



G.N. RICHARDSON & ASSOCIATES
Engineering and Geological Services

February 20, 1998

Mr. Jim Barber
Regional Engineer
NCDENR Solid Waste Section
225 Green St.
Wachovia Bldg., Suite 601
Fayetteville, NC 28301

Carmen Johnson
Fac/Perm/Co ID # 42-04
Date 12/13/97
Doc ID# 81211304

RECEIVED

MAR 04 1998

DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

**Re: C&D Operations Permit - Partial Closure Certification
Halifax County Landfill - Permit #42-04**

Re-**SCANNED**
3/14/14 (of)

Dear Mr. Barber:

The purpose of this letter is to serve as a partial certification of the permit modification for the above mentioned project. Approximately one (1) acre of the compacted soil barrier (CSB) has been constructed in the proposed C&D disposal area as shown on the attached drawing. The CSB in this area was constructed to allow placement of current incoming C&D waste. This portion of the CSB has been tested for compaction, permeability, and thickness. As shown on the attached test results, the CSB tested has a permeability well below the 1×10^{-5} cm/sec required. Due to wet conditions, this area of CSB was constructed thicker than required (approx. 3 feet). Densities were below the specified 95%, but are deemed to be acceptable due to the fairly flat area on which the material is placed and the passing permeability test. Also the area of the constructed CSB has been compacted subsequent to the tests performed.

Based on our oversight and review, the closure cap was constructed in accordance with NCDENR Solid Waste Management Rule .1627 and the Halifax County Landfill Transition Plan, dated December 1996, prepared by G.N. Richardson and Associates, Inc.

Please review this partial certification at your earliest convenience. If you should have any questions or comments, please feel free to contact us at (919) 828-0577.

Respectfully submitted,
G.N. Richardson & Associates, Inc.

Douglas T. DeCesare

Douglas T. DeCesare, E.I.T.
Staff Engineer

Pieter M. Scheer

Pieter Scheer, P.E.
Project Engineer



Attachments



G.N. RICHARDSON & ASSOCIATES
Engineering and Geological Services

FAX TRANSMITTAL SHEET

PLEASE DELIVER THE FOLLOWING TO:

NAME: JIM BARBER

COMPANY: NCDENR

FAX NUMBER: 910-486-1791

FROM: DOUG DECESARE

DATE: 2/26/98 TIME: 8:45 AM

REFERENCE: HALIFAX Co. LANDFILL

REMARKS:

JIM,

ATTACHED IS THE REVISED LETTER AS WE DISCUSSED. ALONG WITH THE LETTER IS A COPY OF THE PERMEABILITY TEST RESULT AND DENSITY RESULTS. CALL ME IF YOU HAVE ANY QUESTIONS. THANKS,

Doug

RICHARD GARNER, HALIFAX Co 919-586-2194

CHARLES ARCHER, HALIFAX Co 919-583-9921

BEN BARNES, NCDENR 919-571-4718

Total number of pages including cover sheet: 5

Please call if there are problems with this fax.



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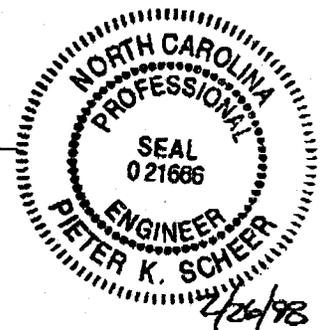
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Pieter Scheer, P.E.
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Geotechnical, Inc.

SOIL DENSITY TEST REPORT

G.N. Richardson & Associates
Halifax County MSW Landfill

DATE: 2/17/98
PROJ. NO: 1-97-1094-CA

Note: This column is only used for aggregate base course testing.

TEST NO.	WATER CONTENT (%)	WET WEIGHT (PCF)	DRY DENSITY (PCF)	MAX DRY DENSITY (PCF)	OPTIMUM MOISTURE (%)	ACTUAL COMPACT. (%)	SPECIFIED COMPACT. (%)	LOCATION	DEPTH (ft)	"See Note" THICKNESS (IN.)
CSB-15P	24.2	123.6	99.5	107.5	19.0	92.6	95	C & D in Cell 1	18" Lift 3	
CSB-16	24.8	122.7	98.3	107.5	19.0	91.5	95	C & D in Cell 1	12" Lift 2	
CSB-17	24.9	120.3	96.3	107.5	26.5	89.6	95	C & D in Cell 1	6" Lift 1	
CSB-18P	26.1	115.7	91.8	93.9	26.5	97.7	95	50' S 50' W of Pt 7	6" Lift 1	
CSB-19	27.3	117.1	92.0	93.9	26.5	98.0	95	40' S 100' W	6" Lift 1	

Note: A Field technician was not present during the actual fill placement; therefore, field test are only indicative of location and elevation.

