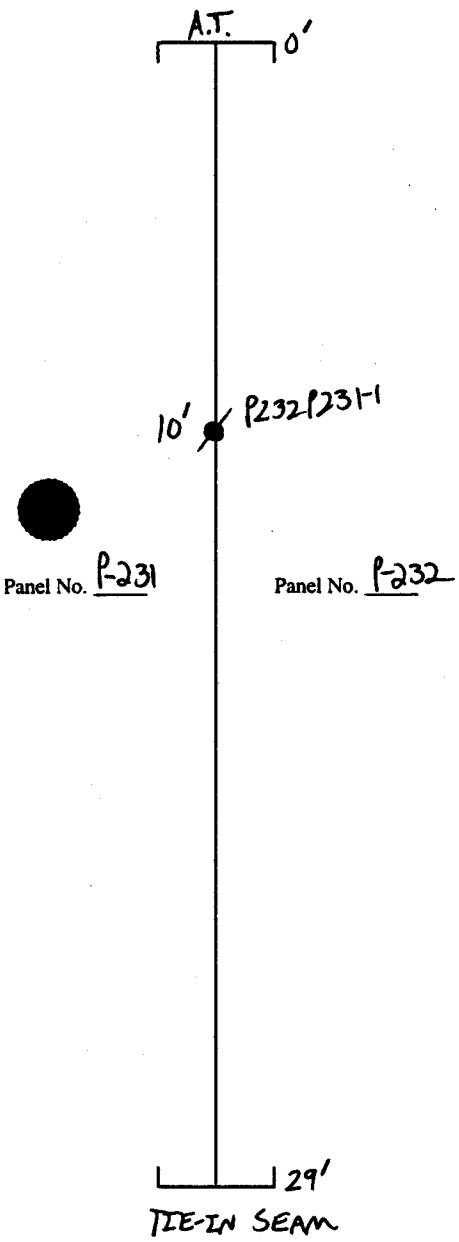
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P232/P231
Seam Length: 29'
Comments: 775/50

Welding Unit No.: MM2
Time Welded: 4:16 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊞	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P232/P231-1	BURN THRU	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

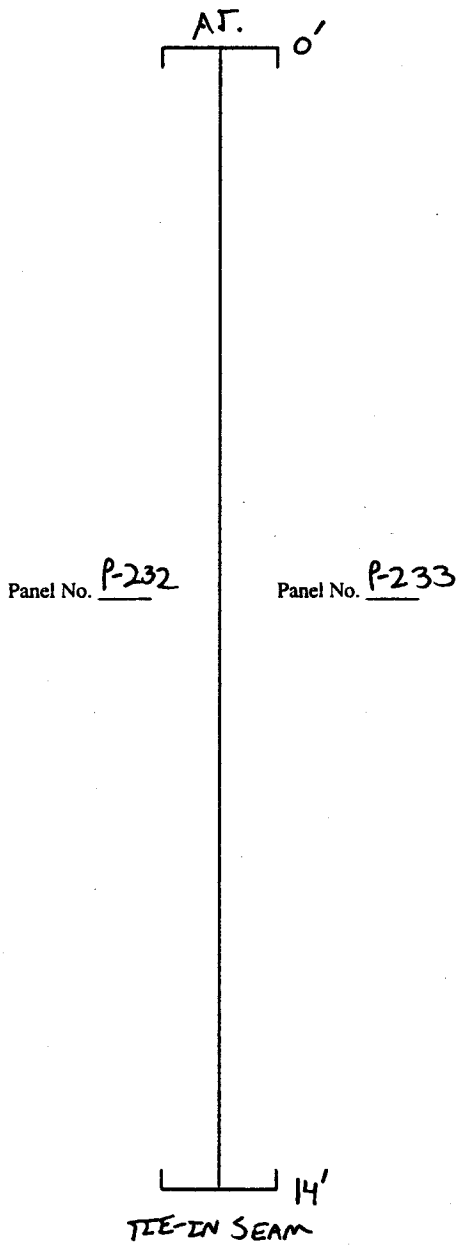
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P233/P232
Seam Length: 14'
Comments: 775 KSO

Welding Unit No.: MM2
Time Welded: 4:20 A.M. / P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No Repairs			

HAZEN AND SAWYER
Environmental Engineers & Scientists

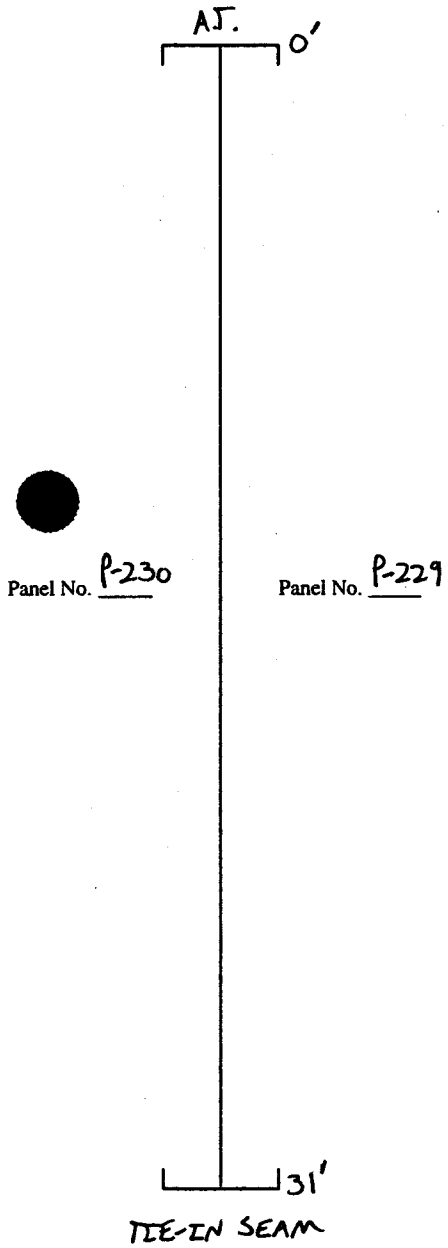
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P230/P229
Seam Length: 31'
Comments: 750/60
Welding Unit No.: MM1
Time Welded: 4:23 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

CQA SEAM INSPECTION FORM

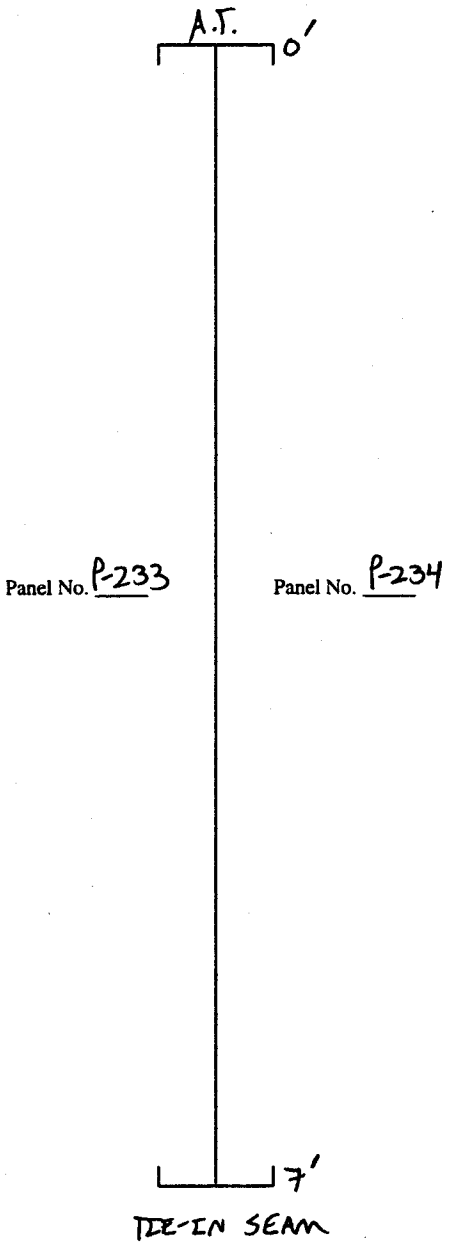
Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P234/P233
Seam Length: 7'
Comments: 775/50

Welding Unit No.: MM2
Time Welded: 4:25 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
No REPAIRS			

HAZEN AND SAWYER
Environmental Engineers & Scientists

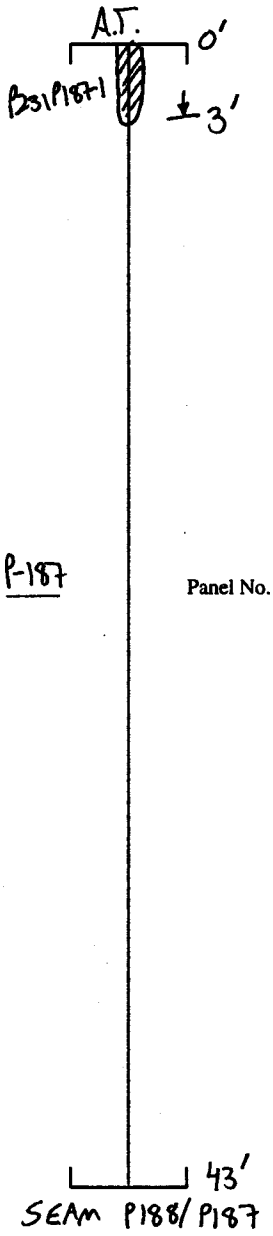
CQA SEAM INSPECTION FORM

Sheet 1 of 1

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: BH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: P231/P187
Seam Length: 43'
Comments: 750/60
Welding Unit No.: MM1
Time Welded: 4:30 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
P231 P187-1	BURN THRU	5/12 V-BOX	FCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

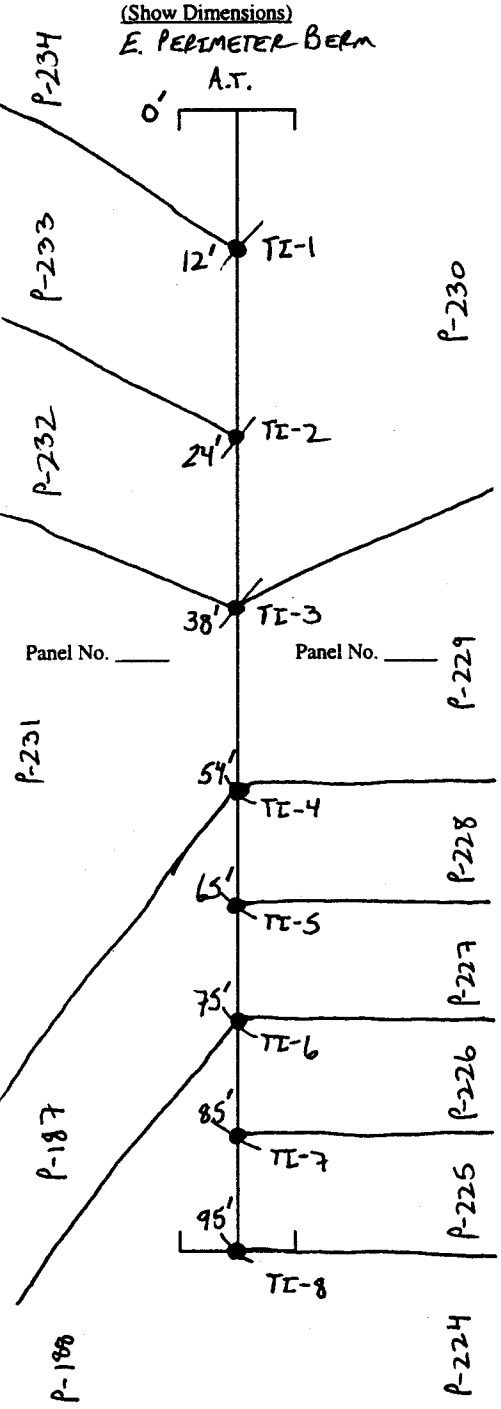
CQA SEAM INSPECTION FORM

Sheet 1 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH / RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: EAST PERIMETER BERM TIE-IN
Seam Length: 324' (TOTAL)
Comments:
MH WELDED 0' TO 145' AND 265' TO E.O.S.
RH WELDED 145' TO 265'
Welding Unit No.: MM2 / MM1
Time Welded: 4:35 A.M. / P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

	ZONE 1 Air Pressure Zone
	Repair Needed
	Repair Completed
	Repair Tested
	Repair Approved
	Destructive Sample
	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-1 THRU	SEAM	5/12	RCB
TI-8	JUNCS.	V-BOX	

HAZEN AND SAWYER
Environmental Engineers & Scientists

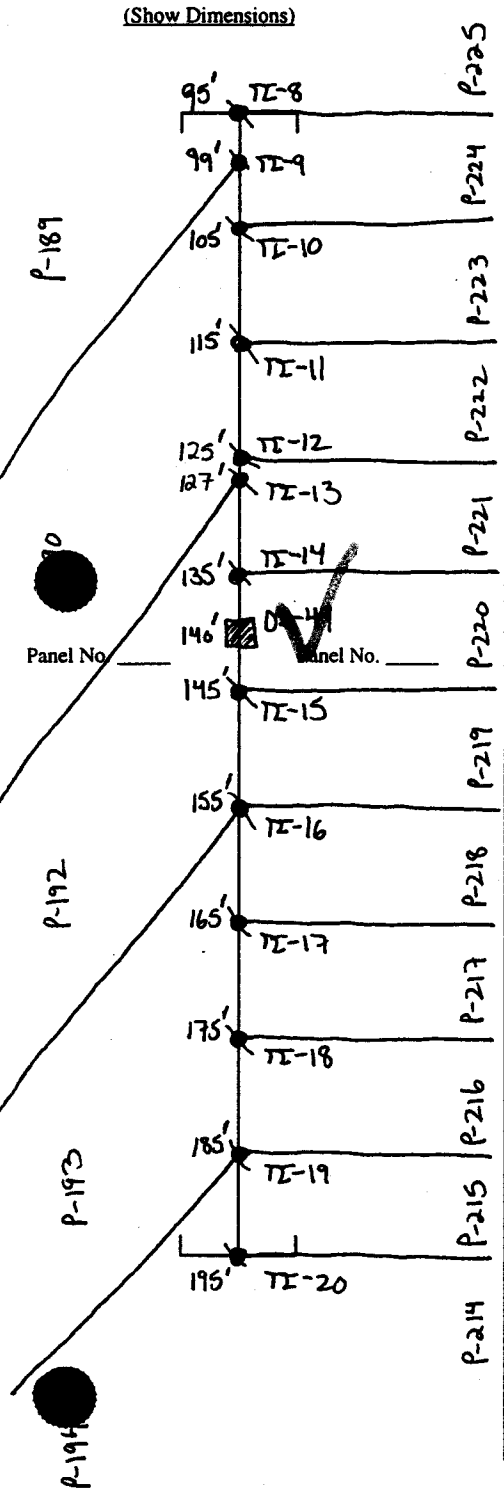
CQA SEAM INSPECTION FORM

Sheet 2 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH / RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: EAST PERIMETER BERM TIE-IN
Seam Length: 324' (TOTAL)
Comments:
MH WELDED 0' TO 145' AND 265' TO E.O.S.
RH WELDED 145' TO 265'
Welding Unit No.: MM2 / MM1
Time Welded: 4:35 A.M./P.M.

