APPENDIX B

Design Calculations

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: ___ DATE: ___ CHKD BY: ___ DATE: ___
PROJECT NAME: KOPPERS-SUPERIOR, WIS. SIT
PROJECT NO. 87-38-68 SHEET ___ OF ___
DESCRIPTION ___

CALCULATION BRIEF
CLOSURE PLAN- KOPPERS; SUPERIOR, WIS. PLANT

TABLE OF CONTENTS

SECTION	PAGE
REFERENCES	ii
FINAL COVER DESIGN	
I CLEAN CLOSURE	1
II CONTINGENCY PLAN	
TOPSOIL	4
FILL	4
GRANULAR DRAINAGE LAYER/PIPING	5
CLAY CAP	6
GEOTEXTILES	8
HELP MODEL OUTPUT	9
SURFACEWATER MANAGEMENT PLAN	
WATERSHED ANALYSIS/HYDROGRAPHS	21
CHANNEL DESIGN	48
CULVERT ANALYSIS	53
DESIGN CALCULATIONS/CONSIDERATIONS	
SETTLEMENT	54
SLOPE STABILITY	62
FREEZE THAW	63
EROSION POTENTIAL	64

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: — DATE: —
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET — OF —
DESCRIPTION DESIGN CALCS./ SURFACEWATER IMPOUNDMENT CLOSURE PLAN

(LL)

REFERENCES

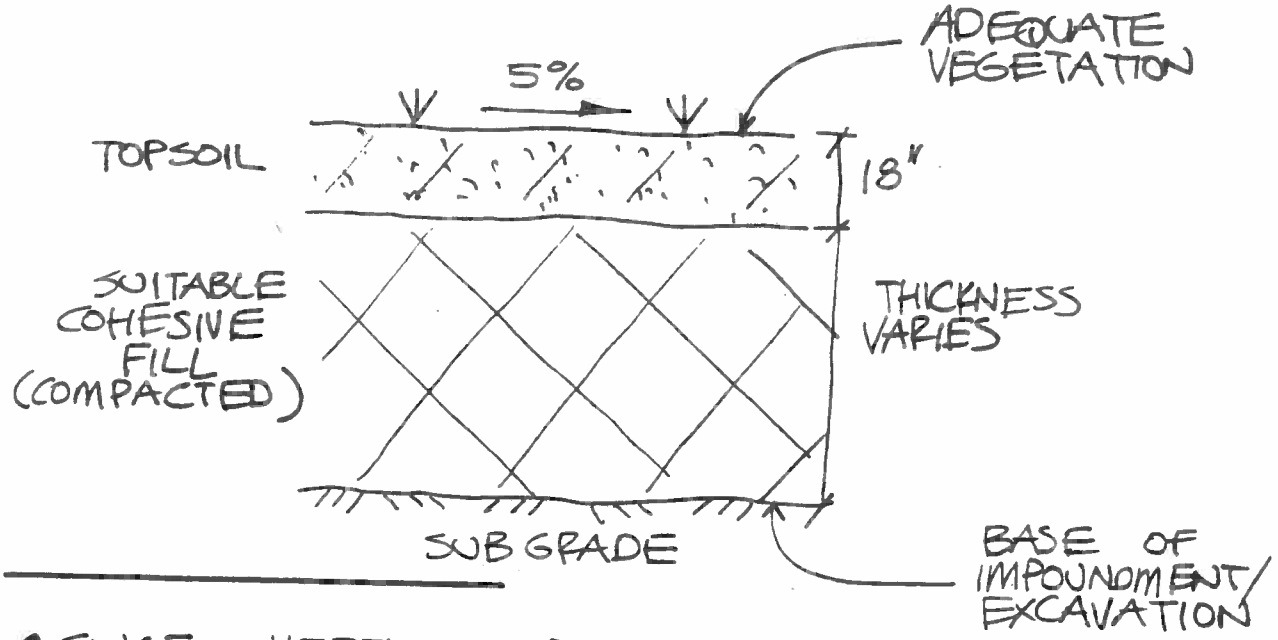
1) OPEN CHANNEL HYDRAULICS, CHOW, 1959.
2) FDN. ANALYSIS AND DESIGN, BOWLES, 1977 (2ND ED.).
3) NAVFAC DM-7.1 DESIGN MANUAL, 1985.
4) HANDBOOK OF STEEL DRAINAGE AND HIGHWAY CONSTRUCTION PRODUCTS, AISI, 1983.
5) [redacted]
6) RAINFALL FREQUENCY ATLAS OF THE UNITED STATES, TECHNICAL PAPER NO. 40; MAY, 1961.
7) STANDARDIZED PROCEDURES FOR PLANTING VEGETATION ON COMPLETED SANITARY LANDFILLS, EPA-600/2-83-055; JULY, 1983
8) HYDROLOGY FOR ENGINEERS, LINSLEY, KOHLER, AND PAULHUS, McGRAW-HILL, 2ND EDITION.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: J.E. DATE: 5/27/87
PROJECT NAME: KOPPERS- SUPERIOR, MIS. SITE
PROJECT NO. 87-38-68 SHEET 1 OF 20
DESCRIPTION DESIGN CALCULATIONS
— IMPOUNDMENT CLOSURE

FINAL COVER DESIGN CALCULATIONS

I. CLEAN CLOSURE



- SINCE VERTICAL PERCOLATION THROUGH THE TOPSOIL / FILL WOULD NOT PRODUCE ANY SIGNIFICANT AMOUNTS OF UNDESIRABLE MATERIALS, NO MIGRATION ANALYSES ARE PERFORMED.
- THE COVER IS DESIGNED TO PROMOTE DRAINAGE AND MANAGE FLOWS. REFER TO SOIL LOSS COMPUTATIONS AND SETTLEMENT ESTIMATES FOR ADDITIONAL SUPPORTING DESIGN ANALYSES.
- COMPACTION, GOOD SURFACE DRAINAGE, AND VEGETATION ARE ANTICIPATED TO REDUCE IMPACTS FROM FREEZE/THAW CYCLES. REFER TO SURFACEWATER PLAN.

Title of run = WATERSHED VII HYDROGRAPH

Watershed data

Hydraulic length = .03 miles
Elevation change = 7 feet.
Area = .25 acres
Concentration time = 2.093058E-02 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = .2871107 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.000
5.000	0.035	0.001
5.500	0.035	0.001
6.000	0.035	0.001
6.500	0.044	0.002
7.000	0.044	0.003
7.500	0.044	0.003
8.000	0.044	0.004
8.500	0.057	0.005
9.000	0.062	0.006
9.500	0.070	0.008
10.000	0.079	0.010
10.500	0.101	0.013
11.000	0.136	0.019
11.500	0.211	0.032
12.000	1.672	0.287
12.500	0.317	0.104
13.000	0.163	0.040
13.500	0.119	0.027
14.000	0.092	0.021
14.500	0.066	0.015
15.000	0.066	0.014
15.500	0.066	0.014
16.000	0.066	0.014
16.500	0.040	0.009
17.000	0.040	0.009
17.500	0.040	0.009
18.000	0.040	0.009
18.500	0.040	0.009

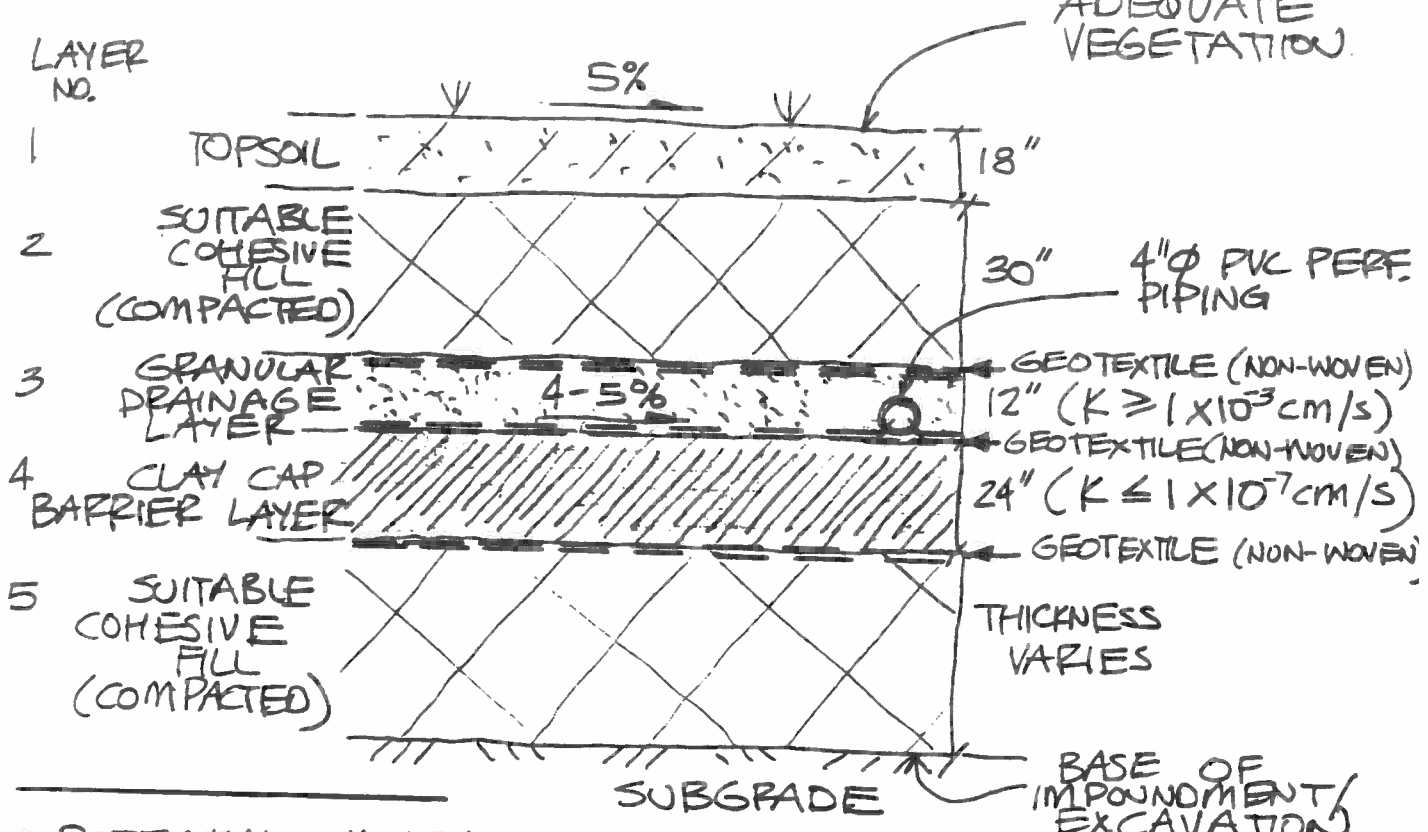
19/3

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.009
19.500	0.040	0.009
20.000	0.040	0.009
20.500	0.026	0.006
21.000	0.026	0.006
21.500	0.026	0.006
22.000	0.026	0.006
22.500	0.026	0.006
23.000	0.026	0.006
23.500	0.026	0.006
24.000	0.026	0.006
24.500	0.000	0.001
25.000	0.000	0.000

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: T.F. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 2 OF 20
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

II CONTINGENCY PLAN



- POTENTIAL MIGRATION OF PRECIPITATION THROUGH THE LANDFILL IS EVALUATED THROUGH USE OF THE HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE MODEL (H.E.L.P.). THE MODEL IS ALSO USED TO DEFINE DESIGN CRITERIA FOR THE DRAINAGE LAYER TO MINIMIZE ANY HEAD BUILD-UP ON THE CLAY CAP AND THUS EFFECTIVELY REDUCE THE POTENTIAL FOR PERCOLATION THROUGH THE BARRIER LAYER.
- REFER TO SOIL LOSS AND SETTLEMENT COMPUTATIONS FOR ADDITIONAL DESIGN ANALYSES. REFER TO THE SURFACEWATER MANAGEMENT PLAN FOR SUPPORTING COMPUTATIONS.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: TE DATE: 5/27/87

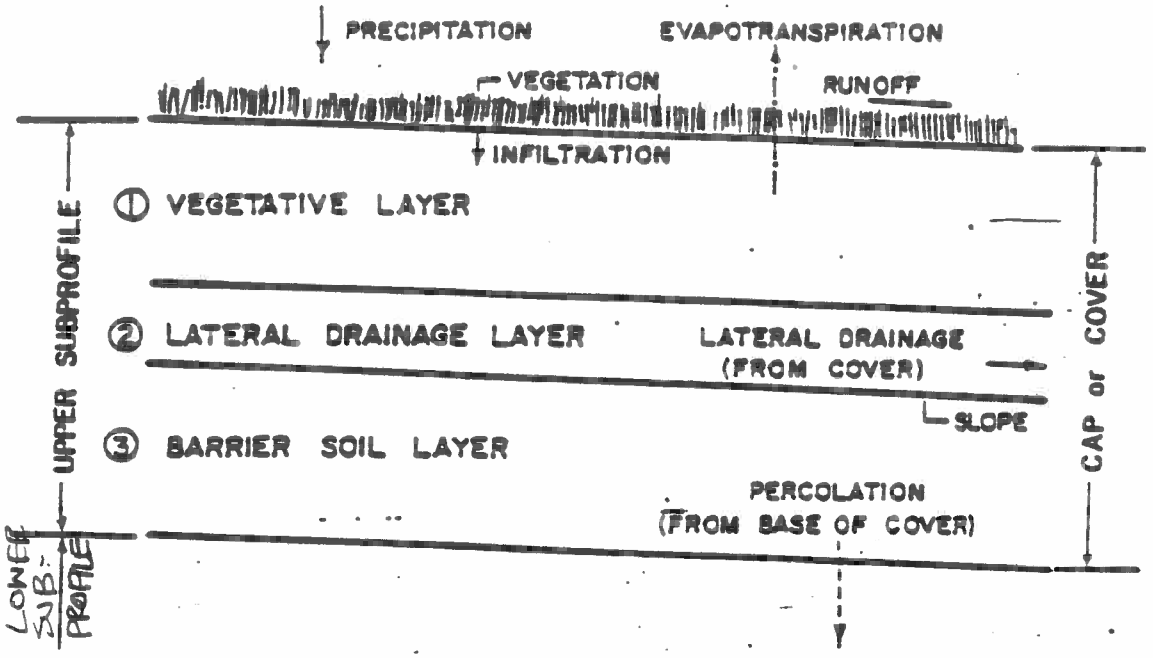
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE

PROJECT NO. 87-38-68 SHEET 3 OF 20

DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

H.E.L.P. MODEL INPUT / ASSUMPTIONS

1) DEFINITIONS:



2) SOIL PROPERTIES ARE ASSUMED BASED ON SITE SOIL INFORMATION (CLASSIFICATION TESTING AND VISUAL CLASSIFICATIONS). IN THE CASE OF THE DRAINAGE LAYER, PROPERTIES ARE DEVELOPED TO MINIMIZE MIGRATION.

3) CLIMATOLOGICAL DATA FOR ST. CLOUD, MINNESOTA IS ASSUMED DUE TO THE RELATIVELY CLOSE PROXIMITY TO THE SITE (ABOUT 100 MILES). IT IS ASSUMED THAT THIS DATA (1974 THROUGH 1978) IS REPRESENTATIVE FOR THE PURPOSE OF ESTIMATING RAINFALL PERCOLATION AND DRAINAGE LAYER EFFICIENCY.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: TE DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 4 OF 20
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

EVALUATION OF FINAL COVER COMPONENTS / SYSTEM:

IN REFERENCE TO THE HELP MODEL OUTPUT (ATTACHED):

LAYER 1 – TOPSOIL

REFER TO SURFACEWATER MANAGEMENT PLAN FOR RELATED DESIGN CALCULATIONS.

LAYER 2 – FILL (COMPACTED)

NO PERTINENT DESIGN CALCULATIONS

LAYER 3 – GRANULAR DRAINAGE LAYER / PIPING

A. TOTAL AMOUNT OF INFILTRATION TO DRAIN (DRAINAGE FROM TOP BARRIER)

- AVG. MONTHLY TOTAL (PEAK IN MAY):

$$= 0.168\ IN \times \frac{Ft}{12\ IN} \times 70{,}000\ Ft^2$$

$$= 980\ Ft^3 / 30\ DAYS\ (33\ Ft^3/D)$$

- PEAK DAILY DRAINAGE

$$= \underline{103.2\ Ft^3/DAY}\ (0.001\ cfs)$$ GOVERNS DESIGN

B. CAPACITY OF 4" ϕ PVC PIPE:

USING MANNINGS EQN. ($n = 0.009$ – REF #1)

$S = 0.005\ Ft/Ft$ (ASSUME FULL FLOW)

$$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$$

$$= \frac{1.49}{0.009} (0.087)\left((0.087)/(1.05)\right)^{2/3} (0.005)^{1/2}$$

$$= 0.19\ cfs = 16{,}724\ CF/DAY\ (125{,}000\ G/D)$$

$16{,}724 >>> 103 \rightarrow$ THEREFORE PIPE IS ADEQUATE.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: T.F. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 5 OF 20
DESCRIPTION DESIGN CALCULATIONS - IMPOUNMENT CLOSURE

C. CHECK PERFORATIONS CAPACITY:

SAY 1/4" ϕ SPACED 3" APART (4 / FOOT)

AREA = 0.00034 Ft^2 / HOLE

TOTAL LENGTH OF PIPE = 1050 L.F.

ESTIMATE 8,400 HOLES FOR THE TOTAL LENGTH OF PIPE; BOTH SIDES OF PIPE.

ASSUME ORIFICE FLOW THROUGH THE HOLE PERFORATIONS:

$$Q = C A \sqrt{2gh}$$

Q = FLOW (cfs)
C = FRICTION COEFF. (USE 0.632)
A = AREA OF FLOW
g = 32.2 Ft/s^2
h = HEAD - USE AN AVG. HEAD OF 0.5 IN. (0.04 Ft)

$$Q = (0.632)(0.00034\ Ft^2)(2)(32.2)(0.04\ Ft))^{1/2}$$

= (0.00034 cfs = 30 CF/D / HOLE x 8400 HOLES
= 250,000 CF / DAY

WHICH IS >> 103 CF/D SO HOLES ARE ADEQUATE FOR PIPE.

D. CHECK CAPACITY OF DRAINAGE LAYER:

ASSUME LAYER IS USCS CLASS'N. OF GP (SAND-GRAVEL MIX). FROM REF. # 8 APPLYING DARCY'S EQN:

$$Q = K_p A S$$

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JM6 DATE: 5/27/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 6 OF 20
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

WHERE K_p = PERMEABILITY (MEINZER UNITS OF GAL/DAY-FT^2)
$\leq$ 10,000 FOR SAND/GRAVEL MIXES

S = SLOPE OF HYD. GRADIENT
SAY 2 IN. HEAD (PEAK VALUE) OVER 125 FEET OR 0.0013 Ft/Ft

A = FLOW AREA FOR A 100 Ft-WIDE SECTION OF SLOPE (12" THICK)
= 1 x 100 Ft = 100 Ft^2

$$Q = 10{,}000 \frac{GAL}{DAY\text{-}Ft^2} \times 100\ Ft^2 \times 0.0013$$

= 1300 GAL/DAY FOR 100' OF SLOPE BUT WITH 4 SIDES OF PIPE FLOWING (1100± LF) Q_T = 14,300 GAL/DAY = 1911 CF/DAY

1911 CF/D >> 103 CF/DAY THEREFORE GRAVEL/SAND LAYER IS ADEQUATE TO DRAIN MIGRATING PERCOLATION IN LESS THAN ONE DAY. DRAINAGE LAYER IS ADEQUATE.

LAYER 4 - CLAY CAP.

IN ACCORDANCE WITH THE PERTINENT REGULATIONS THE CLAY CAP WILL BE (FINAL) 24 INCHES THICK AND AT LEAST 1×10^{-7} CM/S IN-PLACE PERMEABILITY (SATURATED).

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: J.E DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 7 OF 20
DESCRIPTION DESIGN CALCULATIONS
IMPOUNDMENT CLOSURE

PERCOLATION FROM BASE OF COVER: (CONTINGENCY)

AS PRESENTED BY THE HELP MODEL OUTPUT, THE PERCOLATION IS ESTIMATED AT ABOUT AN AVERAGE OF 3200 CU. FT. OF PERCOLATION PER YEAR. THIS REPPRESENTS ONLY 2 % OF THE PRECIPITATION AND IS JUDGED TO BE INSIGNIFICANT RELATIVE TO THE SURROUNDING ENVIRONMENTAL CONDITIONS; THE 24-INCH THICK CLAY CAP IS ADEQUATE.

HEAD ON CLAY: (CONTINGENCY)

AS PRESENTED BY THE HELP MODEL OUTPUT THE HEAD OF MIGRATED PRECIPITATION ON THE CLAY CAP (UNDER PEAD DAILY RAINFALL CONDITIONS) IS ONLY 1.7 INCHES WHICH IS SIGNIFICANTLY LESS THAN THE CRITERIA FOR "BOTOM" LINERS (12 INCHES) AND THEREFORE THE DRAINAGE SYSTEM (GRANULAR ZONE / PIPING) IS ADEQUATE.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/27/87 CHKD BY: T.F. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 8 OF 20
DESCRIPTION DESIGN CALCULATIONS
IMPOUNDMENT CLOSURE

GEOTEXTILES (IN CASE OF CONTINGENT CLOSURE)

USE ONE OF THE FOLLOWING NON-WOVEN FILTER FABRICS AS A SEPERATING MEDIA:

- BETWEEN THE FILL AND TOP OF THE DRAINAGE LAYER;
- BETWEEN THE DRAINAGE LAYER AND TOP OF CLAY; AND,
- BETWEEN THE CLAY AND UNDERLYING FILL.

- MIRIFI 180N (8 OZ/YD^2)
- SUPAC 8NP (8 OZ./YD^2)
- BIDIM U34 (8OZ./YD^2)
- AEF 880 (8 OZ./YD^2)

OR AN APPROVED EQUAL. INSTALL AS PER MANUFACTURER.

REFER TO DESIGN DWGS. FOR DETAILS.

9/20

H.E.L.P. MODEL OUTPUT

****
****

KOPPERS SUPERIOR, WIS. SITE
SURFACE IMPOUNDMENT CLOSURE
FINAL COVER DESIGN

****
****

FAIR GRASS

LAYER 1

VERTICAL PERCOLATION LAYER THICKNESS	=	18.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.4460 VOL/VOL
FIELD CAPACITY	=	0.3380 VOL/VOL
WILTING POINT	=	0.2210 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.03150000 INCHES/HR

LAYER 2

VERTICAL PERCOLATION LAYER THICKNESS	=	30.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5297 VOL/VOL
FIELD CAPACITY	=	0.4667 VOL/VOL
WILTING POINT	=	0.3550 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00205000 INCHES/HR

LAYER 3

10/20

LATERAL DRAINAGE LAYER

SLOPE	=	5.00 PERCENT
DRAINAGE LENGTH	=	125.0 FEET
THICKNESS	=	12.00 INCHES
EVAPORATION COEFFICIENT	=	3.300 MM/DAY**0.5
POROSITY	=	0.3760 VOL/VOL
FIELD CAPACITY	=	0.2180 VOL/VOL
WILTING POINT	=	0.1310 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	7.09000015 INCHES/HR

LAYER 4

BARRIER SOIL LAYER

THICKNESS	=	24.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00014200 INCHES/HR

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS	=	60.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5297 VOL/VOL
FIELD CAPACITY	=	0.4667 VOL/VOL
WILTING POINT	=	0.3550 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00205000 INCHES/HR

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	80.00
TOTAL AREA OF COVER	=	70000. SQ. FT
EVAPORATIVE ZONE DEPTH	=	10.00 INCHES
EFFECTIVE EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
UPPER LIMIT VEG. STORAGE	=	4.4600 INCHES
INITIAL VEG. STORAGE	=	2.7950 INCHES

CLIMATOLOGIC DATA FOR ST. CLOUD MINNESOTA

MONTHLY MEAN TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
11.73	14.61	24.74	39.43	54.73	66.54
71.70	68.83	58.69	44.00	28.71	16.89

MONTHLY MEANS SOLAR RADIATION, LANGLEYS PER DAY

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
161.64	235.39	339.16	445.14	524.94	557.17
533.19	459.44	355.67	249.69	169.90	137.67

LEAF AREA INDEX TABLE

DATE	LAI
1	0.00
130	0.00
144	0.61
159	0.99
173	0.99
187	0.99
202	0.99
216	0.99
230	0.89
244	0.65
259	0.32
273	0.17
366	0.00

FAIR GRASS

WINTER COVER FACTOR = 0.60

****

MONTHLY TOTALS FOR 74

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	0.09	0.83	0.88	1.16	3.26	4.36
	2.25	3.20	1.97	1.58	1.29	0.54
RUNOFF (INCHES)	0.000	0.000	0.000	0.000	0.015	0.240
	0.000	0.693	0.573	0.218	0.208	0.000
EVAPOTRANSPIRATION (INCHES)	0.090	0.830	0.489	2.136	2.708	4.392
	2.243	2.505	1.333	0.509	0.740	0.517
PERCOLATION FROM TOP BARRIER (INCHES)	0.0000	0.0000	0.0000	0.0000	0.0037	0.0711
	0.0945	0.0444	0.0192	0.0095	0.0848	0.0976

12/2

PERCOLATION FROM BASE OF COVER (INCHES)	0.0000	0.0000	0.0000	0.0000	0.0017	0.0133
	0.0374	0.0471	0.0404	0.0326	0.0363	0.0574
DRAINAGE FROM TOP BARRIER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.014
	0.012	0.000	0.000	0.000	0.029	0.019
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

****

****

ANNUAL TOTALS FOR 74

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	21.41	124892.	100.00
RUNOFF	1.945	11345.	9.08
EVAPOTRANSPIRATION	18.493	107874.	86.37
PERCOLATION FROM TOP BARRIER	0.4248	2478.	1.98
PERCOLATION FROM BASE OF COVER	0.2662	1553.	1.24
DRAINAGE FROM TOP BARRIER LAYER	0.074	431.	0.35
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00
SOIL WATER AT START OF YEAR	60.92	355355.	
SOIL WATER AT END OF YEAR	61.47	358586.	
SNOW WATER AT START OF YEAR	0.00	0.	
SNOW WATER AT END OF YEAR	0.08	458.	
ANNUAL WATER BUDGET BALANCE	0.00	0.	0.00

****

****

MONTHLY TOTALS FOR 75

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	2.39 0.21	0.40 4.83	1.75 2.27	3.69 1.08	3.02 3.24	5.78 0.28
RUNOFF (INCHES)	0.000 0.000	0.000 1.535	0.000 0.000	0.812 0.184	0.000 0.000	0.429 0.000
EVAPOTRANSPIRATION (INCHES)	0.803 0.975	1.123 2.265	2.244 2.646	2.250 0.918	3.781 1.022	4.854 0.804
PERCOLATION FROM TOP BARRIER (INCHES)	0.0389 0.1132	0.0163 0.0761	0.0084 0.1036	0.0122 0.0820	0.1090 0.0000	0.1080 0.0000
PERCOLATION FROM BASE OF COVER (INCHES)	0.0601 0.0816	0.0448 0.0838	0.0377 0.0831	0.0280 0.0903	0.0414 0.0693	0.0615 0.0481
DRAINAGE FROM TOP BARRIER (INCHES)	0.000 0.083	0.000 0.007	0.000 0.059	0.001 0.018	0.227 0.000	0.208 0.000
DRAINAGE FROM BASE OF COVER (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

****

****

ANNUAL TOTALS FOR 75

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	28.94	168817.	100.00
RUNOFF	2.961	17272.	10.23
EVAPOTRANSPIRATION	23.684	138158.	81.84
PERCOLATION FROM TOP BARRIER	0.6677	3895.	2.31
PERCOLATION FROM BASE OF COVER	0.7297	4257.	2.52
DRAINAGE FROM TOP BARRIER LAYER	0.603	3518.	2.08
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00
SOIL WATER AT START OF YEAR	61.47	358586.	
SOIL WATER AT END OF YEAR	60.85	354953.	
SNOW WATER AT START OF YEAR	0.08	458.	
SNOW WATER AT END OF YEAR	1.66	9703.	
ANNUAL WATER BUDGET BALANCE	0.00	0.	0.00

****

****

MONTHLY TOTALS FOR 76.

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	0.85 1.92	0.83 0.60	1.78 1.37	0.92 0.44	0.93 0.14	4.84 0.31
RUNOFF (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.944 0.000
EVAPOTRANSPIRATION (INCHES)	0.803 2.808	1.176 0.556	2.333 0.836	1.916 0.508	0.741 0.188	3.483 0.310
PERCOLATION FROM TOP BARRIER (INCHES)	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000

PERCOLATION FROM BASE OF COVER (INCHES)	0.0320 0.0030	0.0202 0.0020	0.0146 0.0013	0.0095 0.0009	0.0066 0.0006	0.0043 0.0004
DRAINAGE FROM TOP BARRIER (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
DRAINAGE FROM BASE OF COVER (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

****

****

ANNUAL TOTALS FOR 76

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	14.93	87092.	100.00
RUNOFF	0.944	5505.	6.32
EVAPOTRANSPIRATION	15.657	91335.	104.87
PERCOLATION FROM TOP BARRIER	0.0000	0.	0.00
PERCOLATION FROM BASE OF COVER	0.0955	557.	0.64
DRAINAGE FROM TOP BARRIER LAYER	0.000	0.	0.00
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00
SOIL WATER AT START OF YEAR	60.85	354953.	
SOIL WATER AT END OF YEAR	60.74	354346.	
SNOW WATER AT START OF YEAR	1.66	9703.	
SNOW WATER AT END OF YEAR	0.00	0.	
ANNUAL WATER BUDGET BALANCE	0.00	5.	0.01

****

16/2

MONTHLY TOTALS FOR 77

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	0.58 4.34	0.98 5.26	3.03 3.15	3.17 2.65	3.48 4.03	3.50 1.23
RUNOFF (INCHES)	0.000 0.216	0.000 1.657	0.000 0.330	0.100 0.705	0.000 0.000	0.000 0.000
EVAPOTRANSPIRATION (INCHES)	0.580 3.581	0.328 2.326	2.285 2.795	2.998 1.521	3.075 1.206	4.528 0.804
PERCOLATION FROM TOP BARRIER (INCHES)	0.0000 0.1168	0.0000 0.0690	0.0000 0.1038	0.0324 0.1129	0.1126 0.1036	0.1117 0.1088
PERCOLATION FROM BASE OF COVER (INCHES)	0.0003 0.0774	0.0002 0.0834	0.0001 0.0797	0.0041 0.0935	0.0300 0.0929	0.0545 0.1017
DRAINAGE FROM TOP BARRIER (INCHES)	0.000 0.096	0.000 0.004	0.000 0.224	0.037 0.315	0.348 0.222	0.247 0.112
DRAINAGE FROM BASE OF COVER (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

ANNUAL TOTALS FOR 77

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	35.40	206500.	100.00
RUNOFF	3.008	17547.	8.50
EVAPOTRANSPIRATION	26.027	151826.	73.52
PERCOLATION FROM TOP BARRIER	0.8716	5085.	2.46
PERCOLATION FROM BASE OF COVER	0.6177	3603.	1.74
DRAINAGE FROM TOP BARRIER LAYER	1.606	9368.	4.54
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00
SOIL WATER AT START OF YEAR	60.74	354346.	
SOIL WATER AT END OF YEAR	61.80	360507.	
SNOW WATER AT START OF YEAR	0.00	0.	
SNOW WATER AT END OF YEAR	3.09	17996.	
ANNUAL WATER BUDGET BALANCE	0.00	-2.	0.00

****

****

MONTHLY TOTALS FOR 78.