David Dean

GeoTechnologies, Inc.

PERMEABILITY TEST

Job Number: 1-97-1094 CA Job Name: HALIFAX COUNTY LANDFILL
 Date: 2/18/98 Sample I.D. CSB-15P Depth: 18" (third lift)

Soil Description: Orange Fine Sandy Micaceous Clayey SILT

SAMPLE DATA

	type		standard proctor	
	remolded ()		Max. Dry Density	lbs/cu.ft.
	undisturbed (X)		Moisture Content	%
			Compaction	%
			Moisture Content	22.8 %
			Wet Density	126.9 lbs./cu.ft.
			Dry Density	103.4 lbs./cu.ft.
			Initial Saturation	97.6 %
			Final Saturation	100.0 %
			Initial Void Ratio	0.6
			Porosity	38.7 %
			Specific Gravity	2.7 apparent
	inches	cm.		
Length	3.009	7.643		
Diameter	2.827	7.181		
Area	5.277	40.496		
Volume	18.887	309.503		
Wet Mass	1.387	629.24 grams		
Dry Mass	1.130	512.4 grams		

TEST DATA

L = 7.64 cm. length of sample
 A = 40.496 sq.cm. area of sample
 a = 0.852 sq.cm. area of burettes
 hi = inflow burette
 ho = outflow burette
 t = time
 h1 = head loss across specimen at t1
 h2 = head loss across specimen at t2

t1	t2	ho1	hi1	h1	ho2	hi2	h2
0	9780	93.7	1.7	92	92.2	3.1	89.1
0	3420	92.2	3.1	89.1	91.8	3.5	88.3
0	3960	91.8	3.5	88.3	91.2	4.1	87.1
0	4080	91.2	4.1	87.1	90.7	4.6	86.1