SEAM DETAIL ✓
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-9 THRU	SEAM	5/12	RCB
TI-20	JUNCS.	V-BOX	
DS-49	DESTRUCT	5/12 V-BOX	RCB

HAZEN AND SAWYER
Environmental Engineers & Scientists

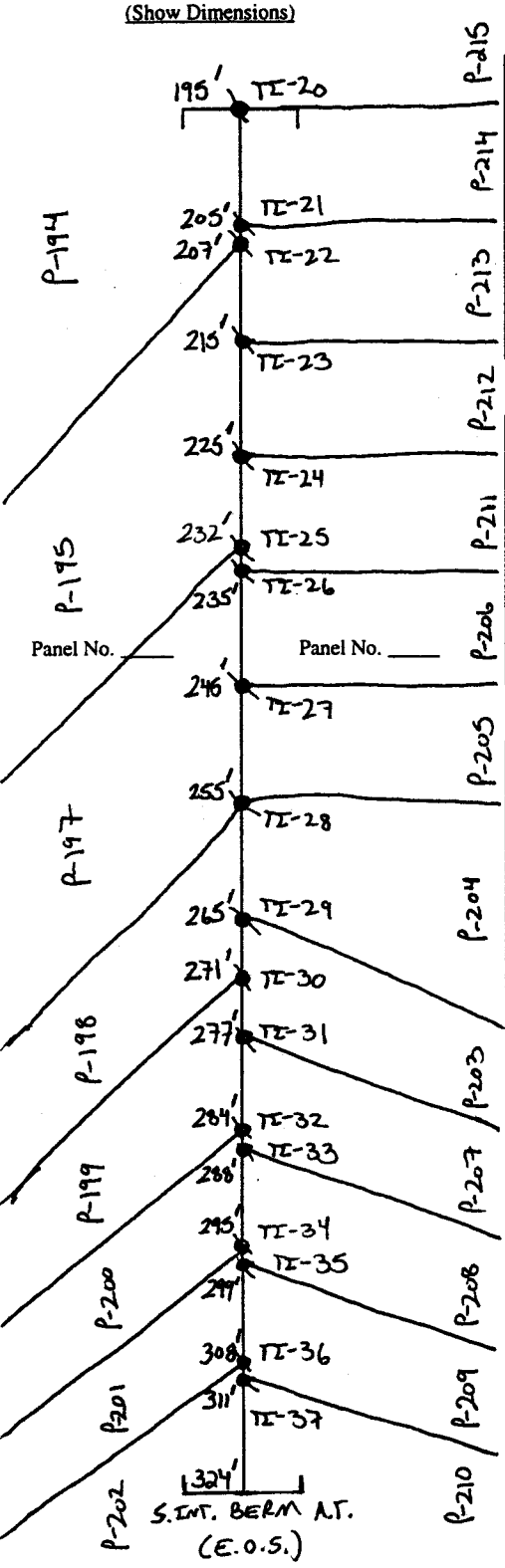
CQA SEAM INSPECTION FORM

Sheet 3 of 3

Project: Halifax Co. Coal Ash Monofill – Cell 2
Project No.: 3786-004
Contractor: Barnhill Contracting Company
Installer: Mid-America Lining Company
Welding Tech.: MH/RH
Type of Welder: WEDGE
Date Welded: 5/9/99

Seam No.: EAST PERIMETER BERM TIE-IN
Seam Length: 324' (TOTAL)
Comments:
MH WELDED 0' TO 145' AND 265' TO E.O.S.
RH WELDED 145' TO 265'
Welding Unit No.: MM2/MM1
Time Welded: 4:35 A.M./P.M.

SEAM DETAIL
(Show Dimensions)



1. Vacuum Box Testing

ZONE	LENGTH	
		Date Tested:
		CQA Tech's Initials:
		No. of Defects Found:
		Date Repairs Made:
		Date Retested:
		Date Inspected & Approved:

2. Air Pressure Testing

Start Time	Start Pressure (PSI)	End Time	End Pressure (PSI)	Zone	Length (FT)	Pressure Loss (PSI)	Approved (Y/N)	If NO, Corrective Action	Approved By

Legend

I	ZONE 1 Air Pressure Zone
○	Repair Needed
⊗	Repair Completed
●	Repair Tested
●/	Repair Approved
⊟	Destructive Sample
▨	Cap Strip Repair

3. Seam Repairs (Patches)

REPAIR NO.	DEFECT TYPE	DATE/NDT TYPE	APPROVED BY
TI-21 THRU	SEAM	5/12	RCB
TI-37	JUNCS.	V-BOX	

HAZEN AND SAWYER
Environmental Engineers & Scientists

APPENDIX 3.10
DESTRUCTIVE SEAM TESTING RESULTS

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF GEOMEMBRANE DESTRUCTIVE SEAM TEST RESULTS

Sample Number	Sample Location (Seam No.)	Date Seamed	Date Tested	Average Peel Adhesion (lb/in)	Average Shear Strength (lb/in)	Testing Laboratory	Comments
DS-1	P6/P5	4/26/99	4/27/99	32.5	50.6	Field	Qualified
DS-2	P15/P14	4/26/99	4/27/99	35.3	54.2	Field	Qualified
DS-3	P30/P29	4/26/99	4/27/99	36.0	49.6	Field	Qualified
DS-4	P38/P37	4/27/99	4/27/99	37.5	52.2	Field	Qualified
DS-5	P50/P51	4/27/99	5/10/99	36.5	47.6	Field	Qualified
			10/14/99	42.0	59.0	TRI/Environmental	Qualified
DS-6	P48/P49	4/27/99	5/10/99	34.3	42.4	Field	Qualified
DS-7	P54/P55	5/3/99	5/10/99	38.9	46.0	Field	Qualified
DS-8	P57/P58	5/3/99	5/10/99	36.2	46.6	Field	Qualified
DS-9	P59/P60	5/3/99	5/10/99	37.6	43.0	Field	Qualified
DS-10	P63/P64	5/3/99	5/14/99	47.1	50.0	Precision Labs	Qualified
			5/10/99	37.7	43.8	Field	Qualified
DS-11	P66/P67	5/3/99	5/10/99	38.5	49.0	Field	Qualified
DS-12	P73/P74	5/4/99	5/11/99	42.8	50.4	Field	Qualified
DS-13	P75/P76	5/4/99	5/11/99	41.1	60.4	Field	Qualified
DS-14	P77/P78	5/4/99	5/11/99	44.2	50.8	Field	Qualified
DS-15	P81/P82	5/4/99	5/11/99	42.2	51.0	Field	Qualified
DS-16	P84/P85	5/4/99	5/14/99	44.2	56.2	Precision Labs	Qualified
			5/11/99	34.0	47.0	Field	Qualified
DS-17	P87/P88	5/4/99	5/11/99	39.5	47.4	Field	Qualified
DS-18	P91/P92	5/4/99	5/11/99	34.5	43.4	Field	Qualified
DS-19	P95/P96	5/4/99	5/11/99	34.7	43.0	Field	Qualified
DS-20	P98/P99	5/4/99	5/14/99	46.3	64.2	Precision Labs	Qualified
			5/11/99	40.1	54.6	Field	Qualified
DS-21	P100/P99	5/5/99	5/11/99	37.5	46.0	Field	Qualified
DS-22	P103/P102	5/5/99	5/11/99	36.8	42.4	Field	Qualified
DS-23	P108/P107	5/5/99	5/11/99	36.1	44.2	Field	Qualified
DS-24	P112/P111	5/5/99	5/11/99	34.0	45.8	Field	Qualified
DS-25	P117/P116	5/5/99	5/11/99	41.0	51.8	Field	Qualified
DS-26	P120/P119	5/5/99	5/14/99	42.4	63.8	Precision Labs	Qualified
			5/11/99	36.3	50.4	Field	Qualified
DS-27	P122/P121	5/6/99	5/11/99	37.1	48.2	Field	Qualified
DS-28	P123/P122	5/6/99	5/11/99	40.1	49.0	Field	Qualified
DS-29	P124/P123	5/7/99	5/11/99	40.6	50.6	Field	Qualified
DS-30	P127/P126	5/7/99	5/11/99	36.3	45.0	Field	Qualified
			10/14/99	47.0	60.0	TRI/Environmental	Qualified
DS-31	P129/P128	5/7/99	5/11/99	40.8	49.6	Field	Qualified
DS-32	P135/P134	5/7/99	5/11/99	40.4	51.4	Field	Qualified
DS-33	P141/P140	5/7/99	5/11/99	44.3	54.0	Field	Qualified
DS-34	P143/P142	5/7/99	5/11/99	40.3	50.4	Field	Qualified

HALIFAX COUNTY COAL ASH MONOFILL
CELL 2 CONSTRUCTION

SUMMARY OF GEOMEMBRANE DESTRUCTIVE SEAM TEST RESULTS

Sample Number	Sample Location (Seam No.)	Date Seamed	Date Tested	Average Peel Adhesion (lb/in)	Average Shear Strength (lb/in)	Testing Laboratory	Comments
DS-35	P147/P146	5/7/99	5/11/99	40.0	47.2	Field	Qualified
DS-36	P150/P149	5/7/99	5/11/99	41.0	50.4	Field	Qualified
DS-37	P155/P154	5/7/99	5/14/99	41.8	63.8	Precision Labs	Qualified
			5/11/99	37.5	45.0	Field	Qualified
DS-38	P158/P157	5/8/99	5/12/99	34.8	41.4	Field	Qualified
DS-39	P161/P160	5/8/99	5/12/99	35.2	40.4	Field	Qualified
DS-40	P166/P165	5/8/99	5/14/99	46.1	61.0	Precision Labs	Qualified
			5/12/99	33.3	40.6	Field	Qualified
DS-41	P168/P167	5/8/99	5/12/99	34.7	39.6	Field	Qualified
DS-42	P171/P170	5/8/99	5/12/99	34.3	41.0	Field	Qualified
DS-43	P174/P173	5/9/99	5/14/99	47.1	59.8	Precision Labs	Qualified
			5/12/99	31.8	39.0	Field	Qualified
DS-44	P181/P180	5/9/99	5/12/99	28.9	42.4	Field	Qualified
DS-45	P186/P185	5/9/99	5/12/99	30.6	40.8	Field	Qualified
DS-46	P189/P188	5/9/99	5/12/99	33.6	40.8	Field	Qualified
			10/14/99	48.0	49.0	TRI/Environmental	Qualified
DS-47	P194/P193	5/9/99	5/12/99	27.8	37.0	Field	Qualified
DS-48	P212/P211	5/9/99	5/12/99	29.8	41.0	Field	Qualified
DS-49	P220/P192	5/9/99	5/12/99	29.5	38.4	Field	Qualified
DS-50	P227/P226	5/9/99	5/12/99	33.8	43.4	Field	Qualified

NOTES:

1. Project requirements are Minimum Average Peel Adhesion of 20 lb/in and Minimum Average Shear Strength of 35 lb/in.
2. Field testing performed by Mid-America Lining Company.
3. Laboratory testing performed by Precision Geosynthetic Laboratories and TRI/Environmental, Inc.

Precision Geosynthetic Laboratories

July 14, 1999

VERIFICATION OF MATERIAL PROPERTIES
Unreinforced Polypropylene Seam
HALIFAX COUNTY LANDFILL

FOR: MID AMERICA LINING CO., INC.
(Reference: PGL Job No. 990391)

MATERIAL DESCRIPTION: Unreinforced Polypropylene seam **No. of MATERIALS:** (7)

ORIGIN OF MATERIAL: INN OF ROANOKE RAPIDS / Roanoke Rapids, NC

DATE RECEIVED: May 14, 1999 **SHIPPER:** Federal Express.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
DS- 10	C #37557
DS- 16	C #37558
DS- 20	C #37559
DS- 37	C #37560
DS- 40	C #37561
DS- 43	C #37562
DS- 26	C #37563

TESTS REQUIRED:

DESCRIPTION	TEST METHOD
Seam Peel Adhesion	ASTM D4437 (As modified by NSF-54, 1993)
Bonded Seam Strength	ASTM D4437 (As modified by NSF-54, 1993)

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 23 ± 2°C (73.1 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Tables 1 through 4. The units in which the data are reported are included on the tables. Break types are defined as Film- tear bond (FTB) and separation (AD).

PRECISION GEOSYNTHETIC LABORATORIES

Cora B. Queja
Quality Assurance

Ronald E. Belanger
Technical Director

1742 West Katella Ave., Suite #4, Orange, CA 92867 TEL : (714) 744-4599 FAX : (714) 744-0357

TABLE 1
QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **MID AMERICA LINING CO., INC.**
PROJECT: **HALIFAX COUNTY LANDFILL**
DATE REC'D: **14-May-99**

MATERIAL: **Unreinforced Polypropylene Seam**
SEAM TYPE: **Heat Fusion Weld**
PGL JOB #: **990391**

TEST METHOD: **ASTM D4437**
DATE REISSUED REPORT: **14-Jul-99**

		SHEAR EVALUATION				PEEL EVALUATION					
SAMPLE ID	PGL CONTROL #	MAXIMUM STRENGTH (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	% PEEL (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
DS- 10	37557	50	>50	FTB		1 Outside	48	<10	SE	FTB	
						2 Outside	48	<10	SE	FTB	
		51	>50	FTB		3 Outside	48	<10	SE	FTB	
						4 Outside	46	<10	SE	FTB	
		51	>50	FTB		5 Outside	48	<10	SE	FTB	
						AVG:	48				N/A
		45	>50	FTB		STD. DEV.	1				
						1 Inside	48	<10	SE	FTB	
		53	>50	FTB		2 Inside	44	<10	SE	FTB	
						3 Inside	47	<10	SE	FTB	
						4 Inside	48	<10	SE	FTB	
						5 Inside	46	<10	SE	FTB	
	AVG.	50			N/A	AVG:	47				N/A
	STD. DEV.	3				STD. DEV.	2				
DS- 16	37558	57	>50	FTB		1 Outside	44	<10	SE	FTB	
						2 Outside	44	<10	SE	FTB	
		51	>50	FTB		3 Outside	46	<10	SE	FTB	
						4 Outside	44	<10	SE	FTB	
		58	>50	FTB		5 Outside	44	<10	SE	FTB	
						AVG:	44				N/A
		57	>50	FTB		STD. DEV.	1				
						1 Inside	44	<10	SE	FTB	
		58	>50	FTB		2 Inside	44	<10	SE	FTB	
						3 Inside	44	<10	SE	FTB	
						4 Inside	45	<10	SE	FTB	
						5 Inside	43	<10	SE	FTB	
	AVG:	56			N/A	AVG:	44				N/A
	STD. DEV.	3				STD. DEV.	1				

BREAK DESCRIPTION (NSF 54, 1993):

AD	ADHESION FAILURE.
BRK	BREAK IN SHEETING.
SE1	BREAK AT OUTER EDGE OF SEAM.
SE2	BREAK AT INNER EDGE OF SEAM THROUGH BOTH SHEETS.
AD-BRK	BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
FTB	FILM-TEAR BOND.

Precision Geosynthetic Laboratories

TABLE
QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **MID AMERICA LINING CO., INC.**
PROJECT: **HALIFAX COUNTY LANDFILL**
DATE REC'D: **14-May-99**

MATERIAL: **Unreinforced Polypropylene Seam**
SEAM TYPE: **Heat Fusion Weld**
PGL JOB #: **990391**

TEST METHOD: **ASTM D4437**
DATE REISSUED REPORT: **14-Jul-99**

		SHEAR EVALUATION				PEEL EVALUATION					
SAMPLE ID	PGL CONTROL #	MAXIMUM STRENGTH (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	% PEEL (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
DS- 20	**37559**	64	>50	FTB		1 Outside	46	<10	SE	FTB	
						2 Outside	44	<10	SE	FTB	
		65	>50	FTB		3 Outside	46	<10	SE	FTB	
						4 Outside	48	<10	SE	FTB	
		61	>50	FTB		5 Outside	48	<10	SE	FTB	
						AVG:	**46**				*N/A*
		64	>50	FTB		*STD. DEV.*	**2**				
						1 Inside	46	<10	SE	FTB	
		67	>50	FTB		2 Inside	44	<10	SE	FTB	
						3 Inside	50	<10	SE	FTB	
						4 Inside	45	<10	SE	FTB	
						5 Inside	46	<10	SE	FTB	
	AVG.	**64**			*N/A*	*AVG:*	**46**				*N/A*
	STD. DEV.	**2**				*STD. DEV.*	**2**				
DS- 37	**37560**	62	>50	FTB		1 Outside	42	<10	SE	FTB	
						2 Outside	41	<10	SE	FTB	
		62	>50	FTB		3 Outside	42	<10	SE	FTB	
						4 Outside	40	<10	SE	FTB	
		66	>50	FTB		5 Outside	40	<10	SE	FTB	
						AVG:	**41**				*N/A*
		63	>50	FTB		*STD. DEV.*	**1**				
						1 Inside	44	<10	SE	FTB	
		66	>50	FTB		2 Inside	42	<10	SE	FTB	
						3 Inside	43	<10	SE	FTB	
						4 Inside	42	<10	SE	FTB	
						5 Inside	42	<10	SE	FTB	
	AVG:	**64**			*N/A*	*AVG:*	**43**				*N/A*
	STD. DEV.	**2**				*STD. DEV.*	**1**				

BREAK DESCRIPTION (NSF 54, 1993):

AD	ADHESION FAILURE.
BRK	BREAK IN SHEETING.
SE1	BREAK AT OUTER EDGE OF SEAM.
SE2	BREAK AT INNER EDGE OF SEAM THROUGH BOTH SHEETS.
AD-BRK	BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
FTB	FILM-TEAR BOND.