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	0.38 5.68	0.17 2.81	0.81 4.66	3.49 0.14	3.14 0.95	4.85 1.02
RUNOFF (INCHES)	0.000 0.730	0.000 0.000	0.000 0.925	0.001 0.000	0.029 0.000	1.362 0.000
EVAPOTRANSPIRATION (INCHES)	0.803 4.946	1.123 2.774	2.285 1.952	2.993 0.652	2.824 0.869	4.343 0.802
PERCOLATION FROM TOP BARRIER (INCHES)	0.0791 0.1120	0.0248 0.1076	0.0128 0.0807	0.0884 0.1128	0.1090 0.1077	0.1071 0.1025

PERCOLATION FROM BASE OF COVER (INCHES)	0.1005	0.0756	0.0630	0.0584	0.0730	0.0830
	0.0932	0.0995	0.0935	0.0987	0.0999	0.1053
DRAINAGE FROM TOP BARRIER (INCHES)	0.013	0.000	0.000	0.129	0.265	0.144
	0.076	0.035	0.071	0.380	0.239	0.083
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

****

****

ANNUAL TOTALS FOR 78

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	28.10	163917.	100.00
RUNOFF	3.047	17775.	10.84
EVAPOTRANSPIRATION	26.368	153811.	93.83
PERCOLATION FROM TOP BARRIER	1.0506	6128.	3.74
PERCOLATION FROM BASE OF COVER	1.0436	6088.	3.71
DRAINAGE FROM TOP BARRIER LAYER	1.434	8365.	5.10
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00
SOIL WATER AT START OF YEAR	61.80	360507.	
SOIL WATER AT END OF YEAR	60.70	354075.	
SNOW WATER AT START OF YEAR	3.09	17996.	
SNOW WATER AT END OF YEAR	0.40	2306.	
ANNUAL WATER BUDGET BALANCE	0.00	0.	0.00

****

****

AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	0.86	0.64	1.65	2.49	2.77	4.67
	2.88	3.34	2.68	1.18	1.93	0.68
RUNOFF (INCHES)	0.000	0.000	0.000	0.183	0.009	0.595
	0.189	0.777	0.366	0.221	0.042	0.000
EVAPOTRANSPIRATION (INCHES)	0.616	0.916	1.927	2.459	2.626	4.320
	2.910	2.085	1.913	0.821	0.805	0.648
PERCOLATION FROM TOP BARRIER (INCHES)	0.0236	0.0082	0.0042	0.0266	0.0669	0.0796
	0.0873	0.0594	0.0615	0.0634	0.0592	0.0630
PERCOLATION FROM BASE OF COVER (INCHES)	0.0386	0.0282	0.0231	0.0200	0.0305	0.0433
	0.0585	0.0632	0.0596	0.0632	0.0598	0.0626
DRAINAGE FROM TOP BARRIER (INCHES)	0.003	0.000	0.000	0.033	0.168	0.122
	0.054	0.009	0.071	0.143	0.098	0.043
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

****

****

AVERAGE ANNUAL TOTALS FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)	PERCENT

PRECIPITATION	25.76	150243.	100.00
RUNOFF	2.381	13889.	9.24
EVAPOTRANSPIRATION	22.046	128601.	85.59
PERCOLATION FROM TOP BARRIER	0.6029	3517.	2.34
PERCOLATION FROM BASE OF COVER	0.5506	3212.	2.14
DRAINAGE FROM TOP BARRIER LAYER	0.743	4336.	2.89
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00

20/2

****

PEAK DAILY VALUES FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)
PRECIPITATION	2.36	13766.7
RUNOFF	1.419	8277.0
PERCOLATION FROM TOP BARRIER	0.0094	54.8
PERCOLATION FROM BASE OF COVER	0.0053	31.2
DRAINAGE FROM TOP BARRIER LAYER	0.018	103.2
DRAINAGE FROM BASE OF COVER	0.000	0.0
HEAD ON TOP BARRIER LAYER	1.7	
HEAD ON BASE OF COVER	0.0	
SNOW WATER	3.28	19104.8

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4031
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.2210

****
****

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR SITE
PROJECT NO. 87-38-68 SHEET 1 OF 33
DESCRIPTION SURFACEWATER MANAGEMENT PLAN - IMPOUNDMENT CLOSURE

INTRODUCTION

THE RUNOFF CONTROL AND MANAGEMENT SYSTEM HAS BEEN DESIGNED TO MANAGE STORMWATER RUNOFF (SURFACEWATER) TO MINIMIZE EROSION AND SEDIMENTATION. THE RUNOFF MANAGEMENT COMPUTATIONS FOLLOW AND ARE BASED ON THE FOLLOWING GENERAL CRITERIA/ ASSUMPTIONS:

1) SOIL CONSERVATION SERVICE (SCS) METHODS ARE APPLICABLE TO THE SITE. A TYPE II STORM DISTRIBUTION IS ASSUMED FOR THE RAINFALL ANTICIPATED DURING THE 25-YEAR FREQUENCY/ 24-HOUR DURATION STORM. UPLAND CURVE METHODOLOGY IS ASSUMED IN CONSTRUCTING SYNTHETIC (UNIT AND WATERSHED) HYDROGRAPHS.
2) MANNINGS EQUATION IS USED IN COMPUTING OPEN-CHANNEL FLOW CHARACTERISTICS.
3) EXISTING CHANNELS, DIVERSIONS, AND CULVERTS ARE EVALUATED AND UPGRADED AS DICTATED BY THE CALCULATIONS. ONLY WATERSHEDS CONTRIBUTING SIGNIFICANT RUNOFF IN THE IMMEDIATE VICINITY OF THE IMPOUNDMENTS (WITHIN

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JM6 DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 2 OF 33
DESCRIPTION SURFACEWATER MANAGEMENT PLAN - IMPOUNDMENT CLOSURE

THE KOPPERS PROPERTY) ARE INCORPORATED INTO THIS MANAGEMENT PLAN.

4) IT IS ASSUMED THAT DUE TO THE RELATIVELY SMALL WATERSHED AREA TOTAL (17.8 ACRES) AND "UNDISTURBED" PERCENTAGE OF AREA; THAT NO ADDITIONAL SEDIMENTATION BASIN(S) WILL BE REQUIRED. EXISTING WATERSHEDS ARE ASSUMED TO BE STABILIZED, HOWEVER, HYDROGRAPHS WERE DEVELOPED BASED ON SCS "DISTURBED" WATERSHED TYPE AS CONSERVATIVE.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: TE DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR WIS. SITE
PROJECT NO. 87-38-68 SHEET 3 OF 33
DESCRIPTION SURFACE WATER MANAGEMENT PLAN - IMPOUNDMENT CLOSURE

WATERSHED SUMMARY

WATERSHED NO.	APPROX. AREA (ACRES)	TOTAL RELIEF (Ft.)	HYDRAULIC LENGTH (MILES) (Ft.)	PEAK (2) DISCHARGE Qp (CFS)	
I	0.66	10	0.08 400	0.9	
II (1)	0.55	6	0.05 250	0.6	
III	0.35	8	0.06 300	0.4	
IV	1.84	11	0.14 750	2.9	
V	1.56	14	0.11 600	2.8	
VI	1.44	9	0.15 800	3.1	
VII	0.25	7	0.03 150	0.3	
VIII	3.70	5	0.27 1400	5.1	
IX	3.60	5	0.27 1400	5.0	
X	2.25	2	0.16 850	4.3	
XI	1.62	4	0.10 550	3.3	
TOTAL	17.82				

(1) WATERSHED II IS ACTUALLY (2) SUBWATERSHEDS OF APPROXIMATELY EQUAL AREA.
(2) REFER TO HYDROGRAPHS FOR EACH WATERSHED ATTACHED

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, MS. SITE
PROJECT NO. 87-38-68 SHEET 4 OF 33
DESCRIPTION SURFACEWATER MANAGEMENT PLAN - IMPOUNDMENT CLOSURE

CHANNEL / WATERSHED SUMMARY

CHANNEL NO.	REACH	CONTRIBUTING WATERSHEDS	TOTAL CONTRIBUTING ACREAGE
C-1	—	VIII	3.7
C-2	—	IX	3.6
C-3	A	X	2.3
	B	X; XI	3.9
	C	I, II, III, IV, VIII, IX, X, XI	14.6
	D	I, II, III, IV, V, VIII, IX, X, XI	16.1
C-4	—	I, II, VIII, IX,	8.5
C-5	—	VI	1.4
C-6	—	I THROUGH XI	17.82
D-1	—	I, II	1.21
D-2	—	II, III	0.90

SINCE THE TIME STEP USED IN DEVELOPING THE HYDROGRAPHS IS RELATIVELY HIGH (0.5 HOURS) THE LAG TIME REQUIRED FOR FLOW FROM HYDROGRAPH GENERATION POINT TO POINT OF INTEREST IS ASSUMED TO BE NEGLIGIBLE. HYDROGRAPHS FOR EACH CHANNEL ARE DEVELOPED BY DIRECTLY SUPERIMPOSING EACH WATERSHED HYDROGRAPH WITH NO LAG TIME (ALL BEGINNING AT TIME = 0.0 HRS.). THIS PROCEDURE IS CONSIDERED TO BE CONSERVATIVE SINCE THE PEAK DISCHARGES ARE LIKELY TO OCCUR AT DIFFERENT TIMES FOLLOWING THE START OF THE RAINFALL.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 5 OF 33
DESCRIPTION SURFACEWATER MANAGEMENT PLANS - IMPOUNDMENT CLOSURE

BASED ON THE CHANNEL/WATERSHED SUMMARY, THE FOLLOWING IS A SUMMARY OF DESIGN FLOWS FOR THE SITE CHANNELS/DIVERSIONS:

CHANNEL/ DIVERSION	PEAK DISCHARGE (Q_P) (1)	DESIGN DISCHARGE (cfs)
C-1	5.1	6
C-2	5.0	5
C-3A	4.3	5
C-3B	7.6	8
C-3C	22.5	23
C-3D	25.3	26
C-4	11.6	12
C-5	3.1	4
C-6	28.8	29
D-1	1.5	2
D-2	1.0	1

ASSUME ALL CHANNEL/DIVERSION SIDE SLOPES ARE 2H:1V

(1) SUMMATION OF INDIVIDUAL PEAK FLOWS FOR WATERSHEDS CONTRIBUTING TO THESE CHANNELS/DIVERSIONS.

Title of run = WATERSHED I HYDROGRAPH

6/33

Watershed data

Hydraulic length = .08 miles
Elevation change = 10 feet.
Area = .66 acres
Concentration time = .1089395 hours
Curve number = 80

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = .8679722 cfs
Discharge volume = .130711 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.000
5.000	0.035	0.000
5.500	0.035	0.000
6.000	0.035	0.000
6.500	0.044	0.000
7.000	0.044	0.000
7.500	0.044	0.000
8.000	0.044	0.000
8.500	0.057	0.002
9.000	0.062	0.005
9.500	0.070	0.009
10.000	0.079	0.013
10.500	0.101	0.022
11.000	0.136	0.037
11.500	0.211	0.071
12.000	1.672	0.868
12.500	0.317	0.362
13.000	0.163	0.144
13.500	0.119	0.099
14.000	0.092	0.077
14.500	0.066	0.056
15.000	0.066	0.053
15.500	0.066	0.054
16.000	0.066	0.054
16.500	0.040	0.036
17.000	0.040	0.033
17.500	0.040	0.033
18.000	0.040	0.033
18.500	0.040	0.033

(E)

7/33

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.033
19.500	0.040	0.033
20.000	0.040	0.033
20.500	0.026	0.024
21.000	0.026	0.022
21.500	0.026	0.022
22.000	0.026	0.022
22.500	0.026	0.022
23.000	0.026	0.022
23.500	0.026	0.022
24.000	0.026	0.022
24.500	0.000	0.004
25.000	0.000	0.000

8/33

Title of run = WATERSHED II HYDROGRAPH

Watershed data

Hydraulic length = .05 miles
Elevation change = 6 feet.
Area = .55 acres
Concentration time = .0694912 hours
Curve number = 80

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = .6303053 cfs
Discharge volume = .1980469 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.000
5.000	0.035	0.000
5.500	0.035	0.000
6.000	0.035	0.000
6.500	0.044	0.000
7.000	0.044	0.000
7.500	0.044	0.000
8.000	0.044	0.000
8.500	0.057	0.002
9.000	0.062	0.004
9.500	0.070	0.006
10.000	0.079	0.010
10.500	0.101	0.016
11.000	0.136	0.027
11.500	0.211	0.052
12.000	1.672	0.630
12.500	0.317	0.259
13.000	0.163	0.104
13.500	0.119	0.071
14.000	0.092	0.055
14.500	0.066	0.041
15.000	0.066	0.038
15.500	0.066	0.039
16.000	0.066	0.039
16.500	0.040	0.026
17.000	0.040	0.023
17.500	0.040	0.024
18.000	0.040	0.024
18.500	0.040	0.024

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.024
19.500	0.040	0.024
20.000	0.040	0.024
20.500	0.026	0.017
21.000	0.026	0.016
21.500	0.026	0.016
22.000	0.026	0.016
22.500	0.026	0.016
23.000	0.026	0.016
23.500	0.026	0.016
24.000	0.026	0.016
24.500	0.000	0.002
25.000	0.000	0.000

Title of run = WATERSHED III HYDROGRAPH

Watersned data

Hydraulic length = .06 miles
Elevation change = 8 feet.
Area = .35 acres
Concentration time = 7.911016E-02 hours
Curve number = 80

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = .4177919 cfs
Discharge volume = .1980469 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.000
5.000	0.035	0.000
5.500	0.035	0.000
6.000	0.035	0.000
6.500	0.044	0.000
7.000	0.044	0.000
7.500	0.044	0.000
8.000	0.044	0.000
8.500	0.057	0.001
9.000	0.062	0.002
9.500	0.070	0.004
10.000	0.079	0.006
10.500	0.101	0.010
11.000	0.136	0.018
11.500	0.211	0.034
12.000	1.672	0.418
12.500	0.317	0.173
13.000	0.163	0.069
13.500	0.119	0.047
14.000	0.092	0.037
14.500	0.066	0.027
15.000	0.066	0.026
15.500	0.066	0.026
16.000	0.066	0.026
16.500	0.040	0.017
17.000	0.040	0.016
17.500	0.040	0.016
18.000	0.040	0.016
18.500	0.040	0.016

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.016
19.500	0.040	0.016
20.000	0.040	0.016
20.500	0.026	0.011
21.000	0.026	0.011
21.500	0.026	0.011
22.000	0.026	0.011
22.500	0.026	0.011
23.000	0.026	0.011
23.500	0.026	0.011
24.000	0.026	0.011
24.500	0.000	0.002
25.000	0.000	0.000

11/3

(3)

12/3:

Title of run = WATERSHED IV HYDROGRAPH

Watershed data

Hydraulic length = .14 miles
Elevation change = 11 feet.
Area = 1.84 acres
Concentration time = .2404618 hours
Curve number = 80

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 2.867888 cfs
Discharge volume = .1980469 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.000
5.000	0.035	0.000
5.500	0.035	0.000
6.000	0.035	0.000
6.500	0.044	0.000
7.000	0.044	0.000
7.500	0.044	0.000
8.000	0.044	0.001
8.500	0.057	0.007
9.000	0.062	0.016
9.500	0.070	0.029
10.000	0.079	0.045
10.500	0.101	0.073
11.000	0.136	0.124
11.500	0.211	0.239
12.000	1.672	2.868
12.500	0.317	1.230
13.000	0.163	0.645
13.500	0.119	0.367
14.000	0.092	0.276
14.500	0.066	0.202
15.000	0.066	0.188
15.500	0.066	0.186
16.000	0.066	0.187
16.500	0.040	0.128
17.000	0.040	0.117
17.500	0.040	0.113
18.000	0.040	0.114
18.500	0.040	0.114

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.114
19.500	0.040	0.115
20.000	0.040	0.115
20.500	0.026	0.085
21.000	0.026	0.079
21.500	0.026	0.077
22.000	0.026	0.077
22.500	0.026	0.077
23.000	0.026	0.077
23.500	0.026	0.078
24.000	0.026	0.078
24.500	0.000	0.016
25.000	0.000	0.004
25.500	0.000	0.000

14/3

Title of run = WATERSHED V HYDROGRAPH

Watershed data

Hydraulic length = .11 miles
Elevation change = 14 feet.
Area = 1.56 acres
Concentration time = .1039138 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 2.835549 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.001
5.000	0.035	0.005
5.500	0.035	0.010
6.000	0.035	0.014
6.500	0.044	0.022
7.000	0.044	0.028
7.500	0.044	0.032
8.000	0.044	0.037
8.500	0.057	0.052
9.000	0.062	0.064
9.500	0.070	0.079
10.000	0.079	0.097
10.500	0.101	0.133
11.000	0.136	0.193
11.500	0.211	0.322
12.000	1.672	2.836
12.500	0.317	1.092
13.000	0.163	0.404
13.500	0.119	0.273
14.000	0.092	0.211
14.500	0.066	0.153
15.000	0.066	0.145
15.500	0.066	0.145
16.000	0.066	0.145
16.500	0.040	0.096
17.000	0.040	0.087
17.500	0.040	0.087
18.000	0.040	0.087
18.500	0.040	0.088

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.088
19.500	0.040	0.088
20.000	0.040	0.088
20.500	0.026	0.063
21.000	0.026	0.059
21.500	0.026	0.059
22.000	0.026	0.059
22.500	0.026	0.059
23.000	0.026	0.059
23.500	0.026	0.059
24.000	0.026	0.059
24.500	0.000	0.009
25.000	0.000	0.000

Title of run = WATERSHED VI HYDROGRAPH

Watershed data

Hydraulic length = .15 miles
Elevation change = 9 feet.
Area = 1.44 acres
Concentration time = .2063783 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 3.083282 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.001
5.000	0.035	0.006
5.500	0.035	0.010
6.000	0.035	0.015
6.500	0.044	0.024
7.000	0.044	0.031
7.500	0.044	0.036
8.000	0.044	0.041
8.500	0.057	0.058
9.000	0.062	0.071
9.500	0.070	0.088
10.000	0.079	0.108
10.500	0.101	0.148
11.000	0.136	0.214
11.500	0.211	0.355
12.000	1.672	3.083
12.500	0.317	1.220
13.000	0.163	0.556
13.500	0.119	0.322
14.000	0.092	0.242
14.500	0.066	0.177
15.000	0.066	0.165
15.500	0.066	0.163
16.000	0.066	0.163
16.500	0.040	0.110
17.000	0.040	0.100
17.500	0.040	0.098
18.000	0.040	0.098
18.500	0.040	0.099

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.099
19.500	0.040	0.099
20.000	0.040	0.099
20.500	0.026	0.072
21.000	0.026	0.067
21.500	0.026	0.066
22.000	0.026	0.066
22.500	0.026	0.066
23.000	0.026	0.066
23.500	0.026	0.066
24.000	0.026	0.066
24.500	0.000	0.012
25.000	0.000	0.002
25.500	0.000	0.000

20/3

Title of run = WATERSHED VIII HYDROGRAPH

Watershed data

Hydraulic length = .27 miles
Elevation change = 5 feet.
Area = 3.7 acres
Concentration time = .6686658 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 5.141358 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.002
5.000	0.035	0.010
5.500	0.035	0.021
6.000	0.035	0.033
6.500	0.044	0.052
7.000	0.044	0.072
7.500	0.044	0.088
8.000	0.044	0.103
8.500	0.057	0.135
9.000	0.062	0.171
9.500	0.070	0.212
10.000	0.079	0.263
10.500	0.101	0.346
11.000	0.136	0.489
11.500	0.211	0.773
12.000	1.672	5.141
12.500	0.317	4.607
13.000	0.163	2.361
13.500	0.119	1.642
14.000	0.092	1.065
14.500	0.066	0.624
15.000	0.066	0.501
15.500	0.066	0.465
16.000	0.066	0.450
16.500	0.040	0.363
17.000	0.040	0.303
17.500	0.040	0.284
18.000	0.040	0.273
18.500	0.040	0.269

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.269
19.500	0.040	0.269
20.000	0.040	0.269
20.500	0.026	0.228
21.000	0.026	0.197
21.500	0.026	0.188
22.000	0.026	0.182
22.500	0.026	0.180
23.000	0.026	0.180
23.500	0.026	0.180
24.000	0.026	0.180
24.500	0.000	0.097
25.000	0.000	0.035
25.500	0.000	0.016
26.000	0.000	0.005
26.500	0.000	0.000

Title of run = WATERSHED IX

Watershed data

Hydraulic length = .27 miles
Elevation change = 5 feet.
Area = 3.6 acres
Concentration time = .6686658 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 5.002402 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.002
5.000	0.035	0.009
5.500	0.035	0.020
6.000	0.035	0.032
6.500	0.044	0.051
7.000	0.044	0.070
7.500	0.044	0.086
8.000	0.044	0.100
8.500	0.057	0.131
9.000	0.062	0.166
9.500	0.070	0.207
10.000	0.079	0.256
10.500	0.101	0.337
11.000	0.136	0.475
11.500	0.211	0.752
12.000	1.672	5.002
12.500	0.317	4.482
13.000	0.163	2.297
13.500	0.119	1.598
14.000	0.092	1.037
14.500	0.066	0.607
15.000	0.066	0.488
15.500	0.066	0.452
16.000	0.066	0.437
16.500	0.040	0.354
17.000	0.040	0.294
17.500	0.040	0.277
18.000	0.040	0.266
18.500	0.040	0.261

23/3

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.262
19.500	0.040	0.262
20.000	0.040	0.262
20.500	0.026	0.222
21.000	0.026	0.192
21.500	0.026	0.183
22.000	0.026	0.177
22.500	0.026	0.175
23.000	0.026	0.175
23.500	0.026	0.175
24.000	0.026	0.175
24.500	0.000	0.094
25.000	0.000	0.034
25.500	0.000	0.016
26.000	0.000	0.004
26.500	0.000	0.000

(6

24/3:

Title of run = WATERSHED X HYDROGRAPH

Watershed data

Hydraulic length = .16 miles
Elevation change = 2 feet.
Area = 2.25 acres
Concentration time = .4822956 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 4.340721 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.002
5.000	0.035	0.008
5.500	0.035	0.016
6.000	0.035	0.024
6.500	0.044	0.037
7.000	0.044	0.049
7.500	0.044	0.059
8.000	0.044	0.068
8.500	0.057	0.092
9.000	0.062	0.114
9.500	0.070	0.143
10.000	0.079	0.177
10.500	0.101	0.237
11.000	0.136	0.339
11.500	0.211	0.551
12.000	1.672	4.341
12.500	0.317	2.347
13.000	0.163	1.355
13.500	0.119	0.838
14.000	0.092	0.477
14.500	0.066	0.340
15.000	0.066	0.299
15.500	0.066	0.285
16.000	0.066	0.281
16.500	0.040	0.209
17.000	0.040	0.184
17.500	0.040	0.173
18.000	0.040	0.169
18.500	0.040	0.170

25/3

time, hr	rainfall, in	hyerograph, cfs
19.000	0.040	0.170
19.500	0.040	0.170
20.000	0.040	0.170
20.500	0.026	0.133
21.000	0.026	0.121
21.500	0.026	0.116
22.000	0.026	0.114
22.500	0.026	0.114
23.000	0.026	0.114
23.500	0.026	0.114
24.000	0.026	0.114
24.500	0.000	0.040
25.000	0.000	0.015
25.500	0.000	0.004
26.000	0.000	0.000

Title of run = WATERSHED #2 HYDROGRAPH

Watershed data

Hydraulic length = .1 miles
Elevation change = 4 feet.
Area = 1.62 acres
Concentration time = .1685072 hours
Curve number = 90

Storm data

SCS Type 2 storm, 24 hour storm
Total precipitation = 4.4 inches
Storm duration = 24 hours
Unit hydrograph type = Disturbed
Max. Discharge = 3.336141 cfs
Discharge volume = .2750078 acre ft

time, hr	rainfall, in	hydrograph, cfs
0.000	0.000	0.000
0.500	0.022	0.000
1.000	0.022	0.000
1.500	0.026	0.000
2.000	0.026	0.000
2.500	0.026	0.000
3.000	0.026	0.000
3.500	0.031	0.000
4.000	0.031	0.000
4.500	0.035	0.001
5.000	0.035	0.006
5.500	0.035	0.011
6.000	0.035	0.016
6.500	0.044	0.026
7.000	0.044	0.033
7.500	0.044	0.038
8.000	0.044	0.044
8.500	0.057	0.061
9.000	0.062	0.075
9.500	0.070	0.094
10.000	0.079	0.115
10.500	0.101	0.157
11.000	0.136	0.229
11.500	0.211	0.380
12.000	1.672	3.336
12.500	0.317	1.305
13.000	0.163	0.505
13.500	0.119	0.329
14.000	0.092	0.252
14.500	0.066	0.184
15.000	0.066	0.172
15.500	0.066	0.172
16.000	0.066	0.173
16.500	0.040	0.115
17.000	0.040	0.104
17.500	0.040	0.104
18.000	0.040	0.104
18.500	0.040	0.104

(4

27/3:

time, hr	rainfall, in	hydrograph, cfs
19.000	0.040	0.104
19.500	0.040	0.104
20.000	0.040	0.104
20.500	0.026	0.075
21.000	0.026	0.070
21.500	0.026	0.070
22.000	0.026	0.070
22.500	0.026	0.070
23.000	0.026	0.070
23.500	0.026	0.070
24.000	0.026	0.070
24.500	0.000	0.012
25.000	0.000	0.000
25.500	0.000	0.000

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

(4E)

BY: JMG DATE: 5/25/87 CHKD BY: — DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS, SITE
PROJECT NO. 87-38-68 SHEET 28 OF 33
DESCRIPTION SURFACEWATER MANAG'T. PLAN I - IMPOUNDMENT CLOSURE

CHANNEL SCHEDULE

CHANNEL/ DIVERSION	REACH	DESIGN FLOW (CFS)	BOTTOM SLOPE (%)	TOTAL DESIGN (2) DEPTH (Ft)	FLOW VELOCITY (3) (FPS)	MANNINGS n (NO UNITS)
C-1	—	6	0.2 (1)	3.0	1.6	0.03 (GRASS
C-2	—	5	0.5 (1)	2.5	2.2	0.03
C-3	A	5	0.33	2.5	1.9	0.03
C-3	B	8	0.33	3.0	2.1	0.03
C-3	C	23	0.33	4.0	2.7	0.03
C-3	D	26	0.40	4.0	3.0	0.03
C-4	—	12	0.5 (1)	3.0	2.7	0.03
C-5	—	4	1 (1)	2.0	2.7	0.03
C-6	—	29	0.5 (1)	4.0	3.3	0.03
D-1	—	2	1	2.0	2.2	0.03
D-2	—	1	1	1.5	1.9	0.03

ALL CHANNELS/DIVERSIONS HAVE 2H:1 SIDE SLOPES WHICH ARE VEGETATED. ALL CHANNELS/DIVERSIONS ARE TRIANGULAR IN CROSS-SECTION (BOTTOM WIDTH = 0 Ft).

(1) BOTTOM SLOPE APPROXIMATED BY SLOPE EXISTING IN FIELD (AS PER JUNE, 1984 SITE TOPO).

(2) TOTAL DEPTH (D_t) = FLOW DEPTH (D_f) + FREEBOARD (D_{fb}) WHERE $D_{fb} = \sqrt{CY}$

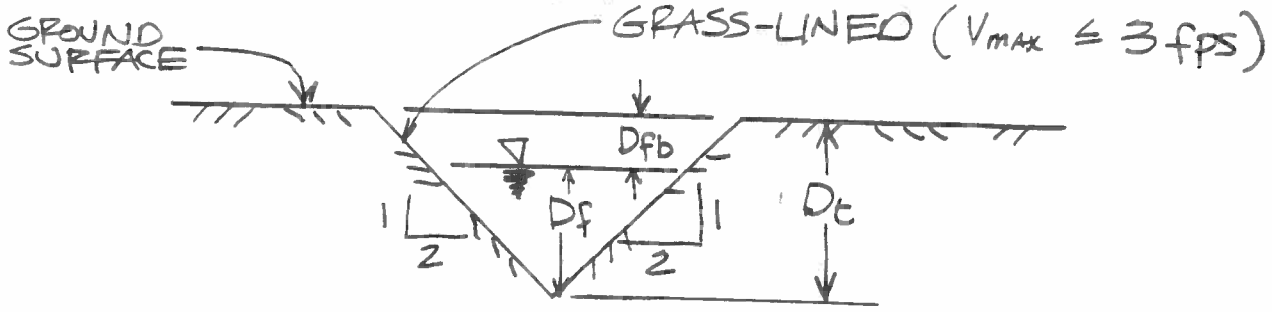
$Y = D_f$ AND $C = 1.5$ (AS PER REF NO. 1)

(3) SINCE ALL CHANNEL/DIVERSION VELOCITIES ARE ≤ 4 fps GRASS LINING EROSION PROTECTION IS ADEQUATE.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, W/S. SITE
PROJECT NO. 87-38-68 SHEET 29 OF 33
DESCRIPTION SURFACEWATER MANAG'T. PLAN - IMPOUNDMENT CLOSURE

CHANNEL CALCULATIONS



Title of run: CHANNEL C-1

Solving for	DEPTH (NORMAL)
Channel shape	Triangle
Flow depth (ft)	1.4
First Side slope	2.0000
Second Side slope	2.0000
Slope of diversion	0.0020
Manning's n	0.0300
CFS	6.00
Cross section area (sqft)	3.7
Hydraulic radius	0.6
fps	1.61
Froude number	0.242

$D_f = 1.4$ Ft
$D_{fb} = \sqrt{1.5 \times 1.4} = 1.4$ Ft
$D_t = 2.8$ Ft
SAY 3.0 Ft.

Title of run: CHANNEL C-2

Solving for	DEPTH (NORMAL)
Channel shape	Triangle
Flow depth (ft)	1.1
First Side slope	2.0000
Second Side slope	2.0000
Slope of diversion	0.0050
Manning's n	0.0300
CFS	5.00
Cross section area (sqft)	2.3
Hydraulic radius	0.5
fps	2.15
Froude number	0.366

$D_f = 1.1$ Ft
$D_{fb} = \sqrt{1.5 \times 1.1} = 1.3$ Ft
$D_t = 2.4$ Ft
SAY 2.5 Ft

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 30 OF 33
DESCRIPTION SURFACE WATER MANAG'T. PLAN - IMPOUNDMENT CLOSURE

Title of run: CHANNEL C-6

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	2.1
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0050
Manning's n.....	0.0300
CFS.....	29.00
Cross section area (sqft)..	8.7
Hydrualic radius.....	0.9
fps.....	3.34
Froude number.....	0.407

$D_f = 2.1$ Ft

$D_{fb} = \sqrt{1.5 \times 2.1} = 1.8$ Ft

$D_t = 3.9$ Ft

SAY 4.0 Ft

Title of run: DIVERSION D-1

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	0.7
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0100
Manning's n.....	0.0300
CFS.....	2.00
Cross section area (sqft)..	0.9
Hydrualic radius.....	0.3
fps.....	2.22
Froude number.....	0.477

$D_f = 0.7$ Ft

$D_{fb} = \sqrt{1.5 \times 0.7} = 1.0$ Ft

$D_t = 1.7$ Ft

SAY 2.0 Ft

Title of run: DIVERSION D-2

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	0.5
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0100
Manning's n.....	0.0300
CFS.....	1.00
Cross section area (sqft)..	0.5
Hydrualic radius.....	0.2
fps.....	1.87
Froude number.....	0.457

$D_f = 0.5$ Ft

$D_{fb} = \sqrt{1.5 \times 0.5} = 0.8$ Ft

$D_t = 1.3$ Ft

SAY 1.5 Ft

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 31 OF 33
DESCRIPTION SURFACEWATER MANAG'T. PLAN - IMPOUNDMENT CLOSURE

Title of run: CHANNEL C-3D

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	2.1
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0040
Manning's n.....	0.0300
CFS.....	26.00
Cross section area (sqft)..	8.7
Hydrualic radius.....	0.9
fps.....	2.99
Froude number.....	0.364

$D_f = 2.1$ Ft
$D_{fb} = \sqrt{1.5 \times 2.1} = 1.8$ Ft
$D_t = 3.9$ Ft
SAY 4.0 Ft

Title of run: CHANNEL C-4

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	1.5
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0050
Manning's n.....	0.0300
CFS.....	12.00
Cross section area (sqft)..	4.5
Hydrualic radius.....	0.7
fps.....	2.68
Froude number.....	0.386

$D_f = 1.5$ Ft
$D_{fb} = \sqrt{1.5 \times 1.5} = 1.5$ Ft
$D_t = 3.0$ Ft

Title of run: CHANNEL C-5

Solving for.....	DEPTH (NORMAL)
Channel shape.....	Triangle
Flow depth (ft).....	0.9
First Side slope.....	2.0000
Second Side slope.....	2.0000
Slope of diversion.....	0.0100
Manning's n.....	0.0300
CFS.....	4.00
Cross section area (sqft)..	1.5
Hydrualic radius.....	0.4
fps.....	2.65
Froude number.....	0.501

$D_f = 0.9$ Ft
$D_{fb} = \sqrt{1.5 \times 0.9} = 1.2$ Ft
$D_t = 2.1$ Ft
SAY 2.0 Ft

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 32 OF 33
DESCRIPTION SURFACEWATER MANAG'T. PLAN - IMPOUNDMENT CLOSURE

Title of run: CHANNEL C-3A

Solving for	DEPTH (NORMAL)
Channel shape	Triangle
Flow depth (ft)	1.2
First Side slope	2.0000
Second Side slope	2.0000
Slope of diversion	0.0033
Manning's n	0.0300
CFS	5.00
Cross section area (sqft)	2.7
Hydrualic radius	0.5
fps	1.85
Froude number	0.302

D_f = 1.2 Ft

$D_{fb} = \sqrt{1.5 \times 1.2} = 1.3$ Ft

D_t = 2.5 Ft

Title of run: CHANNEL C-3B

Solving for	DEPTH (NORMAL)
Channel shape	Triangle
Flow depth (ft)	1.4
First Side slope	2.0000
Second Side slope	2.0000
Slope of diversion	0.0033
Manning's n	0.0300
CFS	8.00
Cross section area (sqft)	3.9
Hydrualic radius	0.6
fps	2.07
Froude number	0.310

D_f = 1.4 Ft

$D_{fb} = \sqrt{1.5 \times 1.4} = 1.4$ Ft

D_t = 2.8 Ft

SAY 3.0 Ft

Title of run: CHANNEL C-3C

Solving for	DEPTH (NORMAL)
Channel shape	Triangle
Flow depth (ft)	2.1
First Side slope	2.0000
Second Side slope	2.0000
Slope of diversion	0.0033
Manning's n	0.0300
CFS	23.00
Cross section area (sqft)	8.5
Hydrualic radius	0.9
fps	2.70
Froude number	0.331

D_f = 2.1 Ft

$D_{fb} = \sqrt{1.5 \times 2.1} = 1.8$ Ft

D_t = 3.9 Ft

SAY 4.0 Ft

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: TE DATE: 5-26-87 CHKD BY: JM6 DATE: 5/27/87
PROJECT NAME: Kopper Flower site
PROJECT NO. 87-32-62 SHEET 33 OF 33
DESCRIPTION SURFACEWATER MANAG'T. PLAN - IMPOUNDMENT CLOSURE

Culvert A 12" CMP $Q = 5.0$ cfs.