ASTM D 5084

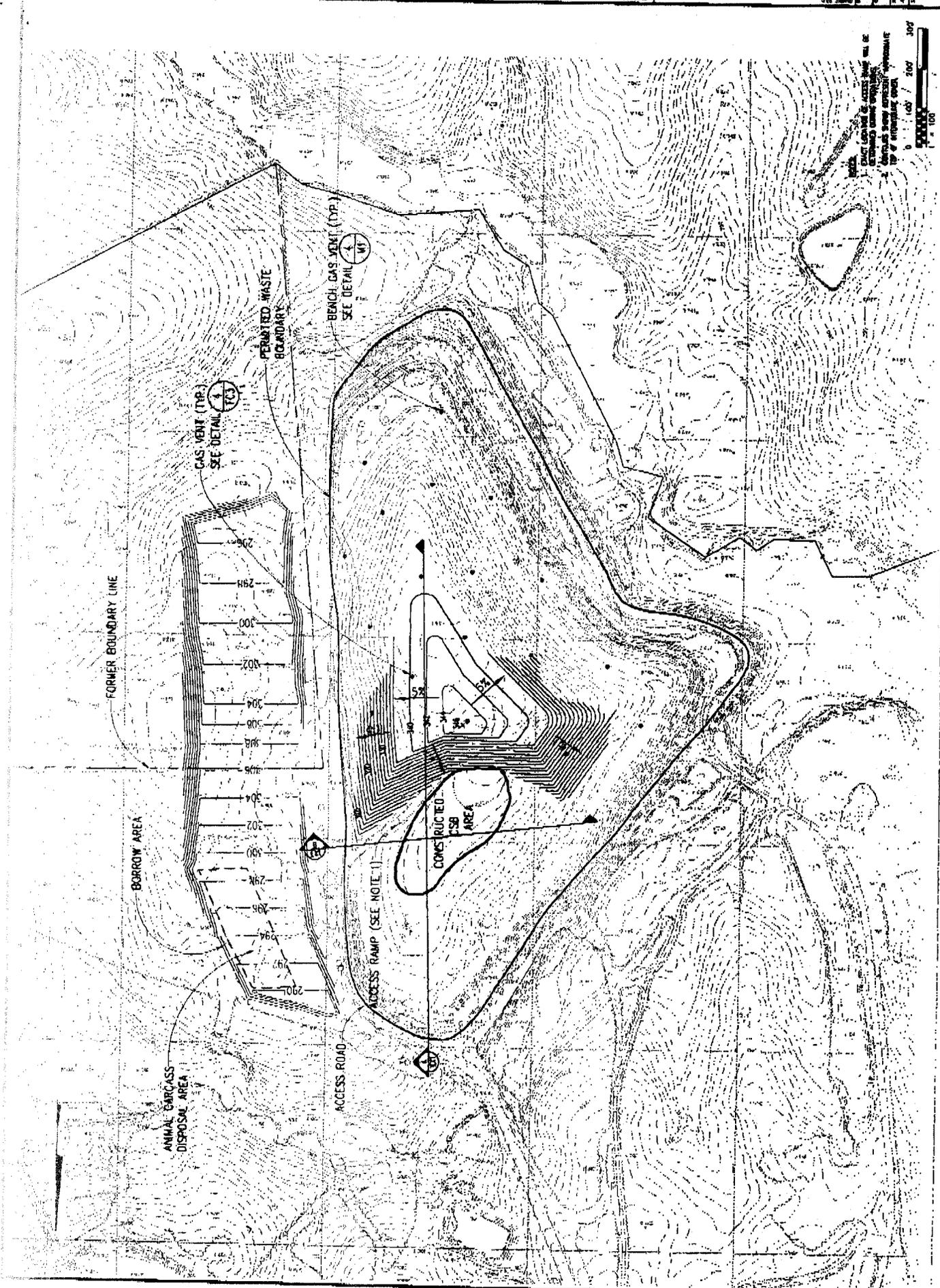
$k = ((aL/(A(a+a))) * \ln(h1/h2))$

Deviation from Average

NOTE:
 5 PSI Confining Pressure
 1 PSI Driving Head

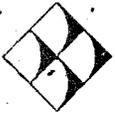
1	k =	2.63E-07	7.4%
2	k =	2.12E-07	13.5%
3	k =	2.78E-07	13.3%
4	k =	2.28E-07	7.2%

Average k = 2.45E-07 cm/sec



1. EXISTING CONTOUR LINES WILL BE RECONSTRUCTED TO MATCH THE CONTOUR LINES SHOWN ON THIS PLAN.
 2. CONTOUR LINES SHALL BE RECONSTRUCTED TO MATCH THE CONTOUR LINES SHOWN ON THIS PLAN.
 3. CONTOUR LINES SHALL BE RECONSTRUCTED TO MATCH THE CONTOUR LINES SHOWN ON THIS PLAN.





G.N. RICHARDSON & ASSOCIATES

Engineering and Geological Services

FAX TRANSMITTAL SHEET

PLEASE DELIVER THE FOLLOWING TO:

NAME: RICHARD GARNER

COMPANY: HALIFAX Co.

FAX NUMBER: 919-586-2184

FROM: DOUG DELESARE EXT: 130 919-828-0577

DATE: 2/19/98 TIME: _____

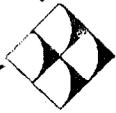
REFERENCE: HALIFAX Co. LANDFILL

COMMENTS: TEST RESULTS WILL BE INCLUDED WITH THE HARD COPY (MAILED COPY).

CC: JIM BARBER, NCDENR 910-486-1111
BEN BARNES, NCDENR 919-571-4310
CHARLES ARCHER, HALIFAX Co. 919-586-9921

Total number of pages including cover sheet: 3

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Engineering and Geological Services