Precision Geosynthetic Laboratories

TABLE
QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **MID AMERICA LINING CO., INC.**
PROJECT: **HALIFAX COUNTY LANDFILL**
DATE REC'D: **14-May-99**

MATERIAL: **Unreinforced Polypropylene Seam**
SEAM TYPE: **Heat Fusion Weld**
PGL JOB #: **990391**

TEST METHOD: **ASTM D4437**
DATE REISSUED REPORT: **14-Jul-99**

		SHEAR EVALUATION				PEEL EVALUATION					
SAMPLE ID	PGL CONTROL #	MAXIMUM STRENGTH (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	% PEEL (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
DS- 40	**37561**	62	>50	FTB		1 Outside	48	<10	SE	FTB	
						2 Outside	48	<10	SE	FTB	
		61	>50	FTB		3 Outside	48	<10	SE	FTB	
						4 Outside	46	<10	SE	FTB	
		63	>50	FTB		5 Outside	44	<10	SE	FTB	
						AVG:	**47**				*N/A*
		61	>50	FTB		*STD. DEV.*	**2**				
						1 Inside	42	<10	SE	FTB	
		58	>50	FTB		2 Inside	45	<10	SE	FTB	
						3 Inside	48	<10	SE	FTB	
						4 Inside	46	<10	SE	FTB	
						5 Inside	46	<10	SE	FTB	
	AVG.	**61**			*N/A*	***AVG:***	**45**				*N/A*
	STD. DEV.	**2**				*STD. DEV.*	**2**				
DS- 43	**37562**	55	>50	FTB		1 Outside	50	<10	SE	FTB	
						2 Outside	44	<10	SE	FTB	
		59	>50	FTB		3 Outside	46	<10	SE	FTB	
						4 Outside	46	<10	SE	FTB	
		63	>50	FTB		5 Outside	44	<10	SE	FTB	
						AVG:	**46**				*N/A*
		62	>50	FTB		*STD. DEV.*	**2**				
						1 Inside	50	<10	SE	FTB	
		60	>50	FTB		2 Inside	48	<10	SE	FTB	
						3 Inside	46	<10	SE	FTB	
						4 Inside	47	<10	SE	FTB	
						5 Inside	50	<10	SE	FTB	
	AVG:	**60**			*N/A*	***AVG:***	**48**				*N/A*
	STD. DEV.	**3**				*STD. DEV.*	**2**				

BREAK DESCRIPTION (NSF 54, 1993):

AD	ADHESION FAILURE.
BRK	BREAK IN SHEETING.
SE1	BREAK AT OUTER EDGE OF SEAM.
SE2	BREAK AT INNER EDGE OF SEAM THROUGH BOTH SHEETS.
AD-BRK	BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
FTB	FILM-TEAR BOND.

Precision Geosynthetic Laboratories

TABLE
QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **MID AMERICA LINING CO., INC.**
PROJECT: **HALIFAX COUNTY LANDFILL**
DATE REC'D: **14-May-99**

MATERIAL: **Unreinforced Polypropylene Seam**
SEAM TYPE: **Heat Fusion Weld**
PGL JOB #: **990391**

TEST METHOD: **ASTM D4437**
DATE REISSUED REPORT: **14-Jul-99**

		SHEAR EVALUATION				PEEL EVALUATION					
SAMPLE ID	PGL CONTROL #	MAXIMUM STRENGTH (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	% PEEL (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
DS- 26	37563	62	>50	FTB		1 Outside	42	<10	SE	FTB	
						2 Outside	42	<10	SE	FTB	
		63	>50	FTB		3 Outside	43	<10	SE	FTB	
						4 Outside	42	<10	SE	FTB	
		65	>50	FTB		5 Outside	41	<10	SE	FTB	
						AVG:	42				N/A
		64	>50	FTB		STD. DEV.	1				
						1 Inside	46	<10	SE	FTB	
		65	>50	FTB		2 Inside	42	<10	SE	FTB	
						3 Inside	43	<10	SE	FTB	
						4 Inside	42	<10	SE	FTB	
						5 Inside	41	<10	SE	FTB	
	AVG.	64			N/A	AVG:	43				N/A
	STD. DEV.	1				STD. DEV.	2				

BREAK DESCRIPTION (NSF 54, 1993):

AD	ADHESION FAILURE.
BRK	BREAK IN SHEETING.
SE1	BREAK AT OUTER EDGE OF SEAM.
SE2	BREAK AT INNER EDGE OF SEAM THROUGH BOTH SHEETS.
AD-BRK	BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
FTB	FILM-TEAR BOND.

Precision Geosynthetic Laboratories

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: HAZEN AND SAWYER
PROJECT: HALIFAX COUNTY COAL ASH MONOFILL
JOB #: 3786-004
CONTACT: MR. ROBERT C. BAKER
DATE REC'D: 14-Oct-99

MATERIAL: fPE
SEAM TYPE: SINGLE WEDGE WELD
TRI LOG #: E2127-99-02
DATE TESTED: 14-Oct-99

ASTM D 4437/413/3083 NSF Modified
ANALYST: EMB
REVIEW: SRA
REPORT DATE: 14-Oct-99

		PEEL EVALUATION					SHEAR EVALUATION			
SAMPLE NUMBER	SPECIMEN NUMBER	MAXIMUM TENSION (lb/in)	PEEL INCURSION (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	MAXIMUM TENSION (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
DS-5	1	43	<10	SE	FTB	20	40	> 50	FTB	35
	2	43	<10	SE	FTB					
	3	43	<10	SE	FTB		63	> 50	FTB	
	4	42	<10	SE	FTB					
	5	41	<10	SE	FTB		63	> 50	FTB	
	MEAN:	42								
							66	> 50	FTB	
							61	> 50	FTB	
						MEAN:	59			
DS-30	1	45	<10	SE	FTB	20	52	> 50	FTB	35
	2	44	<10	SE	FTB					
	3	47	<10	SE	FTB		65	> 50	FTB	
	4	50	<10	SE	FTB					
	5	47	<10	SE	FTB		63	> 50	FTB	
	MEAN:	47								
							60	> 50	FTB	
							58	> 50	FTB	
						MEAN:	60			

The testing herein is based upon accepted industry practice as well as the test methond listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

9063 Bee Caves Road • Austin, Texas 78733-6201 • (512)263-2101 • FAX (512)263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

QUALITY ASSURANCE TESTING
GEOMEMBRANE SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: HAZEN AND SAWYER
PROJECT: HALIFAX COUNTY COAL ASH MONOFILL
JOB #: 3786-004
CONTACT: MR. ROBERT C. BAKER
DATE REC'D: 14-Oct-99

MATERIAL: fPE
SEAM TYPE: SINGLE WEDGE WELD
TRI LOG #: E2127-99-02
DATE TESTED: 14-Oct-99

ASTM D 4437/413/3083 NSF Modified
ANALYST: EMB
REVIEW: SRH
REPORT DATE: 14-Oct-99

		PEEL EVALUATION					SHEAR EVALUATION			
SAMPLE NUMBER	SPECIMEN NUMBER	MAXIMUM TENSION (lb/in)	PEEL INCURSION (%)	LOCUS OF FAILURE	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)	MAXIMUM TENSION (lb/in)	ELONGATION @ BREAK (%)	NSF 54 FAILURE MODE	PROJECT SPEC. (lb/in)
	1	46	<10	SE	FTB	20	44	> 50	FTB	35
	2	50	<10	SE	FTB					
	3	48	<10	SE	FTB		51	> 50	FTB	
	4	*								
	5	*					51	> 50	FTB	
DS-46	MEAN:	48								
							*			
							*			
						MEAN:	49			

*Insufficient material to test required number of replicates.

The testing herein is based upon accepted industry practice as well as the test methond listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

9063 Bee Caves Road • Austin, Texas 78733-6201 • (512)263-2101 • FAX (512)263-2558

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

TRI GEOSYNTHETICS TESTING SERVICES
QUALITY ASSURANCE SEAM TEST REPORT LEGEND

Seam Failure Modes (as per NSF 54, Appendix A)

FTB:	Film Tearing Bond
BLF:	Brittle Liner Failure
NON FTB:	Non Film Tearing Bond

Locus/Break Codes: Dielectric/Solvent Welds

CL:	Break in sheeting at clamp edge.
BRK:	Break in sheeting.
SE:	Break at seam edge.
AD-BRK:	Break in sheeting after some adhesion failure between sheets.
AD:	Failure in adhesion between sheets.

Locus/Break Codes: Fillet Weld Seams

AD1:	Failure in adhesion. Specimens delaminate under bead and break through the extruded material in outer region.
AD2:	Failure in adhesion.
AD-WL:	Break through fillet weld.
SE:	Break at seam edge.
AD-BRK:	Break in bottom sheeting after some adhesion failure between the fillet and the bottom sheet (applicable to peel only).
HT:	Break at the edge of the hot tack for specimens which could not be delaminated in the hot tack.

Locus/Break Codes: Fabric Reinforced Liner

AD:	Adhesion failure resulting in delamination in the plane of the bond.
DEL:	Delamination in the plane of the scrim (peel only).
AD-DEL:	Delamination in the plane of the scrim after some delamination in the plane of the bond (peel only).
BRK:	Break in sheet through both the fabric and the piles of the polymer.
FP:	Fabric pullout. Pullout of threads parallel to the direction of test followed by break in polymeric sheeting.

The testing reported herein is based upon industry practice as well as the test method listed. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material.

9063 Bee Caves Road • Austin, TX 78733-6201 • (512) 263-2101 • FAX (512) 263-2558

APPENDIX 3.11
MID-AMERICA LINING
GEOMEMBRANE PANEL DIAGRAM

"Under Seperate Cover"

Section 4

SECTION 4
INTERNAL STORMWATER COLLECTION SYSTEM

4.0 INTERNAL STORMWATER COLLECTION SYSTEM

4.1 Overview

The Coal Ash Monofill design allows for settlement of suspended coal ash along the low end of a cell prior to draining of contact water from the cell. As runoff collects at the low end of the cell, it enters an aggregate-wrapped pipe drain that leads to a single sump. In this way, the potential for coal ash to be washed directly from the cell is minimized. The gravity discharge line from the sump leads directly to a detention basin where additional settling occurs prior to discharge.

For this project, an Internal Stormwater Collection System was constructed along the low (southern) end of Cell 2. In addition, the existing system in Cell 1 was upgraded.

The new systems consist of the following elements:

- Toe Drain;
- Sump/Riser;
- Discharge Piping.

Each element is discussed in detail in the paragraphs below.

4.2 Toe Drain

4.2.1 Cell 2

The toe drain constructed along the inside toe of the South Intermediate Berm consists of a 6-inch diameter perforated HDPE pipe surrounded by AASHTO No. 57 aggregate, as shown on Detail 3, Drawing G6 of the Record Drawings. The first step in construction was to place an approximately 10-foot wide layer of 16 ounce per square yard (oz/sy) Cushion Geotextile atop the Geomembrane. The perforated pipe was fusion welded on-site by Mid America Lining Co., and was then placed directly on the Cushion Geotextile. The location of the perforations were monitored to assure they faced downward as shown in the Drawings.

Once the HDPE collector pipe was placed in Cell 2, Barnhill placed No. 57 stone on the Cushion Geotextile using a hydraulic excavator located atop the South Intermediate Berm. The aggregate was allowed to roll slowly out of the excavator bucket to minimize risk of puncture to the Geomembrane. Once an initial lift of aggregate was placed, additional aggregate was placed (from less than 1-foot in height) on in-place aggregate. The aggregate drain was graded using the excavator bucket and hand labor as necessary to meet the minimum dimensions shown on Detail 3, Drawing G6 of the Record Drawings.

4.2.2 Cell 1

Two existing riser assemblies were removed from Cell 1 as part of the Cell 2 construction project. The risers were located at the eastern and western terminus of an 18-inch HDPE drain pipe, and were removed and discarded. The 18-inch piping was cut into 40 foot long sections and removed by the Contractor. In place of the 18-inch piping, a toe drain of similar construction to that of Cell 2 was installed. Installation of the toe drain was completed by working from a bench excavated in the coal ash disposed in Cell 1.

Coal ash and aggregate were removed from the toe drain area using a hydraulic excavator. A layer of Cushion Geotextile was placed atop the Cell 1 Operational Cover and the 6-inch diameter perforated HDPE pipe was installed. The No. 57 stone was placed in a similar manner as for Cell 2, except that Barnhill's equipment operated from a bench they excavated in the coal ash adjacent to the south berm of Cell 1.

4.3 Sump/Riser

4.3.1 Cell 2

The prefabricated HDPE sump for Cell 2 was installed during Cell 1 Construction and sealed with a temporary HDPE sheet. A concrete riser was placed over the sump during Cell 1 construction and the excavation was backfilled. During Cell 2 construction, the Contractor excavated the soil around the riser, removed the concrete riser, and exposed the HDPE sump. During Geomembrane installation, the temporary HDPE sheet was removed and the HDPE sump flange was exposed and visually inspected. The existing discharge line was flushed with water from the Cell 2 sump. Once Geomembrane installation was completed, a prefabricated HDPE riser was installed over the sump and the 6-inch toe-drain

collector pipes were welded to the riser. Details of the riser are provided on Drawing G6 of the Record Drawings. Shop submittals showing fabrication details of the riser assembly are provided in Appendix 4.1.

The interior of the 4-ft. diameter HDPE riser was fitted with a high strength fiberglass grating (Duradek, I-6000) and backfilled with ½-inch (nominal) washed gravel supplied by Hanson Sand and Gravel. Gradation data for the gravel are provided in Appendix 4.2.

Once the washed stone was placed in the riser, an HDPE lid was bolted to the top of the riser.

Synthetic Drainage Media (SDM), consisting of Geonet (Transnet 220) and Filter Geotextile (Amoco 4553) was placed beneath the riser and 50-feet to the north, east and west of the sump. SDM was placed a distance of 5-feet up the slope of the South Intermediate Berm in accordance with the Drawings. AASHTO No. 57 stone was placed around the riser using the method described previously, and to the dimensions shown on Section D, Drawing G6 of the Record Drawings.

4.3.2 Cell 1

The new sump riser installed for Cell 1 was identical to that previously described for Cell 2. Prior to installation of the riser in Cell 1, remaining aggregate was removed from the Cell 1 sump area. Barnhill then flushed the 12-inch diameter discharge line with water from a water truck.

The 6-inch diameter toe-drain pipe was butt fusion welded to the riser and the riser was placed over the Cell 1 sump. Fiberglass decking, washed gravel and a lid were installed as described for the Cell 2 riser. No. 57 stone was then placed around the riser.