Assume inlet controls and pipe projects from fill

using inlet control nomograph p189 Handbook of Steel Drainage + Highway Construction Product

$\frac{HW}{D} = 2.8 \rightarrow HW = 2.8'$

Approximate elevation of head water is $671' + 2.8' = 673.8'$
Approximate road elevation is 674' so culvert is acceptable as is.

Culvert B. 12" CMP $Q = 4.3$ cfs

Same assumptions as in Culvert A

$\frac{HW}{D} = 2.0 \rightarrow HW = 2.0$

Approximate elevation of head water is $672' + 2' = 674'$
Approximate road elevation is 674' so culvert is acceptable as is.

Culvert C 12" steel pipe $Q = 5.1$ cfs.

Same assumptions as above

$\frac{HW}{D} = 2.83 \rightarrow HW = 2.83'$

Approximate elevation of head water is $671' + 2.83' = 673.83'$
Approximate road elevation is 674' so culvert is acceptable as is

Culvert D

36" C.M.P. $Q = 29$ cfs.

Same assumptions as above

$\frac{HW}{D} = .95 \rightarrow HW = (3)(.95) = 2.85'$

Culvert is acceptable as is SINCE BANKS OF CHANNEL C-6 ARE DEEPER THAN 3'.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87 (5A)
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 1 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

SETTLEMENT

ESTIMATE THE SETTLEMENTS RESULTING FROM BACKFILLING THE EXCAVATED SURFACE IMPOUNDMENTS. THE PURPOSE OF THIS IS TO ACCOMODATE ANY SETTLEMENT / SUBSIDING INTO THE DESIGNED FINAL COVER TO MAINTAIN ITS INTEGRITY. THIS WILL ESSENTIALLY REALIZE 1) A DECREASED POTENTIAL FOR LEAKAGE (THROUGH THE COVER) DUE TO POSSIBLE CRACKING AND 2) INCREASED RUNOFF POTENTIAL BY MAINTAINING AN ADEQUATE UNIFORM SLOPE.

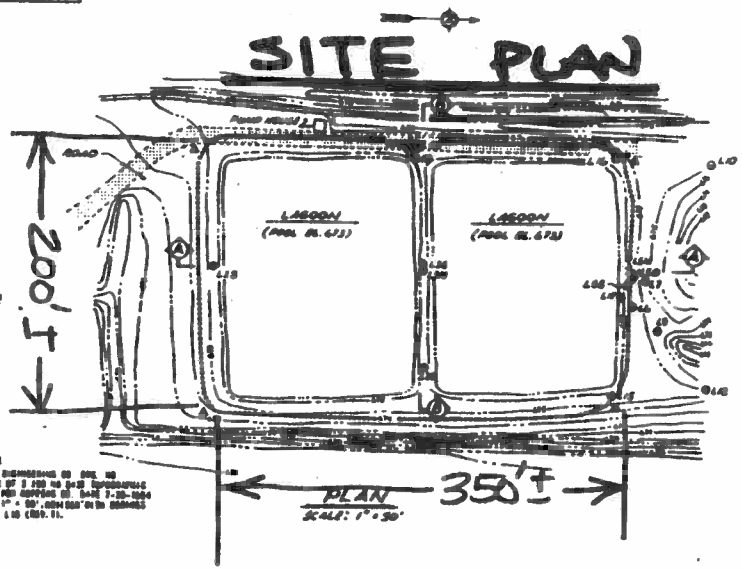
ANALYSIS ASSUMPTIONS: THE FOLLOWING ASSUMPTIONS ARE MADE REGARDING SETTLEMENT:

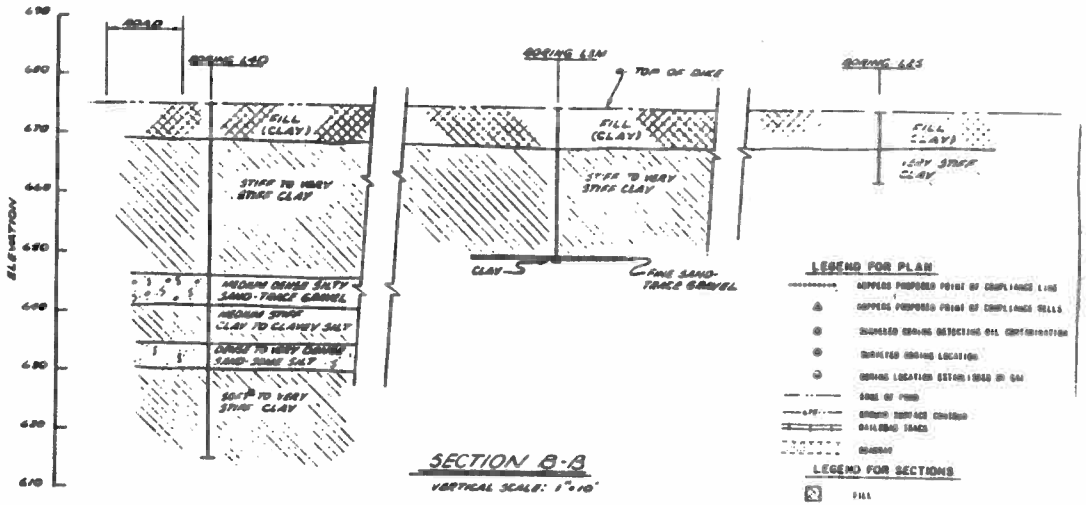
1. BASED ON PREVIOUS SUBSURFACE EXPLORATION AT THE SITE(1) THE ATTACHED SITE PLAN AND TYPICAL SECTION ARE ASSUMED REPRESENTATIVE OF SITE CONDITIONS.
2. SITE CONDITIONS ARE ASSUMED TO CONSIST OF THE FOLLOWING GENERAL SOILS, AND (BASED ON THE LIMITED TEST DATA AND OUR EXPERIENCE WITH SIMILAR SOILS, THE

(1) SURFACE IMPOUNDMENT EXPLORATIONS, LINER INTEGRITY AND DIKE STABILITY, RCRA PART B PERMIT APPLICATION, EXISTING LAGOONS, SUPERIOR, WISCONSIN, BY GAI CONSULTANTS, 2/6/85

13-063-98

SITE PLAN

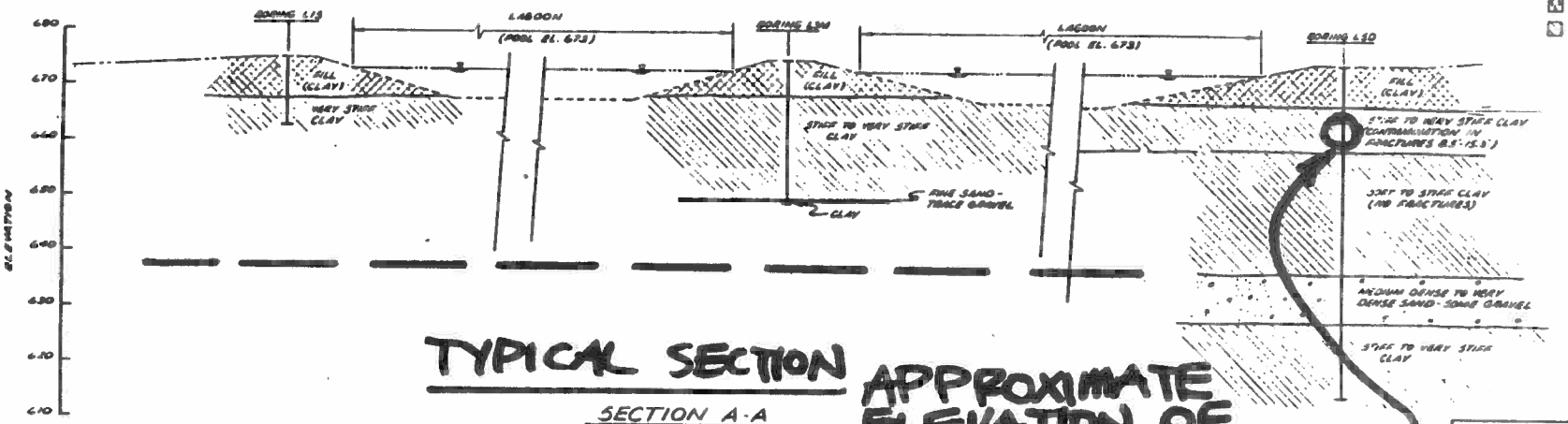




SECTION B-B
VERTICAL SCALE: 1"=10'

LEGEND FOR PLAN

LEGEND FOR SECTIONS



TYPICAL SECTION

SECTION A-A
VERTICAL SCALE: 1"=10'

APPROXIMATE ELEVATION OF TESTED SAMPLE (EL 665±)

FIGURE 4

unl

20

55

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: MG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS SITE
PROJECT NO. 87-38-68 SHEET 3 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

SUPERIOR SITE SOILS) ARE JUDGED TO POTENTIALLY CONTRIBUTE THE FOLLOWING TYPES OF DEFORMATION/COMPRESSION (REFER TO TYPICAL SECTION):

ELEV. 645± TO ELEV. 665± : STIFF TO VERY STIFF CLAY

ELEV. 615± TO ELEV. 645± : INTERLAYERED SAND, GRAVEL, AND CLAY (MED DENSE TO VERY STIFF)

BOTH MAJOR SITE STRATA COULD POTENTIALLY CONTRIBUTE PRIMARY AND SECONDARY CONSOLIDATION AS WELL AS ELASTIC SETTLEMENT COMPONENTS. THESE ARE ASSESSED BELOW.

3) ASSUMING A NATURAL GROUND SURFACE OF APPROXIMATELY ELEV. 670±; OVEREXCAVATION OF SOIL AND COMPACTED BACKFILL OPERATIONS WILL NOT APPRECIABLY ADD ADDITIONAL LOAD TO THE UNDERLYING CLAYS THAT HAVE NOT ALREADY BEEN IMPOSED BY THE ORIGINAL OVERBURDEN. FURTHER, SITE SOILS ARE VERY LIKELY TO BE HIGHLY OVERCONSOLIDATED DUE TO GLACIAL MOVEMENTS IN THE REGION. THIS IS EXEMPLIFIED BY THE RELATIVELY STIFF/DENSE CONSISTENCIES SHOWN IN THE BORINGS OF PREVIOUSLY REFERENCED REPORT. ASSUME SITE CLAYS ARE OVERCONSOLIDATED. FURTHER ASSUME THAT THE SOILS MOST LIKELY TO CONSOLIDATE WOULD BE THOSE IMMEDIATELY UNDERLYING THE IMPOUNDMENTS (i.e. EL 645 – EL 665).

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87 (57)
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 4 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

4) ASSUME THAT SUITABLE COHESIVE FILLS WITHIN THE OVEREXCAVATED / EXCAVATED IMPOUNDMENTS WILL BE PLACED AND COMPACTED (CONTROLLED FILL) ACCORDING TO GOOD ENGINEERING PRACTICES TO MINIMIZE SETTLEMENTS, INCREASE DENSITY, PROVIDE EROSION RESISTANCE, AND INCREASE SHEAR STRENGTH. THE FILL / COVER SYSTEM IS NOT ANTICIPATED TO CONTRIBUTE ANY SIGNIFICANT COMPRESSIBILITY SINCE IT IS A CONTROLLED FILL MATERIAL. HOWEVER, AS WITH ALL FILLS, VARIABILITY MAY BE ACCOUNTED FOR BY CONSERVATIVELY ASSUMING THAT THE COMPACTED FILL COULD POTENTIALLY SETTLE 1% (TOTAL OF THE FILL THICKNESS. THIS WILL BE SUPERIMPOSED ON CONSOLIDATION AND ELASTIC SETTLEMENTS.

5.) ASSUME THE EXISTING DIKES WILL EITHER REMAIN IN-PLACE OR BE REPLACED WITH CONTROLLED FILL. IN ANY CASE, THE INCREASED LOAD WILL BE INSIGNIFICANT COMPARED TO THE IMPOUNDMENT FILL AND THESE WILL NOT CONTRIBUTE TO ANY SETTLEMENTS.

6) ASSUME TIME RATE OF SETTLEMENT TO BE INSIGNIFICANT FOR THIS APPLICATION

7) MAXIMUM SETTLEMENTS ARE ESTIMATED FOR THE THICKEST FILL (HIGHEST LOAD) AREAS. SETTLEMENTS (POTENTIAL) AT THE OUTER LIMITS OF THE FILL WILL BE ZERO; VARYING LINEARLY BETWEEN THESE POINTS.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 5 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

SOIL PROPERTIES (REFER TO GAI TESTING)

STIFF TO V. STIFF CLAY

$\gamma_T \cong 115$ PCF

$\bar{N}$ (AVG. BLOW COUNT) $\cong$ 6 BPF (BLOWS PER FOOT)

*E_s (STATIC MODULUS OF ELASTICITY) $\cong$ 450 KSF

*ν (POISSONS RATIO) = 0.3

*SEE REFERENCE NO. 2, PG 35

CONSOLIDATION PARAMETERS:

FROM GAI TESTING (ATTERBERG LIMITS) LL = 81%

FROM REFERENCE NO. 2, PG 51 GLACIAL CLAYS MAY OFTEN BE APPROXIMATED AT

$C_c \cong 0.009 (LL - 10)$

$C_c \cong 0.009(81 - 10) = 0.64$ (CONSERVATIVELY HIGH)

HOWEVER, ASSUMING OVERCONSOLIDATION,

$C_{cr} \approx 0.1 C_c = 0.1(0.64) = 0.064$ (CONSERVATIVELY HIGH)

FROM REFERENCE NO. 3; PG 7.1-22

$e \approx e_o \cong 0.6$ (CONSERVATIVE)

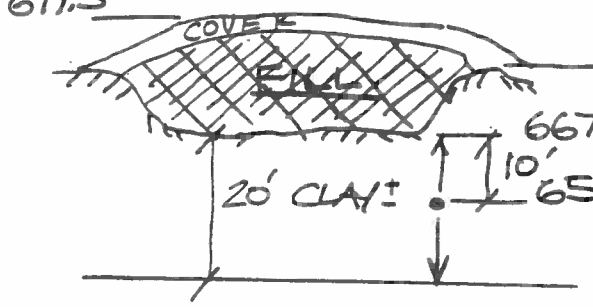
ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.F DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 6 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

SETTLEMENT CALCULATIONS

- EXISTING VERTICAL STRESSES:

ASSUMING AN EXISTING GROUND SURFACE OF EL 667 (APPROX. BASE OF IMPOUNDMENT)



σ'_{V_0} = 115 PCF x 10 Ft
= 1,150 PSF

ASSUME NO OVERBURDEN LOAD DUE TO IMPOUNDMENT MATERIAL OR LIQUID.

- CHANGE IN STRESS: ($\Delta\sigma'_{V_0}$)

MAXIMUM HEIGHT OF FILL = (679.5 - 667) = 12.5 Ft
(ASSUME NO DISSIPATION OF VERTICAL STRESS WITH DEP

$\Delta\sigma'_{V_0}$ = 120 PCF x 12.5 Ft = 1,500 PSF

TOTAL SETTLEMENT (S_T) = $S_i + S_c + S_s$
(S_i: ELASTIC; S_c: PRIMARY CONSOLIDATION; S_s: SECONDARY COMPRESSION (CREEP))

$$S_i = qB\frac{1-\nu^2}{E_s}I_w$$

(REFERENCE NO. 2; pg 157)

ASSUME B = 200 Ft*; q = 0.75 TSF; I_w = 1.2

* B IS THE LEAST DIMENSION OF THE 350' x 200' LOADED AREA.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.F. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 7 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

$$S_i = (1.5\ KSF)(1.2)\frac{(1-0.3^2)}{450\ KSF}(200\ Ft)$$

$$= \underline{0.73\ Ft\ (9\ INCHES)}$$

ASSUMING OVERCONSOLIDATION:

$$S_c = C_{cr}\frac{H_o}{1+e_o}\ LOG\ \frac{\bar{\sigma}_{vo}+\Delta\bar{\sigma}_v}{\bar{\sigma}_{vo}}$$

$$= (0.064)\frac{(20\ Ft)}{1.6}\ LOG\left(\frac{1150+1500}{1150}\right)$$

$$= (0.064)\ (12.5)\ (0.36)$$

$$= \underline{0.29\ Ft\ (3.5\ INCHES)}$$

SECONDARY COMPRESSION IS ASSUMED TO BE NEGLIGIBLE COMPARED WITH THE MAGNITUDE OF SETTLEMENTS ESTIMATED AS A RESULT OF ELASTIC AND PRIMARY COMPRESSION.

ESTIMATE OF CONTROLLED FILL SETTLEMENT:

TOTAL FILL THICKNESS ≈ 12.5 Ft
ASSUME 1% COMPRESSION (TYPICAL)

$$12.5\ Ft \times 0.01 = \underline{1.5\ INCHES}\ (MAXIMUM)$$

$$S_t = S_i + S_c + S_s + 1.5\ INCHES$$

$$= 9 + 3.5 + 0 + 1.5 = \underline{14\ INCHES}\ (1.2\ Ft.)$$

NOTE THAT THIS IS A CONSERVATIVE VALUE OF THE MAXIMUM POTENTIAL SETTLEMENT AS A RESULT OF THE (ASSUMED) CONSERVATIVE SOIL PARAMETERS. BASED ON AVAILABLE LAB DATA, THE HIGH PLASTICITY OF THE SITE CLAYS*

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: TF. DATE: 5/27/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 8 OF 8
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

ARE LIKELY TO PRECLUDE THE DEVELOPMENT OF POTENTIAL SETTLEMENT CRACKING,

SHOULD THE CLOSED SITE REQUIRE A CLAY CAP CLOSURE. A 14-INCH SETTLEMENT (MAXIMUM) WOULD ONLY REDUCE THE COVER SLOPE FROM 5% (DESIGN) TO ABOUT 4% ASSUMING ONLY SETTLEMENT AT THE CENTER. IN ACTUALITY, SETTLEMENT COULD BE EXPECTED TO OCCUR OVER THE FULL SLOPE AS A FUNCTION OF FILL THICKNESS. IT IS THEREFORE REASONABLE THAT THE SETTLED SLOPES WOULD BE ON THE ORDER OF 5%.

ALTHOUGH THERE IS A GENERAL LACK OF AVAILABLE SITE SOIL LABORATORY DATA, IT IS OUR JUDGEMENT THAT THE OVERCONSOLIDATED SITE CLAYS MAY EXPERIENCE LESS THAN HALF OF THE MAXIMUM POTENTIAL SETTLEMENT CALCULATED ABOVE. CONSEQUENTLY, FINAL SLOPES WILL HAVE GRADES OF AT LEAST 3% AND THE INTEGRITY OF A CONTINGENT CLOSURE (INCLUDING A CLAY COVER) WILL BE MAINTAINED. THIS IS FURTHER SUPPORTED BY THE FACT THAT THE MAJORITY OF THE SETTLEMENT IS (THEORY-BASED) ELASTIC COMPRESSION, A PORTION OF WHICH WILL OCCUR IMMEDIATELY UPON LOADING; PRIOR TO CLAY PLACEMENT IN THE CASE OF THE CONTINGENCY PLAN.

* PL = 41, PI ≈ 40% AS PER GAI LAB DATA.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: TE DATE: 5/28/87
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 1 OF 1
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

SLOPE STABILITY CONSIDERATIONS

SINCE THE CLOSED IMPOUNDMENTS WILL BE CONSTRUCTED WITH 5% SLOPES, (2.9°) IT IS HIGHLY UNLIKELY THAT UNSTABLE SLOPE CONDITIONS WILL DEVELOP WITHIN THE COMPACTED FILL. BY INSPECTION, THE SLOPES ARE VERY STABLE AND WILL AID IN MAINTAINING THE CLOSURE COVER INTEGRITY.

ADDITIONALLY, AS A RESULT OF THE EXCAVATED IMPOUNDMENTS (BOTTOM EL. 667±) A TYPICAL BEARING CAPACITY FAILURE IS VERY UNLIKELY DUE TO THE EMBEDMENT OF THE FILL IN THE STIFF SITE SOILS.

THE SLOPES ARE ADEQUATELY STABLE AS DESIGNED.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: ___ DATE: ___
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 1 OF 1
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

FREEZE/THAW CONSIDERATIONS

BASED ON INFORMATION OBTAINED FROM THE CITY OF SUPERIOR, WISCONSIN, ENGINEERING DEPARTMENT AND BUILDING INSPECTION DEPARTMENT, THE ENGINEERING DESIGN FROST DEPTH FOR FOUNDATIONS IN THE CITY OF SUPERIOR IS 5. FEET. THEREFORE, THE FINAL COVER FOR THE IMPOUNDMENT CLOSURE IS DESIGNED TO BE A MINIMUM OF 5 FEET THICK TO "INSULATE" THE 24-INCH THICK CLAY CAP IN THE CASE OF A CONTINGENT CLOSURE. IN THIS CASE, THE DRAINAGE PIPING (INVERT) IS SIMILARLY COVERED BY 5 FEET AND IS THUS PROTECTED FROM SIGNIFICANT FREEZING.

THE OUTSLOPE DISCHARGE POINT OF THE PIPING IS, OBVIOUSLY, LESS THAN 5' BELOW GROUND HOWEVER, SHOULD THE SYSTEM FLOW DURING THE ANTICIPATED "WET SEASON", THE POSSIBILITY OF PIPE CLOGGING (BY ICE) IS SIGNIFICANTLY REDUCED DUE TO ABOVE-FREEZING TEMPERATURES DURING THE SPRING/SUMMER/FALL.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: ___ DATE: ___
PROJECT NAME: HOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 1 OF 5
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

EROSION POTENTIAL EVALUATION

ESTIMATE GROSS SOIL EROSION BY THE UNIVERSAL SOIL LOSS EQUATION (USLE)

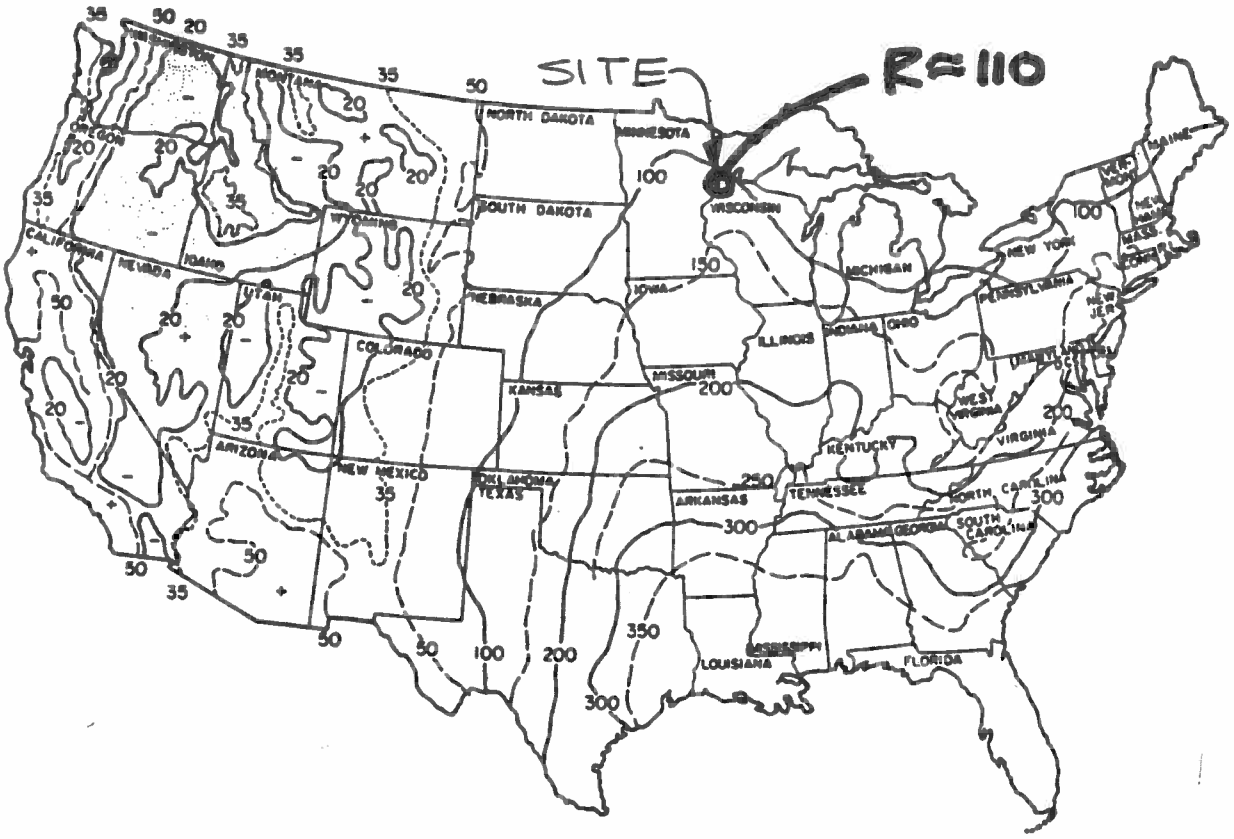


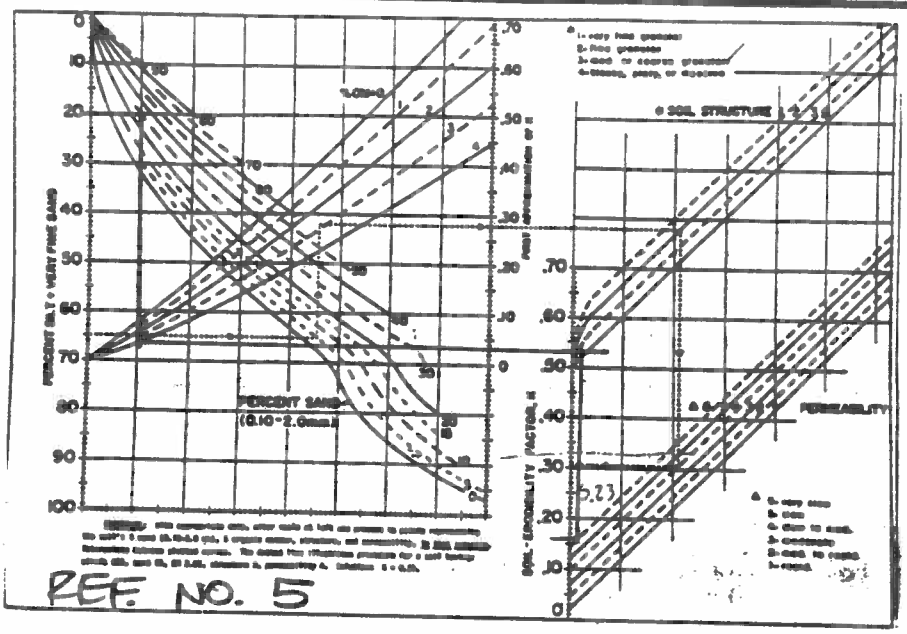
Figure 5.3. Average annual values of the rainfall-erosivity factor, R. (Stewart et al., 1975)

REF. NO. 5

SITE WATERSHED ≅ 1.8 ACRES.

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: — DATE: —
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 2 OF 5
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE



REF. NO. 5

ASSUME ABOUT 20% SILT/FINE SAND IN TOPSOIL AND NEAR-SURFACE SUBSOILS, AND ABOUT 30% SAND, AND 4% ORGANICS.

FINE GRANULAR/ VERY SLOW PERMEABILITY.

ERODIBILITY FACTOR → $K \approx 0.16$

SLOPE FACTOR (LS)

AVERAGE SLOPE LENGTH (1 SEGMENT) = 150 Ft AT AN AVG. SLOPE OF 5%

(60)

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: [illegible] DATE: [illegible]
PROJECT NAME: KOPPERS - SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 3 OF 5
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

CROP MANAGEMENT AND RUNOFF CONTROL FACTORS

ASSUMING CLOSURE BEGINS IN JANUARY:

A.) JAN 1 TO FEB 1
EXCAVATION / TESTING / BACKFILLING

B.) FEB 1 TO MARCH 1
COMPACTED SLOPES W/ MULCH

C.) MAR 1 TO MAY 1
SEED (PERMANENT) 1ST 60-DAY

D.) MAY 1 TO DEC 31
PERMANENT VEGETATION (2-12 MONTHS)

Table 5.4 Typical C_1 Factor Values Reported in the Literature.*

Condition	C_1 factor
1. Bare soil conditions	
freshly disked to 6-8 inches	1.00
after one rain	0.89
loose to 12 inches smooth	0.90
loose to 12 inches rough	0.80
compacted bulldozer scraped up and down	1.30
same except root raked	1.20
compacted bulldozer scraped across slope	1.20
same except root raked across	0.90
rough irregular tracked all directions	0.90
seed and fertilize, fresh, unprepared seedbed	0.64
same after six months	0.54
seed, fertilize and 12 months chemical	0.38
not tilled signs crusted	0.01
tilled signs crusted	0.02
compacted fill	1.24-1.71
undisturbed except scraped	0.66-1.30
scarified only	0.76-1.31
sawdust 2 inches deep; disked in	0.61
2. Asphalt emulsion	
1250 gallons/acre	0.02
1210 gallons/acre	0.01-0.019
605 gallons/acre	0.14-0.57
302 gallons/acre	0.28-0.60
151 gallons/acre	0.65-0.70
3. Dust binder	
605 gallons/acre	1.05
1210 gallons/acre	0.29-0.78
4. Other chemicals	
1000 lb fiber glass roving with 60-150 gallons/acre	0.01-0.05
Aquatain	0.68
Aerospray 70, 10 percent cover	0.94
Curasol AE	0.30-0.48
Petroset SB	0.40-0.66
PVA	0.71-0.90
Terra-Tack	0.66
wood fiber slurry, 1000 lb/acre fresh	0.05
wood fiber slurry, 1400 lb/acre fresh	0.01-0.02
wood fiber slurry, 3500 lb/acre fresh	0.10
5. Seedings[1]	
temporary, 0 to 60 days[2]	0.40
temporary, after 60 days	0.05
permanent, 0 to 60 days[2]	0.40
permanent, 2 to 12 months	0.05
permanent, after 12 months	0.01
6. Brush	0.35
7. Excelsior blanket with plastic net	0.04-0.10

1. If plantings are used with mulches, use the minimum C_1 values.
2. If dry weather occurs at planting and emergence is a problem, extend the 0-60 days to a period when rainfall normally occurs.

* National Cooperative Highway Research Program, 1976.