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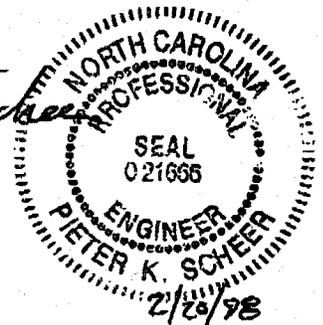
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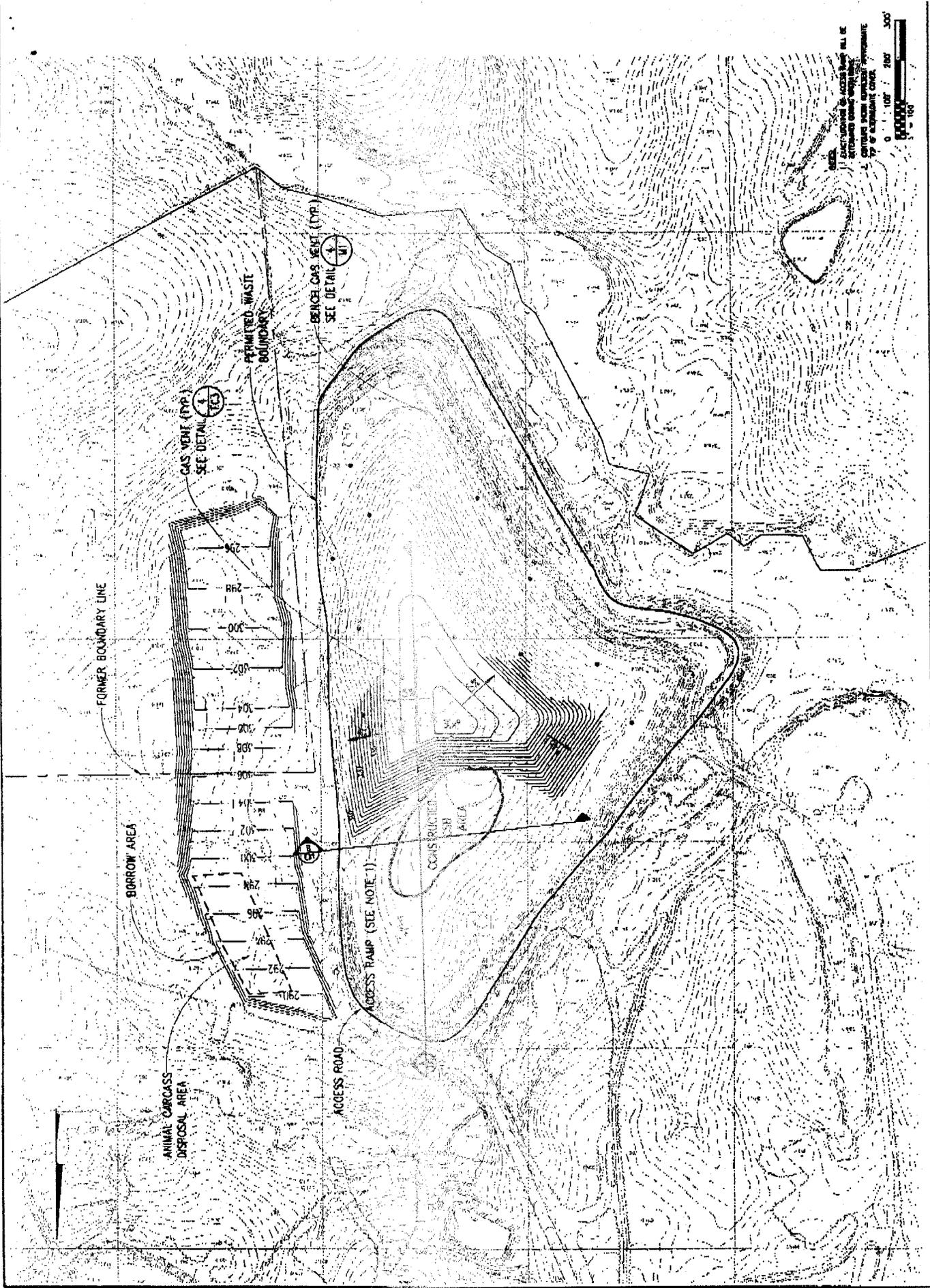
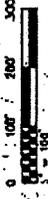
Douglas T. DeCesare, E.I.T.
 Staff Engineer

Pieter Scheer, P.E.
 Project Engineer



Attachments

NOTES:
 1. ELEVATIONS ON ACCESS RAMP SHALL BE
 DETERMINED USING THE FOLLOWING
 2. CONTAINS FROM EXISTING SURVEY
 3. SEE EXHIBIT SHEET



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MAK 04 1998

PERMEABILITY TEST

**DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE**

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ASTM D 5084

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from Average

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PROJ. NO: 1-97-1094-CA

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