4.4 Discharge Piping

The 12-inch diameter HDPE gravity discharge pipe for both Cells 1 and 2 was installed during Cell1 construction. During Cell 2 construction, the discharge piping was visually examined where it was exposed at the two sumps and at the discharge point in the existing

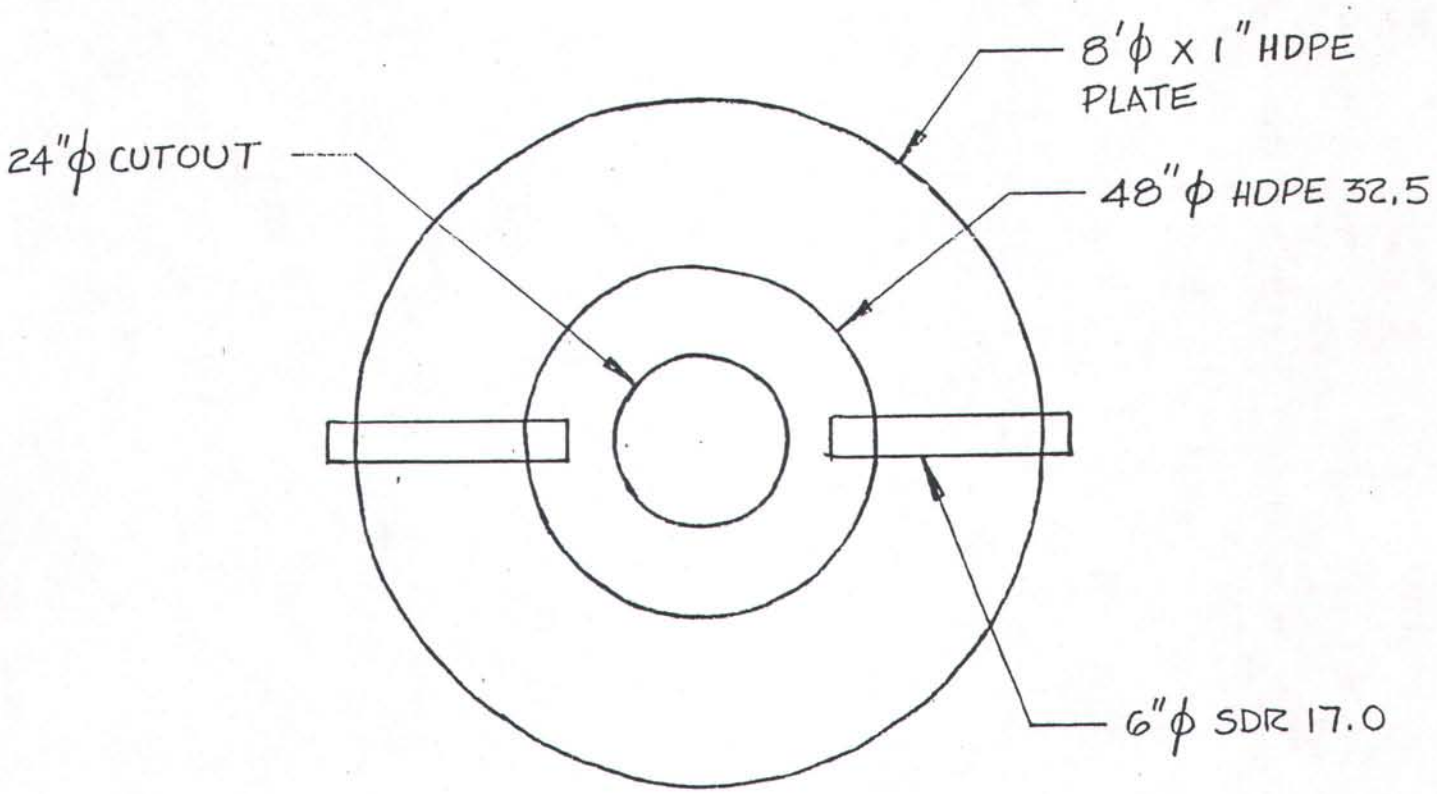
detention basin. Any debris observed was removed prior to and during flushing of the pipe by the Contractor. No damage was observed and no discharge piping was replaced.

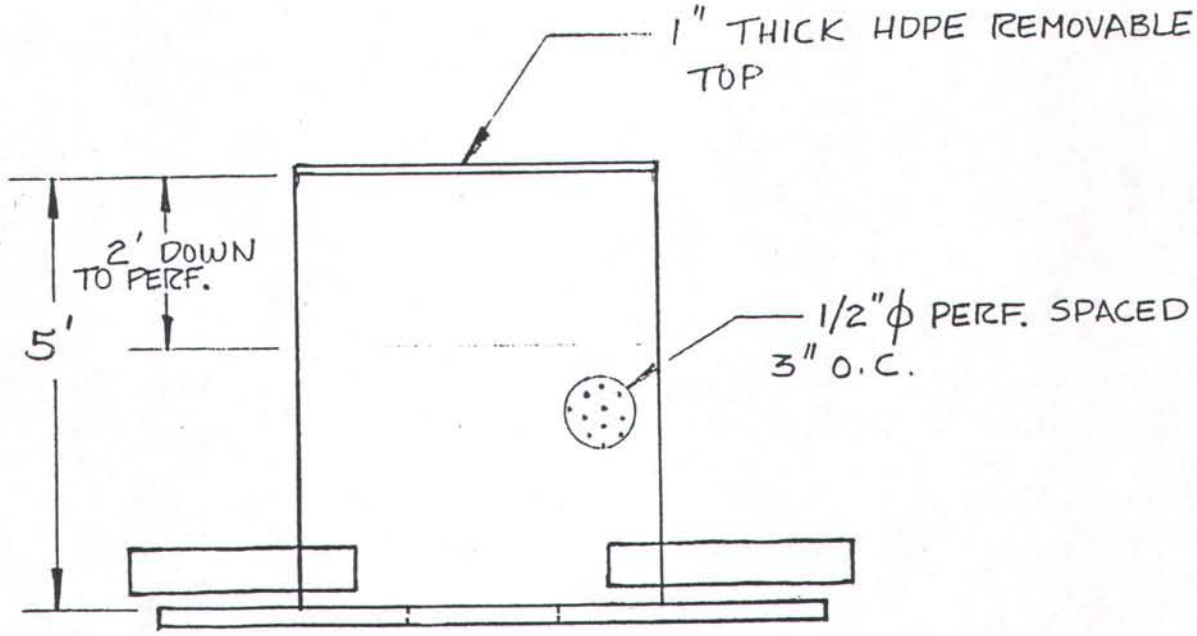
APPENDIX 4.1
HPDE RISER AND FIBERGLASS GRATING SUBMITTALS

Company FIFE PIPE COMPANY
Operation COLUMBIA, SC
Address 145 CALVIN DRIVE
Attention GREG L. LEHMAN
Subject CELL 2 SUMP RISER FABRICATIONS

Post-it® Fax Note 7671	Date	# of pages ▶
To	From	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

Particle Size_____ Psi_____ Gravity_____ Length_____ Elev_____ GPM_____





Form No.: 42483 Drawing No.: Date: 2/13/96 By: G. LEHMAN ©WD 1987

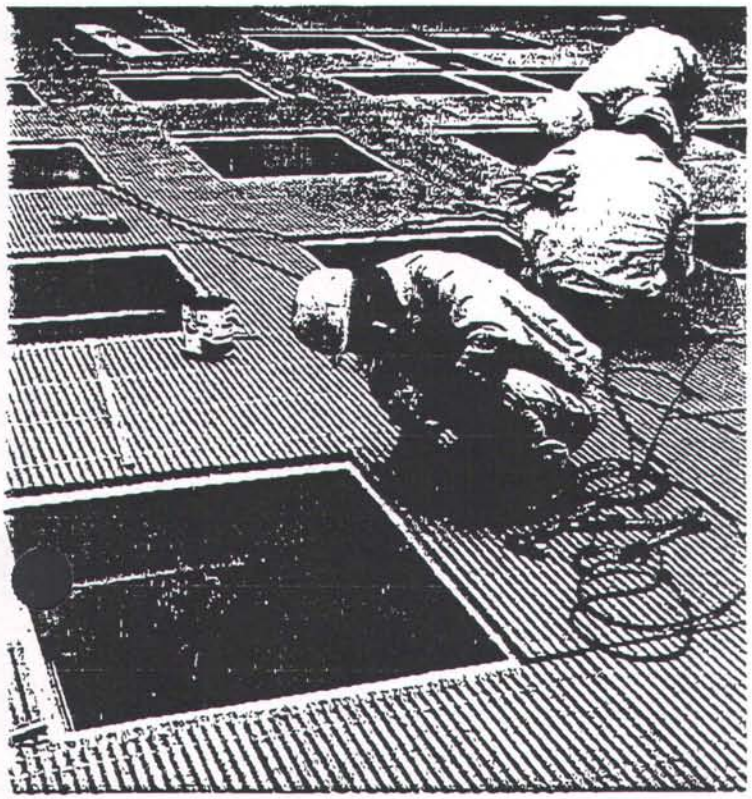
COMPANY

Approved as submitted

BY: S.R.

DATE 10/8/98

High Strength Fiberglass Grating



DURADEK® fiberglass grating manufactured with unique cross bar construction can be cut to any size like a solid sheet.

Features

DURADEK® fiberglass grating has had a dramatic effect on the way plant engineers view corrosion problems in industrial environments because DURADEK® is an ideal replacement for steel or aluminum gratings in these environments. Long life, inherent in fiberglass (often outlasts steel 20-to-1), makes DURADEK® a problem solving material where frequent grating and walkway replacement costs are unacceptable.

DURADEK® has these features:

- Corrosion Resistant
- Structurally Strong
- High Impact strength
- High Fatigue Strength
- Lightweight
- Non-Conductive
- Resistant to Chipping and Cracking
- Aesthetically Pleasing Appearance
- Anti-Skid
- Rigid
- Easy to Fabricate
- Low Maintenance
- Low Thermal Conductivity
- Non-Sparking

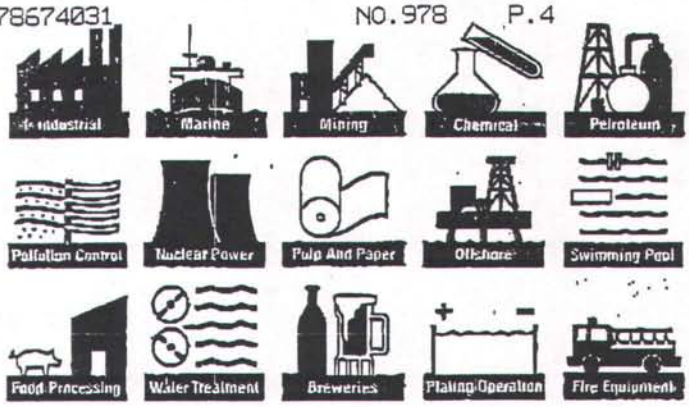
DURADEK® is lightweight and therefore easily handled in installation and costs less to ship than steel grating. Furthermore, because of the unique cross-bar construction, DURADEK® grating panels can be easily modified to fit almost any plant requirement.

All of these factors add up to low installation costs and are another reason for the increasing popularity of DURADEK®. Whether you are designing, building or replacing walkways or platforms, make DURADEK® your choice for long-lasting, dependable service.

Applications

DURADEK® High Strength Grating is designed to be used as walkways, platforms and decking in a wide variety of applications:

- General Industry
- Chemical/Petrochemical Plants
- Railroad — AAR Approval
- Pulp and Paper Plants
- Food & Beverage Operations
- Water/Wastewater Treatment Plants
- Plating Operations
- Mass Transit Systems
- Power Plants
- Fire Equipment
- Marine
- Mining

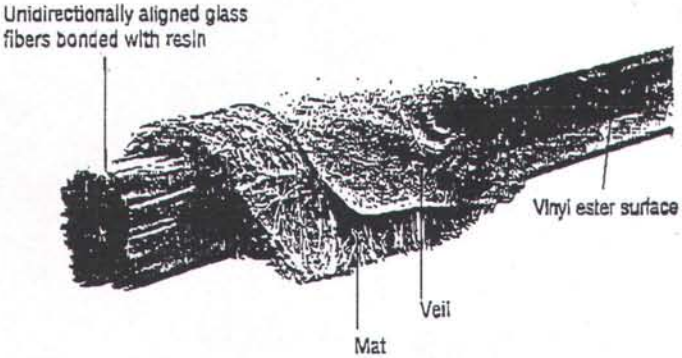


Materials of Construction

DURADEK® is a combination of fiberglass reinforcements (fibers and mat) and a thermosetting vinyl ester resin system. DURADEK® is produced by the pultrusion process. The method of manufacture produces many of the outstanding characteristics of DURADEK®.

DURADEK® Pultrusion

The DURADEK® pultrusion process pulls continuous glass fibers, continuous glass fiber mat, and plastic fiber veil through a liquid resin bath. It is then pulled through a heated shaping die where the resin is solidified, producing a continuous, solid part. The continuous glass fibers resist the stresses of tension, compression and bending. A continuous glass fiber mat surrounds the surfaces to prevent lineal splitting and chipping.



Surface Veil

The surface veil is an integral part of the pultrusion and enhances corrosion and UV resistance. It is made from material similar to the resin used in manufacturing the part, and pushes the glass fibers away from the surfaces of each part, producing a 100% thick resin surface.

UV Coatings

DURADEK® offers extremely long life, even when exposed to salts, acids, and caustics. However, ultraviolet radiation found in sunlight can degrade exposed resin surfaces. UV inhibitors are added to the resin at the time of manufacture and, in most applications, provide more than adequate UV protection. A UV coating is offered as an option when UV inhibitors are not adequate for optimum protection. This coating requires extra lead time for manufacturing.

Anti-Skid

The top of DURADEK® grating is covered with a permanently bonded grit, baked epoxy, anti-skid surface with optional grit material and particle sizes available.

Resin & Colors

DURADEK®'s Fire Retardant Vinyl Ester Resin, manufactured from a premium grade vinyl ester resin with antimony trioxide added, exceeds the requirements for Class 1 rating of 25 or less per ASTM E-84 and meets self-extinguishing requirements of ASTM D-635.

Ideal for severe corrosion applications, vinyl ester has better resistance to caustic and certain acid environments than polyester resins and can be used for most applications. Ask for the *Strongwell Corrosion Resistance Guide* for more information.

Standard colors are yellow and gray.

Shapes, Sizes & Availability

DURADEK® is available in three shapes and sizes: 1" deep I-bar, 1-1/2" deep I-bar, and 2" deep T-bar. These shapes are assembled into 12 panel sizes for your convenience; 3-, 4- and 5-foot widths in each of 8-, 10-, 12-, and 20-foot lengths. Standard panels come with cross-rod spacings of 6" or optional 12" on center. Yellow and gray vinyl ester panels with cross-rods at 6" on center can be shipped from the factory within 72 hours. Distributors stock DURADEK® in major cities throughout the USA and Canada.

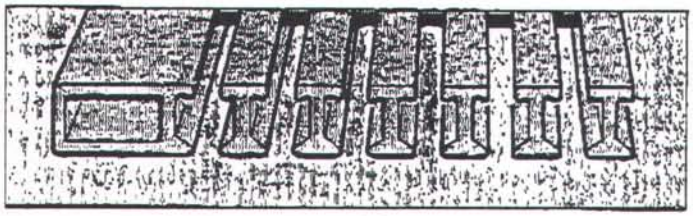
Unique Cross-Rod & Fixed-Spacer Assembly Forms DURADEK® Bearing Bars Into a Strong Unified Panel

This unique system consists of two continuous, pultruded spacer bars and a center core wedge. The spacers are notched at each bearing bar so that the bars are both mechanically locked and chemically bonded to the web of each bearing bar. This separates and affixes bearing bars firmly in position and distributes concentrated loads to adjacent bars. The system allows DURADEK® grating to be cut and fabricated like a solid sheet. Standard carpenters' tools with abrasive cutting edges may be used: just coat the cut ends with a resin sealer and install. Ask for the detailed *Grating Field Fabrication Guide.*

Accessories

Stair Treads & Landings

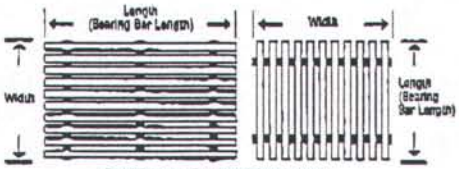
Stair treads and landings are produced by attaching nosing to the leading edge of the treads or landings. This gives added strength and rigidity to the area that takes impact and abuse. In addition, the nosing provides more surface area for skid resistance, wear, and better visibility. Exceeds OSHA Standard 1910-24.



TREAD WIDTH AND COLOR AVAILABILITY	STAIR TREAD SERIES	MAXIMUM SPAN FOR 300 LBS. AT MIDSPAN 1/8" OR LESS DEFLECTION	1/4" OR LESS DEFLECTION
11" Gray or Yellow	I-6000 1"	29"	37"
11" Gray or Yellow	I-6000 1-1/2"	40"	52"
12" Gray or Yellow	T-5000 2"	47"	59"

Ordering DURADEK®

When ordering DURADEK®, make sure the bearing bars in the panel are oriented in the correct direction for the application. Bearing bars should traverse from support to support. Cross-rods are not intended to be applied in the span direction. The drawings below will help you specify the width and length of panels.



Panel Sizes Are Specified: Width x Length

Custom DURADEK®

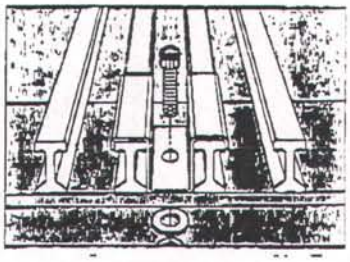
DURADEK® panels in specific panel sizes or variety of panel sizes can be manufactured to customer specifications upon request direct to Strongwell–Chatfield Division. Customer should provide drawings. Custom panel size ordering can eliminate material waste and produce labor savings in field installation.

DURAGRID® Fiberglass Grating

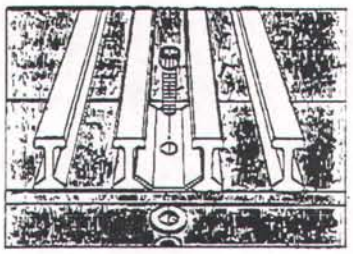
Fiberglass grating can be manufactured in custom resins, colors, bar spacings and bar profiles (other than DURADEK® line) to fill a customer's needs. Contact Strongwell for this information.