REF. NO. 5

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: JMG DATE: 5/25/87 CHKD BY: T.E. DATE: 5/28/87
PROJECT NAME: KOPPERS- SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 4 OF 5
DESCRIPTION DESIGN CALCULATIONS — IMPOUNDMENT CLOSURE

SEE TABLE BELOW

TIME PERIOD	ACTIVITY	(1) % AVG. ANNUAL R	C_R	C_S	WEIGHTED $C_P = C_R \times C_S \times (1)$
A	EXC/BACKFILL	0	1.0	1.48	0
B	COMPACT/MULCH	0	1.0	0.35	0
C	SEED (1ST 2 mos.)	3	1.0	0.40	1.2
D	SEED (PERM)	97	1.0	0.05	4.85
				TOTAL	6.05

$\overline{CP} = \frac{6.05}{100} = 0.061$ $\quad \overline{C_S} = 0.023$ $\quad \overline{C_R} = 1.0$

Table 5.1 Percentage of the Average Annual Erosion Index Value Which Will Occur on a Given Date after January 1. Computed for the Geographic Areas Given in Figure 5.8. (Adapted from Wischmeier and Smith, 1965)

Date	Geographic Area																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Jan. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	1	1	1	3	2	2	2	1	1	0	1	0	0	0	0	1
20	0	0	0	0	1	0	0	2	2	1	2	0	0	0	0	0	1	2	2	2	5	4	3	4	2	3	1	3	0	1	0	1	2
Feb. 1	0	0	0	0	2	0	1	3	4	2	3	0	1	0	0	1	2	3	3	3	7	7	5	7	3	4	2	4	1	2	1	2	3
10	0	0	0	1	3	0	2	4	5	3	4	0	1	1	1	2	2	4	5	4	9	9	7	8	4	5	3	5	2	2	1	2	3
20	0	0	0	1	4	0	3	5	7	4	6	0	1	1	1	3	3	5	7	5	12	11	9	11	6	7	4	6	3	3	1	3	4
March 1	0	1	0	2	4	0	3	7	9	6	7	0	1	2	2	4	3	6	9	7	14	13	11	13	7	9	5	7	4	3	2	3	6
10	0	1	1	3	5	0	4	9	12	8	8	1	2	3	3	5	4	8	12	9	15	16	13	15	9	12	7	9	5	4	3	4	8
20	0	2	1	4	7	0	5	11	14	10	9	1	3	4	4	6	5	9	14	12	17	19	16	18	11	14	8	10	6	5	3	5	9
April 1	0	3	2	5	10	1	6	14	17	12	10	2	3	5	5	8	6	11	17	14	19	22	18	20	13	16	10	12	7	6	4	6	11
10	1	4	3	7	13	2	8	18	21	15	13	3	4	6	7	10	7	13	19	15	21	25	21	23	15	19	12	14	9	7	5	7	13
20	2	5	4	9	17	4	10	22	25	18	15	4	5	8	9	12	8	16	22	17	24	29	24	26	17	22	15	16	10	8	6	8	14
May 1	3	7	6	12	21	8	14	28	29	22	18	5	7	10	11	14	11	20	26	19	26	33	27	29	19	25	18	17	11	10	7	10	15
10	5	9	9	16	26	13	22	34	33	27	23	8	10	12	14	17	13	25	30	21	28	37	30	32	22	28	21	20	13	13	10	12	17
20	7	13	15	21	32	20	32	41	38	33	29	11	14	16	18	21	16	30	33	24	31	41	33	34	25	32	24	22	14	16	14	14	18
June 1	11	19	23	27	37	27	40	48	42	39	34	16	19	20	23	24	20	35	37	27	34	44	35	37	28	36	26	25	17	19	17	17	21
10	18	25	33	34	43	34	47	53	46	44	38	23	28	25	28	30	25	40	41	31	37	48	38	41	32	40	29	28	20	23	21	20	21
20	27	33	43	41	49	40	53	57	50	49	42	30	40	31	34	39	32	45	45	36	41	52	41	45	36	44	33	32	24	29	27	25	28
July 1	36	42	51	47	54	43	57	60	54	53	46	38	47	38	40	44	39	50	50	41	47	55	45	51	40	48	37	36	30	35	33	32	32
10	45	51	58	52	58	50	60	63	57	55	49	46	54	47	47	53	47	54	54	47	54	59	49	56	44	54	42	41	38	40	39	39	37
20	54	58	64	57	61	55	63	65	59	58	53	54	59	55	53	59	55	58	59	55	61	63	54	62	48	61	49	48	46	47	47	45	41
Aug. 1	63	67	70	62	64	60	67	67	62	61	57	62	65	62	60	64	63	63	64	62	68	67	60	68	53	68	57	56	54	55	55	51	46
10	72	74	75	66	67	65	70	70	65	64	60	70	71	68	67	68	70	67	68	68	73	70	65	73	58	73	66	63	61	63	63	57	52
20	81	80	80	70	70	70	72	73	67	67	64	78	76	74	73	74	76	71	73	74	77	72	70	77	63	78	74	70	68	69	70	63	58
Sept. 1	90	85	84	75	74	74	76	77	70	70	68	84	81	79	79	78	81	74	77	79	80	75	74	80	69	81	80	76	75	75	76	68	64
10	93	89	88	80	78	79	78	80	72	74	71	88	86	83	83	83	85	77	79	83	82	77	78	82	75	84	85	81	81	80	81	73	69
20	96	93	91	85	83	84	81	83	75	78	75	91	90	87	87	85	88	81	82	86	84	79	81	84	82	86	89	84	85	83	85	77	73
Oct. 1	98	95	93	89	87	89	85	85	78	82	79	94	93	90	91	88	91	84	84	88	86	81	83	87	88	88	92	87	89	86	88	81	77
10	99	97	95	93	90	94	90	88	80	86	83	96	95	93	93	91	93	87	86	90	88	82	85	88	91	89	93	89	92	88	91	84	80
20	100	98	96	95	93	97	95	90	83	88	86	97	97	95	96	93	94	90	88	91	89	84	87	90	93	90	94	91	94	90	93	87	82
Nov. 1	100	99	97	97	95	98	98	92	85	91	89	98	98	96	95	95	95	92	90	92	90	86	88	92	94	91	95	93	95	93	94	89	85
10	100	100	98	98	96	99	99	94	88	93	92	98	98	97	96	96	96	94	92	94	92	88	90	93	95	92	95	94	96	95	96	91	88
20	100	100	99	99	97	100	99	96	90	95	94	99	99	98	97	97	97	96	94	95	93	91	91	95	95	94	96	96	97	96	97	94	91
Dec. 1	100	100	100	100	98	100	99	98	93	97	96	99	99	99	98	98	98	97	95	96	94	94	93	97	96	95	97	97	98	97	98	96	91
10	100	100	100	100	99	100	100	99	95	98	98	100	100	99	99	99	98	98	97	97	96	96	95	98	97	97	98	98	99	98	99	97	96
20	100	100	100	100	100	100	100	100	98	99	99	100	100	100	100	100	99	99	98	98	98	98	98	99	98	98	99	99	100	99	100	98	98

REF. NO. 5

ALMES & ASSOCIATES INC.
CONSULTING ENGINEERS

BY: MG DATE: 5/25/87 CHKD BY: — DATE: 5/28/87
PROJECT NAME: KOPPERS- SUPERIOR, WIS. SITE
PROJECT NO. 87-38-68 SHEET 5 OF 5
DESCRIPTION DESIGN CALCULATIONS - IMPOUNDMENT CLOSURE

Results

```
Rainfall erosivity factor= 110
Soil erodability factor= .16
Number of watershed segments= 1
Segment 1 slope-length factor= .6562086
Watershed slope-length factor= .6562086
Crop management factor= .061
Erosion control practice factor= 1
Watershed area= 1.8 acres

Soil loss= .7045055 tons/acre-year (INITIAL CONSTRUCTION TO 12 MONTHS
Soil loss= 1.26811 tons/year
```

ALTHOUGH MAXIMUM SLOPES ARE ≤ 5%, THE ANTICIPATED SOIL LOSS IS < 2 TONS/ACRE-YEAR AND IS THEREFORE JUDGED TO BE TOLERABLE. NOTE THAT UNDER LONG-TERM CONDITIONS, (> 12 MONTHS AFTER PERMANENT SEEDING) THE SOIL LOSS IS REDUCED SIGNIFICANTLY FROM THE VALUE CALCULATED.

APPENDIX C

Sprayfield Closure Plan

Revised 08/27/87

I. FACILITY/CONTACT INFORMATION

Owner/Operator's name:		Koppers Company, Inc.
Facility EPA ID No.:		WID006179493
Address:		Koppers Co., Inc. P.O. Box 397 Superior, Wisconsin 54880
Telephone Number:	Plant - Koppers (Pgh.) - Keystone -	(715) 392-2221 (412) 227-2000 (412) 733-9500

CONTACTS

Koppers Company, Inc., Superior, Wisconsin Plant

Mr. David Shaw - Plant Manager

Mr. Warren Dolsen - Assistant Plant Manager

Keystone Environmental Resources, Inc.

R. J. Anderson - Environmental Program Manager

R. M. Morosky - Project Manager

II. Introduction

It is Koppers contention that the sprayfield at its Superior, Wisconsin facility is not a RCRA hazardous waste unit. Although Koppers hereby reserves all of its rights to challenge the classification of the sprayfield as a hazardous waste unit, this plan is submitted pursuant to Chapter 181 of the Wisconsin Administration Code and comments received from the Wisconsin Department of Natural Resources (WDNR).

Subject to its legal rights as recorded above, Koppers intends to follow the guidelines as established in the aforementioned regulations when closing the sprayfield. These guidelines and the task associated with the closure of the sprayfield are described in the following sections of this document.

III. General Description

The spray irrigation field was constructed in the mid 1970's. Water from the second surface impoundment of the two stage series is discharged to the sprayfield. A map (attachment 1.0) locates the spray irrigation field relative to the surface impoundments and the plant facilities.

IV. Partial and Final Closure Activities

Koppers will begin closure of the sprayfield after November 8, 1988. Closure activities will proceed in conjunction with closure of the surface impoundments.

The sprayfield closure process includes the biodegradation of any wastewater constituents and the monitoring of soils and soil pore liquids to determine when closure activities are complete. In the event that this process is not feasible, additional closure activities will be implemented. The following sections detail the tasks for closure.

V. Closure Performance Standard

The closure plan for the spray irrigation field was designed such that the facility should not require further maintenance or control. However, a contingent plan is also presented in this document in the event clean closure using the described methodology is not feasible.

The plan ensures the treatment of wastewater constituents to sufficient levels so as to eliminate threats to human health and the environment. This includes the migration or potential escape of contaminants to the groundwater, surface waters or to the atmosphere. Contaminated materials generated during closure and equipment decontamination will be disposed of in an approved hazardous waste facility.

VI. Contents of Closure Plan

The designated project supervisor for the surface impoundment closure will also oversee the closure of the spray irrigation field. Personnel requirements will include a drilling contractor and sampling laboratory personnel. Plant personnel will perform all other site work necessary to effect a clean closure as described below.

1.0 Reconnaissance Survey

Closure of the sprayfield will be initiated once flow from the surface impoundments is terminated as described in the Closure Plan for the Surface Impoundments. At that time, the soils within the sprayfield will be evaluated to determine the existence and extent of any wastewater constituents. Initially, samples will be taken from ten locations within the sprayfield and analyzed for napthalene, phenols and oil and grease. This will provide a basis for closure operations. The sample points are located on a grid system as seen in attachment 2.0 but may be slightly modified to include areas affected by the spray.

The evaluation will begin with a comprehensive field reconnaissance survey to quantify the constituent levels in the sprayfield soils and to locate a suitable area outside of the sprayfield for background sampling. Background samples for impoundment closure may be used if acceptable to the WDNR. After the sprayfield has been inspected visually, the grid system may be modified to locate soil core sample points in more appropriate areas.

1.1 Soil Sampling (To confirm clean closure)

One or more background soil samples will be taken from an area unaffected by plant operation but representative of sprayfield soils. This sample will be statistically compared to a minimum of 10 soil core samples taken within the sprayfield area. Attachment 2.0 locates the 10 soil sample locations. The exact sample locations may vary slightly to ensure that the area of influence of the spray

nozzles is included. The samples will be analyzed individually in order to develop a contaminate gradient diagram for the area. If "hot spots" exist they may be excavated and disposed of in an approved RCRA disposal site. A statistical analysis approach to sampling and data evaluation similar to those described in TEST METHODS FOR EVALUATION OF SOLID WASTE, PHYSICAL/CHEMICAL METHODS, SW-846 (U.S. EPA 1982b) will be used when developing the program. Samples will be taken uniformly across the grid shown in Attachment 2.0.

1.2 Water Samples

In addition to soil core samples, soil pore liquid samples may be taken if the moisture level is sufficient. Groundwater monitoring currently being conducted at the site will continue.

1.3 Sample Analysis

All samples, both soil and water, will be analyzed for constituents found to be present in the plant wastewater and additional parameters as listed with their respective EPA test method in Table 1.0. The chemical analyses on all of the samples will be performed by an approved laboratory. Typical QA/QC procedures can be found in Appendix A of this document.

If the evaluation indicates that there is an appreciable difference between background soils and sprayfield soil or if the initial screening indicates significant contamination closure will proceed in the manner described below. An appreciable difference is defined as two standard deviations from the background sample(s).

2.0 Closure Procedure

Adjustments to nutrients and pH will be made such that biodegradation is maximized. The soil will then be tilled and seeded with a non-food chain vegetative cover and the wastewater delivery system will be modified to deliver

"clean" water to provide necessary soil moisture. The soil moisture will be maintained at a level to support the growth of the vegetative cover and to enhance the biodegradation of constituents. The existing berm will also be maintained to prevent run-off and run-on.

TABLE 1

ANALYTICAL PARAMETERS FOR SOIL SAMPLES
KOPPERS COMPANY, INC.
SUPERIOR, WI PLANT

Parameter	Test Method	Parameter	Test Method
pH	9045	arsenic	7060
conductivity	9050	barium	6010
Total Organic Carbon (TOC)	Walky-Black	cadmium	6010
phenol	8040	chromium	6010
pentachlorophenol	8040	lead	7421
2-chlorophenol	8040	magnesium	6010
p-chloro-m-cresol	8040	selenium	7740
2,4-dimethylphenol	8040	zinc	6010
2,4-dinitrophenol	8040	copper	6010
trichlorophenols	8040		
tetrachlorophenols	8040		
chrysene	8310		
naphthalene	8310		
fluoroanthene	8310		
benzo(b)fluoranthene	8310		
benzo(a)anthracene	8310		
dibenzo(a)anthracene	8310		
acenaphtalene	8310		
indeno(1,2,3-cd)pyrene	8310		
benzo(a)pyrene	8310		
Total polychlorinated dioxins	8280		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	8280		
benzene	8020		

2.1 Monitoring

In order to monitor the biodegradation progress, Koppers periodically will analyze the soils and soil-pore liquids, for the indicator parameters described in section 1.0. Certification of closure will be pursued once it is determined that there is no appreciable difference between the sprayfield and background soil. Clean closure will be confirmed when all ten soil core samples are analyzed for the table 1.0 parameters and results fall within two standard deviations of the background analyses.

2.2 Decontamination or Disposal of Equipment

Once the sprayfield soils are determined to be clean or if the contingent plan is implemented, the piping for the water delivery system will be removed, cut into small pieces and disposed of in a proper manner.

2.3 Personnel Protection Area

The personnel protection area provided for the surface impoundment closure will also be used during the sprayfield closure. At a minimum, the area will include a clean change area, lockers and shower facilities.

3.0 Maximum Waste Inventory

Because the sprayfield receives only treated wastewater, it is difficult to predict the amount, if any, of residual constituents that may be present at the time of closure.

4.0 Closure Schedule

As of the date of preparation of this revised plan, an exact date has not been set

for the closure of the sprayfield. Initiation of closure is dependant upon the construction and start-up of the new wastewater treatment facility and the initiation of surface impoundment closure. Closure of the sprayfield will be initiated within sixty (60) days of final discharge to the sprayfield. Closure task durations are listed in Table 2.0.

The exact amount, if any, of residual contamination will determine the work effort required for closure and thereby affect the closure schedule. Also, adverse site weather conditions will likely delay the closure. Once the closure procedures detailed in this document are approved and the task durations are determined to be realistic, it may become apparent that an extension will be necessary. At this time, Koppers will request an extension.

VIII. Contingent Closure Plan

1.0 Elimination of Waste

Koppers plans to use the procedures previously discussed to decontaminate the sprayfield. However, if clean closure becomes impossible by the described method, the following activities will be implemented.

2.0 Excavation

Contingent closure of the sprayfield will be achieved by excavation of contaminated soils. The process will proceed as described in the surface impoundment closure plan. First areas proven to be contaminated during the site evaluation will be excavated, segregated and disposed of in an approved landfill.

3.0 Final Cover Design and Construction (Contingent Closure)

Contingent Closure of the sprayfield will be achieved by in situ capping after excavation of contaminated soils. The closure process will proceed as described in the surface impoundment closure plan. A clay barrier cap will be installed over all or a portion of the sprayfield if clean-closure is infeasible.

Revised 08/27/87

TABLE II

SCHEDULE FOR CLOSURE OF SPRAYFIELD

KOPPERS
SUPERIOR, WISCONSIN PLANT

TASK	DURATION
First soil sampling/analysis and lysimeter installation	Sept. 15 - Nov. 15, 1988
pH and nutrient adjustments Tilling and seeding; water system modifications	Oct. 15 - March 15, 1989
Second soils and soil pore liquids sampling/analysis	March 15 - May 15(1)
Evaluate and submit necessary data for regulatory concurrence of clean-closure	May 15 - Aug. 15
Decision to continue or, if necessary, contingent closure	---

(1) **Due to cold weather coditions, soil sampling will not continue through January and February.**

In Situ Capping

The subgrade within the sprayfield area will be proffrolled with a heavy rubber tired or tracked vehicle to stabilize the surface materials and locate any soft spots requiring additional work. The layers are to be applied in lifts approximately 6 to 8 inches in thickness and to be compacted with equipment that can produce or exceed the Standard Proctor Compaction energy. Soils should be within 2 percent of optimum moisture content to achieve desired density. Each lift will be compacted to 100 percent of the maximum dry density as determined by the Standard Proctor Compaction test (ASTM D-698). A field density and moisture content test will be conducted on each lift to verify that this degree of compaction is achieved. The final lifts are to be graded to contours that blend with the final contours of the surface impoundments.

A geotextile membrane will be placed on top of the first layer of fill to provide support to the impervious clay cap layer. The clay layer will be 24 inches thick and will have a minimum permeability of 1.0×10^{-7} cm/sec and will extend a minimum of 2 feet beyond the sprayfield boundary. The layer will be graded such that a 3 percent slope exist from a center line crown. The clay soils will be compacted to 100 percent of maximum dry density (ASTM D-698) at, or above the 2 percent optimum moisture content. Field density and moisture content test will be conducted on each lift to again verify that the proper degree of compaction is achieved.

A second geotextile membrane and a synthetic impervious liner will be placed on top of the clay cap. To collect the lateral drainage, a 4 inch perforated drain pipe will be provided around the periphery of the layer. Appendix C details the calculations that show the efficiency of the capping system. These calculations apply to both the surface impoundment cap and the sprayfield cap designs.

Attachment 2.0 illustrates a typical cross section of the closure cover for the surface impoundments and the sprayfield. Finally, an 18 inch layer of topsoil will be graded to a minimum of 3 percent and seeded with a non-food crop vegetative cover to prevent erosion. Sheet drainage from the sprayfield will be directed to existing and/or newly installed drain swales that will also accept the discharge of the 6 inch perimeter drain.

Seeding and fertilizing of the sprayfield area will be performed in conjunction with the seeding program for the surface impoundment closure.

IX. Post-Closure Requirements

If clean closure is not achieved by either biodegradation or excavation then, post-closure care will proceed as describe in section IX of the surface impoundment closure plan. Installation of additional monitoring wells in the sprayfield area may be implemented if deemed necessary at the time of closure.

X. Certification of Closure

Upon completion of closure, Koppers will submit to the WDNR a certification and construction documentation report by an independent state of Wisconsin registered engineer that the facility has been closed in accordance with the specifications of the approved closure plan. Koppers will maintain a copy of the approved Closure Plan and all revisions to the Plan until certification of closure completeness has been accepted by WDNR.

In order to expedite the certification process, Koppers may certify both the impoundment and sprayfield closure as one project. However, if timing of each program is such that this will delay the certification of either of the projects then Koppers may choose to certify each project individually.

XI Sampling and Analysis Plan

1.0 Introduction

This sampling and analysis plan provides guidance for monitoring the closure operations and confirming clean sprayfield closure at the Koppers Co., Inc., Superior, Wisconsin facility. Naphthalene, phenols and oil and grease will be used as indicator parameters to monitor closure progress. Final confirmation of clean closure will include all of the soil analyses found in Table 1.0 and the groundwater monitoring program already in-place at the site.

2.0 Soil Sampling

Soil sampling will consist of background, preliminary and final sprayfield samples. All samples will be taken by qualified sampling personnel and will be analyzed by an approved laboratory.

2.1 Background Soil Sampling and Analysis

Four background soil samples will be taken in an area that is upgradient and unaffected by site activities. The sample points will be located during an extensive site reconnaissance and will be submitted to the WDNR for approval prior to sampling.

Continuous samples will be taken using a two inch split spoon sampler and/or auger. If approved by the WDNR, these samples may be used for confirming clean closure of both the sprayfield and impoundments, as such, sampling would begin at the surface and continue to a depth four feet below the impoundment bottom. The sample would be separated into two parts to be representative of the sprayfield and impoundment soils. If use of the same background sample location for confirming clean closure of both the sprayfield and impoundments is not approved by WDNR,

then individual representative locations will be selected.

Samples will be analyzed for all of the parameters listed in Table 1.0. The respective EPA test method included in Table 1.0 and the QA/QC procedure in Appendix A will be followed.

2.2 Preliminary Sprayfield Sampling and Analysis

Preliminary sprayfield soil samples will be taken from the ten sample locations shown in Attachment 2.2. Borings will be to a depth of four feet with split spoon samples taken at 0-12, 12-24, 24-36, and 36-48 inches. The first two samples will be analyzed initially and the remaining will be analyzed as needed. Samples will be taken at the beginning, middle and end of the biorestoration process. Additional samples may be taken, if necessary, to monitor any excavation operations.

Samples will be analyzed for naphthalene, phenols and oil and grease following the QA/QC procedures in Appendix A and the respective EPA methodology listed in Table 1.0.

2.3 Confirmation of Clean Sprayfield Closure

The confirmation of clean sprayfield closure will involve both soil and groundwater sampling and analysis. Groundwater monitoring already in-place at the site should be sufficient to verify that no adverse groundwater effects are being caused by the sprayfield.

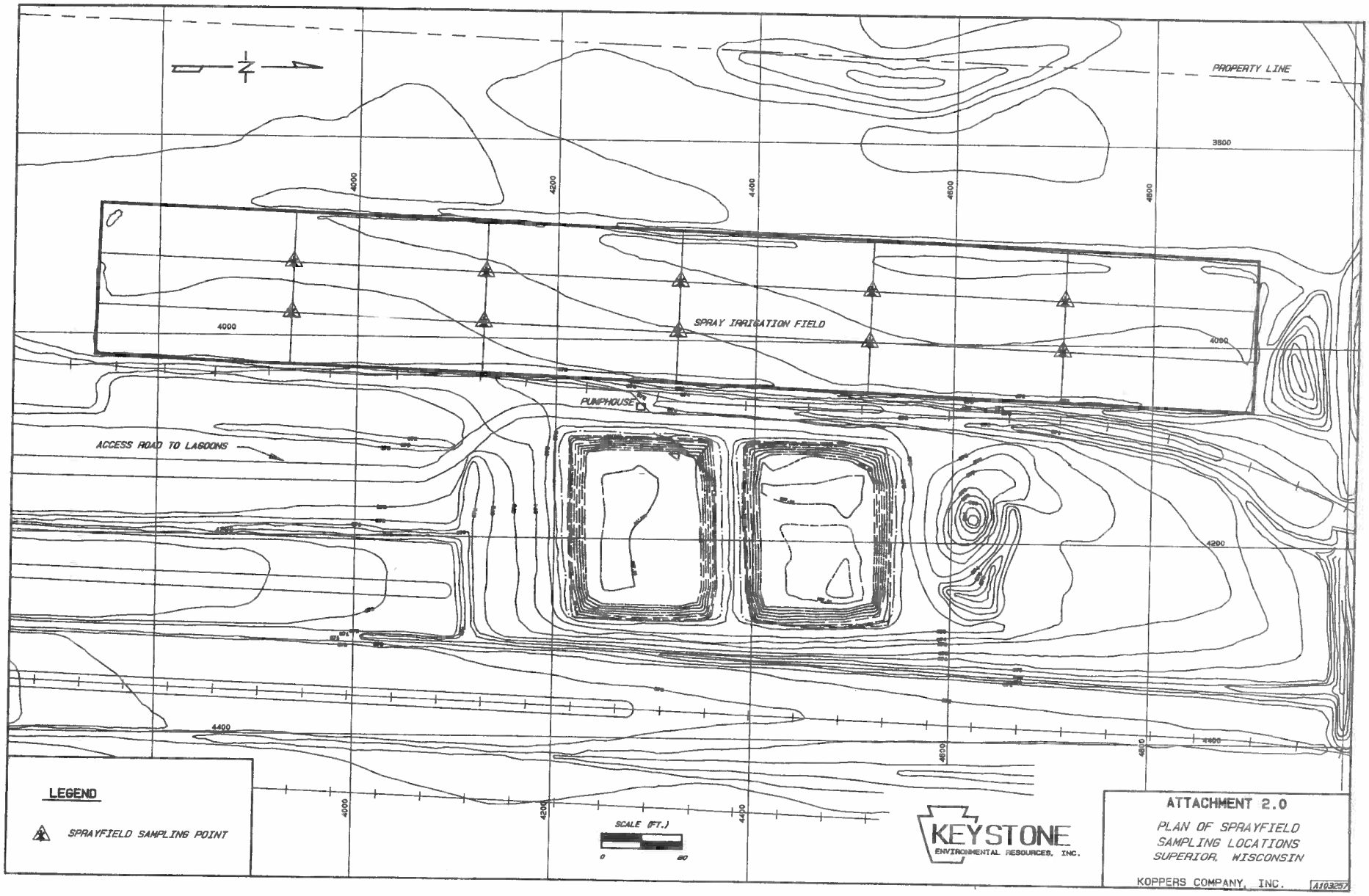
Soil samples will be taken at the same ten locations used for preliminary monitoring but with a 1/2 foot sampling interval for a total of four feet. The soil samples will be analyzed for the Table 1.0 parameters using the above mentioned protocol.

2.4 Equipment Decontamination Sampling and Analysis

Because most of the equipment used for closure activities will be used during the normal course of plant operation, visual verification of clean is sufficient to place it back into service. Expendible equipment will be disposed of in an appropriate manner.

2.5 Surface Water Sampling and Analysis

Impoundments and sprayfields are designed to prevent run-on and run-off which eliminates any surface water pathway for contaminant migration. For this reason, no surface water sampling and analysis is required.


PROPERTY LINE
SPRAY IRRIGATION FIELD
PUMPHOUSE
ACCESS ROAD TO LAGOONS
LEGEND
SPRAYFIELD SAMPLING POINT
SCALE (FT.)
0
60
KEYSTONE
ENVIRONMENTAL RESOURCES, INC.
ATTACHMENT 2.0
PLAN OF SPRAYFIELD
SAMPLING LOCATIONS
SUPERIOR, WISCONSIN
KOPPERS COMPANY, INC.
A103257

APPENDIX D

SAMPLING AND ANALYSIS PLAN
KOPPERS COMPANY, INC.
SUPERIOR, WISCONSIN

Revised 08/27/87

1.0 Introduction

This sampling and analysis plan provides guidance for monitoring the closure operations and confirming clean impoundment and sprayfield closure at the Koppers Company, Inc., Superior, Wisconsin facility. Napthalene, phenols and oil and grease will be used as indicator parameters to monitor closure progress. Final confirmation of clean closure will include all of the soil analyses found in Table 1.0 and the groundwater monitoring program already in-place at the site.

2.0 Soil Sampling

Soil sampling will consist of background, preliminary and final impoundment samples. All samples will be taken by qualified sampling personnel and will be analyzed by an approved laboratory.

2.1 Background Soil Sampling and Analysis

Four background soil samples will be taken in an area that is upgradient and unaffected by site activities. The sample points will be located during an extensive site reconnaissance and will be submitted to the WDNR for approval prior to sampling.

Continuous samples will be taken using a two inch split spoon samples and/or auger. Sampling will begin once the elevation of the impoundment bottom is reached and will continue for an additional depth of four feet. If approved by the WDNR, these samples may also be used for confirming clean closure of the sprayfield and, as such, sampling would begin at the surface and continue to a depth four feet below the impoundment bottom elevation. Each sample would be separated into two parts to be representative of the sprayfield and impoundment soils. If use of the same background sample location for confirming clean closure of both the sprayfield and impoundments is not approved by the WDNR, then individual

representative locations will be selected.

Samples will be analyzed for all of the parameters listed in Table 1.0. The respective EPA test method included in Table 1.0 and the QA/QC procedure in Appendix A will be followed.

2.2 Preliminary Impoundment Soil Sampling and Analysis

Preliminary impoundment soil samples will be taken from the sample points located on the map in attachment 2.2. Five samples are to be taken from each impoundment bottom and one sample from each dike wall of each impoundment. The dike wall samples will be horizontal borings. Both the dike wall and bottom borings will be for four feet with samples taken at 0-12, 12-24, 24-36 and 36-48 inches. The 0-12 and 12-24 inch samples will be analyzed first and the remaining samples will be analyzed later, if necessary, to determine the extent of contamination.

All samples will be analyzed for napthalene, phenols and oil and grease. These parameters were chosen because they are representative of K001 sludge and should be a good indication of the extent of contamination. Again, the QA/QC procedure in Appendix A and the respective EPA test method listed in Table 1.0 will be used.

2.3 Confirmation of Clean Impoundment Closure

The confirmation of clean impoundment closure will involve both soil and groundwater sampling and analysis. Groundwater monitoring already in-place at the site will be used to demonstrate that the impoundments are causing no adverse effect on the groundwater. Additional soil sampling and analysis will be required.

Soil samples will be taken at the same locations used for preliminary evaluation and from eight additional locations. The additional sample locations are also shown

on the site map in Attachment 2.2. Nine bottom borings and four sidewall borings will be made in each impoundment. Two inch split spoon samples will be taken at 1/2 foot intervals for a total of 4 feet.

Samples will be analyzed for all of the parameters listed in Table 1.0.

2.5 Water Sampling and Analysis

Groundwater sampling and analysis plans are detailed in Section IX Part 3.0.

Impoundments and sprayfields are designed to prevent run-on and run-off which eliminates any surface water pathway for contaminant migration. For this reason, no surface water sampling and analysis is required.

2.6 Sludge Sampling and Analysis

A grab sample of the impoundment sludge will be taken and analyzed prior to disposal to verify that the sludge can be designated a K001 waste. The sludge sample will be analyzed for polynuclear aromatic hydrocarbons (PAH), phenols and pentachlorophenol, which are the primary constituents of K001. The following analytical methods will be used:

- PAH -- EPA 8100
- Phenol -- EPA 8040
- Pentachlorophenol -- EPA 8040

B.2

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 1, 1987

IN REPLY REFER TO: 4430

Mr. James R. Batchelder, Vice President & Manager
Technical and Environmental Services
Tar and Wood Products Sector
Koppers Co., Inc.
Pittsburg, PA 15219

File Superior

SUBJECT: Hazardous Waste Closure and Long-Term Care Plan
Conditional Approval
Koppers Co., Inc. - Surface Impoundment
EPA ID: WID006179493

Dear Mr. Batchelder:

The Department of Natural Resources has completed its review of your report entitled "Closure and Post-Closure Plan for the Koppers Co., Inc. Hazardous Waste Management Facility, Superior, Wisconsin - Surface Impoundments, EPA ID. No. WID006179493". This report was prepared by Keystone Environmental Resources, Inc. of Monroeville, Pennslyvania and submitted on June 1, 1987 with revisions received on August 28, 1987. We are informing you that your closure and long-term care plan is conditionally approved. Based on our review, we have determined that the closure and long-term care plan requirements found in ch. 181, Wis. Adm. Code will be adequately addressed, provided the conditions set forth in the attached approval report are met.

The conditions of approval are necessary to insure that the construction, closure and long-term care activities called for in the closure plan are properly designed and implemented. Prior to any construction activities being initiated on any of the items discussed in the closure plan, all conditions associated with that construction activity shall be addressed to the Department's satisfaction. All contractors at the site shall be provided with a copy of this conditional approval as part of their contract document. Please review this approval report carefully.

5910

If you have any questions regarding the conditional approval, please contact Ed Lynch at (608) 266-3084.