Panel Hold-Downs

Weldable 316L stainless steel saddle clips are available for all grating series listed. (Bolts are priced separately from the saddle clips.)

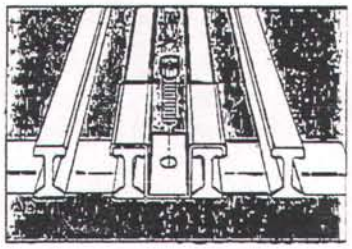


Weldable 316L stainless steel insert clips are available for all grating series listed. (Bolts are priced separately from the insert clips.)

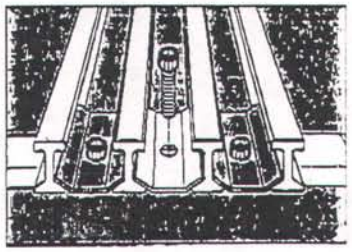


Panel Connectors

316L stainless steel saddle clips are available as panel connectors for all series grating. (Bolts are included in the connector's price.)

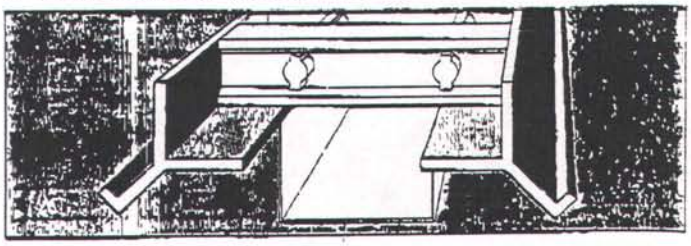


Insert clip hold-downs are available for all series grating. (Bolts are included in the connector's price.)

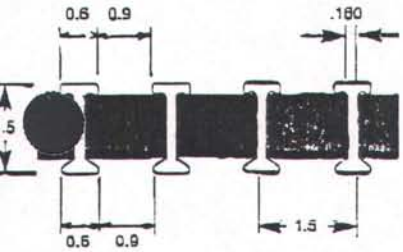


Curb Angle

DURADEK® Curb Angle provides a strong, firm base for bearing bars and is pultruded from the same material and in the same manner as other DURADEK® products. Corrosion resistant, non-conducting Curb Angles are available for all three sizes of bearing bars in gray fire retardant vinyl ester.



DURADEK I-6000 1½"



SERIES	BEARING BAR THICKNESS	NO BARS PER FOOT	BEARING BAR CENTER	OPEN SPACE	% OPEN AREA	APPROX WEIGHT	RESIN	COLOR
I-6000	1.500"	8	1.500"	.900"	60%	3.3 LBS. PER SQ. FT.	FIRE RETARDANT (STANDARD) OR VINYL ESTER	YELLOW OR GRAY

$A = 3.136\ IN^2/FT$ OF WIDTH $S = 1.240\ IN^3/FT$ OF WIDTH

$I = 0.928\ IN^4/FT$ OF WIDTH

Standard crossrods at 12" on center. Other spacings available on request.

The modulus of elasticity will vary with span length due to the non-homogeneous make-up of composite material (see table).

LOAD/DEFLECTION TABLE

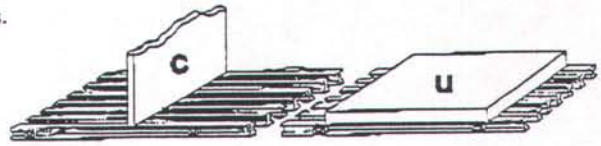
I-6000 1½" BEARING BARS

SPAN INCHES																			MAXIMUM LOAD	SAFE LOAD 2:1 SAFETY FACTOR	E x 10^6 PSI
12	u	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	[illegible]	[illegible]	[illegible]
	Δu	.001	.002	.004	.006	.008	.010	.012	.014	.016	.018	.020	.022	.024	.026	.028	.030	.032	[illegible]	[illegible]	
	c	100	200	300	400	500	750	1000	1250	1500	2000	2500	3000	3500	4000	4500	5000	5500	[illegible]	[illegible]	
	Δc	.001	.002	.003	.004	.005	.006	.008	.010	.012	.016	.020	.025	.031	.037	.044	.051	.059	[illegible]	[illegible]	
18	u	133	267	400	533	667	1000	1333	1667	2000	2667	3333	4000	4667	5333	6000	6667	7333	15,644	7,822	4.05
	Δu	.004	.009	.013	.016	.020	.030	.040	.050	.060	.081	.101	.121	.141	.161	.181	.201	.221	.473	.237	
	c	100	200	300	400	500	750	1000	1250	1500	2000	2500	3000	3500	4000	4500	5000	5500	11,733	5,866	
	Δc	.003	.007	.010	.013	.016	.024	.032	.040	.048	.065	.081	.097	.113	.129	.145	.161	.177	.379	.189	
24	u	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Δu	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	c	100	200	300	400	500	750	1000	1250	1500	2000	2500	3000	3500	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	Δc	.007	.015	.022	.029	.037	.055	.073	.091	.109	.145	.182	.219	.255	.292	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
30	u	80	160	240	320	400	600	800	1000	1200	1600	2000	2400						5,546	2,773	4.40
	Δu	.018	.035	.051	.069	.086	.129	.173	.215	.259	.344	.430	.516						1.193	.596	
	c	100	200	300	400	500	750	1000	1250	1500	2000	2500	3000						6,933	3,466	
	Δc	.014	.028	.041	.055	.069	.103	.138	.172	.207	.275	.344	.413						.954	.477	
36	u	67	133	200	267	333	500	667	833	1000	1333	1667	[illegible]						[illegible]	[illegible]	[illegible]
	Δu	.029	.058	.084	.113	.145	.218	.291	.363	.436	.581	.726	[illegible]						[illegible]	[illegible]	
	c	100	200	300	400	500	750	1000	1250	1500	2000	2500	[illegible]						[illegible]	[illegible]	
	Δc	.023	.046	.070	.093	.116	.174	.233	.291	.349	.465	.581	[illegible]						[illegible]	[illegible]	
[illegible]	u	57	114	171	229	286	429	571	714	857	1143								2,720	1,360	4.59
	Δu	.045	.090	.135	.181	.226	.340	.453	.565	.678	.905								2.155	1.078	
	c	100	200	300	400	500	750	1000	1250	1500	2000								4.761	2,380	
	Δc	.036	.072	.108	.145	.181	.272	.362	.452	.543	.724								1.724	.862	
48	u	50	100	150	200	250	375	500	625	750	1000								[illegible]	[illegible]	[illegible]
	Δu	.060	.119	.179	.238	.298	.446	.595	.743	.892	[illegible]								[illegible]	[illegible]	
	c	100	200	300	400	500	750	1000	1250	1500	2000								[illegible]	[illegible]	
	Δc	.053	.107	.160	.213	.266	.399	.533	.666	.799	[illegible]								[illegible]	[illegible]	
54	u	44	89	133	178	222	333	444	556										1,559	776	4.71
	Δu	.093	.188	.280	.375	.469	.703	.936	1.173										3,270	1.639	
	c	100	200	300	400	500	750	1000	1250										3,496	1,748	
	Δc	.074	.150	.224	.300	.375	.562	.749	.936										2.621	1.311	
60	u	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											[illegible]	[illegible]	[illegible]
	Δu	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											[illegible]	[illegible]	
	c	100	200	300	400	500	750	1000											[illegible]	[illegible]	
	Δc	.102	.204	.306	.408	.511	.765	[illegible]											[illegible]	[illegible]	
66	u	36	73	109	145	182	273												969	484	4.76
	Δu	.168	.340	.508	.675	.848	1.271												4.513	2.257	
	c	100	200	300	400	500	750												2,666	1,333	
	Δc	.134	.272	.406	.540	.678	1.017												3.611	1.805	
72	u	33	[illegible]	[illegible]	[illegible]	[illegible]													[illegible]	[illegible]	[illegible]
	Δu	.215	.440	[illegible]	[illegible]	[illegible]													[illegible]	[illegible]	
	c	100	200	300	400	500													[illegible]	[illegible]	
	Δc	.173	.352	.525	.698	.876													[illegible]	[illegible]	

DEFLECTION AND MAXIMUM LOAD DATA WAS CALCULATED FROM LAB TESTS CONDUCTED BY AFC INC.

Loading to the left of the blue verticle lines produce a deflection of less than .25 inches.

c IS CONCENTRATED LOAD LBS/FT OF WIDTH
Δc IS DEFLECTION UNDER CONCENTRATED LOAD
u IS UNIFORM LOAD LBS/FT^2
Δu IS DEFLECTION UNDER UNIFORM LOAD



AVAILABLE WIDTHS (CENTERS 1.5")

WIDTH	#BARS	WIDTH	#BARS	WIDTH	#BARS	WIDTH	#BARS	WIDTH	#BARS	WIDTH	#BARS
3"	2	13.5"	9	22.5"	15	33"	22	42"	28	52.5"	35
4.5"	3	15"	10	24"	16	34.5"	23	43.5"	29	54"	36
6"	4	16.5"	11	25.5"	17	36"	24	45"	30	55.5"	37
7.5"	5	18"	12	27"	18	37.5"	25	46.5"	31	57"	38
9"	6	19.5"	13	28.5"	19	39"	26	48"	32	58.5"	39
10.5"	7	21"	14	30"	20	40.5"	27	49.5"	33	60"	40
12"	8			31.5"	21			51"	34		

APPENDIX 4.2
AGGREGATE SUBMITTALS

Wake Stone Corporation

Quarry Phone Numbers:
919/266-9266—Knightdale
919/677-0050—Triangle
919/775-7349—Moncure
919/985-4411—Nash County

Locations:
U.S. 64 East, Raleigh, N.C.
I-40 at Harrison Ave., Cary, N.C.
U.S. 1 at Deep River, Moncure, N.C.
SR 1527 at I-95, Gold Rock, N.C.

Business Office Address:
P.O. Box 190
Knightdale, N.C. 27545
919/266-1100
Fax 919/266-1149

September 28, 1998

Mr. Shannon Dougals
Barnhill Contracting Company, Inc.
PO Box 1529
Tarboro, NC 27886
Fax (919) 823-0137

RE: Halifax County Landfill
Coal Ash Mono-Fill Expansion
Halifax County, NC

Dear Shannon:

This letter will certify to you that the ABC, #5, #57, Class B rip rap, and Class I rip rap shipped to the above referenced project from our NASH COUNTY QUARRY meets all requirements for aggregate gradation as stated in Table 1005-1 "Aggregate Gradation, Coarse Aggregate" and Table 1042-1 "Acceptance Criteria for Rip Rap and Stone for Erosion Control" in the NC DOT's Standard Specifications for Roads and Structure book dated July 1995.

Sincerely,
WAKE STONE CORPORATION

Samuel T. Bratton
Vice President

BARNHILL CONTRACTING COMPANY
THESE ARE TRANSMITTED as checked below:
— For approval
— For your use
— As requested
— Approved as submitted
— Approved as noted
BY S.C. DATE 10/8/98

FAX TO: **Shanon Douglas, Barnhill Contracting**
Fax (252) 823 - 0137
Voice (252) 823 - 1021
FROM: Chip Lawler, Hanson, Quality Assurance
Fax (910) 893 - 8646
Voice (910) 893-8543
Pager (919) 420 -9400
Mobile (919) 417 -4656

Hanson
Senter Sand & Gravel
2/11/99
Barnhill Contracting, Tarboro

Sieve Size	#4	Sieve Size
2"	100	2"
1 1/2"	100	1 1/2"
1"	50	1"
3/4"	4	3/4"
1/2"	2	1/2"
3/8"	1	3/8"

BARNHILL CONTRACTING COMPANY
THESE ARE TRANSMITTED as checked below:
✓ For approval
— For your use
— As requested
— Approved as submitted
— Approved as noted
BY S.K. DATE 2/12/99

Section 5

SECTION 5
ACCESS RAMP AND TIPPING AREA

5.0 ACCESS RAMP AND TIPPING AREA

Construction of the Cell 2 Access Ramp and Tipping Area was completed between May 19 and May 24, 1999 by Barnhill Contracting. The new ramp provides access to Cell 2 from existing disposal Cell 1 by crossing the North Intermediate Berm. The ramp has a minimum roadway width of 20-ft to facilitate access into Cell 2 by tri-axle hauling trucks as well as disposal operations equipment (e.g., bulldozers, etc). At the base of the access ramp, a tipping area approximately 100-ft long by 20-ft wide was constructed to provide access and sufficient turn-around space for vehicles during initial disposal operations in the cell. A plan view showing the access ramp/tipping area location and a cross-sectional view of the access ramp are shown on Drawing No. G7 of the Record Drawings.

The Access Ramp and Tipping Area were constructed entirely of coal ash excavated from Cell 1. The ramp and tipping area were constructed by first placing a layer of 16 oz/sy Cushion Geotextile (TNS E160) over the entire ramp/tipping area footprint. Construction of the ramp commenced on the Cell 1 side of the North Intermediate Berm and was accomplished using a track excavator. The excavator worked along a bench cut into the Cell 1 coal ash. From this location, the excavator was used to place coal ash from the toe of the Intermediate Berm up to the crest. As the excavator placed ash, the ash was leveled and tracked in with a D6 LGP bulldozer. Once the crest of the Intermediate Berm was reached, an additional 3-ft of coal ash was placed atop the berm to protect the underlying geosynthetics from damage. The track excavator then worked from the crest of the North Intermediate Berm and was used to place ash on the Cell 2 side of the berm from the toe up to the crest. Hazen and Sawyer provided full-time monitoring of placement operations during this time to observe any signs of damage to the underlying liner system. No such damage was observed.

Once the initial crossing of the North Intermediate Berm was completed, the remainder of the Access Ramp and Tipping Area were constructed using tri-axle hauling trucks and a bulldozer. The trucks backed down the advancing ramp and end-dumped coal ash along the leading edge of the Cushion Geotextile. Coal ash thickness in the active dumping area was always kept at a 3-ft minimum to protect the underlying liner system from damage. Once end-dumped, the coal ash was leveled, spread, and tracked in using a D6 LGP bulldozer. During leveling, spreading, and tracking operations, the coal ash lift thickness

was kept at a 1-ft minimum to protect the underlying liner system from damage. The minimum final thickness of the Access Ramp and Tipping Area was 2-ft, as shown on Detail 1, Drawing No. G7 of the Record Drawings.

Section 6

SECTION 6
GROUNDWATER MONITORING WELL ABANDONMENT AND INSTALLATION

6.0 GROUNDWATER MONITORING WELL ABANDONMENT AND INSTALLATION

6.1 Groundwater Monitoring Well and Piezometer Abandonment

Groundwater monitoring wells and piezometers installed for design and permitting of the facility and for water quality monitoring for Cell 1 were abandoned prior to construction activities. The main objective of the well abandonment program at the site was to ensure that bore holes do not act as conduits by hydraulically linking separate soil strata. For this reason, all monitoring wells and piezometers in the construction area were abandoned in accordance with State guidelines prior to construction.

A total of 2 monitoring wells and 4 piezometers were abandoned in two phases to support construction. The locations of the abandoned wells and piezometers are shown on Drawing No. G2 of the Record Drawings attached as Section 7.

Two groundwater monitoring wells (MW-13 and MW-14) and three piezometers (B-12, B-13, and B-15) were abandoned on October 13 and 14, 1998, in advance of excavation of the Cell 2 base area. All of the wells were over-drilled to full depth and grouted to the ground surface. Where well casings and screens could not be removed, the wells were pressure-injection grouted to the ground surface. These 5 wells were abandoned by Graham and Currie Well Drilling Company, Inc., with full-time monitoring provided by a Graham and Currie Staff Geologist. The Well Abandonment Records prepared by Graham and Currie are provided in Appendix 6.1.

The remaining well that was abandoned (piezometer B-5), was abandoned on January 7, 1999, while construction at the site was suspended due to unfavorable weather conditions. This well was abandoned by GeoTechnologies, Inc., with full-time monitoring provided by a geologist from EcoScience Corporation. This well was damaged during construction operations, with the protective casing and standpipe being broken off near the ground surface. However, the well was still visible and GeoTechnologies used a weighted measuring tape to verify the full well depth prior to abandonment.

Piezometer B-5 was abandoned by over-drilling the well to its full depth and grouting the bore hole to within 10 feet of the ground surface. This 10-foot interval was left ungrouted as the Contractor indicated that approximately 12 to 15 feet of soil cut still needed to be removed from the well area. EcoScience's well abandonment report, including the well diagram and Well Abandonment Record, is provided in Appendix 6.2.