Sincerely,

Paul P. Didier

Paul P. Didier, P.E., Director
Bureau of Solid Waste Management

RK:ED:jm
Attachment

cc: North West District - Gary LeRoy
Brule Area Office - Director
Hazardous Waste - Ed Lynch - SW/3
Residuals Management - Jim Brownell - SW/3
Industrial Wastewater Section - Greg Hill - WW/2
RCRA Permitting - EPA Region V - Chuck Slaustas - 5HS/13
RCRA Enforcement - EPA Region V - 5HE/12
Systems Management Section - SW/3
Dave Shaw - Koppers Co., Inc. - Superior
Robert Anderson - Keystone Env. Res.
Ron Morosky - Keystone Env. Res.
Ron O'Toole - Keystone Env. Res.
Terry Kirchner - Keystone Env. Res.
8673W

5910

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL APPROVAL
CLOSURE AND LONG-TERM CARE PLAN
KOPPERS CO., INC. - SURFACE IMPOUNDMENTS
WID006179493

GENERAL INFORMATION

Authorized Contacts:

Mr. Dave Shaw - Plant Manager
Mr. Warren Dolson - Assistant Plant Manager
Koppers Company, Inc.
P.O. Box 397
Superior, WI 54880
(715) 392-2221

Property Owner and Operator:

Koppers Company, Inc.
436 7th Avenue
Koppers Building
Pittsburg, PA 15219

Location of Site:

The Koppers facility is located approximately 2 miles southeast of Superior, Wisconsin in sections 12 and 13, T48N, R13W, Town of Superior, Douglas County. The site is located adjacent to the intersection of Hwys. A and Z.

Report Prepared by:

Robert J. Anderson, Environmental Program Manager
Ronald M. Morosky, Project Manager
Keystone Environmental Resources
440 College Park Drive
Monroeville, PA

Site Description:

Koppers Company, Inc. began operation at its Superior facility in 1928. The entire site occupies approximately 112 acres. The wood treating facility and waste handling facility are located on a smaller portion near the northern end. The majority of the site is used for storage of treated and untreated wood. Currently, the plant uses creosote for the pressure treatment of railroad cross ties. The use of pentachlorophenol (PCP) preservative was

5910

discontinued in the early part of 1982. Other wood products, such as coals and pilings may also be produced.

The surface impoundments were constructed in the mid-1970's. The only hazardous waste generated is K001 waste (bottom sediment sludge from the treatment of wastewaters from wood preserving processes using creosote or pentachlorophenol). The surface impoundments are preceeded by oil/water separation and flow equalization. Hydrocarbon material removed prior to the surface impoundments is reused in the wood treating process. As such, the amount of contaminants that flow into the surface impoundment is minimized.

Each impoundment is a regular shaped rectangle which measures approximately 127 feet by 170 feet on the inside top of the dike measurement. The bottom of the impoundments are about 7 feet below the top of the dike with side slopes of about 3 horizontal to 1 vertical (3:1). The total bottom area of each lagoon is roughly 40,672 square feet and the maximum hydraulic volume is 294,550 cubic feet (2,203,234 gallons). The facility is located in an area generally designated for agricultural use.

Site Geology

The geologic materials beneath the Superior site vicinity consists of a thick section of Pleistocene with some Holocene age sediments overlaying Precambrian bedrock. The top of the bedrock underlying the Superior, Wisconsin area is reported in local water well logs to be between 170 to 210 feet below the land surface. The bedrock consist of flat-lying quartz sandstone.

The Pleistocene section consist of the Copper Falls and Miller Creek formations (Mickelson, et al., 1984). The Copper Falls formation is found approximately 100 feet to 140 feet below the land surface with an average thickness of 40 feet. The Miller Creek formation overlies the Copper Falls and consist of those materials from the ground surface to a depth of approximately 100 feet to 140 feet.

The Copper Falls formation consists of reddish to brownish sandy sediment. The majority of the Copper Falls consist of sandy till. However, a large amount of sand and gravel deposited by glacial meltwater streams occur interbedded with in the till deposits.

The Miller Creek formation consists predominantly of red clay till. However, up to approximately one-quarter of the formation probably consists of bedded reddish silt and clay deposited in glacial lakes. It occurs interbedded within the till. Small amounts of interbedded sand and gravel also occur. The Miller Creek formation consists of two members; the Hanson Creek Member (lower) and the Douglas Member (upper).

Both are composed predominantly of clay till. However, the Hanson Creek till is siltier and browner than the Douglas till. The blue green clay unit identified in the local water supply well logs may be the upper most portion of Hanson Creek Member. It may be a lake bed deposit that was exposed when lake levels decreased and clay was subject to drying.

5910

On-site geologic investigations of the site conducted by GAI Consultants in 1985 describe the subsurface geology as lake bed deposits composed of unlaminated red-brown clay containing discontinuous layers of silt and sand. Ten soil borings were drilled to variable depths, each terminating in red-brown clay. The borings ranged in depth from 30 to 60 feet. The clay was probably deposited by glacial ice rather than within a lake because it is unlaminated.

The following characteristics were observed in the underlying deposits. The upper (0 to 5 feet) consist of fill material deposits and topsoil. Underlying the fill is red-brown highly plastic, unlaminated clay, with thin vertical, hairline fractures in-filled with a greenish-gray clay-like material. The fractured clay continued to a maximum depth of 18 feet, but generally was less than 15 feet.

Below the fractured clay, a similar red-brown highly plastic, unlaminated clay was present ranging from 15 feet to further than 60 feet below the surface. Fractures and the gray clay in-fillings were absent. Very little organic matter was detected. Where sand, silt or gravel layers were not detected the clay continued to the bottom of all borings.

Eight of the soil borings encountered variable amounts of sand, silt and gravel deposits within the unfractured clay. The sand was multicolored, subangular and generally poorly sorted with samples exhibiting layers or bedding. The sand found between 35 feet and 45 feet depths exhibited fining up sequence with gravel on the bottom grading to a coarse to medium sand with fine sand and silt on top. The sandy units had a variable range in thickness of 1 inch to 10 feet. Two soil borings encountered only trace amounts of these deposits.

Below and between the sandy units the red-brown highly plastic, unlaminated, unfractured clay was observed. The bottom of the clay unit was not detected by these soil borings.

A recent regional study of the area by Clayton (1984) reported the clay sequence to be part of the Douglas till. The till was described as red-brown clay deposited during the end of the Wisconsin glacial stage.

Site Construction:

The goal of this closure activity is to remove all hazardous wastes and contaminated soils from the area where the surface impoundments are located and thereby achieve clean closure (Section V). In the event all wastes or contaminated soils cannot be removed, then the site will be closed in accordance with the requirements for a hazardous waste landfill and the site will be capped. Closure activities will begin in April 1988 and be completed by October 1989 (Attachment 5.1-1; Section VI).

Closure of the surface impoundments at the site include removal of all free liquids from them, removal of all K001 bottom sediment (sludge) and as much contaminated soil as feasible. It is anticipated that approximately 300 cubic yards of sludge is present and that approximately 1,900 cubic yards of

5910

contaminated soil will be removed. This hazardous waste will be shipped to an engineered, secured hazardous waste landfill.

Once the hazardous waste and contaminated soils have been removed, a preliminary soil investigation (Section VII) will be conducted to determine the extent and existence of any residual hazardous contaminants. The results of the preliminary investigation will be used to decide whether to pursue a clean closure. If a decision is made to pursue clean closure additional soil sampling will take place. If clean closure is achieved, then existing perimeter fencing will be removed, and the surrounding berms will be excavated. The impoundment excavation will be backfilled with unclassified soil fill paced in 8 inch lifts and compacted to 95% density. Following fill placement, an 18 inch thick topsoil material will be placed above the soil fill. The site will then be raked, seeded and mulched to minimize erosion. Plan sheet A103034 shows final grades for a clean closure.

If clean closure cannot be achieved, then the contingent closure plan must be implemented. The contingent closure (Section VIII) calls for backfill of the surface impoundment excavation with unclassified soil material (predominantly cohesive soils) to a specified grade. A non-woven geotextile will be placed above the soil fill. A composite cap will then be laced over the site. This cap will consist of a clay barrier with a minimum thickness of 24 inches, a synthetic flexible membrane liner (FML), a non-woven geotextile, a drainage layer with a minimum thickness of 12 inches, a non-woven geotextile, suitable unclassified cohesive fill with a minimum thickness of 30 inches, and a topsoil layer with a minimum thickness of 18 inches. The cap will be graded to a minimum 3% slope and be raked, seeded, and mulched to minimize erosion. Total cap thickness will be at least seven feet thick. Plan sheet A103032 shows final grades for closure using the contingent closure plan.

Long Term Care:

The long term care period for this facility is 30 years commencing from the date of Department approval of the construction documentation submittal. The post closure activities include inspections and maintenance of the site, inspection and maintenance of the groundwater monitoring system and implementing the groundwater monitoring plan. Requirements of the groundwater monitoring plan may be reduced in the future.

FINDINGS OF FACT

The Department finds that:

1. Koppers Co., Inc. owns and operates a hazardous waste facility in Section 12 of T48N, R14W, Town of Superior, Douglas County, Wisconsin. The current surface impoundments and spray irrigation field has been used since the mid 1970's.

2. Koppers Co., Inc. submitted to the U.S. EPA a Resource Conservation and Recovery Act (RCRA) notification form informing EPA of hazardous waste generation, transportation and storage activities at their Superior,

5910

Wisconsin facility on August 18, 1980. Koppers submitted a RCRA Part A application on November 18, 1980 and was subsequently granted interim status to store hazardous waste by U.S. EPA.

3. The Department reviewed the Koppers Co. RCRA Part A application and accompanying material that compromised the ch. NR 181, Wis. Adm. Code, interim license application and granted Koppers an interim license on April 1, 1985.

4. On April 1, 1985 the Department "called in" the Koppers Co. Feasibility Report for the surface impoundments and container storage area. The Feasibility Report was due on December 31, 1985.

5. The hazardous waste surface impoundments are subject to the Landfill and Surface Impoundment Standards found in s. NR 181.44, Wisconsin Administrative Code and Groundwater and Leachate Monitoring Standards found in s. NR 181.49, Wisconsin Administrative Code.

6. On January 2, 1986, Koppers Co. submitted a feasibility report for the hazardous waste surface impoundments and container storage facility. Numerous revisions to report were made in response to Department notices of the completeness.

7. On September 5, 1986, Koppers Co. withdrew the feasibility report for the surface impoundments and on September 23, 1986 notified of their intent to close the surface impoundments.

8. The information submitted in connection with the closure and long-term care plan review includes the following:

   a. The "Closure and Post Closure Plan for the Koppers Co., Inc. Hazardous Waste Management Facility - Superior Wisconsin" submitted on June 1, 1987 with revisions received on August 28, 1987. Prepared by Keystone Environmental Resources, Monroeville, Pennsylvania.

   b. The "Koppers Co., Inc. Closure Plan - Surface Impoundments - Spray Field - Superior, Wisconsin" submitted on December 18, 1986. Prepared by Koppers Co., - Pittsburgh, Pennsylvania.

   c. The "Feasibility Report - Koppers Co., Inc. - Superior, Wisconsin" covering the surface impoundments and container storage submitted on January 2, 1986. Prepared by Woodward-Clyde Consultants, Chicago, Illinois.

   d. The " Geology and Groundwater Hydrogeology Investigation for Koppers Co., Inc., Wood Treating Plant, Superior, Wisconsin" submitted on January 3, 1986. Prepared by Woodward-Clyde Consultants, Chicago, Illinois.

9. Department and related correspondences/documents considered in review of the closure and post-closure plant.

   a. The Department's July 28, 1987 closure plan notice of incompleteness.

5910 -

b. The Department's April 1, 1987 closure plan notice of noncompliance.

c. Other Department correspondence to Koppers dated January 26, 1986, August 4, 1986, and April 11, 1986, Department memorandums dated March 26, 1987 and July 24, 1986, and related file material.

d. Chapter NR 181, Wisconsin Administrative Code

CONCLUSIONS OF LAW

1. The closure and long-term care plan has been prepared in accordance with applicable Wisconsin Statutes and Administrative Codes. The Department has the authority to determine closure, long-term, and termination standards for hazardous waste facilities pursuant to ss. 144.441(1m) and 144.62(8)(e), Stats. These requirements are listed in ss. NR 180.42(8) and (9) and 181.44(12) and (14) and 181.49, Wis. Adm. Code.

2. Koppers Co., Inc. is an existing hazardous waste facility as defined in s. 144.61(5m), Stats., and operates a hazardous waste surface impoundment as defined in s. NR 181.04(94), Wis. Adm. Code.

3. Listed hazardous wastes as defined in s. NR 181.16, Wis. Adm. Code are stored in the Koppers Co., Inc. surface impoundment. Hazardous waste means any solid waste as defined by the Department as hazardous under s. 144.62(2), Stats., and is defined in s. NR 181.12, Wis. Adm. Code.

4. Section 144.64(2)(c), Stats., allows the Department to issue an interim license to the owner or operator of the hazardous waste facility in existence on November 19, 1980 if the person applies for a license and complies with the restrictions prescribed by rule or special order by the Department pending the decision on the issuance of a final operating license. Koppers Co., Inc. was granted an interim license by the Department on April 1, 1985.

5. Section NR 181.42(8)(d), Wis. Adm. Code, requires the Department to approve, deny or modify a closure plan. The Koppers Co., Inc. Closure and Long-Term Care Plan, as modified by the conditions of this approval, meets the requirements of ss. NR 181.42(8) and (9) and ss. NR 181.44(12) and (14), Wis. Adm. Code. The closure and long-term care plan as conditionally approved will comply with those sections.

6. The environmental monitoring program as conditionally approved in the closure and long-term care plan will comply with the groundwater monitoring requirements of s. NR 181.49, Wis. Adm. Code.

CONDITIONS OF APPROVAL

General

1. All site construction, documentation and closure and post closure activities of the Koppers Co., Inc. surface impoundments shall be in accordance with the Revised Closure and Post-Closure Plan and accompanying plan sheets of engineering drawings as prepared by Keystone Environmental

5910

Resources, ch. NR 181, Wisconsin Administrative Code and the Conditions of Approval contained in this Conditional Approval Report. In the event of any discrepancies, the Conditions of Approval contained herein shall take precedence. Any proposed changes to the closure and post-closure plan or this approval shall be presented to the Department in writing. If the Department feels these changes are compatible with the proper closure and long-term care of the site, an addendum will be added to this approval indicating acceptance of those changes. Department approval is necessary prior to implementation of any changes.

2. A copy of the Modified Closure and Long-term Care Plan and a set of engineering drawings and this modified approval shall be retained at the facility's office at all times and shall be used by the individuals responsible for proper closure and long-term care of the surface impoundments. Individuals responsible for construction, closure and long-term care shall be informed of the conditions required in this approval. A copy of this conditional approval and report shall be included with all contractor construction documents.

3. The Department reserves the right to require changes to any conditions of this approval should an evaluation of the groundwater monitoring results, construction documentations or site inspections by District or Bureau staff reveal that changes are necessary.

4. All reports and investigations called for in this approval shall be prepared by a Professional Engineer registered in the state of Wisconsin. Koppers Co., Inc. shall submit all these reports and investigations called for in this approval in a timely fashion on the dates stated herein.

5. The schedule of events leading to closure of the surface impoundments are included in this condition. If for any reason Koppers Co., Inc. cannot meet the dates of this schedule, the Department shall be notified in writing why the action has not been completed.

Schedule For Closure of Surface Impoundments

Task	Duration
1988	
Preliminary removal standing liquid	April 1 - Aug. 15,
Wastewater treatment system start-up and final receipt of waste in surface impoundments	Aug. 15 - Aug. 25,
Final removal of standing liquid	Aug. 25 - Sept. 15,
Accumulate and remove K001 sludge	Sept. 15 - Oct. 15,
Remove visibly contaminated subgrade soil	Oct. 15 - Nov. 15,

5910

Impoundment subgrade preliminary soil sampling/analysis	Oct. 15 - Nov. 15,
Background soil sampling/analysis	Oct. 15 - Nov. 15,
1989	
Evaluate data and decide to pursue clean or contingent closure	Nov. 15 - Feb. 15,
If clean closure, sample and analyze for Table 1.0 parameters	Feb. 15 - May 15,
Regulatory response	May 15 - June 15,
If clean closure: Remove additional subgrade (if if necessary), backfill, cover, seed and decontaminate equipment	June 15 - Sept. 15,
If contingent closure: Backfill, cover (RCRA cap) seed and decontaminate equipment	June 15 - Sept. 15,
Completion of Closure Certification	Sept. - Oct. 15,

6. Any well that is abandoned as a result of closure shall be abandoned in accordance this condition. Proper abandonment of monitoring devices shall seal the well completely in order to prevent future contamination of groundwater. The sealing materials used shall be continuous, physically and chemically stable and have a hydraulic conductivity of less than 1 x 10^{-7} cm/sec. The exact location of abandoned wells and borings and the date and the method of abandonment shall be documented in writing. The abandonment method shall also be documented by photographs. All monitoring wells shall be abandoned and documented in accordance with ss. NR 141.25, Wis. Adm. Code. A report documenting that the monitoring devices have been properly abandoned shall be submitted with the construction documentation report.

7. Koppers Co., Inc. shall have a competent resident inspector on site during the entire closure period.

8. Koppers Co., Inc. shall inform the Department of any hazardous waste treatment activities that occur on site during closure. This includes the treatment of any K001 sludge by mixing with flyash or kiln dust. The Department shall be provided with a specific treatment plan which covers treatment location, treatment type, treatment structure and mixing ratio between the sludge and absorbant material.

9. Koppers Co., Inc. shall provide the Department with all sampling and analytical results from the soil investigations done to determine if clean closure is feasible.

5910

10. Koppers Co., Inc. shall contact the Department for approval of the location of the background soil borings.

Groundwater Monitoring and Long-term Care Conditions

11. Koppers Co., Inc. shall submit the results of the annual analysis report required by s. NR 181.49(6)(j)6., Wis. Adm. Code, for its entire groundwater monitoring system as soon as they become available.

12. Koppers Co., Inc. shall maintain a groundwater monitoring plan as required by s. NR 181.49, Wis. Adm. Code. The following wells will be the ch. NR 181, Wis. Adm. Code, monitoring wells.

Upgradient (Background)	Downgradient	
W-4A	L-1S	R-5D
W-4B	L-2S	R-6D
W-4C	L-4S	L-4D
	W-5	R-7D
		R-8D (W-6)
		R-9D

A well information form is needed for well R-5D, when that well is constructed.

13. Wells W-5, R-5D, R6-D, R-7D and R-9D must be sampled for the entire s. NR 181.16 Table VI (40 CFR Appendix IX is acceptable), hazardous constituents list.

To determine the existing level of Table VI (Appendix IX) constituents present in the groundwater, all wells will then be monitored an additional three times (on a monthly basis for all detected Table VI (Appendix IX) constituents, hazardous constituents listed under EPA hazardous waste number K001, indicator parameters, and several welfare parameters. This shall include the following:

Parameters

Indicator and Welfare Drinking Water Standards	Hazardous Constituents For Which K001 is Listed	Detected Table VI Hazardous Constituents
pH	Pentachlorophenol	Methylene Chloride
Conductivity	Phenol	Acetone
Temperature	2-Chlorophenol	Bis (2-Ethylhexyl)-phthalate
		Aluminum
Total Dissolved Solids	P-Chloro-M-Cresol	Arsenic
Hardness	2,4-Dimethylphenyl	Cadmium
Nitrate	2,4-Dinitrophenol	Calcium
Chloride	Trichlorophenol	Chromium
Ammonia	Tetrachlorophenol	Chromium
Total Organic	Creosote	Cobalt
	Chrysene	Copper

5910

Carbon	Naphthalene	Iron
Chemical Oxygen	Fluoranthene	Lead
Demand	Benzo (b) Fluoranthene	Manganese
	Benzo (a) Pyrene	Nickel
	Indeno (1,2,3-cd) Pyrene	Potassium
	Benz (a) Anthracene	Selenium
	Dibenz (a) Anthracene	Sodium
	Acenciphthalene	Vanadium
		Zinc

In addition, there have been Table VI (Appendix IX) detects upgradient in the background wells. Koppers Co., Inc. must determine the source of the constituents in these wells as it is unlikely these wells are influenced by the surface impoundments.

14. All samples collected for laboratory analysis shall be filtered in the field using a 0.45 micron inline filter unless otherwise approved by the Department. It appears that the analyses for inorganic Appendix IX parameters were performed on unfiltered samples, because the concentrations were extremely high (for example, iron averaged approximately 94 mg/l). If subsequent sampling rounds show that the actual concentrations of any of these metals at the facility are within the limits that can reasonably be expected in this clay environment, upon the request of Kopper's, the Department will drop those metals from the required list of parameters in Condition 13.

15. Once Koppers Co., Inc. has completed the analysis, a background value for each constituent detected must be established. This information must be submitted to the Department for review and concurrence. Once background has been established, the Department will establish groundwater protection standards for each detected constituent.

16. Background values for the parameters listed in Condition 13 shall be calculated by using 4 rounds of dated collected from wells unaffected by the site. In the past it appeared that wells W-4A, W-4B, and W-4C would be suitable background wells. However, hazardous constituents have been detected in these wells. Though they may not have been impacted by the surface impoundments, they probably do not represent background conditions.

17. Once site background has been established, samples shall be collected quarterly from each upgradient and each downgradient well analyzed for the parameters listed in Condition 13, the background data to determine whether any statistically significant different exists. The data and the test calculations shall be submitted to the Department quarterly. As proposed by Koppers, the Cochran's approximation to the Behrens - Fisher student's t-test shall be used to perform the statistical comparisons. The procedures described in NR 181.49(6)(h)1.a., Wis. Adm. Code. Upon written request from Koppers Company, the Department will consider approving a statistical test which requires 1 lab analysis per well per quarter rather than 4 analyses as required by the Cochran's approximation to the Behrens - Fisher student's t-test.

591

18. Groundwater elevations shall be measured in all monitoring wells on a quarterly basis. The measurements shall be made before the wells are purged or sampled.

19. Koppers Co. Inc. shall monitor all ch. NR 181, Wis. Adm. Code, compliance monitoring wells listed in Condition 12 for detected parameters on a quarterly basis and compare them to background. If a groundwater protection standard is exceeded, then Koppers Co., Inc. shall notify the Department and propose a corrective action program as outlined in s. NR 181.49(6)(j), Wis. Adm. Code.

20. Koppers Co., Inc. shall submit a revised ch. NR 181, Wis. Adm. Code groundwater monitoring plan reflecting these conditions and the requirements of s. NR 181.49(b) must be submitted within 45 days of the date of this approval. Koppers Co., Inc. may suggest minor revisions to these conditions in that plan submittal.

Financial Responsibilities

21. If clean closure cannot be attained and the contingent closure plan is implemented, Koppers Co., Inc. shall submit a long-term care plan specifying the inspection, maintenance and care of the facility during its 30 year post-closure care period.

22. Closure and Long-Term Care (NR 181.42(10), WAC).

    The closure costs presented are underestimated due to conditions of this closure plan. Revised cost estimates based upon the cost of closing the surface impoundments in accordance with the conditions of this closure and long-term care plan must be submitted. These costs must assume the most expensive closure will take place. The long-term care cost estimate must be covered in the proof mechanism. The revised cost estimates and proof mechanism shall be submitted within 45 days of the date of this approval.

23. Liability Requirement (NR 181.42(11), WAC)

    Koppers Co., Inc. must obtain liability insurance coverage for non-sudden accidental occurrences in the amount of $3 million per occurrence with an annual aggregate of at least $6 million, exclusive of legal defense costs. As part of the revisions to ch. NR 181, Wis. Adm. Code, a financial net worth test may be used. Koppers Co. is responsible for having this coverage now and proof of coverage must be submitted within 45 days of the date of this letter.

Construction Documentation

24. A Construction Documentation Report verifying and documenting all aspects of site construction shall be prepared following completion of construction. The report shall include the following information at a minimum:

5910

a. Plan sheets documenting: the extent of excavation and fill, all groundwater monitoring devices; grade and sidewall elevations of the cap including spot elevations; the location and types of testing performed; the locations of drainage ditches, access roads, berms; and any other pertinent information. In addition, invert elevations shall be provided on all gradient control and collection pipes.

b. Cross-sections shall be constructed to document the certified area. The drawings shall consist of a minimum of one north-south cross-section and one east-west cross-section. The cross-sections shall include base grades and final grades.

c. A comprehensive narrative explaining how construction of the project was accomplished along with an analysis of the data obtained during the soil investigation program. This report shall also include an appendix containing all the raw data from the field and laboratory soil testing performed.

d. A series of 35 mm color prints documenting all major aspects of site construction.

e. A letter under the seal of a registered professional engineer certifying that the site has been constructed in substantial compliance with the approved plans. Any deviations from the approved plans shall be noted.

Contingent Cap

25. The cap shall be constructed in accordance with the design specified in the closure and long-term care plan and the engineering plan sheets and as modified by the conditions of this approval. The cap shall consist of non-woven geotextile, a minimum 2 foot thick recompacted clay layer, a non-woven geotextile, a flexible membrane liner consisting of 40 mil high density polethylene (HDPE), a minimum 1 foot thick granular drainage layer, a non-woven geotextile, a minimum of 2.5 foot thick soil fill layer and a minimum 1.5 foot thick layer of topsoil. The final cover will be seeded, fertilized and mulched.

26. The flexible membrane line (FML) shall be at a minimum 40 mil high density polyethylene (HDPE) and not polyvinyl chloride (PVC). The FML shall be designed, tested and installed as specified in conditions.

27. Documentation Testing for The Clay Cap Shall be as Follows:

    a. Density testing shall be performed on a 100-foot grid pattern for each lift with the grid pattern offset on each subsequent lift. A lift shall not exceed eight inches in thickness after compaction. At least five densities shall be conducted per lift for each acre of clay placed. The testing locations shall be offset on each successive lift.

5910

b. A minimum of one undisturbed soil sample per 1,000 cubic yards shall be retrieved and analyzed for Atterberg limits, grain size (to the two micron particle size), moisture content, and dry density. Laboratory hydraulic conductivity tests shall be performed on at least one undisturbed sample.

c. A Modified Proctor curve shall be developed for the clay and again if visible changes in soil quality are observed in order that density testing can be correlated to the appropriate soil type.

d. The clay component, drainage blanket, cover material and topsoil thickness shall be verified on a 100 foot grid pattern. This may be satisfied with a survey after each increment of construction.

Material Specifications

28. Clay

The clay cap shall meet the following specifications:

Classification:	CL or CH under the Unified Soil Classification System
Thickness:	Minimum of 2 feet for the cap
Permeability:	Less than or equal to $1x10^{-7}$ cm/sec.
Liquid Limit:	30% or greater
Plasticity Index:	15% or greater
Compaction:	95% standard Proctor
Grain Size:	P200 Content of 50% by weight or greater

Documentation testing of the final clay capping material shall be as follows:

a. Three density tests per acre per lift.

b. One undisturbed soil sample per acre shall be retrieved and analyzed for grain size, Atterberg limits, moisture content, dry density and permeability.

c. Verification of clay cap thickness on a 100-foot grid pattern.

d. A standard Proctor curve shall be developed for each major soil type in order that density testing can be correlated to the appropriate soil type.

29. Drainage Layer

A minimum 1 foot thick granular drainage blanket shall be placed over the membrane. The drainage materials shall meet the following specifications:

a. Grain size; P200 content of 5% or less,

b. Permeability: $1x10^{-3}$ cm/sec or greater,

5910

c. Verification of drainage layer thickness on a 100 foot grid pattern,

d. Two permeability tests to document the permeability, and

e. Uniformity Coefficient: 6 or less.

30. Topsoil and Seed Mixture

Documentation testing of topsoil, seed, fertilizer and mulch placement shall consist of the following:

a. One grab sample of topsoil per acre shall be analyzed for soil pH and classified under the USDA soil classification system.

b. Verification of thickness on a 100-foot grid pattern.

c. The amount and type of fertilizer, seed and mulch used per acre.

d. A short narrative which explains how the seed bed was prepared and a summary of how placement of the seed, fertilizer and mulch were accomplished.

e. A series of 35 mm slides or color prints which document the work.

HDPE Membrane Requirements

31. The Department shall be notified in writing of the identities and qualifications of the geomembrane supplier, membrane installation contractor, and any other contractors involved in the project as soon as they are selected. The geomembrane information must be approved by the Department prior to implementing any membrane-related work. The following minimum information shall be included:

a. Identification of polymers and admixtures, quality control for the raw materials, fabrication methods, and quality control of geomembrane panels prior to shipment. Include sources of resins, all compounding materials, panel fabricators, and specific factory testing and seaming methods, as applicable, with detailed description of the processes.

b. Quality control for transporting and storing the membrane panels.

c. An experience record of the installer including contacts for projects previously completed within the last five years, including name, address, and phone number of contacts, type of application, and acreage completed.

d. The proposed equipment to be used in membrane installation, including machinery used in panel layout, sand drainage blanket placement, membrane seaming and testing, and soil processing.

5910

e. Quality control for seams, including identification of the destructive and nondestructive testing equipment with standards which define seam failure.

32. Koppers Co., Inc. shall provide for Departmental review a fabrication plan prior to commencing installation of the membrane liner. The fabrication plan shall include the following:

    a. Size and configuration of all panels to be assembled with a panel identification scheme.

    b. General location and type of all seams.

    c. Construction details for all membrane related work, including:

        i. Minimum panel overlap,

        ii. Penetration and attachment details for any points of membrane puncture, and

        iii. Panel anchoring methods.

33. Upon receipt of all HDPE membrane, Koppers Co., Inc. shall obtain samples as specified and test the samples for the following chemical and physical properties as specified to verify that the correct material has been delivered. Representative samples shall be taken from each membrane thickness. Data should be recorded and reported to the Department with the site construction documentation report.

a.	Thickness:	1 per 50,000 ft^2
b.	Density:	1 per 50,000 ft^2
c.	Melt Index:	1 per 50,000 ft^2
d.	Tensile and Elongation Properties (include copies of stress-strain diagrams from lab)	ASTM D638 2 per lot (for each thickness)
e.	Modulus of Elasticity (include copies of stress-strain diagrams from lab)	ASTM D882 2 per lot (for each thickness)
f.	Environmental Stress Crack	ASTM D1693 (Five samples from the polymer used to fabricate the geomembrane)

HDPE Site Construction

34. Installation of the HDPE membrane shall not proceed at temperatures below 40°. There shall be no seaming of the HDPE during rainy weather.

5910

35. Field seaming shall be performed by qualified seamers under the director supervision of a master seamer. The master seamer shall have experience seaming or performing quality control on a minimum of 1,000,000 square feet of HDPE membranes of 40 mil or greater thickness using the proposed field seaming method.

36. All geofabric installed in the site which will be exposed to sunlight for more than five days shall be UV resistant. Documentation of the fabric's UV resistance shall be included in the construction documentation report.

HDPE Quality Control

37. Destructive and nondestructive seam testing on all HDPE membrane installation shall be performed on the seams as follows:

    a. Nondestructive seam testing shall be performed on all seams over their full length and on all areas that have been repaired or where the membrane has been penetrated.

    b. Nondestructive same testing shall be performed using the vacuum test method or other method approved by the Department.

    c. Test seams for each seaming machine shall be made once each day at a minimum. Each seamer shall perform at least one test seam each day. A portion of each test seam shall be tested in the field for shear and peel and the other portion sent to a laboratory for testing.

    d. Field tests shall be performed using standardized specimen sizes in tensile testing machines with quantitative recording of test results.

    e. The test seam sample sent to the laboratory shall be labeled with a date, ambient temperature, seamer, and whether the test seam passed the field test.

    f. The test seam samples sent to the laboratory shall be tested for:

Peal Adhesion	ASTM D413
Bonded Seam Strength	ASTM D3083

38. Daily inspector's summary reports shall be prepared for each day that significant construction is either attempted or accomplished at the site. The reports shall described construction practices employed for membrane installation, collection piping placement, sand blanket placement and revegetation work accomplished. Outline drawings on 8 1/2" by 11" paper shall be prepared as necessary to record construction progress. The reports shall contain the following information:

    a. Amount and location of membrane placed. Changes from the fabrication plan should be noted.

    b. Identification of the panel numbers for the panels installed.

5910

c. Location of field seams completed.

d. Results of test seams.

e. Location and results of nondestructive seam testing.

f. Location of repairs made and results of the nondestructive testing of these repairs.

g. Location of samples taken for destructive testing.