6.2 Groundwater Monitoring Well Installation

During Cell 2 construction, a new groundwater monitoring well (MW-17) was installed for water quality monitoring of Cells 1 and 2. Monitoring well MW-17 is a temporary well which will be abandoned during the construction of Cell 3 of the Coal Ash Monofill. This new well was installed by GeoTechnologies, Inc., on January 7, 1999, with full-time monitoring provided by a geologist from EcoScience Corporation. The EcoScience well installation report, including the Well Construction Record, is provided in Appendix 6.2. Coordinates and top of casing elevation for Well MW-17 are provided on Drawing No. G2 of the attached Record Drawings.

Temporary Monitoring Well MW-17 replaces Temporary Wells MW-13 and MW-14 in the facility's approved Water Quality Monitoring Plan.

APPENDIX 6.1
GRAHAM & CURRIE
WELL ABANDONMENT RECORDS

North Carolina
Department of Environment, Health, & Natural Resources
Division of Environmental Management
Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535

WELL ABANDONMENT RECORD

CONTRACTOR Graham + Currie Well Drilling Co. Inc REG. NO. Pump Contractor # 875 well contractor # 537

1. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: Littleton - Aurelian Springs County Halifax
NC State Road 1417 Thelma
(Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: Halifax County Pub. Utility
Historic Courthouse
3. ADDRESS: P.O. Box 38 - King St, Halifax NC 27839

4. TOPOGRAPHY : draw, slope, hilltop, valley, flat

5. USE OF WELL: Piezometer DATE: 10-14-98

6. TOTAL DEPTH: 39.5 DIAMETER: 2 inch

7. CASING REMOVED:

feet	diameter
NONE	Two inch

8. SEALING MATERIAL:

Neat cement		Sand cement	
bags of cement	2	bags of cement	
gals. of water	14	yds. of sand	
		gals. of water	

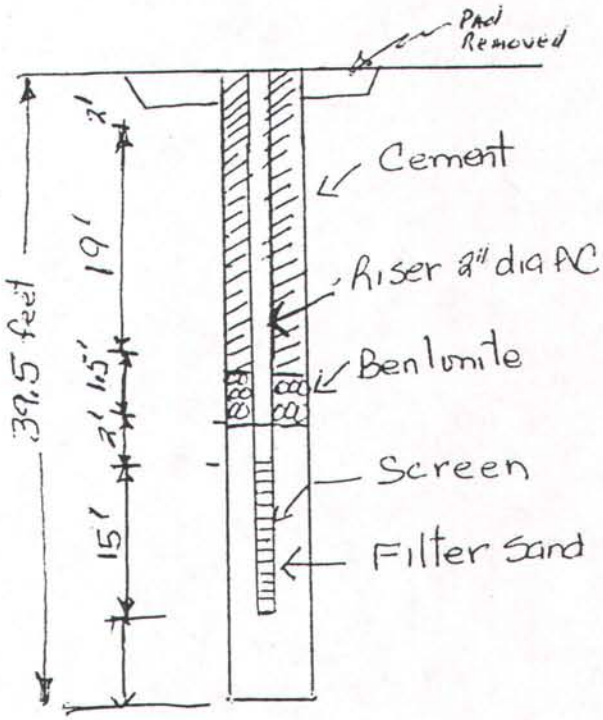
Other
Type material Grouter - Jack Hammer

Amount

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
Tremie Pressure Grout

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

B-12



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Ryan Wells Date 10/14/98

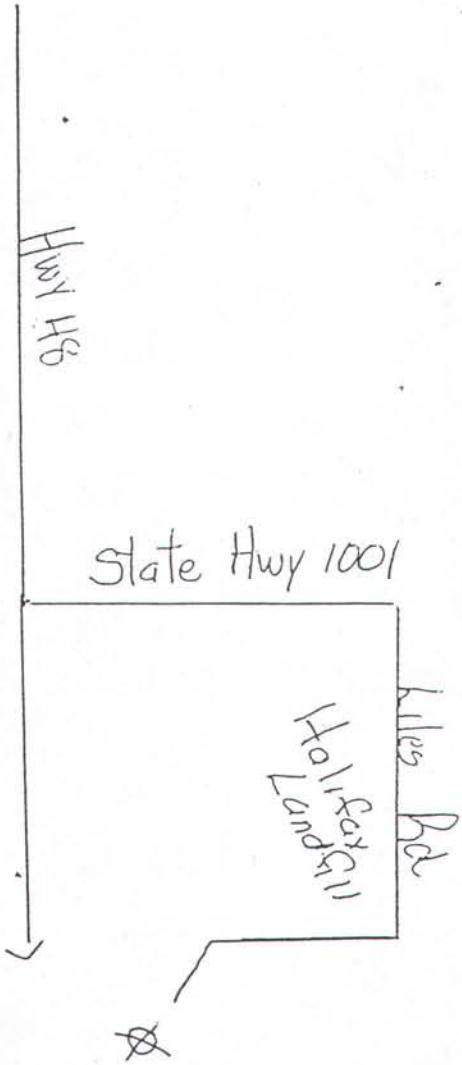
WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State High way road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

GW-30 Revised 7/17/92

METHOD EMPLACEMENT OF MATERIAL

Riser was cut to manageable level, and where concrete pads existed, they were cut up by jack hammer. Neat cement slurry was mixed in a grouter and, where casing and screens were not removed, pressure injected into the well, completely filling it from the bottom of the well to the top. Well abandonment was completed in accordance with EHNR- Environmental Management Specification requirements.



North Carolina
Department of Environment, Health, & Natural Resources
Division of Environmental Management
Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535

WELL ABANDONMENT RECORD

CONTRACTOR Graham + Currie Well Drilling Co. inc. REG. NO. Pump installer #805 well contractor #537

1. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: Littleton - Aurelian Springs County HALIFAX
NC STATE ROAD 1417 (Road, Community, Subdivision, Lot No.)
Thelma Quadrangle No.

2. OWNER: HALIFAX County Pub. Utility
Historic Courthouse
3. ADDRESS: P.O. Box 38 - King St. HALIFAX NC 27839

4. TOPOGRAPHY : draw, slope, hilltop, valley, flat

5. USE OF WELL: PIEZOMETER DATE: _____

6. TOTAL DEPTH: 40 DIAMETER: 2

7. CASING REMOVED:

feet	diameter
NONE	Two inch

8. SEALING MATERIAL:

Neat cement		Sand cement	
bags of cement	3	bags of cement	
gals. of water	21	yds. of sand	
		gals. of water	

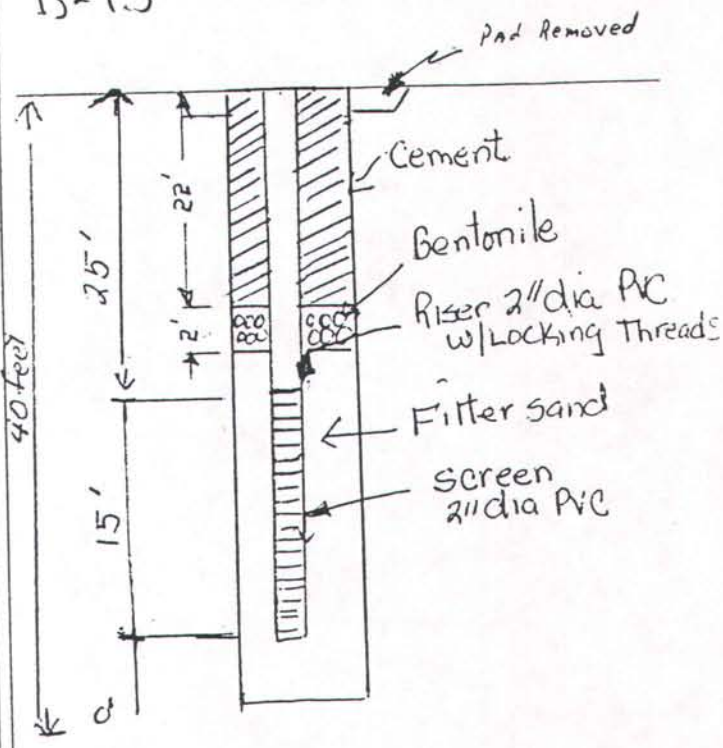
Other
Type material GROUTER

Amount _____

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
Tremie / Pressure grout

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

B-13



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Ryan Little Date 10/14/98

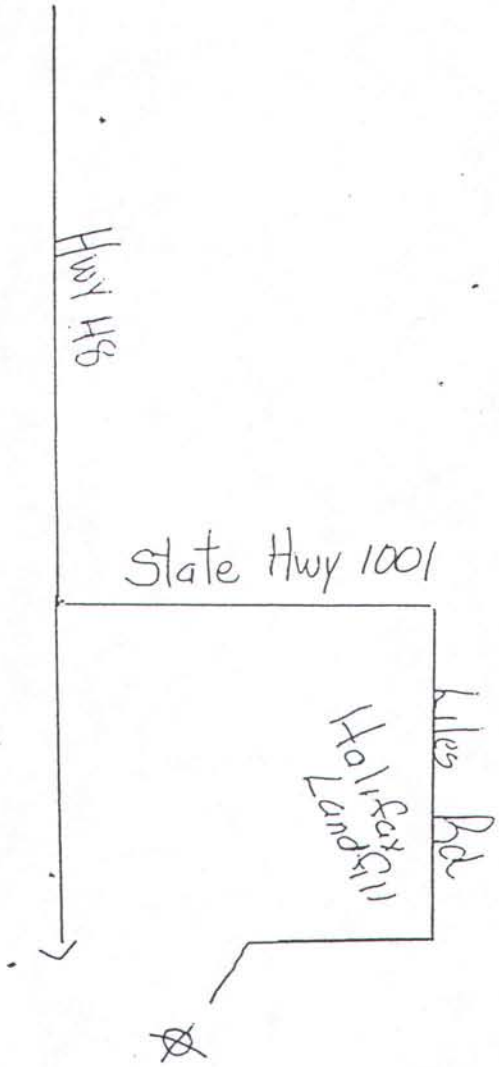
WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State High way road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

GW-30 Revised 7/17/92

METHOD EMPLACEMENT OF MATERIAL

Riser was cut to manageable level, and where concrete pads existed, they were cut up by jack hammer. Neat cement slurry was mixed in a grouter and, where casing and screens were not removed, pressure injected into the well, completely filling it from the bottom of the well to the top. Well abandonment was completed in accordance with EHNR- Environmental Management Specification requirements.



North Carolina
Department of Environment, Health, & Natural Resources
Division of Environmental Management
Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535

WELL ABANDONMENT RECORD

Pump installation # 875

CONTRACTOR Graham & Currie Well Drilling Co. Inc. REG. NO. Well Contractor # 537

1. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: Littleton - Aurelian Springs County Halifax

(Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: Halifax County Public Utilities
Historic Courthouse

3. ADDRESS: P.O. Box 38, King St. Halifax NC 27839

4. TOPOGRAPHY : draw, slope, hilltop, valley, flat

5. USE OF WELL: Piezometer DATE: 10-14-98

6. TOTAL DEPTH: 34' DIAMETER: 2-Inch

7. CASING REMOVED:

feet	diameter
N/A	two-inch

8. SEALING MATERIAL:

Neat cement		Sand cement	
bags of cement	3	bags of cement	
gals. of water	21	yds. of sand	
		gals. of water	

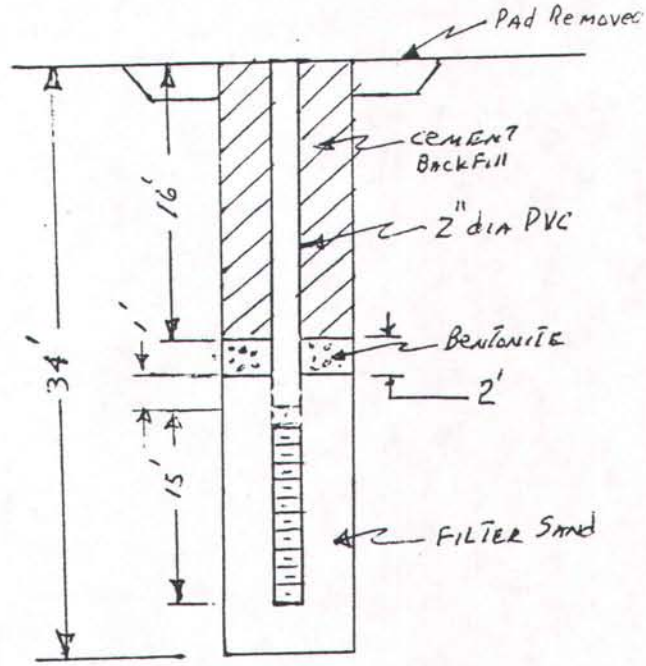
Other
Type material Grouter - Jack Hammer

Amount

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
Tremie / pressure grout.

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

PW-
B-15



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Ryan Wette Date 10/14/98

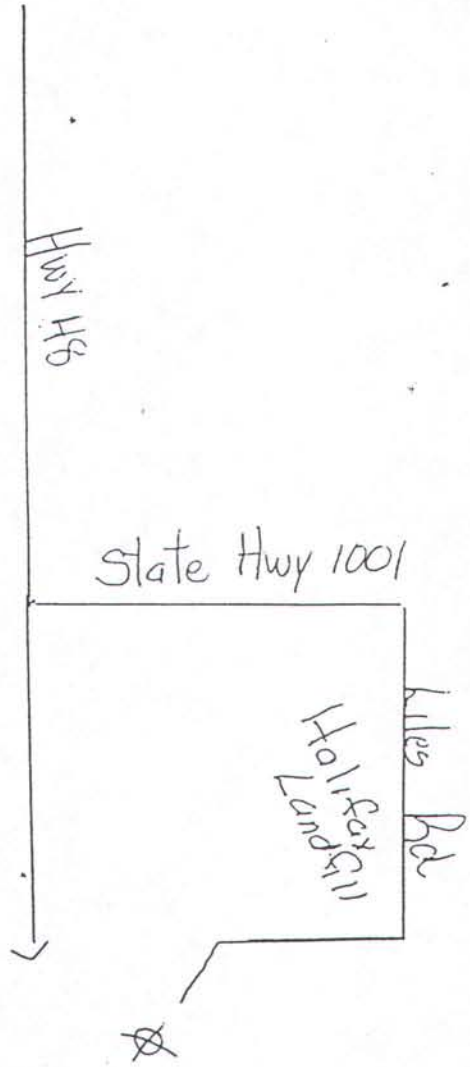
WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State High way road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

GW-30 Revised 7/17/92

METHOD EMPLACEMENT OF MATERIAL

Riser was cut to manageable level, and where concrete pads existed, they were cut up by jack hammer. Neat cement slurry was mixed in a grouter and, where casing and screens were not removed, pressure injected into the well, completely filling it from the bottom of the well to the top. Well abandonment was completed in accordance with EHNR- Environmental Management Specification requirements.