39. A construction documentation report shall be submitted to the Department for review and approval. This shall be submitted with other construction documents. The site construction documentation report must be signed and stamped by a professional engineer registered in Wisconsin and an opinion given as to whether the site has been constructed in substantial compliance with the approved plans. The report shall include:

a. Plan view(s) utilizing a one foot contour interval and showing the location of all items constructed with spot elevations shown for the actual grades implemented on approximate 100 foot intervals.

b. Plan view(s) of piping layout used with spot elevations provided.

c. Results of the chemical and physical testing performed on the membrane as designated in Condition 33.

d. Location, type, manufacturer, trade name, quantity and installation methods for any geotextiles used. A sample of each geotextile used shall be included in the construction documentation report.

e. Copies of the daily field installation reports kept throughout construction.

f. A series of 35 millimeter photographs documenting all aspects of site construction and membrane placement with photos of all points of membrane penetration.

g. Cross-section drawings, one lengthwise and one crosswise through the cap showing membrane placement, drainage layers, collection system, anchor trenches, and other pertinent site features.

h. A statement from the geomembrane inspector giving an opinion the geomembrane integrity at the end of geomembrane placement.

Spray Irrigation Field

40. Koppers Co., Inc. shall implement the closure plan for its spray irrigation field as discussed in the closure plan report. The results of that closure and all actions taken shall be incorporated into the construction documentation report covering covering closure of the surface impoundments.

5910

CONDITIONAL APPROVAL

Based on the foregoing findings of fact and conclusions of law, the Department hereby conditionally approves the closure and long-term care plan for the Koppers Co., Inc. surface impoundment. This is based on the premise that all conditions required by this approval are met.

NOTIFICATION OF APPEALS RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Wis. Stats.

Dated: 9/30/87

DEPARTMENT OF NATURAL RESOURCES

For the Secretary

Paul P. Didier

Paul P. Didier, P.E., Director
Bureau of Solid Waste Management

Edward K. Lynch

Edward K. Lynch, P.E.
Environmental Engineer
Hazardous Waste Management Section
Bureau of Solid Waste Management

James Brownell

James Brownell, Hydrogeologist
Residuals Management and Land
Disposal Section
Bureau of Solid Waste Management

8673W

5910

B.3

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

File SUPERIOR

October 21, 1987 IN REPLY REFER TO: 4430

Mr. James R. Batchelder, Vice President and Manager
Technical and Environmental Services
Tar and Wood Products Sector
Koppers Co., Inc.
Pittsburg, PA 15219

SUBJECT: Hazardous Waste Closure and and Long-Term Care Plan
Koppers Co., Inc. - Surface Impoundment
Condition Clarification
EPA I.D. WID 006179493

Dear Mr. Batchelder:

This letter is to clarify the intent of one of the conditions listed in the closure and long-term care plan approval issued by the Wisconsin Department of Natural Resources on October 1, 1987. Condition 17 of that letter included several typographical mistakes which were not corrected prior to the approval being issued. As a result, the Department is at this time clarifying that condition. The condition is meant to read as follows:

"17. Once site background has been established, samples shall be collected quarterly from each upgradient and each downgradient well and analyzed for the parameters listed in Condition 13. This data shall then be statistically compared to the background data to determine whether any statistically significant differences exist. The data and test calculations shall be submitted to the Department quarterly. As proposed by Koppers, the Cochran's approximation to the Behrens-Fisher student's T-test shall be used to perform the statistical comparisons following the procedures described in s. NR 181.49(6)(h)1.a., Wis. Adm. Code. Upon written request from Kopper's Co., the Department will consider approving a statistical test which requires one lab analysis per quarter per well rather than four analyses as required by Cochran's approximation to the Behrens-Fisher student's T-test."

Please review this condition carefully and amend it to the previously issued plan approval. We regret any confusion this may have caused.

5910

If you have any questions regarding this condition, please contact either Ed Lynch at (608) 266-3084 or Jim Brownell at (608) 267-3534.

Sincerely,

Barbara J. Zellmer, Unit Leader
Hazardous Waste Regulatory Unit
Hazardous Waste Management Section
Bureau of Solid Waste Management

BJZ:dl/9156W

cc: Gary LeRoy - NWD
Director - Brule Area Office
Ed Lynch, Hazardous Waste - SW/3
Jim Brownell, Residuals Management - SW/3
Greg Hill, Industrial Wastewater - WW/2
Rick Karl, EPA Region V - RCRA Enforcement 5HE/12
Chuck Slaustas - EPA Region V - RCRA Permitting, 5HS/13
Systems Management Section - SW/3
Dave Shaw - Koppers Co., Inc., Superior
Robert Anderson - Keystone Environmental Resources
Ron Morolsky - Keystone Environmental Resources
Ron O'Toole - Keystone Environmental Resources
Terry Kirchner - Keystone Environmental Resources

5910

B.4

Beazer Materials and Ser , Inc.
A Member of THE BEAZI ROUP
Environmental Services
436 Seventh Avenue, Pittsburgh, PA 15219
Phone: 412-227-2500 Fax: 412-227-2950

NOV 2 0 1989

86-106

Beazer

November 17, 1989 FEDERAL EXPRESS

Mr. Edward K. Lynch, P.E.
Wisconsin Department of
Natural Resources
Hazardous Waste Management Section
Bureau of Solid Waste Management
101 South Webster Street, GEF II
Madison, WI 53707

Re: Construction Documentation Report
Surface Imoundments
Koppers Industries, Inc.
Superior, Wisconsin

Dear Mr. Lynch:

Enclosed please find five (5) copies of the Construction Documentation Report describing the closure of the surface impoundment system for the above-referenced facility. The report also contains the engineer's and operator's certification of closure. Please note that information to be included as Appendix G is not available at this time and will be forwarded to you upon receipt for inclusion.

BM&S is anxious in obtaining agency approval of this closure report in an expeditious manner so as to reduce our required financial assurance currently demonstrated through a letter of credit.

Please call if you have any questions.

Sincerely,

Matthew C. Plautz, P.E.
Program Manager-Environmental Services

MCP/cr
Enclosures
cc: B. Nolan
R. Hamilton
R. Vorpe
J. Batchelder (KII) [1 copy enclosure]
J. Heller (KII) [1 copy enclosure]
M. Bollinger (Keystone)
W. Ice (Keystone)
A. Tipton (EPA IV) [1 copy enclosure]

Writer's Direct Dial 412-227-2952

VOLUME I

CONSTRUCTION DOCUMENTATION REPORT
SURFACE IMPOUNDMENT CLOSURE
KOPPERS INDUSTRIES, INC.
SUPERIOR, WISCONSIN

Prepared for:

BEAZER MATERIALS AND SERVICES, INC.
PITTSBURGH, PENNSYLVANIA

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
3000 TECH CENTER DRIVE
MONROEVILLE, PENNSYLVANIA 15146

PROJECT NO: 178275-04

NOVEMBER 1989

DCC#R299

TABLE OF CONTENTS
VOLUME I

Page

LIST OF TABLES iii

LIST OF FIGURES iii

1.0 INTRODUCTION 1-1

2.0 PROJECT PERSONNEL 2-1

3.0 SUMMARY OF IMPOUNDMENT CLOSURE ACTIVITIES 3-1

4.0 CLOSURE ACTIVITIES 4-1

4.1 Health and Safety 4-1
4.2 Preconstruction Meetings 4-2
4.3 Groundwater Monitoring 4-2

4.3.1 Well Decommissioning 4-2
4.3.2 Monument Installation 4-3
4.3.3 Well Installation 4-3

4.4 Impoundment Subgrade 4-4

4.4.1 Evaluation 4-4
4.4.2 Preparation for Construction 4-9

4.5 Unclassified Soil Fill 4-11
4.6 Clay Barrier Soil 4-12
4.7 Synthetic Membrane 4-14
4.8 Drainage Layer Construction 4-16
4.9 Unclassified Cover Soil 4-18
4.10 Topsoil Placement 4-19
4.11 Seeding and Mulching 4-20
4.12 Drainage Improvements 4-21

5.0 CERTIFICATION 5-1

6.0 DEED NOTICE ..... Map Pocket

7.0 POST CLOSURE CARE 7-1

ATTACHMENT 1 Sludge Removal Report
ATTACHMENT 2 Closure Construction Photographs
ATTACHMENT 3 As-Built Drawings

VOLUME II

APPENDICES

A Boring Logs/Well Construction Diagrams
B Subgrade Laboratory Analytical Results
C Keystone Inspection Reports
D Daily Field Reports
E Field and Laboratory Test Results
F Materials and Suppliers List
G Synthetic Membrane Certification Report

LIST OF TABLES

3-1	Project Milestone Dates	3-1a
4-1	Monitoring Well Physical Data Summary For Wells Decommissioned in August, 1988	4-3a
4-2	Monitoring Well Physical Data Summary For Wells MW-1S, MW-4S and MW-4D	4-4a
4-3	Observations of Visible/Odorous Indications of Chemical Constituent Presence	4-5b
4-4	Summary of Subgrade and Background Sampling Analyses	4-6a
4-5	Summary of Laboratory Tests - Atterberg, Permeability, and Classification	4-9a
4-6	Summary of Field Nuclear Gage Test Results	4-12a
4-7	Geomembrane Test Results - Field Seams	4-15a

LIST OF FIGURES

1-1	Site Vicinity Map	1-2a
1-2	Site Plan	1-2b
4-1	Plan Map of Existing Well and Boring Locations	4-3b
4-2	Impoundment Soil Sampling Locations	4-4b
4-3	Background Soil Sampling Locations	4-5a
4-4	Surface Impoundment Closure Liner	4-16a

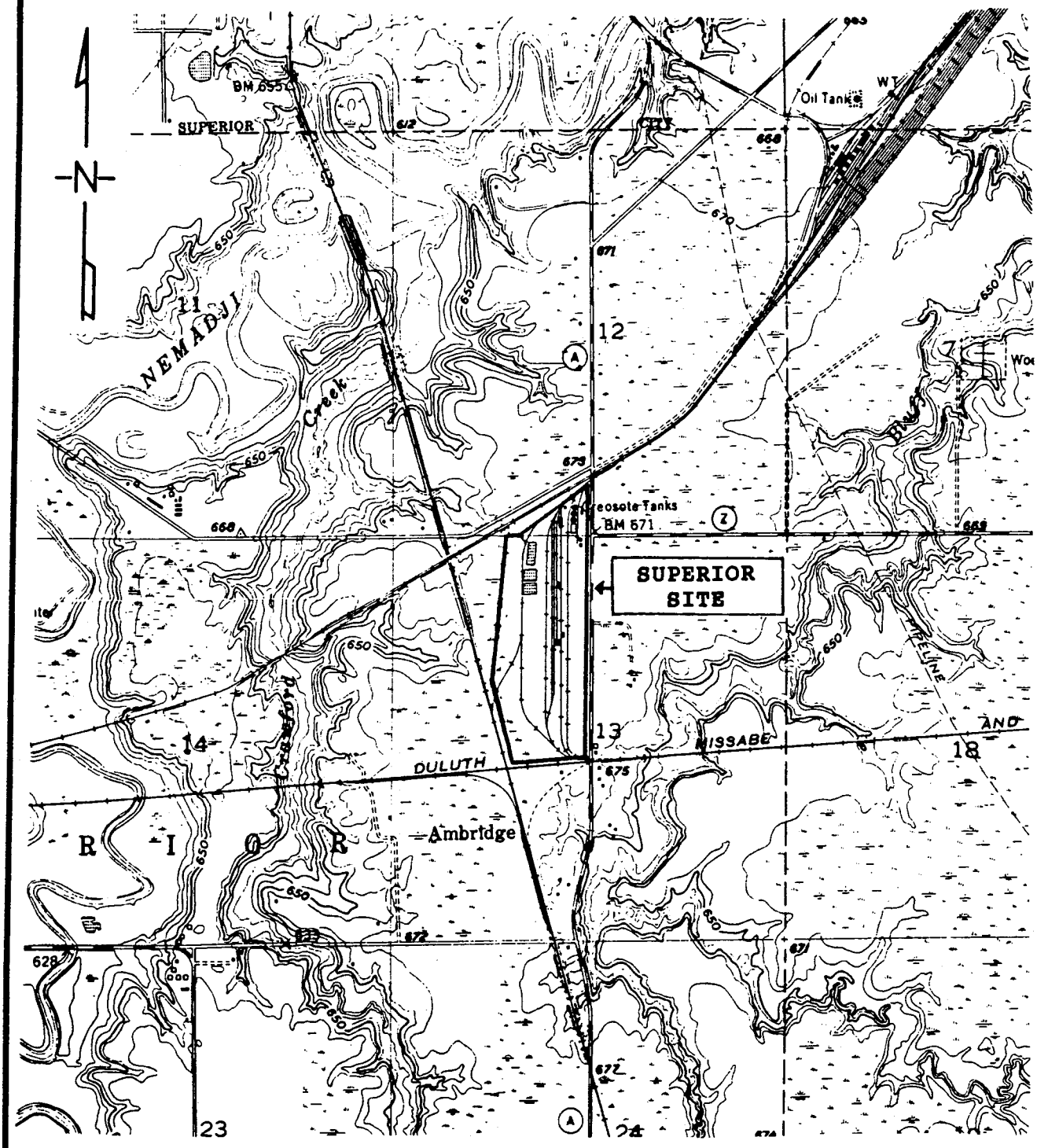
1.0 INTRODUCTION

This Construction Documentation Report, titled "Surface Impoundment Closure - Koppers Industries, Inc., Superior, Wisconsin" has been prepared to conform to the requirements contained in the conditional approval by the Wisconsin Department of Natural Resources (WDNR) on October 1, 1987 of "Closure and Post-Closure Plan for the Koppers Company, Inc. Hazardous Waste Management Facility, Superior, Wisconsin - Surface Impoundments - EPA I.D. No. WID006179493 ("the Plan") dated August 27, 1987. The location of the Koppers Industries site is shown on Figure 1-1. Figure 1-2 shows the location of the surface impoundments on the plant property. "The Plan" was prepared in accordance with the requirements of the Wisconsin Administrative Code, Chapter 181.

This report will provide information required by conditions 24 and 33 through 39 in the above noted Conditional Approval and includes:

- Listing of project personnel
- Documentation of sludge removal from the surface impoundments
- Plans and cross-sections to document the extent of excavation and fill and to document the certified area
- Construction narrative explaining how the project was accomplished
- Description of well decommissioning
- Technical description of cap construction
- Color print photo documentation
- Letter of Certification under the seal of a registered professional engineer

- Appendices containing daily field reports, inspection reports, materials and services suppliers lists, and field and laboratory test results; the Appendices have been bound separately as Volume II.



REFERENCE:

SUPERIOR, WIS.—MINN.
NE/4 SUPERIOR 15' QUADRANGLE
N 4637.5—W 9200/7.5

1954
PHOTOREVISED 1983
DMA 2577 II NE—SERIES V861

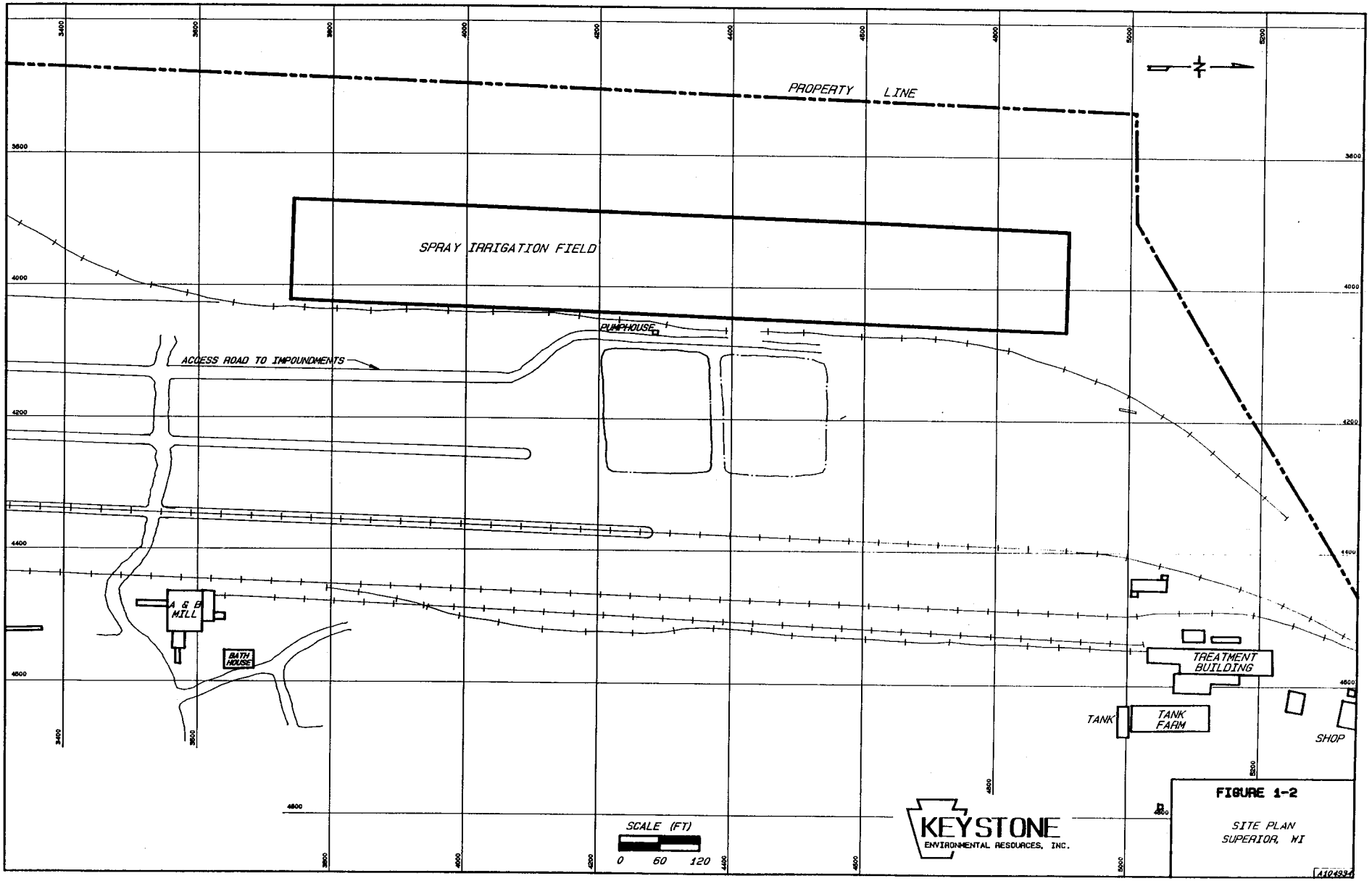
SCALE (FEET)
0 2000

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

FIGURE 1-1

SITE VICINITY MAP
SUPERIOR WOOD PLANT
SUPERIOR, WI

C67641


PROPERTY LINE
SPRAY IRRIGATION FIELD
PUMPHOUSE
ACCESS ROAD TO IMPOUNDMENTS
A & B MILL
BATH HOUSE
TREATMENT BUILDING
TANK
TANK FARM
SHOP
SCALE (FT)
0 60 120
KEYSTONE
ENVIRONMENTAL RESOURCES, INC.
FIGURE 1-2
SITE PLAN
SUPERIOR, WI
A104994

2.0 PROJECT PERSONNEL

The principal organizations and individuals involved in the project were as follows:

Owner:

Koppers Industries, Inc.
Superior, WI
John Heller - Plant Manager
David Shaw - Plant Manager

Project/Construction Manager:

Keystone Environmental Resources, Inc.
Monroeville, PA
Diane Smith - Hydrogeologist
Bill Ice - Project Manager
Walt Kuenzi - Certifying Engineer
James Thomas - Health & Safety Manager
Richard Van Tassel - Geotechnical Engineer

Geotechnical Testing, Observations, & Consulting:

STS Consultants, Ltd.
Superior, WI
Fred TePaske - Engineering Technician

Contractor:

J. R. Jensen & Son, Inc.
Superior, WI
Keith Jensen - President

Liner Subcontractor:

Geo-Synthetics, Inc. (GSI)
Pewauke, WI
Eric Snow - Field Supt.

Surveyor:

Seaway Engineering Co.
Duluth, MN
John Hinzmann, Jr. - PE&LS

Throughout the project, representatives from the above organizations met as needed; to plan the work activities, to discuss the status of the work, and to review the progress of construction activities.

David Shaw, the former Koppers Plant Manager, served as Construction Coordinator and Resident Inspector, with Fred TePaske of STS Consultants on board to follow geotechnical aspects and observe construction practices. Both prepared daily field reports which were distributed to serve as a communication tool and to support subsequent documentation.

3.0 SUMMARY OF IMPOUNDMENT CLOSURE ACTIVITIES

It must be noted herein that certain predecessor events required as part of the "Closure" had already occurred prior to Jensen's arrival on site. As early as April 1988, dewatering operations had commenced with K-001 sludge and bottom sediment removal completed by August 3, 1988. This phase of the work was performed directly between the owner and another contractor with no participation by Keystone Environmental Resources, Inc. However, since this work is considered an integral part of the closure, its documentation is included in this report. (See Attachment 1).

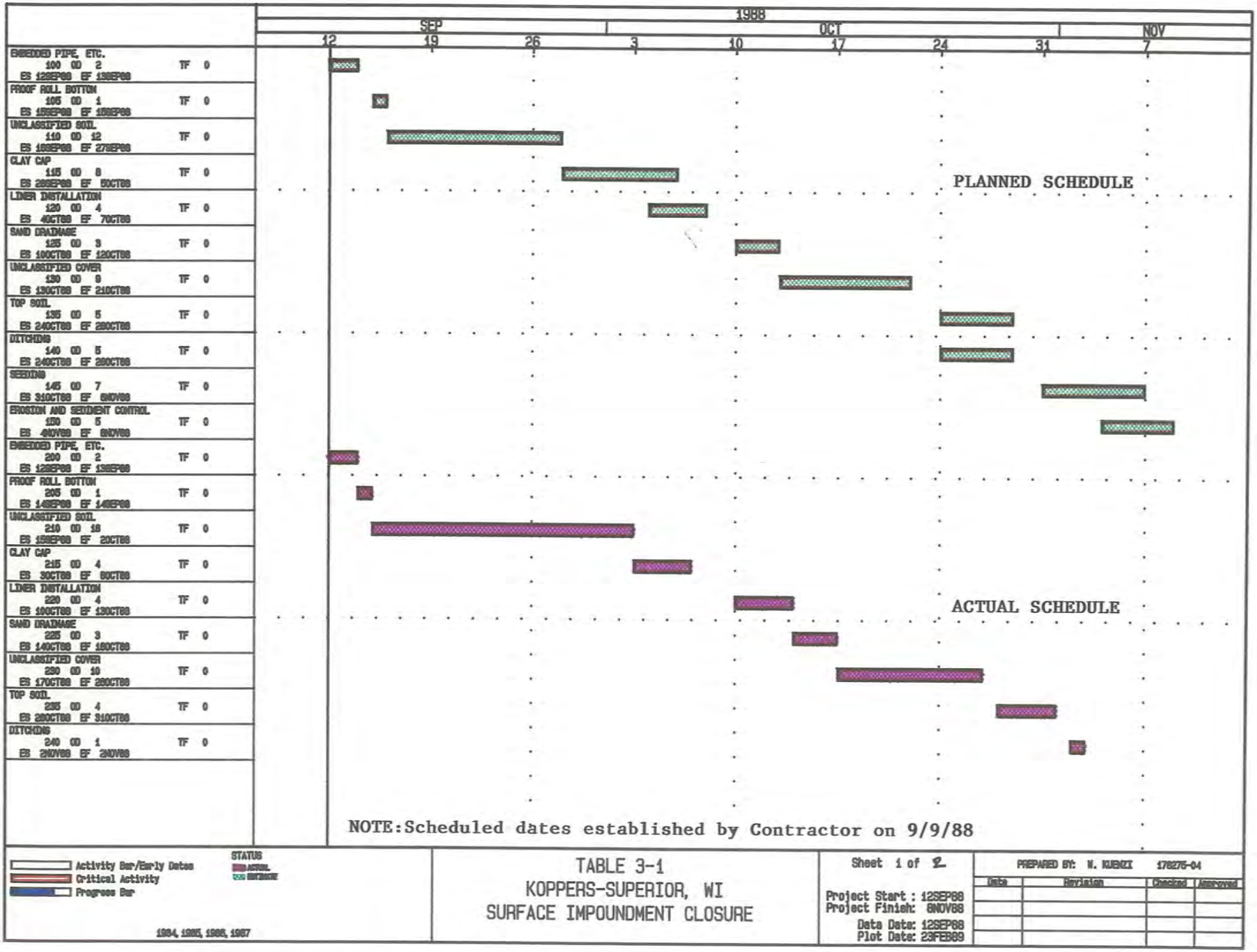
Also, during August 1988, a Keystone hydrogeologist obtained soil samples and supervised the decommissioning of eleven wells around the impoundments. These activities are documented in a subsequent section of this report.

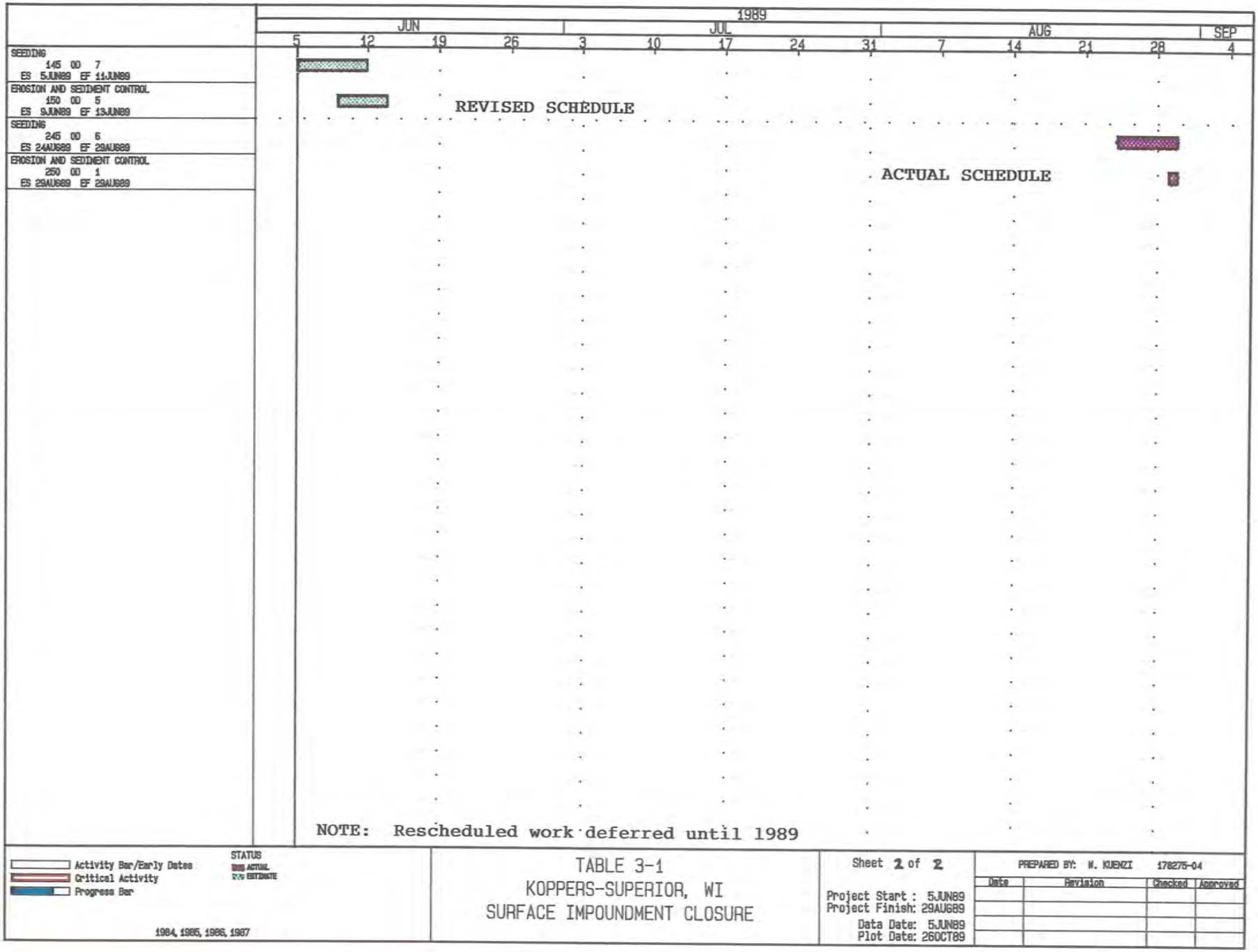
Keystone prepared bid packages, secured proposals, and assisted the owner in awarding construction contracts during August 1988. The scope of work was based strictly on the Closure Plan dated August 27, 1987, and DNR's "conditional approval letter" dated October 1, 1987.

Early in September 1988, Keystone's Health and Safety Department conducted a Hazardous Workers Operation Training Program at Superior, WI for all personnel to be involved in the work.

Concurrent with the above, Keystone's engineers held a series of preconstruction meetings with J.R. Jensen & Sons, STS Consultants, and Seaway Engineering to review details of the work to be performed and to prepare and agree on a schedule for completing each task. (See Table 3-1.) Expected accountability and administrative procedures to be followed were also covered at these meetings.

Site mobilization and actual field work by Jensen began on September 12, 1988. During the first two days, embedded pipes were removed and the dike separating the two impoundments was partially removed to permit easy access between the two areas. The areas were proof-rolled and reworking of the fill was required at several soft spots to achieve the desired compact condition prior to placement of fill material.


1988
SEP
OCT
NOV
12
19
26
3
10
17
24
31
7
EMBEDDED PIPE, ETC.
100 OD 2 TF 0
ES 12SEP88 EF 13SEP88
PROOF ROLL BOTTOM
105 OD 1 TF 0
ES 15SEP88 EF 15SEP88
UNCLASSIFIED SOIL
110 OD 12 TF 0
ES 16SEP88 EF 27SEP88
CLAY CAP
115 OD 8 TF 0
ES 28SEP88 EF 5OCT88
LINER INSTALLATION
120 OD 4 TF 0
ES 4OCT88 EF 7OCT88
SAND DRAINAGE
125 OD 3 TF 0
ES 10OCT88 EF 12OCT88
UNCLASSIFIED COVER
130 OD 9 TF 0
ES 13OCT88 EF 21OCT88
TOP SOIL
135 OD 5 TF 0
ES 24OCT88 EF 28OCT88
DITCHING
140 OD 5 TF 0
ES 24OCT88 EF 28OCT88
SEEDING
145 OD 7 TF 0
ES 31OCT88 EF 8NOV88
EROSION AND SEDIMENT CONTROL
150 OD 5 TF 0
ES 4NOV88 EF 8NOV88
EMBEDDED PIPE, ETC.
200 OD 2 TF 0
ES 12SEP88 EF 13SEP88
PROOF ROLL BOTTOM
205 OD 1 TF 0
ES 14SEP88 EF 14SEP88
UNCLASSIFIED SOIL
210 OD 18 TF 0
ES 15SEP88 EF 2OCT88
CLAY CAP
215 OD 4 TF 0
ES 3OCT88 EF 6OCT88
LINER INSTALLATION
220 OD 4 TF 0
ES 10OCT88 EF 13OCT88
SAND DRAINAGE
225 OD 3 TF 0
ES 14OCT88 EF 18OCT88
UNCLASSIFIED COVER
230 OD 10 TF 0
ES 17OCT88 EF 28OCT88
TOP SOIL
235 OD 4 TF 0
ES 28OCT88 EF 31OCT88
DITCHING
240 OD 1 TF 0
ES 2NOV88 EF 2NOV88
PLANNED SCHEDULE
ACTUAL SCHEDULE
NOTE:Scheduled dates established by Contractor on 9/9/88
Activity Bar/Early Dates
Critical Activity
Progress Bar
STATUS
ACTUAL
REMAINDER
1984, 1985, 1986, 1987
TABLE 3-1
KOPPERS-SUPERIOR, WI
SURFACE IMPOUNDMENT CLOSURE
Sheet 1 of 2
Project Start : 12SEP88
Project Finish: 6NOV88
Data Date: 12SEP88
Plot Date: 23FEB89
PREPARED BY: N. KUENZI 178275-04
Date
Revision
Checked
Approved


1989
JUN
JUL
AUG
SEP
5
12
19
26
3
10
17
24
31
7
14
21
28
4
SEEDING
145 00 7
ES 5JUN89 EF 11JUN89
EROSION AND SEDIMENT CONTROL
150 00 5
ES 9JUN89 EF 13JUN89
SEEDING
245 00 6
ES 24AUG89 EF 29AUG89
EROSION AND SEDIMENT CONTROL
250 00 1
ES 29AUG89 EF 29AUG89
REVISED SCHEDULE
ACTUAL SCHEDULE
NOTE: Rescheduled work deferred until 1989
Activity Bar/Early Dates
Critical Activity
Progress Bar
STATUS
ACTUAL
ESTIMATE
1984, 1985, 1986, 1987
TABLE 3-1
KOPPERS-SUPERIOR, WI
SURFACE IMPOUNDMENT CLOSURE
Sheet 2 of 2
Project Start : 5JUN89
Project Finish: 29AUG89
Data Date: 5JUN89
Plot Date: 26OCT89
PREPARED BY: W. KUENZI 178275-04
Date
Revision
Checked
Approved

After Seaway's baseline survey, unclassified fill was hauled in, dumped, layered with a D-6 dozer, and compacted with a vibratory sheepsfoot to grade per plan. This unit of work started September 15, but was not completed until October 2, 1988, due to excessive periods of precipitation.

Placement of the 24-inch layer of clay barrier soil, handled in a similar fashion, began October 4, 1988, and was completed four days later. Sand was used with a road grader to smooth out rough spots prior to placing the liner.

GSI mobilized to the site on October 10, 1988. On the following day (Oct. 11), GSI placed and seamed 16 panels of HDPE liner. The balance of the synthetic membrane was placed and seamed. All seams were leak tested and repaired as required the following two days. Concurrently, Jensen assisted by excavating and backfilling the anchor trenches.

Jensen placed the first layer of geotextile fabric on October 14, 1988, followed by placement of underdrain pipes and 12-inch drainage layer. A second layer of geotextile was placed on top of the drainage material.

Unclassified fill hauling, placement, and compaction started on October 18, 1988 for the 30-inch depth of soil fill called for on top of the drainage layer. Due to periods of rainfall, this unit of work was not completed until October 28.

Topsoil placement and rough grading of this material was completed on November 4, 1988. Remaining work (final drainage improvement, seeding, and mulching) was rescheduled for late spring 1989 due to rapidly approaching winter weather.

Jensen re-mobilized during June 1989 with the placement of an additional 438 cubic yards of top soil and completion of rough grading.

Seaway Engineering established final grades which were approved by Keystone in August 1989. Jensen completed final touch-up work on August 25 prior to arrival of their landscape sub-contractor, Kerrick Sod Co.

All activities related to vegetation work (lime, fertilizer, seed and mulch) by Kerrick were completed on August 29, 1989. Ample subsequent rainfall resulted in a successful level of germination over the entire surface area as observed by Keystone on October 4, 1989.

4.0 CLOSURE ACTIVITIES

4.1 Health and Safety

At the time of bid solicitation, a site-specific Health and Safety Plan was prepared and included as part of the bid document to insure that contractors would be alerted to the project health and safety requirements. Additionally, after the contract was awarded, a special 24-hour health and safety training program was conducted by Keystone's Health and Safety Department for contractor's personnel. This presentation was amplified by covering the content of the Health and Safety Plan including:

Personnel Decontamination Procedures.

Air Monitoring.

Personnel Protective Equipment.

Emergency Procedures (First Aid, Fire, Etc.).

Material Safety Data Sheets.

Levels of Protection.

During removal of abandoned pipes and a manhole, and also during preparation of the subgrade (modified Level C), Keystone provided an on-site health and safety representative to conduct organic vapor monitoring utilizing the HNu photoionization analyzer. Observations indicated that respirators were not required.

During the balance of the project (Level D), the owner's plant manager served as the on-site health and safety officer. No injuries or problems were encountered.

4.2 Preconstruction Meetings

Prior to project mobilization, Keystone representatives met with participating organizations/contractors to insure that the work would be executed efficiently and in strict accordance with the plans and specifications. Three meetings were held to:

a. Identify the participants and responsibilities of each member of the team.

b. Review the scope of work (owner's responsibility - contractor's responsibility, etc.)

c. Select locations for imported materials.

d. Establish construction schedule.

e. Promulgate reporting requirements.

f. Discuss potential suppliers of commercial materials.

g. Review Health and Safety Plans.

h. Clarify inspection and testing requirements.

i. Agree on frequency of survey to verify grades.

Memos from the three preconstruction meetings are contained in Appendix C.

4.3 Groundwater Monitoring

4.3.1 Well Decommissioning

During the week of August 1, 1988, 11 wells (L-1S, L-2S, L-3S, L-3M, L-4S, L-4M, L-4D, L-5S, L-5M, L-5DR, and L-17) were decommissioned so that they would not interfere with the capping of the surface impoundments. A physical data summary of

these wells is presented in Table 4-1. The locations of these 11 abandoned wells are shown in Figure 4-1.

The decommissioning procedure involved removing the steel protective casings and cutting the PVC riser pipe off at ground level. In several cases, the PVC well pipe was entirely removed from the ground because it was lodged inside the steel protective casing. Any well pipe remaining below the surface was filled with cement-bentonite grout which was allowed to cure for 24 hours. All of the S-series wells were then drilled out with 4 1/4 inch ID hollow stem augers to their total depths. All of the M-series and D-series wells were drilled out with 4 1/4 inch ID hollow stem augers to a depth of ten feet. Finally, the borehole was filled with cement-bentonite grout.

4.3.2 Monument Installation

Three surveying monuments were also installed per the specifications of Seaway Engineering Company of Duluth, Minnesota, the surveying contractors. The approximate locations of these three monuments are shown on Figure 4-1; they were located near the impoundments for use in the construction and surveying of the impoundment cap.

The monuments were installed by drilling an eight foot deep boring at each location and inserting a six inch diameter cardboard tube into each boring. At the location of Mon-1, the tube was successfully inserted to a depth of seven feet and one-half inch. At Mon-2, the tube was inserted to a depth of six feet and at Mon-3 it was inserted to a depth of eight feet. A concrete company was then called to cement the surveyors monuments (aluminum caps over rebar) in place within each cardboard tube. Mon-3 was subsequently destroyed by the contractor during the construction of the cap for the impoundments.

4.3.3 Well Installation

The locations of all existing and decommissioned monitoring wells in the vicinity of the surface impoundments at the Superior site are shown on Figure 4-1.

In April 1988, a Keystone hydrogeologist supervised the drilling and logging of boring R-5D. Originally, this location was to be the site of a monitoring well to be screened

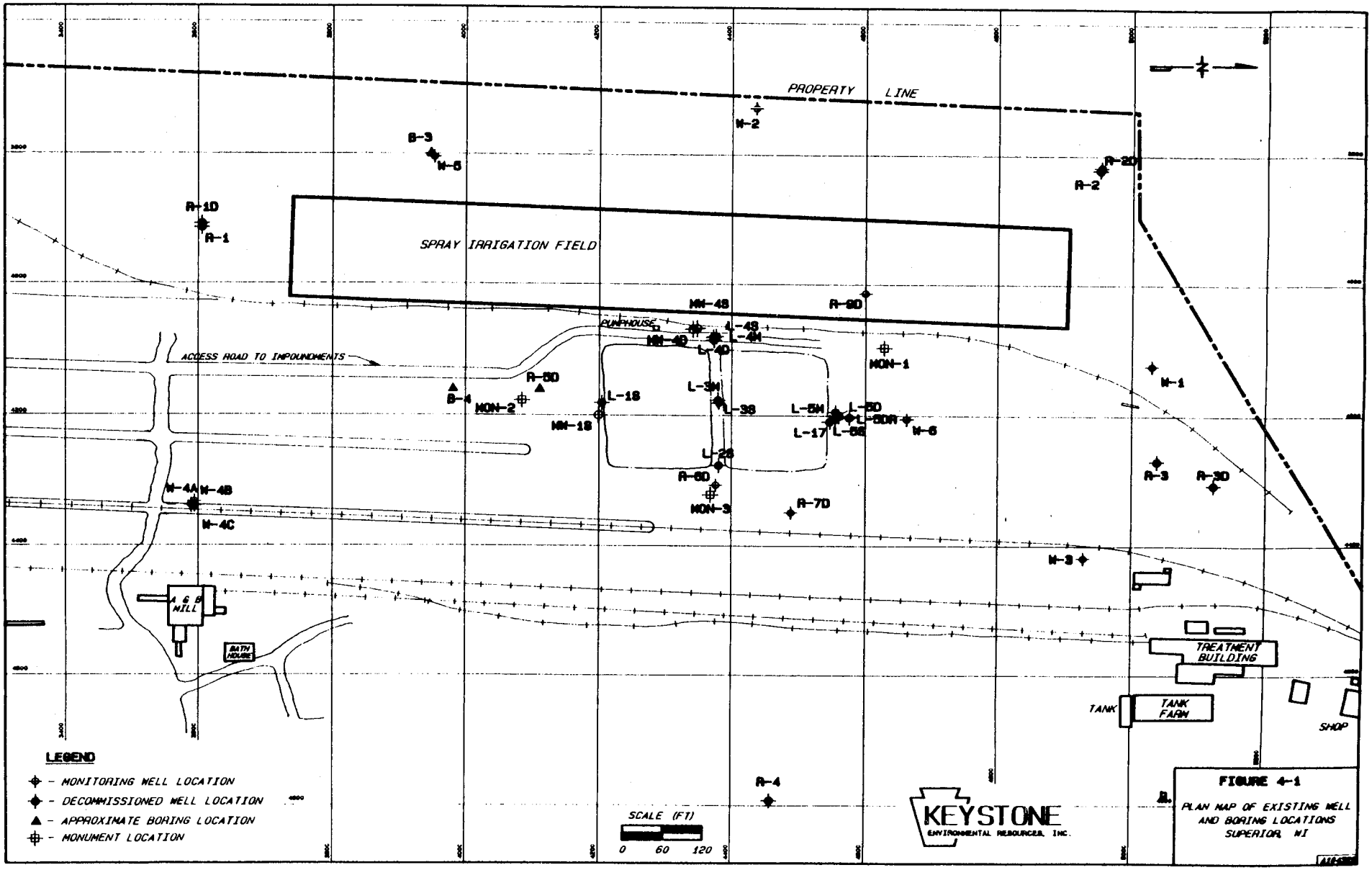
TABLE 4-1

MONITORING WELL PHYSICAL DATA SUMMARY FOR WELLS DECOMMISSIONED IN AUGUST, 1988

SUPERIOR, WISCONSIN KOPPERS INDUSTRIES, INC.

Well No.	Installation Date	Depth of Boring (Ft.)	Well Screen Type	Screened Interval (Ft.)	Screened Interval (Geologic Material)	PVC Measuring Point Elevation (Ft. Above MSL)
L-1S	6/84	12.0	2" PVC	2.0-12.0	Clay	678.59
L-2S	6/84	12.0	2" PVC	2.0-12.0	Clay	678.58
L-3S	6/84	12.0	2" PVC	2.0-12.0	Clay	678.14
L-3M	6/84	25.5	2" PVC	14.8-24.8	Clay	677.22
L-4S	6/84	12.0	2" PVC	2.0-12.0	Clay	678.82
L-4M	6/84	25.0	2" PVC	15.0-25.0	Clay	677.64
L-4D	6/84	60.0	2" PVC	25.0-35.0	Sand	677.24
L-5S	6/84	18.0	2" PVC	5.0-15.0	Clay	678.41
L-5M	6/84	25.0	2" PVC	15.0-25.0	Clay	677.75
L-5DR	8/86	46.5	2" PVC	35.5-45.5	Sand	676.48
L-17	7/84	15.0	2" PVC	5.0-15.0	Clay	676.72

Note: The wells were installed under the supervision of GAI Consultants, Inc. of Monroeville, PA.


PROPERTY LINE
SPRAY IRRIGATION FIELD
ACCESS ROAD TO IMPOUNDMENTS
PUMPHOUSE
A & B MILL
BATH HOUSE
TREATMENT BUILDING
TANK FARM
TANK
SHOP
B-3
M-5
M-2
R-1D
R-1
R-2D
R-2
MM-4S
MM-4D
L-4S
L-4M
L-4D
R-6D
MON-1
M-1
B-4
MON-2
R-5D
L-1S
MM-1S
L-3M
L-3S
L-5M
L-5D
L-5DR
L-1T
L-5S
M-6
L-2S
R-6D
MON-3
R-7D
M-4A
M-4B
M-4C
M-3
R-3
R-3D
R-4
LEGEND
- MONITORING WELL LOCATION
- DECOMMISSIONED WELL LOCATION
- APPROXIMATE BORING LOCATION
- MONUMENT LOCATION
SCALE (FT)
0 60 120
KEYSTONE
ENVIRONMENTAL RESOURCES, INC.
FIGURE 4-1
PLAN MAP OF EXISTING WELL AND BORING LOCATIONS
SUPERIOR, WI

within the sand unit found within 35 to 50 feet below the ground surface at the Superior site. However, during drilling no sand unit was encountered at the chosen location after split-spoon sampling had been performed to a depth of 59 feet. Keystone obtained permission from WDNR to grout the boring. Thus, no well was installed at location R-5D; the boring log for boring R-5D is located in Appendix A.

In November 1988, Keystone subcontracted Wisconsin Test Drilling, Inc. of Schofield, Wisconsin to supervise the installation of three wells, MW-1S, MW-4S and MW-4D, in the vicinity of the impoundments. Wells MW-1S and MW-4S were screened within the clay unit, while well MW-4D was screened within the sand. The locations of these newly installed wells are shown on Figure 4-1. The boring logs for these wells are located in Appendix A. Table 4-2 presents a physical data summary for these three wells. A fourth well, MW-2S was to be installed within the clay unit, however, marshy ground conditions precluded installation of this well in November, 1988. This well is scheduled to be installed on November 6-7, 1989.

4.4 Impoundment Subgrade

4.4.1 Evaluation

Closure of the two surface impoundments at the Superior site was initiated during July 1988. The removal of all impoundment sludge and visibly contaminated soils was completed on August 2, 1988, allowing the subgrade sampling activities to take place after this time. Because the impoundment system is being closed as a landfill, and the sludges and visibly contaminated soil had been removed, the subgrade sampling program was designed to characterize subgrade soil quality after excavation, and to gather data to determine if any potential effect on human health or the environment could exist after closure. Background soil samples were also collected to provide information on soil quality unaffected by the surface impoundment.

Subgrade sampling was conducted at 12 locations which had previously been approved by the Wisconsin Department of Natural Resources (WDNR), as shown in Figure 4-2. Four borings were located in the bottom of each of the two impoundments (LB-1 through LB-8). The remaining four borings (LB-9 through LB-12) were located on the berms of the impoundments. Two background borings (BB-

TABLE 4-2

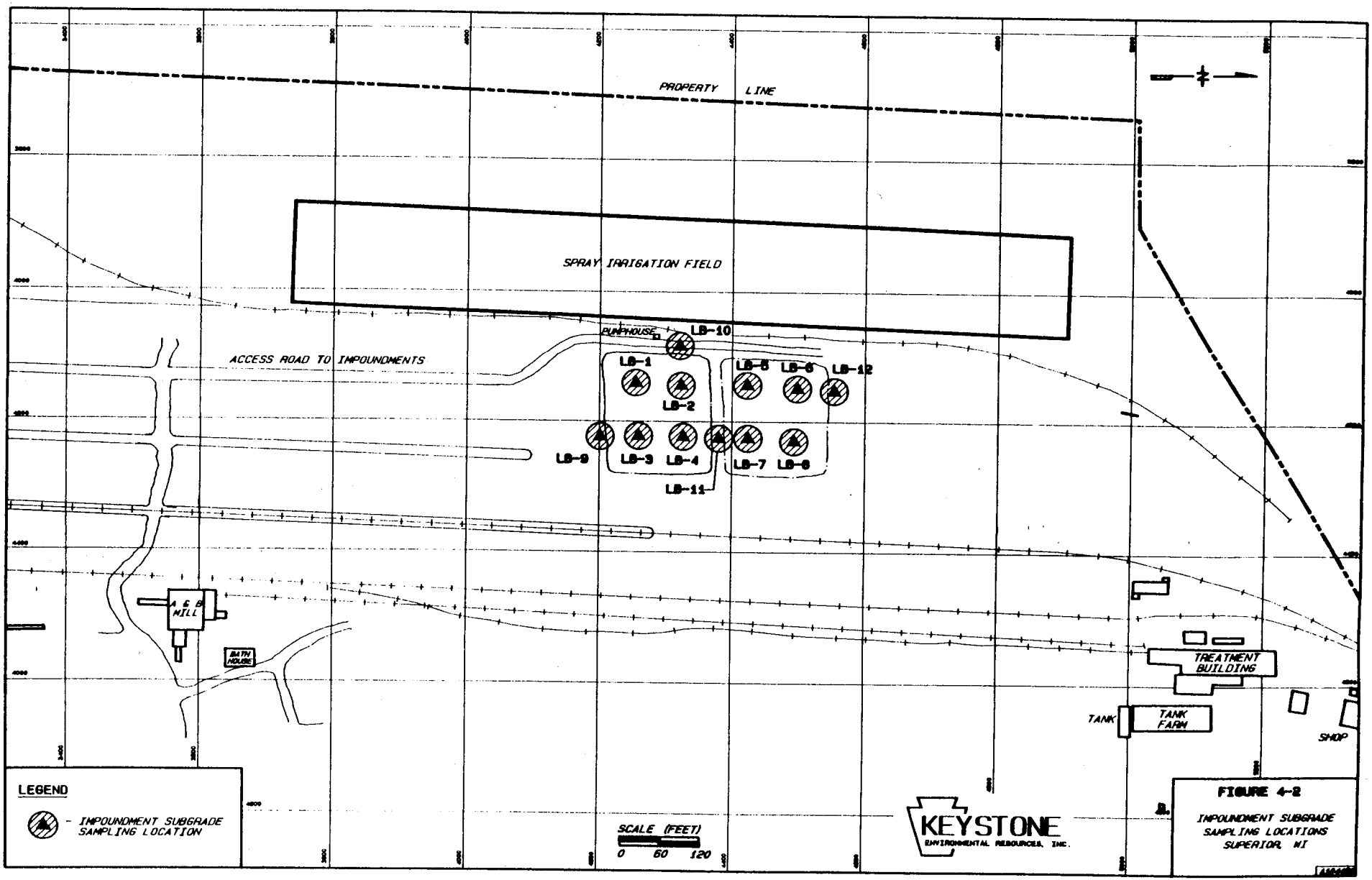
MONITORING WELL PHYSICAL DATA SUMMARY FOR WELLS MW-1S, MW-4S AND MW-4D

SUPERIOR, WISCONSIN KOPPERS INDUSTRIES, INC.

Well No.	Installation Date	Depth of Boring (Ft.)	Well Screen Type	Screened Interval (Ft.)	Screened Interval (Geologic Material)	PVC Measuring Point Elevation (Ft. Above MSL)
MW-1S	11/88	22.5	2" PVC	12.0-22.0	CLAY	676.84
MW-4S	11/88	27.5	2" PVC	11.5-21.5	CLAY	677.89
MW-4D	11/88	46.5	2" PVC	35.3-45.3	SAND	678.18

NOTES:

(1) Wells installed under supervision of Wisconsin Test Drilling, Inc. in November, 1988.
(2) Screen slot size is 0.01 inches.
(3) Elevations surveyed in November, 1988.


PROPERTY LINE
SPRAY IRRIGATION FIELD
PUMPHOUSE
ACCESS ROAD TO IMPOUNDMENTS
LB-10
LB-1
LB-2
LB-5
LB-6
LB-12
LB-9
LB-3
LB-4
LB-7
LB-8
LB-11
A & B MILL
BATH HOUSE
TREATMENT BUILDING
TANK
TANK FARM
SHOP
LEGEND
- IMPOUNDMENT SUBGRADE SAMPLING LOCATION
SCALE (FEET)
0 60 120
KEYSTONE
ENVIRONMENTAL RESOURCES, INC.
FIGURE 4-2
IMPOUNDMENT SUBGRADE SAMPLING LOCATIONS
SUPERIOR, WI

1 and BB-2) were located in the approximate locations shown in Figure 4-3. Wisconsin Test Drilling, Inc. was subcontracted for the soil boring/sampling. An engineering type ATV drill rig (CME 45) was used to perform these borings.

The borings located in the bottom of the two impoundments (LB-1 through LB-8) were sampled by hydraulically pushing a Shelby Tube sampler or three-inch split-spoon from the ground surface to a 1.0 foot depth interval, and then hydraulically pushing a two inch split spoon from 1.0 to 3.0 feet. The borings located on the berm (LB-9 through LB-12) were advanced using hollow stem augers. Split-spoons were hydraulically pushed 1.5 to 2.0 feet; samples were collected continuously to the termination of the boring. The two background borings (BB-1 and BB-2) were advanced by hydraulically pushing a three-inch split-spoon continuously to the termination of the boring. Soil samples collected in the field were trimmed and logged according the Burmeister soil classification system, placed in clean glass jars, and stored at the Superior plant. Any visible or odorous indication of the presence of chemical constituents in these samples was noted. When split-spoons were used, they were decontaminated between samples with soapy water, followed by a clean water rinse and rinses with acetone and distilled water. After completion of each boring located in the bottom of the surface impoundments, the small holes were backfilled and the top six inches were sealed with bentonite. Borings located in the berms of the impoundments were grouted upon completion, and the background borings were entirely filled with bentonite. Boring logs for all impoundment and background borings are contained in Appendix A. Descriptions of visible or odorous indications of the constituents of concern are located in Table 4-3.

The uppermost 35 to 50 feet of unconsolidated material which lies beneath the ground surface at the site consists of a Quaternary red-brown clay deposit. This deposit has been interpreted to represent lake bottom sediments deposited beneath a floating year-round ice cover, thus explaining the lack of varves or laminations within this clay. Gray silt pockets or streaks observed in the past and also evident in the impoundment borings may be consistent with the lake bottom interpretation for these sediments. The bottom of this clay has not been penetrated by any borings at the site. At depths ranging from 35 to 50 feet below ground surface, a semi-continuous sand deposit characteristic of a meltwater stream deposit is present. Local information indicates that bedrock is present at 170 to 210 feet below the surface at the site.

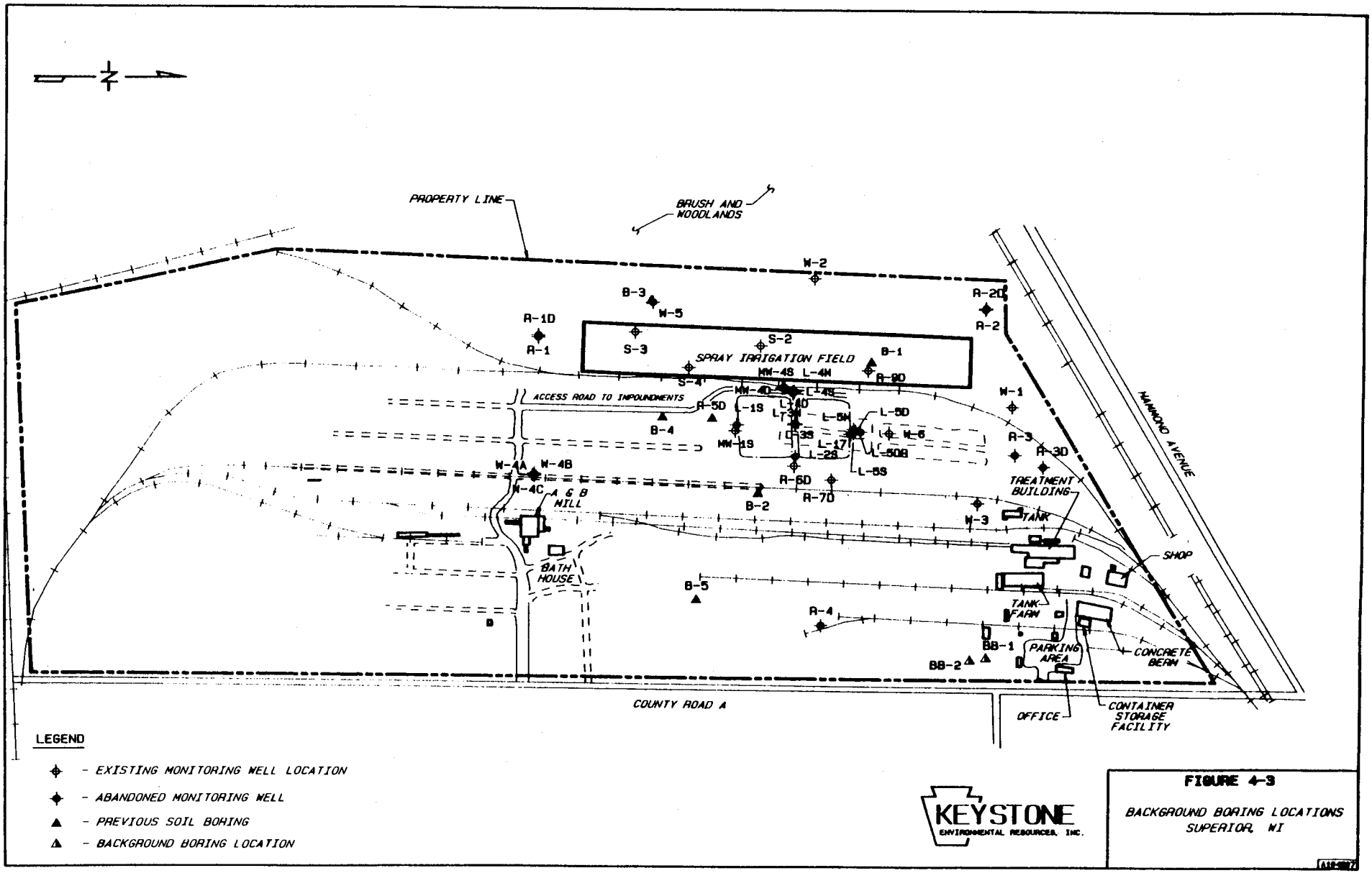


FIGURE 4-3

BACKGROUND BORING LOCATIONS
SUPERIOR, WI

TABLE 4-3

OBSERVATIONS OF VISIBLE/ODOROUS INDICATIONS OF CHEMICAL CONSTITUENT PRESENCE

SUPERIOR, WISCONSIN
KOPPERS INDUSTRIES, INC.

Boring	Observation
LB-1	Creosote odor at 0.0-1.0 ft.
LB-2	Creosote odor at 0.0-1.0 ft.
LB-3	Creosote odor at 0.0-1.0 ft.
LB-4	No odor, no visible indications
LB-5	Creosote odor at 0.0-1.0 ft.
LB-6	Creosote odor at 0.0-1.0 ft., Slight creosote odor at 1.0-2.0 ft., Very slight creosote odor at 2.0-3.0 ft.
LB-7	Very slight creosote odor at 0.0-1.0 ft.
LB-8	Creosote odor at 0.0-1.0 ft.
LB-9	Slight creosote odor at 3.5-5.5 ft., Strong creosote odor and creosote patches at 5.5-9.5 ft., Slight creosote odor at 9.5-10.5 ft., Very slight creosote odor at 10.5-11.5 ft.
LB-10	No odor, no visible indications
LB-11	No odor, no visible indications
LB-12	No odor, no visible indications
BB-1	No odor, no visible indications
BB-2	No odor, no visible indications

As seen in the boring logs, the red-brown clay to clay and silt is the predominant unit present at all locations. A trace of light gray silt pockets/streaks was observed at all locations and traces of organics present as plant material or decomposed organics were present at most locations. Layers of discontinuous fine sand up to one inch thick were observed in boring LB-12 only. At the background boring locations, two to three feet of fill was present just above the red-brown clay unit.

Selected subgrade and soil samples were submitted for laboratory analysis. For LB-1 through LB-8, located in the bottom of the impoundments, the 0.0 to 1.0 foot sample was selected for analysis. Using an average surface elevation for these eight borings, and knowing the elevation of each of the borings located on the berms of the impoundments, a sample which would be located at the same elevation as the 0.0 to 1.0 foot sample in the impoundment bottoms was collected for analysis in each of the four borings in the berms. Thus, in LB-9 and LB-12, the 8.5 to 9.5 foot interval was analyzed, in boring LB-10 the 9.0 to 10.0 foot interval was analyzed and in LB-11 the 7.5 to 8.5 foot interval was selected for analysis. The depth interval for the samples to be analyzed in the background borings was selected in a similar matter. Thus, for both BB-1 and BB-2, the 6.5 to 7.5 foot depth interval was submitted for analysis. The termination depth of the borings located on the impoundment berms and the background borings was two feet below the depth of the sample selected for laboratory analysis.

All samples to be submitted for laboratory analysis were placed in iced coolers and shipped overnight to Keystone's Analytical Laboratory in Monroeville, Pennsylvania. All of the collected samples were analyzed for polynuclear aromatic hydrocarbons, phenolics, oil and grease, arsenic, chromium, copper, lead and zinc. Analytical results for these samples are contained in Appendix B.

Table 4-4 lists the total polynuclear aromatic compounds and total phenolics levels found in each sample. Of the total phenolics listed, phenol was the constituent most commonly found; it was present in eight samples. Pentachlorophenol and 4-nitrophenol were each present in five samples and 2,4-dimethylphenol was found in four samples. Of the polynuclear aromatic compounds, phenanthrene, naphthalene and fluoranthene were the constituents most commonly found at elevated

TABLE 4-4

SUMMARY OF SUBGRADE AND BACKGROUND SAMPLING ANALYSES

SUPERIOR, WISCONSIN
KOPPERS INDUSTRIES, INC.

Sample	Total Polynuclear Aromatic Compounds (ug/Kg)	Total Phenolics (ug/Kg)
LB-1, 0.0-1.0 ft.	48389	2373
LB-2, 0.0-1.0 ft.	220.2	ND
LB-3, 0.0-1.0 ft.	82613	751
LB-4, 0.0-1.0 ft.	745.2	1162
LB-5, 0.0-1.0 ft.	1857	88.0
LB-6, 0.0-1.0 ft.	15113	844
LB-7, 0.0-1.0 ft.	903.6	178
LB-8, 0.0-1.0 ft.	1168.17	420
LB-9, 8.5-9.5 ft.	171590	1529
LB-10, 9.0-10.0 ft.	1617.3	898
LB-11, 7.5-8.5 ft.	94.3	71.2
LB-12, 8.5-9.5 ft.	ND	185
BB-1, 6.5-7.5 ft.	ND	ND
BB-2, 6.5-7.5 ft.	22.97	872

NOTE:

(1) ND indicates not detected.

concentrations as compared to the other polynuclear aromatic compound constituents.

In addition, oil and grease was detected in four borings. These concentrations were 176 mg/Kg in LB-3, 59.4 mg/Kg in LB-4, 73.6 mg/Kg in LB-6 and 215 mg/Kg in LB-9. Boring LB-9 showed the highest levels of chemical constituents of concern and also was the only boring at which visible creosote was present. It is believed that the discontinuous creosote patches which were observed in the LB-9 sample were present in the soil before the construction of the impoundments and were not the result of migration through the berm, but rather the results of previous operations.

The two borings located in the southern half of the southern-most impoundment, LB-1 and LB-3, contain relatively high levels of total polynuclear aromatic compounds and total phenolics. Considering the other borings, no obvious spatial patterns are apparent. LB-6 had relatively high levels of total polynuclear aromatic compounds and total phenolics. One background boring sample, BB-2, contained a total phenolic level of 872 ug/Kg, comprised entirely of phenol. The presence of phenol in the background sample may indicate that the phenol levels in the impoundment samples may not be present entirely as a result of the treatment of wastewater in the impoundments. Phenols and phenolic compounds occur naturally in all soils; they are generated in part from decomposition of vegetation.

The levels of total polynuclear aromatic compounds are most likely higher than the total phenolics levels because of their relative sorption/solubility differences. Polynuclear aromatic hydrocarbons are strongly adsorbed onto soils and phenolics are generally more water soluble, although the individual phenolics constituents vary widely in solubility.

Each soil sample was also analyzed for total arsenic, total chromium, total copper, total lead, and total zinc. Considering first total arsenic, several samples (including LB-9 which showed the highest level of total polynuclear aromatic compounds) had concentrations below the detection limits for arsenic. The highest level of arsenic, 3150 ug/Kg, was present in sample LB-11. One background sample, BB-1, contained 1080 ug/Kg arsenic. Arsenic is found naturally in soils; the mean value of arsenic in dry soils is reported to be 6 ppm which is equivalent to 6000 ug/Kg.

Total chromium was present in all soil samples tested; both background soil samples had levels very similar to the subgrade samples. Levels of chromium did not vary significantly across the site; the range of values was 30,000 ug/Kg in LB-5 to 45,600 ug/Kg in LB-9.

Total copper also was present in every tested soil sample. With the exception of sample LB-1, which had a total copper level of 84,600 ug/Kg, concentrations were similar. Excluding LB-1, total copper levels ranged from 40,100 ug/Kg in BB-2 to 53,900 ug/Kg in LB-8. Again, spatial trends did not appear significant.