North Carolina
Department of Environment, Health, & Natural Resources
Division of Environmental Management
Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535

WELL ABANDONMENT RECORD

Pump installation # 875

CONTRACTOR Graham + Currie Well Drilling Co. Inc. REG. NO. Well contractor # 537

1. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: LITTLETON-AURELIAN SPRINGS County HALIFAX

(Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: HALIFAX COUNTY Pub UTILITY
HISTORIC COURTHOUSE

3. ADDRESS: P.O. Box 38, KING ST. HALIFAX NC 27839

4. TOPOGRAPHY : draw, slope, hilltop, valley, flat

5. USE OF WELL: MONITOR DATE: 10-13-98

6. TOTAL DEPTH: 41.5 DIAMETER: 2"

7. CASING REMOVED:

feet	diameter
None	2"

8. SEALING MATERIAL:

Neat cement		Sand cement	
bags of cement	3	bags of cement	
gals. of water	21	yds. of sand	
		gals. of water	

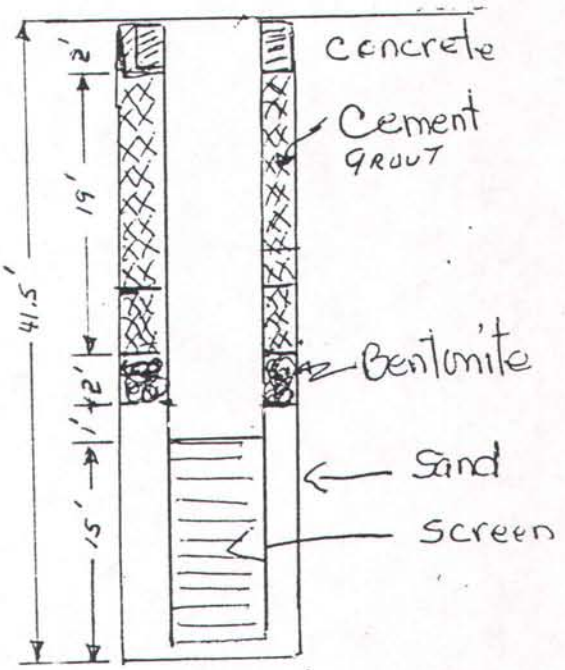
Other
Type material GROUTER

Amount

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
Tremmie/Pressure Treated

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

MW-13



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Ryan Watts Date 10-13-98

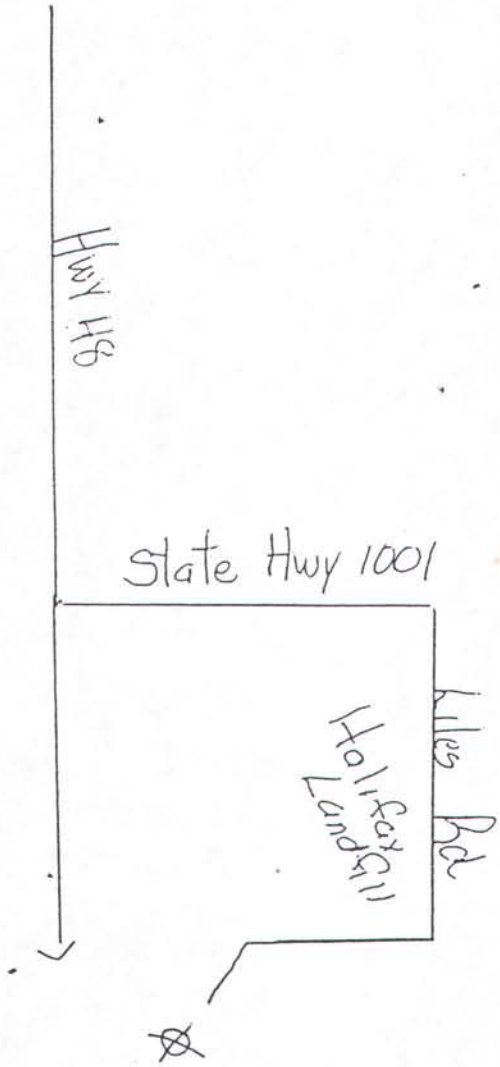
WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

GW-30 Revised 7/17/92

METHOD EMPLACEMENT OF MATERIAL

Riser was cut to manageable level, and where concrete pads existed, they were cut up by jack hammer. Neat cement slurry was mixed in a grouter and, where casing and screens were not removed, pressure injected into the well, completely filling it from the bottom of the well to the top. Well abandonment was completed in accordance with EHNR- Environmental Management Specification requirements.



North Carolina
Department of Environment, Health, & Natural Resources
Division of Environmental Management
Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535

WELL ABANDONMENT RECORD

CONTRACTOR Graham + Currie Well Drilling Co. Inc. REG. NO. Pump installation #875 well contractor #537

1. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: LITTLETON - Aurelian Springs County HALIFAX

(Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: HALIFAX COUNTY
HISTORIC COURTHOUSE
3. ADDRESS: P.O. Box 38, KING ST. HALIFAX NC 27839

4. TOPOGRAPHY : draw, slope, hilltop, valley, flat

5. USE OF WELL: MONITOR DATE: 10-14-98

6. TOTAL DEPTH: 36.5 DIAMETER: 2"

7. CASING REMOVED:

feet	diameter
None	2"

8. SEALING MATERIAL:

Neat cement		Sand cement	
bags of cement	3	bags of cement	
gals. of water	21	yds. of sand	
		gals. of water	

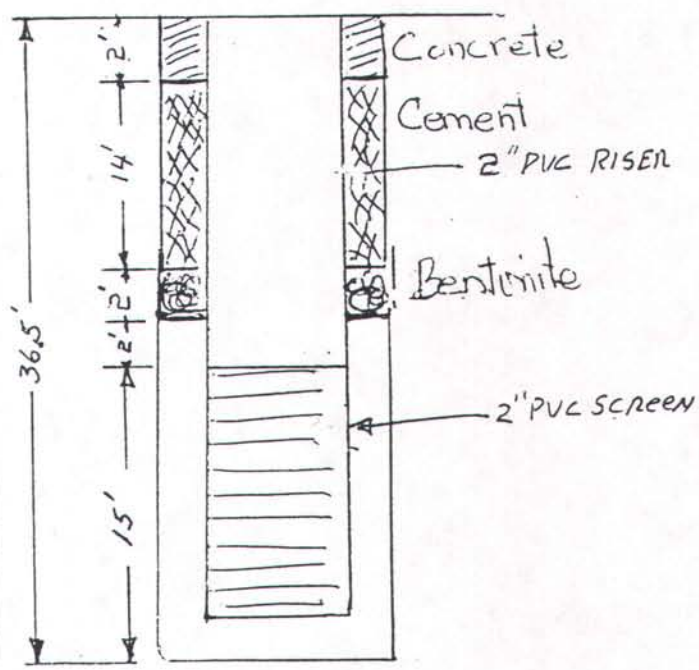
Other
Type material GROUTER - JACK HAMMER

Amount

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
Tremmie Pressure Treated

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

MW-1A



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Ryan Watts Date 10/14/98

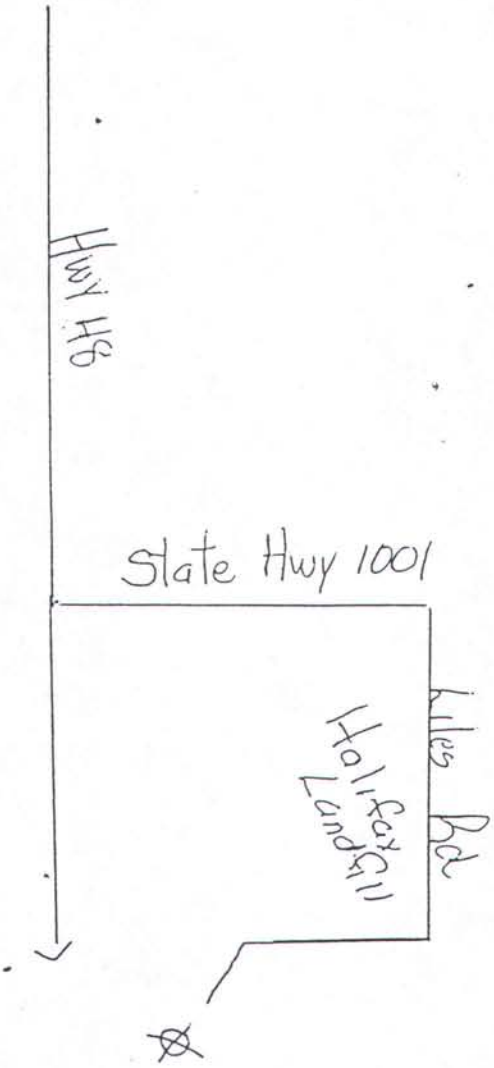
WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State High way road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

GW-30 Revised 7/17/92

METHOD EMPLACEMENT OF MATERIAL

Riser was cut to manageable level, and where concrete pads existed, they were cut up by jack hammer. Neat cement slurry was mixed in a grouter and, where casing and screens were not removed, pressure injected into the well, completely filling it from the bottom of the well to the top. Well abandonment was completed in accordance with EHNR- Environmental Management Specification requirements.



APPENDIX 6.2
ECOSCIENCE CORPORATION
WELL ABANDONMENT AND
WELL COMPLETION RECORDS AND REPORT

EcoScience

612 Wade Avenue Suite 200 Raleigh, NC 27605 Telephone: 919.828.3433 Fax: 919.828.3518

January 12, 1999

HAZEN & SAWYER
JAN 12 1999
RECEIVED

Mr. John A. Bove, P.E.
Hazen and Sawyer, P.C.
4011 WestChase Blvd.
Raleigh, NC 27607

Re: Halifax County Landfill Well Installation and Abandonment **99-001**
921 Liles Road, Littleton, Halifax County, NC

Dear Mr. Bove:

EcoScience Corporation (ESC) is pleased to have completed well installation and abandonment activities at the above-referenced site. The following describes the methodology utilized to complete this project.

On January 7, 1999, ESC personnel supervised the installation of one new groundwater monitoring well on-site. The well (designated MW17) was installed as follows. GeoTechnologies, Inc. (N.C. Driller Registration Number 1599) advanced 3.25-inch (in) inner diameter (ID) hollow stem augers to a depth of 25 feet (ft) utilizing a CME 550 all-terrain drill rig. Split-spoon samples were collected at 5-ft intervals beginning at a depth of 3 ft below ground surface (BGS). The split-spoon samples were evaluated for geologic purposes, only and a representative sample from each interval was retained in a glass jar for future use, as necessary. Groundwater was observed in samples collected between the approximate depths of 13 to 23 ft. A 10-ft section of 0.01-in slotted Schedule 40 PVC screen was chosen in order to bracket the zone of observed groundwater, and a 15-ft section of Schedule 40 PVC casing was added to the screen. Another approximately 1.5-ft section of riser was added to the assembly as stickup. The well was packed with #2 well sand to a depth of 10 ft BGS, followed by 1.5 ft of bentonite pellets which were hydrated after placement. The well was completed to the surface with a grout of three 94-pound (lb) bags of Portland Type I/II cement mixed with approximately 15 gallons (gals) of water. Finally, a locked, protective steel casing (4 in x 5 ft) was placed over the well and embedded in the cement. Because the cement had not set prior to leaving the site at nightfall, MW17 was developed the following day. On January 8, 1999, ESC personnel returned to the site. A static water level was measured from MW17 at 14.93 ft BGS, using an electronic water meter. The well was developed by removing water with a disposable Teflon bailer until the well was essentially dry. Approximately 28 gals of water was removed before the well yielded non-turbid water. Once developed, conductivity measurements were collected from the formational water until an equilibrium of 25 micro-seconds/centimeter (μS/cm) was reached. Once at equilibrium, the pH of the formational water was measured in order to confirm or deny grout contamination. A pH measurement of 4.5 was obtained from the well, which indicates that grout contamination is a non-issue. Attached please find a completed N.C. Division of Water Quality (DWQ) Well Construction Record (Form GW-1 REV. 1/98) for MW17.

Also on January 7, 1999, ESC personnel supervised as GeoTechnologies, Inc. abandoned existing groundwater monitoring well MW5 (B5). The steel outer casing, as well as an approximated 3-ft PVC riser, was broken at the surface by previous construction activities. A weighted measuring tape was lowered into the well, which was still visible at the ground surface. The well measured 47 ft BGS. Using the CME 550 all-terrain drill rig, GeoTechnologies, Inc. centered 3.25-in (ID) hollow stem augers over the PVC casing. According to the well construction record prepared by ENSCI Corporation (attached) at the time of installation (undated), MW5 was grouted with Portland cement from the ground surface (elevation 310.6 ft above mean sea level (AMSL) to an elevation of 271.6 ft AMSL. This well record indicates that 39 ft of cement grout was used to complete MW5. The record was assumed to be accurate. However, only approximately 2 to 3 ft of concrete was encountered during advance of the augers. Also, it appears from the soil cuttings (reddish-brown silt) that MW5 was actually backfilled with soil to a depth of 37ft. Augering continued to a depth of 48.5 ft. Between the depths of 37 and 48.5 ft, the drill cuttings changed to hydrated, gray micaceous silt mixed with fine sand, until drilling resistance (typically associated with bedrock) was encountered. The change in drill cuttings (inconsistent with the local geology) coupled with drilling resistance, suggests the bottom of the well/boring. The only evidence of PVC casing/screen observed in the drill cuttings occurred within the first 2 to 3 ft BGS. Abandonment of MW5 (B5) was completed by introducing a grout of fourteen 94-lb bags of Portland Type I/II cement, mixed with approximately 75 gals of water, into the annulus of the augers. Grouting was discontinued at a depth of approximately 10 ft BGS in order to allow further grading activities associated with the construction of a new disposal cell on-site. Attached please find a completed DWQ Well Abandonment Record (Form GW-30 Revised 1/98) for MW5 (B5).

John, I would appreciate your attaching site maps showing the locations of MW17 and MW5 (B5) to the corresponding well records prior to submitting them to DWQ. Additionally, copies of these records should be submitted to Halifax County and GeoTechnologies, Inc.

ESC appreciates this and every opportunity to be of service to Hazen and Sawyer. Should you have any questions or concerns, or require further assistance, please do not hesitate to contact me.

Sincerely,

ECOSCIENCE CORPORATION

Janet L. Hardy

Janet L. Hardy
Geologist
:jlh

Attachments

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
P.O. Box 29578 - Raleigh,N.C. 27626-0578-Phone (919) 733-3221

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GeoTechnologies, Inc.
DRILLER REGISTRATION #: 1599
STATE WELL CONSTRUCTION PERMIT#: N/A

1. **WELL USE (Check Applicable Box):** Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☒
   Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use:

2. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Littleton County: Halifax
   921 Liles Road
   (Road, Community, or Subdivision and Lot No.)

3. OWNER Halifax County
   ADDRESS 921 Liles Road
   (Street or Route No.)
   Littleton, NC 27850
   City or Town State Zip Code

4. DATE DRILLED 01/07/99
5. TOTAL DEPTH 23.5 ft
6. CUTTINGS COLLECTED YES ☐ NO ☒
7. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
8. STATIC WATER LEVEL Below Top of Casing: 17.93 FT.
   (Use "+" if Above Top of Casing)
9. TOP OF CASING IS 3 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
10. YIELD (gpm): N/A METHOD OF TEST
11. WATER ZONES (depth): 13+ to 23+ ft

DEPTH From To	DRILLING LOG Formation Description
0 - 8 ft	red-brn sl. sandy CLA w/ yell & blk. mottle
8 -13 ft	v. moist; as above w/ vertical blk incl. (1-5 mm in thickness)
13 -18 ft	wet; lt. grn/gray micaceous qtz & felds SAND
18 -23 ft	wet; red-orng SILT w/ red & blk. siltst. in
23 -25 ft	as above; becomes dry & schistose @ 25 ft.

If additional space is needed use back of form

12. CHLORINATION: Type N/A Amount

13. CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	3	0		2-in	Sch 40	PVC
	0	13.5		2-in	Sch 40	PVC

14. GROUT:

	Depth From	To	Ft.	Material	Method
	0	8.5		neat grout	poured
	8.5	10		bentonite	hydrated

15. SCREEN:

Depth From	To	Ft	Diameter	Slot Size	Material
13.5	23.5		2-in in.	0.01 in.	Sch 40 PVC
			in.	in.	
			in.	in.	

16. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
10	23.5		#2	well sand

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

(SEE BACK)

SOURCE: AURELIAN SPRINGS AND THELMA, N.C. USGS 7.5' QUADRANGLES

17. REMARKS:

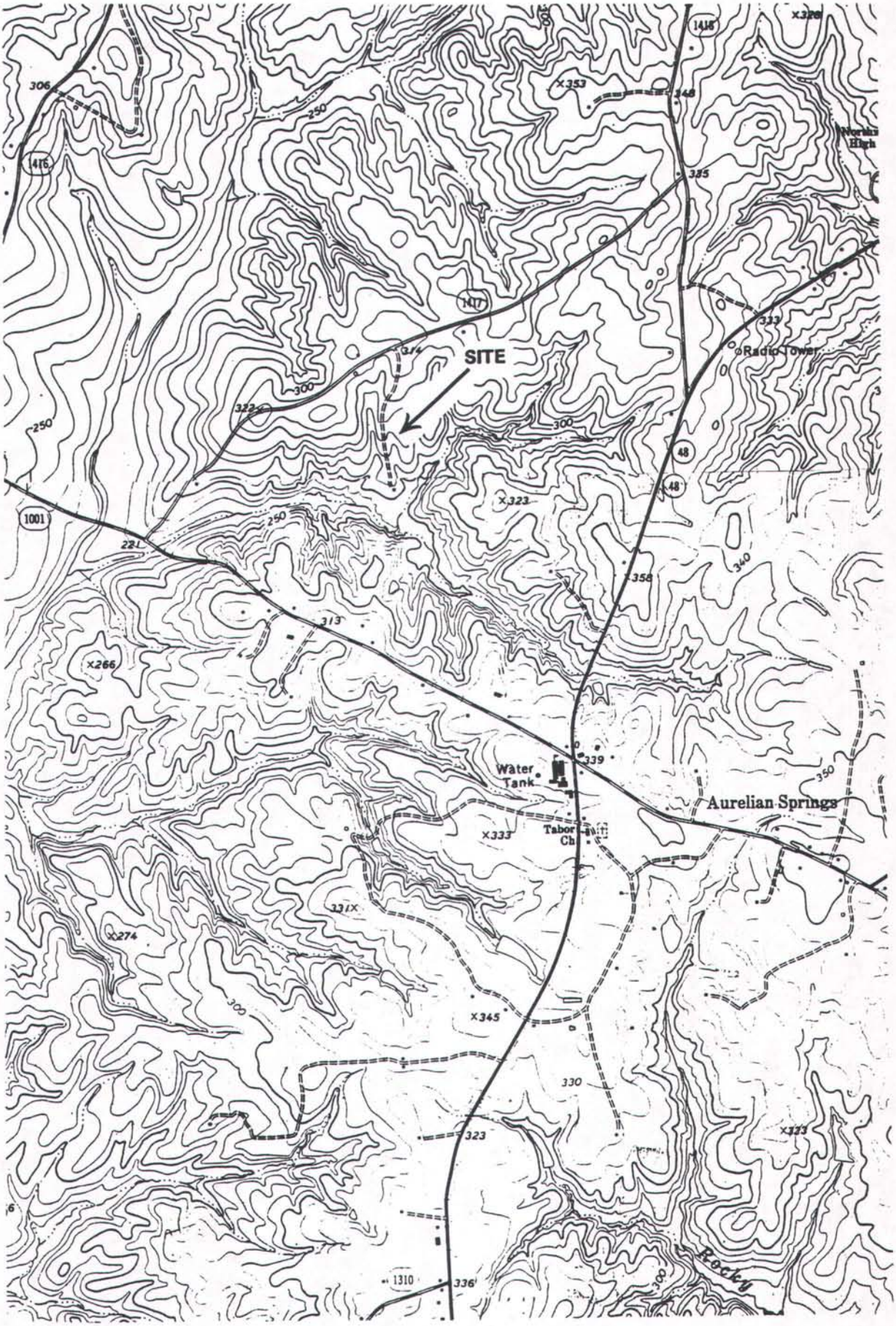
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Janet L. Hardy — SIGNATURE OF CONTRACTOR OR AGENT
1-12-99 — DATE

Submit original to Division of Water Quality and copy to well owner.

FOR OFFICE USE ONLY
Quad No:
Serial No:

GW-1 REV. 1/98



SOURCE: AURELIAN SPRINGS AND THELMA, N.C. USGS 7.5' QUADRANGLES

North Carolina
Department of Environment and Natural Resources
Division of Water Quality, Groundwater Section
P.O. Box 29578, Raleigh, N.C. 27626-0578

WELL ABANDONMENT RECORD **WELL I.D. OWB-109**
CONTRACTOR: GeoTechnologies, Inc. REG. NO.: 1599

1. WELL LOCATION: (Show a sketch of the location on back of form).
   Nearest Town: Littleton County: Halifax
   921 Liles Road Aurelian Springs & Thelma, N.C. USGS 7.5' Quadrangles
   (Road, Community, Subdivision, Lot No.) (Quadrangle)

2. OWNER: Halifax County

3. ADDRESS: 921 Liles Road
   Littleton, NC 27850

4. TOPOGRAPHY: draw, toe of slope, hilltop, flat

5. USE OF WELL: monitoring DATE: unknown

6. TOTAL DEPTH: 47 ft (+ 3 ft riser) DIAMETER: 2 in

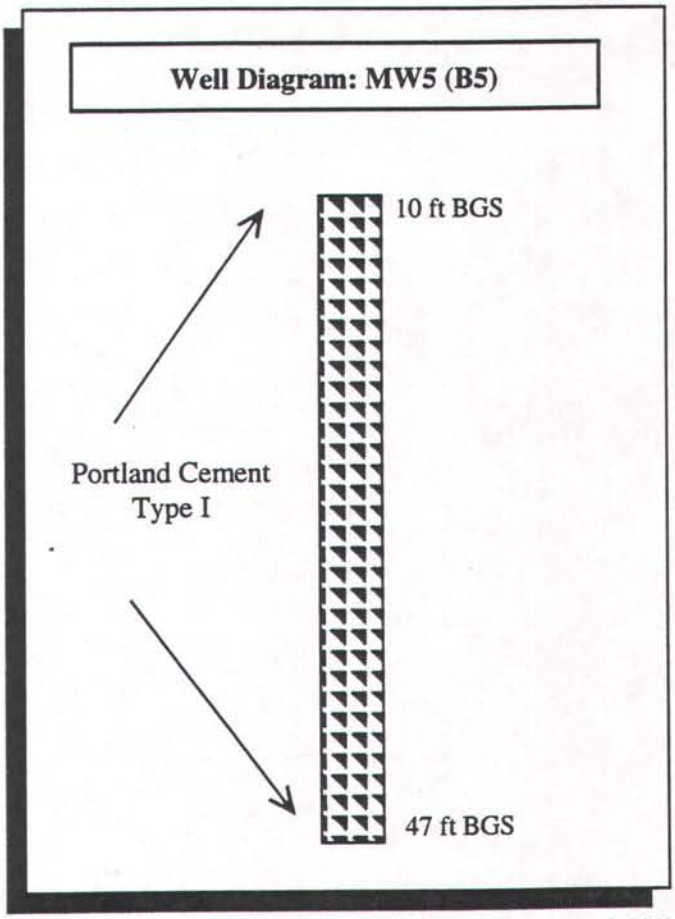
7. CASING REMOVED:

	feet	diameter	
riser:	3	2 in	(riser broken off at ground surface)
screen:	0	2 in	(screen broken off inside grout)

8. SEALING MATERIAL:

neat cement		sand cement
bags of cement	14	bags of cement
gals. of water	75	yds. of sand
		gals. of water

Other:
Type material: _____
Amount: _____



9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL

Riser was broken at the surface by construction contractors. Since no riser of casing could be removed from the grout, 3.25-inch (OD) hollow-stem augers were advanced to the bottom of the borehole. Concrete was mixed and pumped into the bottom of the borehole within the annulus of the augers. Formational water was displaced until slurry flowed visibly from the augers. As each auger was removed, slurry was pumped into next auger's annulus and allowed to permeate the borehole until the hole was filled to approximately 10 feet from ground surface (to allow for further excavation/grading at the landfill). It is believed that the PVC casing and screen was destroyed during drilling .

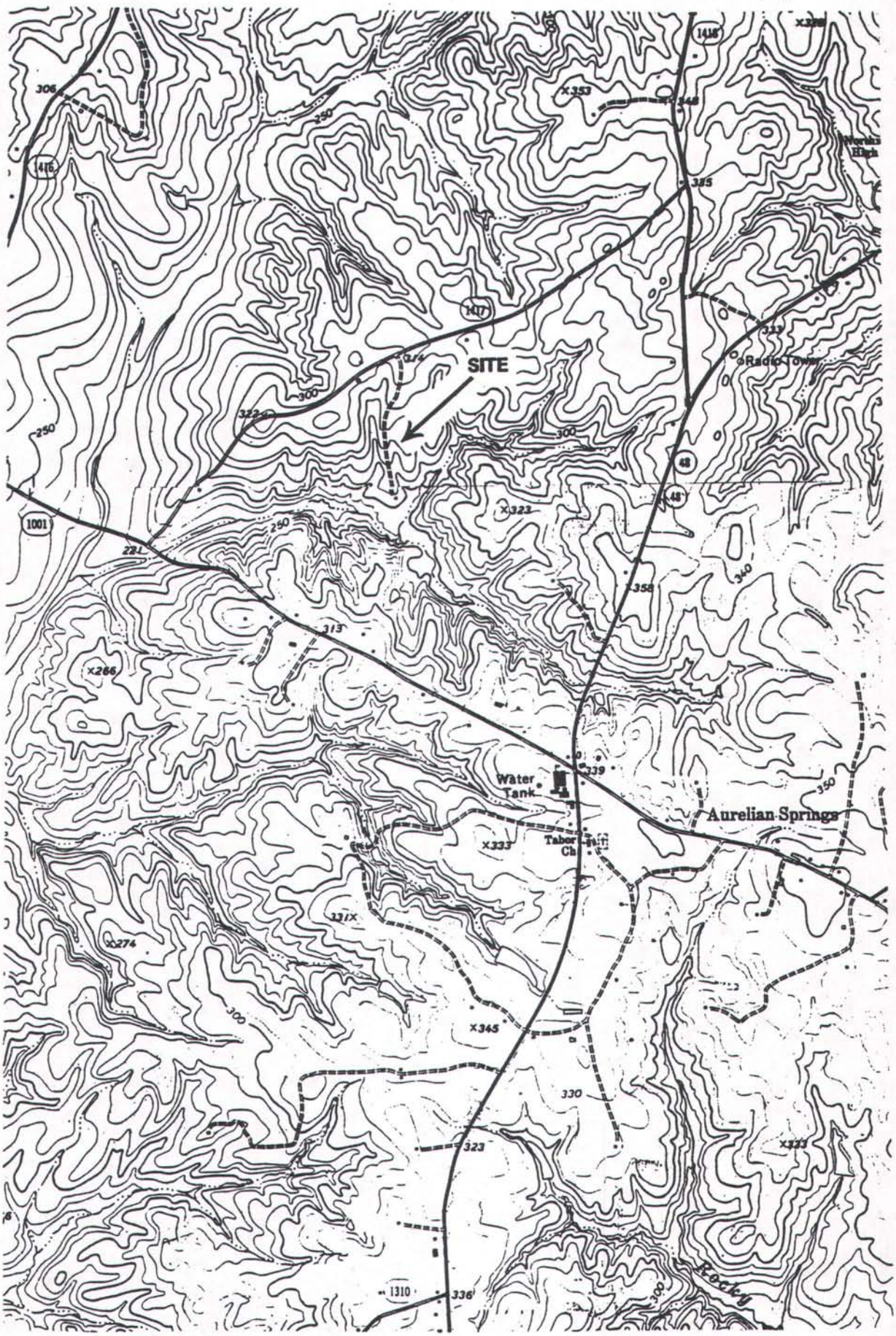
I hereby do certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Janet R. Hardy Date: 1-12-99

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway Road identification numbers. (SEE ATTACHED SITE MAP).

Submit original to the Division of Water Quality, one copy to the owner, and one copy to the driller.

GW-30 Revised 1/98



SOURCE: AURELIAN SPRINGS AND THELMA, N.C. USGS 7.5' QUADRANGLES

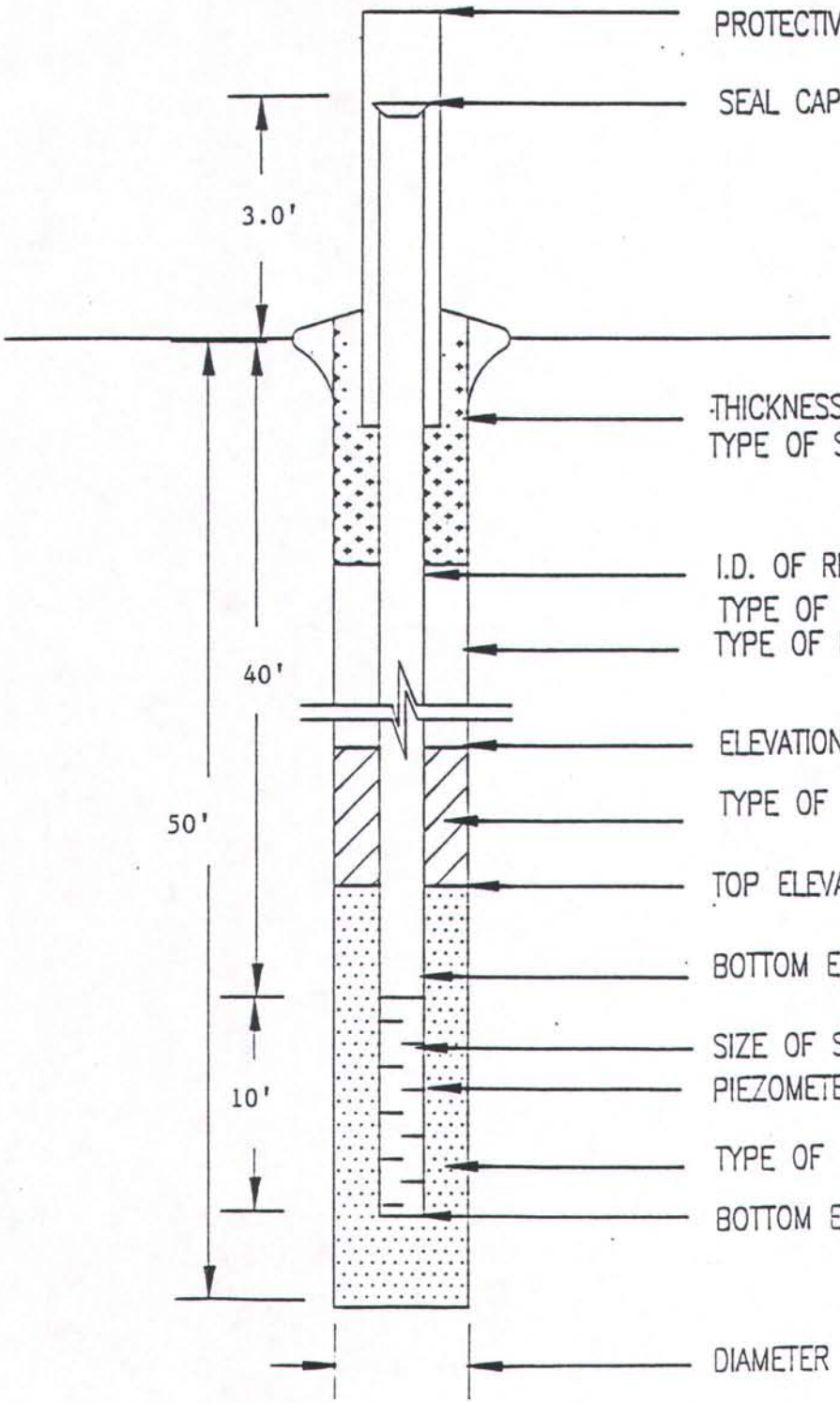
HALIFAX COUNTY LANDFILL (MONO ASH) WELL ABANDONMENT (MW5- B5)

ENSCI CORPORATION

MONITORING WELL INSTALLATION SKETCH

PROJECT HALIFAX COUBTY ASH MONOFILL
GROUND ELEVATION 310.6
BENCH MARK DATA
ELEVATION OF TOP OF PIEZOMETER 313.6

PIEZOMETER NUMBER MW-5 (B 5)
DEPTH TO WATER LEVEL 21.4'
ELEVATION OF WATER LEVEL 289.2



PROTECTIVE BOX W/LOCKING CAP

SEAL CAP

THICKNESS OF SURFACE SEAL 2'
TYPE OF SURFACE SEAL PORTLAND CEMEN

I.D. OF RISER PIPE 2"
TYPE OF RISER PIPE SCH 40 PVC
TYPE OF BACKFILL PORTLAND CEMENT

ELEVATION OF TOP OF SEAL 272.6

TYPE OF SEAL BENTONITE

TOP ELEVATION OF FILTER SAND 271.6

BOTTOM ELEVATION OF RISER 270.6

SIZE OF SCREEN OPENINGS .010"
PIEZOMETER SCREEN DIAMETER 2"

TYPE OF FILTER SAND C-33

BOTTOM ELEVATION OF PIEZOMETER 260.6

DIAMETER OF BOREHOLE 7.75"

Section 7

SECTION 7
RECORD DRAWINGS

HALIFAX COUNTY COAL ASH MONOFILL

CELL 2 RECORD DRAWINGS
(UNDER SEPARATE COVER)

Sheet No.	Dwg. No.	Description
		Cover
1	X1	Index of Drawings, Symbols, and Abbreviations
2	G1	Facility Plan
3	G2	Existing Site Conditions
4	G3	Cell 2 – Geomembrane Grading Plan
5	G4	Berm Details
6	G5	Miscellaneous Details
7	G6	Miscellaneous Internal Stormwater Management System Details
8	G7	Miscellaneous Details
9	G8	Internal Stormwater Management System Header Pipe Profile
10	G9	Cell 2 – Erosion and Sedimentation Control Plan
11	G10	Erosion and Sedimentation Control Sections and Details