Total lead levels showed the most variation of all metals tested. Background sample BB-1 had the highest lead concentration; 76,680 ug/L. The only other three samples with this order of magnitude lead level were LB-1, LB-3 and LB-9, which had the highest total polynuclear aromatic compound concentrations. Other soil samples had values ranging from 6650 ug/L in LB-4 to 9140 ug/L in LB-8.

Total zinc was found at similar levels in all samples and did not show significant spatial variation. Values ranged from 49,200 ug/L in LB-10 to 65,400 ug/L in LB-1.

Past slug testing performed in wells completed in the clay at the Superior site revealed that the hydraulic conductivity of the clay averaged 1.6×10^{-5} cm/second. In contrast, the sand layer present at the site between 35 and 50 feet below ground surface has a hydraulic conductivity in the 10^{-3} cm/second range. This range is typical for a sand deposit and is at least two orders of magnitude greater than the hydraulic conductivity calculated for the clay. Thus, the sand layer is considered the uppermost aquifer at the Superior site, while the clay acts as an aquitard.

In summary, although there is evidence of elevated levels of chemical constituents of concern in several subgrade samples, this condition is expected to remain localized due to the low permeability of the clay. The detection of creosote odors rapidly tapered off with depth, even though creosote has a low odor threshold. Groundwater samples from the abandoned 11 wells had not been degraded in quality, with the exception of well L-5S which was located in the vicinity of a previously abandoned surface impoundment. Because of the high permeability contrast between the clay unit and the underlying sand unit, the primary direction of groundwater migration within the clay and the direction of mobility of elevated

chemical constituents within soils will be vertically downward. Any appreciable lateral groundwater migration at the Superior site will occur through the sand unit, which is currently being monitored.

4.4.2 Preparation for Construction

To prepare for the construction, several activities were performed and included the evaluation of clay and drainage material borrow sources, proof rolling the subgrade, and the removal of buried pipes at the impoundment dike. These activities are described in this section.

Clay Borrow Source

The project team members inspected the lands from which the contractor proposed to obtain clay soil required to backfill the surface impoundments and construct the clay closure cap. Two samples of clay soil were obtained from the area of the proposed borrow area. A visual inspection of the borrow source and soil indicated that it was a highly plastic clay and there appeared to be a sufficient quantity available to fulfill project requirements.

Soils laboratory tests were performed on the samples to obtain geotechnical parameters. Grain size and Atterberg limit tests were performed to obtain quantitative data to describe the soils. Moisture density tests were performed to determine the degree of compaction that could be achieved during construction. In addition, Permeability tests were performed to confirm the coefficient of permeability was low enough for a closure cap. The results of these tests are presented in Table 4-5.

The results of these tests are presented in the report where the specific soil layer is discussed. In summary, the borrow source can be described as a red-brown clay, trace of sand, highly plastic, and can be compacted to a dry density in excess of 90 pounds per cubic foot. The results of the soils tests, performed by the STS on a subcontract basis, are presented in Appendix E.

TABLE 4-5

SUMMARY OF LABORATORY TESTS
Atterberg, Permeability, and Classification
SUPERIOR, WI SITE

Layer	Sample	Source (1)	Atterberg LL	Atterberg PL	Atterberg PI	Permeability (cm/sec) (2)	Soil Type (3)	Comments
Soil Fill	A1-B1	B	80.8	24.5	56.3		CH	
	A1-B2	B	70.7	22.6	48.1		CH	
	A1-C1	S	70.6	25.7	44.9		CH	
	A1-C2	N	71.4	25.3	46.1		CH	
	A1-C3	N	74.0	24.4	49.6		CH	
	A1-C4	S	68.4	24.5	43.9		CH	
	A1-C5	N	82.4	24.3	58.1		CH	
	A1-C6	N	70.7	22.0	48.7		CH	
	A1-C7	S	73.7	23.1	50.2		CH	
	A1-C8	S	95.8	28.8	67.0		CH	
Clay Barrier	A2-B1	B	91.0	26.2	64.8	2.81×10^{-8}	CH	
	A2-B2	B	79.4	24.0	55.4	2.58×10^{-9}	CH	
	A2-C1-1	N	76.0	26.0	50.0	4.00×10^{-9}	CH	First Lift
	A2-C1-2	S	90.0	29.0	61.0	2.30×10^{-9}	CH	First Lift
	A2-C2-1	N	84.0	29.0	55.0	2.50×10^{-9}	CH	Second Lift
	A2-C2-2	S	84.0	29.0	55.0	2.50×10^{-9}	CH	Second Lift
	A2-C3-1	S	81.3	24.6	56.7	7.36×10^{-8}	CH	Third Lift
	A2-C3-2	N	80.1	24.2	55.9	1.70×10^{-9}	CH	Third Lift
Drainage Layer (4)	A3-B2	B				1.47×10^{-2}	SP	Cu = 2.4, Cc = 0.96(5)
	A3-B3	B				3.89×10^{-2}	SP	Cu = 2.2, Cc = 0.84
	A3-B4	B					SP	Cu = 2.5, Cc = 0.91
	A3-C1-1	S					SP	Cu = 2.1, Cc = 0.89
	A3-C1-2	N					SP	Cu = 2.4, Cc = 0.73

TABLE 4-5 (Continued)

Layer	Sample	Source (1)	Atterberg LL	Atterberg PL	Atterberg PI	Permeability (cm/sec) (2)	Soil Type (3)	Comments
Cover Soil	A4-C1	N	92.3	28.1	64.2		CH	
	A4-C2	S	89.9	26.7	63.2		CH	
	A4-C3	N	91.1	26.6	64.5		CH	
Topsoil	A5-B1	B	73.2	40.4	32.8		MH	
	A5-B2	B	75.6	42.1	33.5		MH	
	A5-C1	N	77.3	40.7	36.6		MH	
	A5-C2	S	73.6	36.1	37.5		MH	

NOTES:

(1) - Source code: B = borrow, N = North Impoundment, S = South Impoundment.
(2) - Permeability testing: Clay - Falling Head, Granular - Constant Head; Borrow sample - remolded, Field sample - undisturbed.
(3) - Soil type determined by Unified Soil Classification System (USCS).
(4) - Borrow sample A3-B1 was from another borrow source not used for construction.
(5) - Cu = Uniformity coefficient, Cc = Coefficient of curvature.

Drainage Layer Materials

The initial borrow sources proposed by the Contractor for drainage material, the "Patterson Pit", was inspected and evaluated. The banks of the pit showed signs of having high percentages of silt and widely varying distributions of particle sizes. A soil sample had been previously obtained by the contractor so no sample was taken. It was judged that this material would require screening to remove the fine materials and it was not recommended as a source for the drainage layer materials. The contractor was instructed to find another source of material suitable for the drainage layer.

The Contractor subsequently found a source of suitable sand and gravel that fulfilled the requirements for drainage layer materials. Drainage layer materials were obtained from the "Allen pit", located on Highway B, in Douglas County.

Three samples of material from this borrow source were obtained and soils laboratory tests performed. Three sieve analyses, two Standard Proctors, and two permeability tests were performed on the Allen pit materials. The test results are presented in Table 4-5 and are summarized as follows:

Grain Size	silt or clay	0%
	fine to coarse sand	85%
	fine to coarse gravel	15%
Uniformity Coef.		2.2 to 2.5
Standard Proctor		100 to 104 PCF; 7% Wc
Permeability (cm/sec)		1.5 to 3.9 x 10^{-2}

The amended closure plan required less than 5% passing the number 200 sieve, a uniformity coefficient less than 6, and a permeability greater than 1 x 10^{-3} centimeters per second (cm/sec). Based upon these results, the materials fulfilled the requirements for drainage materials as prescribed in the closure plan and were approved for the closure construction.

Site Preparation and Proof-rolling

To ready the impoundments to receive fill materials, some preparatory work was required to remove rainfall that had collected and to dry out the in situ soils. The plant personnel pumped out the ponded rainfall and discharged it onto the spray evaporation field. Air drying and discing of the wet soils was performed by the contractor to improve the condition of the soils. These efforts improved the condition of the soils so that the proof-rolling activities could be accomplished. The proof-rolling of the subgrade is shown on Photograph No. 1 (Photographs are presented in Attachment 2).

Removal of Buried Pipes and Center Dike

Some buried pipes in the center dike area and perimeter walls of the impoundments were uncovered and removed as shown on Photograph No. 2. In addition, higher portions of the center dike were cut down to permit the backfilling of the impoundments and to construct the full thickness of the closure cap. Photograph No. 3 shows the excavation of the higher portions of the center dike. The materials excavated were placed and compacted on the bottom of the impoundments to prepare the impoundments to receive imported backfill. The pipes were cleaned and removed from the impoundments.

These activities were accomplished to prepare the impoundments for the subsequent backfilling operations and closure cap construction.

4.5 Unclassified Soil Fill

The clay soil from the approved borrow source was placed, conditioned, and compacted in the soil fill zone of the cap construction. The compaction of the first layer of unclassified soil fill is illustrated by Photograph No. 4. The clay soils were wetter than the optimum moisture content and required drying prior to the compaction effort. To obtain the proper moisture condition, the soil was spread over the work area, disced with farm equipment to break down clods and increase the soil surface area. The soils were disced repeatedly until the soil was dryed,and clods broken down enough to enable compaction.

The soils were spread over the fill area by a dozer and compacted with a self-propelled compactor as shown by Photograph No. 5. The conditioned soils were compacted in lifts of about 8 inches thickness using a self-propelled compactor. The compactor had a "sheeps-foot" type drum and an oscillator to apply dynamic forces to the soils. Inspection of the soil conditioning and compaction work was performed by STS's inspector who was experienced in working with the local soils to construct engineered embankments. A compacted surface of the unclassified soil fill zone is shown on Photograph No. 6. The extent of this embankment zone is illustrated on cross-sections of the "as-built" drawings, which are contained in Attachment 3.

During these operations, field nuclear density testing was performed to assure the construction met the requirements of the closure plan. Thirty-five field nuclear-density tests were performed to assure the compacted soil fill met the dry density requirement of at least 95 percent for compacted clay soil. As presented in Table 4-6, all field tests showed the compacted densities fulfilled the dry density requirement and the moisture content was slightly wetter than the optimum of 24 percent.

In addition to the field density tests, samples of the compacted fill were obtained to perform geotechnical tests in a soils laboratory. Eight samples were obtained, four from each surface impoundment at various levels of the backfilling operation. These samples were tested in the soils laboratory for grain size and Atterberg limits. The results of these tests are presented in Appendix E and are summarized in Table 4-5. These results indicate the soil materials were essentially the same as the red-brown, highly plastic clay that was approved for the closure cap construction.

4.6 Clay Barrier Soil

The clay barrier soil was constructed of soils from the approved borrow for clay soil fill. The red-brown clay soil was tested and approved for use as the low permeability fill to form the barrier clay zone of the closure cap. The soil type, plasticity, maximum density and permeability test results fulfilled project requirements as discussed under Section 4.4.2, above.

Since the soil fill and the barrier clay soil are the same material, and the placement, conditioning, and compaction operations were the same, there is no potential for the migration of fines from one soil zone to the other. Accordingly, there was no need

TABLE 4-6

SUMMARY OF FIELD NUCLEAR GAGE TEST RESULTS
SUPERIOR, WI SITE

Layer	Total Test Number	Range of Density (pcf)	Range of Maximum Density (%)	Mean Density (pcf)	Mean Percent Optimum (%)	Mean Water Content (%)
NORTH IMPOUNDMENT						
Soil Fill	18	89.8 to 92.4	95 to 98	90.8	95.8	28.8
Clay Barrier Layer	8	90.2 to 93.0	95 to 98	91.0	95.6	29.4
Drainage Sand Layer	3	95.6 to 96.3	95 to 96	95.9	95.3	6.6
Cover Soil	8	90.3 to 92.5	95 to 97	91.2	95.9	28.5
Topsoil	5	69.6 to 71.4	91 to 93	70.7	92.0	35.4
SOUTH IMPOUNDMENT						
Soil Fill	17	89.7 to 96.9	95 to 100	91.7	96.5	28.2
Clay Barrier Layer	7	90.5 to 96.7	95 to 100	92.9	97.4	27.2
Drainage Sand Layer	3	95.5 to 96.4	95 to 96	95.8	95.3	6.2
Cover Soil	7	90.8 to 92.6	96 to 97	91.7	96.7	28.0
Topsoil	5	68.9 to 70.3	90 to 91	69.7	90.8	35.3

for the geotextile filter fabric between these two layers and it was omitted with the concurrence of Wisconsin Department of Natural Resources.

Along with the field density tests, additional soils laboratory tests were performed to assure the soils from the borrow source was suitable for barrier clay soil. Two samples were obtained and grain size, Atterberg limits, Standard Proctors, and permeability tests were performed to document that the soil was appropriate for the intended construction. The results of these tests are presented in Appendix E for samples A2-B1 and A2-B2. These results are summarized as follows:

Test	Sample A2-B1	Sample A2-B2
Standard Proctor	92 PCF 29% Wc	92 PCF 27% Wc
Grain Size	5% Sand 95% Fines	5% Sand 95% Fines
Atterberg Limits	91% LL 26% PL 65% PI	79% LL 24% PL 55% PI
Permeability (cm/sec)	2.8×10^{-8}	2.6×10^{-9}

The above data indicates that this source of clay barrier soil fulfills the regulatory requirements for a permeability less than 1×10^{-7} cm/sec.

The clay barrier soil was placed, conditioned and compacted in lifts of about 8 inches thickness and the operations are shown by Photograph No. 7. The construction methods were the same as for the unclassified soil fill zone. Construction inspection and quality assurance testing was performed by the field representative of the certifying engineer. The results of the field nuclear density tests for each compacted layer are presented in Appendix E and summarized in Table 4-6. The fifteen field density tests indicate that all dry densities exceeded the requirement of 95 percent of maximum dry density.

In addition, samples of the compacted fill were obtained and tested in the soils laboratory to confirm the soils were the same as approved for construction and that in-place permeabilities of the constructed fill were less than the regulatory requirement for clay barrier soil. These test results are summarized in Table 4-5 and indicate that the permeability of the constructed fill was less than the required 1×10^{-7} cm/sec.

This soil zone was constructed in three lifts of 8 inches each to yield the required 2 feet thickness of clay barrier soil. The thickness and extent of the of the barrier clay soil is shown on the "as-built" plan and cross-section drawings. The top layer was brought to the required elevations and graded to provide the 5 percent slope designated in the approved closure plan. The surface of the barrier clay soil zone is illustrated by photograph No. 8.

4.7 Synthetic Membrane

Subsequent to the approval of the barrier clay soil construction, the "impermeable" membrane was installed. In preparation for the liner, an anchor trench was excavated around the perimeter of the impoundment as shown on the detail of the approved design. This trench was excavated two feet higher and offset six feet along the south, west and north edges of the clay barrier soil. The anchor trench excavation along the western edge is shown on Photograph No. 9. Along the eastern perimeter the trench was offset nine feet and about one foot higher than the barrier soil layer as shown on Photograph No. 10. The extent of the impermeable membrane installation is shown on the "as-built" plan and cross-section drawings.

In addition to the anchor trench construction, a leveling course of sand was spread over the clay soil layer to fill small depressions in the clay soil surface. The placement of this sand cushion is shown on Photograph No. 11 and the cushion is also evident in Photographs No. 9 and 10, cited above. This thin layer was recommended by the membrane installer (Geo-Synthetics, Inc.) to provide uniform bedding for the liner. This layer was placed to a thickness of from 0 to 2 inches, the thicker zones at the edges near the anchor trench.

Geo-Synthetics rolled out the 40 mil thickness of HDPE liner material to cover the clay barrier soil and to extend down into the anchor trench. Photograph No. 12

shows the liner in place along the southern edge of the impoundment. The liner material panels were spread out from the southern edge, progressing to the north with about 4 inch overlaps for seaming purposes. Sand filled bags were placed on the liner to prevent it from being moved and/or overturned by the wind. Photograph No. 13 shows the liner in place on the sand cushion and lying in the anchor trench.

The northern edge of the installed liner is illustrated by Photograph No. 14. A view of the complete liner installation is shown on Photograph No. 15, looking from the south in a northerly direction. The rolls of geotextile material are shown distributed on the geomembrane for installation.

After a sufficient number of panels were laid out, the panels were joined using the seaming tool as shown by Photograph No. 16. The seaming tool was a self propelled, hot shoe tool manufactured by National Seal Company, the membrane manufacturer. The seaming tool made two simultaneous parallel fusion welded seams with an air channel between the welds. This air channel was used to pressure test the fusion welds in the quality assurance testing of the field seams. Seaming was only done when air temperatures were above $40^{o}F$ as required by the closure plan.

After the entire membrane was installed, seamed and tested, areas where the air channel leaked during the pressure test were located and patched using the extrusion welding technique. In addition, test strips of the field seams were cut out and sent to the laboratories for QA/QC testing of the field seams. Replacement patches were fixed to the liner using the extrusion welding technique. An extrusion welded patch is shown by Photograph No. 17.

The test strips were tested by the installer and also by STS to determine construction quality. The tests results of the membrane and field welds performed by STS for the certifying engineer are presented in Appendix E and summarized in Table 4-7. These results indicated that the seams did not peal-off fail but that the base material failed at the grips which applied the testing forces.

In addition to the tests on the field seams, samples of the geomembrane were tested to confirm the synthetic material fulfilled the project specifications. Samples of the membrane were tested to confirm the thickness, density, strength, and moduli of elasticity.

TABLE 4-7

GEOMEMBRANE TEST RESULTS
FIELD SEAMS
SUPERIOR, WI SITE

Seam ID	Strength At Yield (lbs.) (1)	Peel Adhesion (lbs.) (1)	Peel Adhesion Test Remarks
#2	114 124	82 84	Both samples broke @ edge of bonded area.
#8	122 100	84 80	Both samples broke @ edge of bonded area.
#15	115 121	63 57	Both samples 1/8" peel, then broke @ edge of bonded area.
#19	124 117	88 79	Both samples broke @ edge of bonded area.

NOTES:

(1) - 1" wide test specimen load value.

The results of these tests are presented in Appendix E and are summarized in Table 4-7. The membrane panels, seams, and test sample locations are shown in Figure 4-4. These results indicate that the synthetic membrane materials furnished and installed at the project fulfill the specifications for the project. The extent and position of the installed impermeable membrane can be inferred from the anchor trench locations shown on the attached "as-built" section drawing.

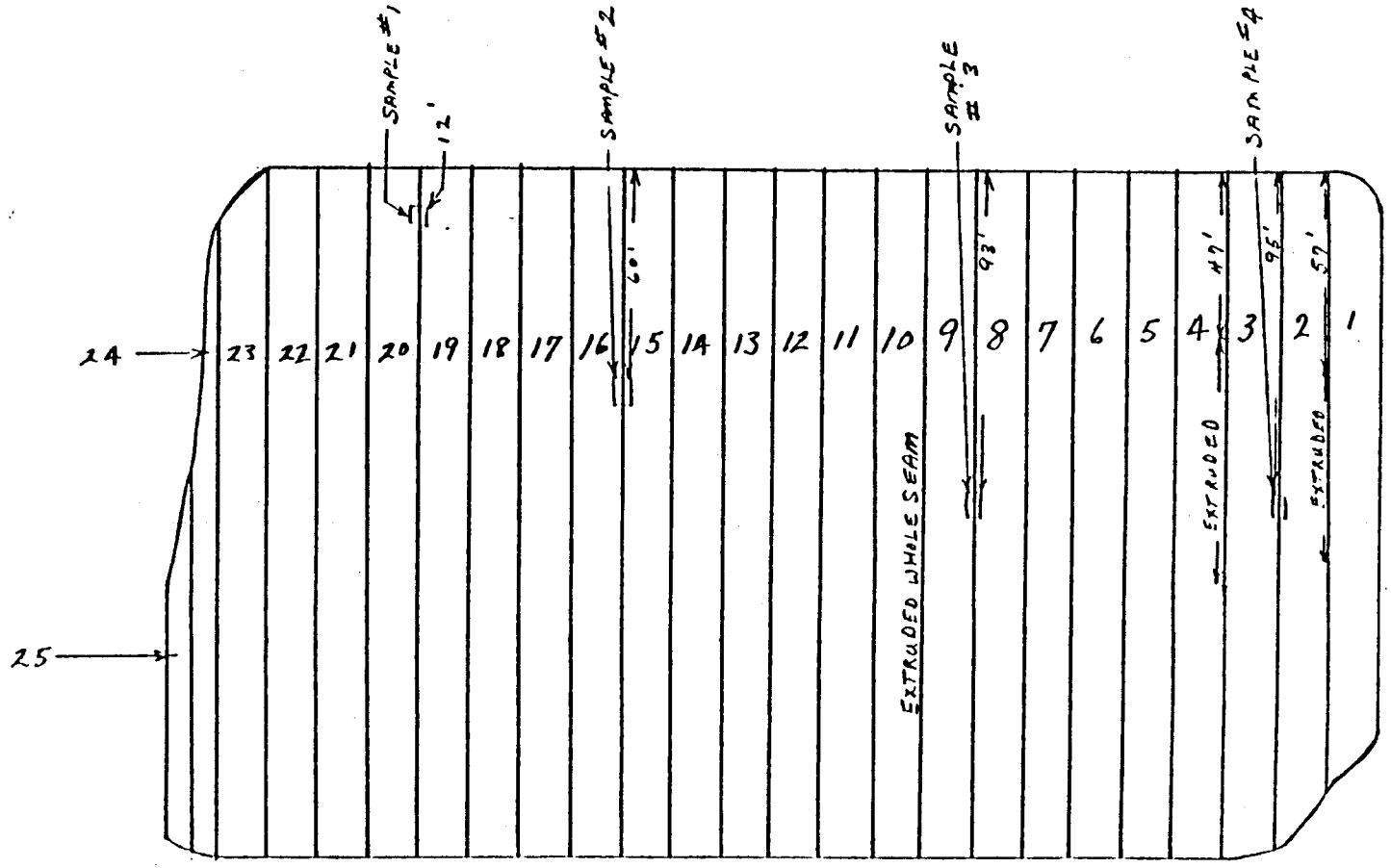
4.8 Drainage Layer Construction

After the membrane liner was installed, the drainage layer zone of the closure cap was constructed. Atop the membrane a layer of non-woven geotextile material was placed to protect the membrane from the drainage layer materials. The weight of the geotextile material was 10 ounces per square yard, spun bounded, polypropylene material manufactured by Exxon Corporation. This material exceeded the approved requirements which called for minimum of 8 ounce per square yard material.

Photograph No. 18 shows the rolls of geotextile unrolled over the geo-membrane with a lap of at least 18 inches for adjacent sheets. The geotextile was also anchored in the anchor trench which surrounded the perimeter of the closure cap. This construction was performed under the direction of the membrane installer and inspected by the field representative of the certifying engineer (STS's construction inspector).

The infiltrate collection pipe was placed on the geotextile as shown in Photograph No. 19. The schedule 40, four inch diameter polyvinyl chloride pipe was placed with the perforated holes in the downward position. The pipe was installed to slope downward from the western side of the impoundments to the discharge points located at the drainage ditch situated on the eastern side of the impoundments.

The drainage layer was then carefully placed atop the protective geotextile layer. As can be seen on Photograph No. 20, the granular material was placed and spread carefully using a light dozer. The full thickness of the sand / gravel drainage layer material was placed and spread over the geotextile. The material was spread by a small dozer in a lifting manner, insuring that the geotextile was not displaced as the granular materials were spread.



NOT TO SCALE

FIGURE 4-4

SURFACE IMPOUNDMENT

CLOSURE LINER

SUPERIOR, WI

Drawn by: EJS
November 1, 1988
Geo-Synthetics, Inc.

The placement of the drainage layer was inspected by the construction inspector and advice was provided by the geomembrane installer. The full thickness of the drainage material was assured by manual excavations to confirm that the full one foot thickness was placed. Field density tests (see Table 4-6) performed during construction indicate that the placed density of the drainage layer materials exceeded the prescribed 95 percent of maximum density.

Samples of the furnished materials were obtained and laboratory sieve tests performed to confirm the materials fulfilled project requirements. The results of the tests are presented in Appendix E and are summarized on Table 4-5. These tests indicate that the furnished materials were essentially the same as the approved materials and should perform as intended in the approved closure cap design. As shown on Table 4-5, the permeability of the drainage layer is expected to exceed the required 1×10^{-2} cm/sec.

After the granular materials were placed, the top layer of the geotextile was placed to cover the granular drainage layer materials. The 10 ounce per square yard, non-woven polypropylene filter fabric manufactured by Exxon corporation was unrolled on the surface of the granular drainage layer materials. Adjacent sheets were lapped a minimum of 18 inches as specified on the approved drawings. The sand filled bags were distributed over the surface and the cover layer of unclassified fill placed to protect the geotextile from turning over and/or displacement by the action of the wind. The placed drainage layer material and geotextile filter fabric, being covered with the unclassified cover soil, are shown on Photograph No. 21.

The anchor trench was backfilled, fixing the edges of the drainage layer and thereby completing the drainage layer construction. Periodic inspection of all operations of the drainage layer construction was performed by STS's construction inspector, as a representative of the certifying engineer. The completed drainage layer is shown on the photographs in Attachment 2 and the "as-built" plan and cross-section drawings in Attachment 3.

4.9 Unclassified Cover Soil

The clay soil from the approved borrow source was used as fill in the unclassified soil fill zone which overlies the drainage layer. This material was placed, conditioned, and compacted in the same manner as the other layers of clay soil. The first layer was placed carefully to prevent displacing or damaging the geo-textile material covering the drainage layer. The placement of the first lift of this soil zone is shown on Photograph No. 22. As can be seen, the drainage layer materials, geo-textile and soil fill are being completed in the proper sequence.

Successive lifts of the clay soil were placed until the full 30 inch thickness of this unclassified soil fill zone was constructed. The final surface of this layer of the closure cap is shown in Photograph No. 23. Also shown is the survey team taking level readings to ascertain the final grade of this zone. The surface of this layer also reflects the grade required for the surface of the closure cap.

The thickness and grade of this zone of the closure cap are illustrated on the as-built drawings. In general, the constructed thickness was about the required 30 inches and the grade of the top surface had the required 5 % slope. Some warping and deviations are evident near the edges of the cap to accommodate the irregular shape of the adjacent, unaltered soils.

The quality of the constructed fill was determined by field density tests performed on each lift of the fill. The results of these tests are presented in Appendix E and are summarized in Table 4-6. A total of 15 nuclear density tests were performed on this fill zone, 8 on the northern and 7 on the southern impoundment. The percent of optimum dry for all these tests equal or exceed the required 95 percent value.

In addition to the field density tests, samples of the soil were tested in the soils laboratory to confirm the soil met the requirements for this fill zone. The results of the tests are summarized on Table 4-5 and indicate that this soil can be characterized as a red-brown clay, having a high plasticity. The grain size tests indicate that the particle size distribution of this soil was very uniform and similar to that of the approved borrow source material for clay fill.

4.10 Topsoil Placement

Samples of soil were obtained from the source proposed by the contractor. These samples were tested in a soils laboratory to determine its suitability for use as the topsoil zone. Grain size, Atterberg limit, Standard Proctor, and fertility tests were performed on the soil samples to confirm that it would fulfill project requirements and support vegetation.

The results of these tests are presented in Appendix E and are summarized in Table 4-5. These tests indicate that the topsoil can be classified as a brown silt, trace of sand and highly plastic (MH according to the U.S.C.S.). In addition, the soil can be compacted to a maximum dry density of about 77 pounds per cubic foot at an optimum moisture content of 33 percent.

The soil fertility tests indicate the recommended amounts of soil supplements required per acre to support vegetation and to raise the soil pH. Based on the two samples tested, no lime is required for a pH of 6.0, and 2700 to 4300 pounds per acre of lime are required to raise the pH to 6.5. The amount of phosphorus required ranges between 54 and 68 pounds of P/2-O/5 per acre for grasses and legume grasses, respectively. Based upon these tests results, the topsoil was approved for project use.

The topsoil was placed on the completed unclassified fill layer as shown on Photograph No. 24. The topsoil was subsequently compacted to achieve a density of a least 90 percent of the maximum dry density. Field density tests using a nuclear densometer were performed on each lift of the topsoil. The results are presented in Appendix E and are summarized in Table 4-6 as follows, for 10 tests - all dry densities meet the 90 % requirement with the maximum value of 93 %.

In addition, QA/QC tests on two samples obtained during construction indicate that the properties of the topsoil did not change significantly during the construction. The material tested as brown silt, trace of sand with high plasticity.

The topsoil was placed, spread and compacted before the end of the 1988 construction season. Final grading of the topsoil materials, tilling of the seed bed, adding soil amendments, and seeding remain to be accomplished in the next construction season. Survey data was obtained by Seaway and confirmed that

additional topsoil would be required to complete the cap construction. The surface of the placed topsoil is shown on Photograph No. 25, depicting the end of the 1988 construction season.

Jensen remobilized during June 1989 to complete the closure construction. Jensen placed, spread, and compacted approximately 438 cubic yards of additional topsoil material. In addition, grading was completed to shape the cap to satisfy slope and grade requirements. The topsoil construction work was completed by the end of June 1989.

The completed construction was surveyed by Seaway Engineering in July 1989. Keystone developed as-built drawings based on the Seaway survey data. The final grades were approved by Keystone in August 1989

4.11 Seeding and Mulching

A professional seeding contractor (Kerrick Sod Company) was procured by Jensen and scheduled for the end of August 1989. Jensen finish graded the cap in preparation for the seeding operation during the week of August 26, 1989. The seeding contractor arrived on-site and completed the work on August 29, 1989.

The seeding operations entailed adjusting the topsoil chemistry, placing the seed mix, and finally placing a mulch ground cover. Lime and fertilizer were distributed over the topsoil using a mechanical broadcast spreader. The seed mix was prepared and placed onto the cap area by hydroseeding. The hay mulch was then blown onto the cap area and set into position by anchor discing. In anchor discing the discs are set straight with the direction of travel thereby cutting the hay and slightly pushing the hay into the soil. The application rates for each material used during the seeding operation are shown in the table below.

SEEDING OPERATION MATERIALS SUMMARY

ITEM		APPLICATION RATE
Seed Mixture	Perennial Rye	80 Lbs./Acre
	Tall Fescue	75 Lbs./Acre
	Birdsfoot Trefoil	30 Lbs./Acre
Fertilizer, 5-10-5		30 Lbs./1000 SF
Lime		2200 Lbs./Acre
Hay Mulch		2000 Lbs./Acre

During October 1989, 5 weeks after seeding, a site inspection was completed to examine the cap construction area. The grasses were growing over the entire capped area as shown on Photograph No. 26, looking northward. Photograph No. 27, looking southward, shows a closer view of the grasses. No barren or eroded areas were observed on the cap area.

4.12 Drainage Improvements

The drainage channel adjacent to the closure cap on the eastern side was enlarged to improve the drainage which serves the project area. To increase the capacity of this drainage channel, the invert of the channel was lowered and the ditch widened. A view of this construction is shown on Photograph No. 28.

The drainage channels south of the impoundments did not need improvement because their cross sections already exceeded the design cross section. Along the western side of the closure cap, a drainage channel and flow plain is present and the top of the closure cap slopes to this channel. It is proposed that this area has sufficient capacity and a new channel is not required along this side. The existing drainage capacity probably far exceeds the proposed capacity of the drainage channel in this area.

Based upon the size and location of the existing drainage channels, and the manner in which the finished cap drains to the adjacent drainage channels, it appears that the

present constructed drainage system will fulfill project requirements. Subsequent to completion of the closure cap construction and vegetation work, some channel cleaning and improvements might be required to maintain the capacity of the existing drainage system.

The improvements of the eastern drainage channel completed the construction activities for 1988 at the impoundment closure cap construction. The Winter season's snow, as shown by Photograph No. 25, caused the construction to cease for calendar year 1988.

During the cap grading and topsoil placement work of June 1989, some additional grading of the cap-drainage channel edge was completed. This work was necessary to provide a uniform drainage channel profile for surface water drainage from the cap.

During the October 1989 site inspection, the condition of the drainage channels and pipe outlets were observed. The drainage channel were free of any debris or obstructions and were nearly dry. Photograph No. 29, looking southward, shows the cap-drainage channel edge. The exposed end of the pipe outlets were clear and the flow path appeared to be unobstructed. No water was flowing from the pipes.

5.0 CERTIFICATION

See the attached forms.

PROFESSIONAL ENGINEER CERTIFICATION OF CLOSURE

I, Walter Kuenzi, P.E. being a Registered Professional Engineer in accordance with the State of Wisconsin statutes and codes related to Professional Engineers, do hereby certify to the best of my knowledge, information and belief that,

Name & Location:	Koppers Industries, Inc. Superior, Wisconsin
Facility:	Surface Impoundments (Closure)
EPA ID No.:	WID006179493

is constructed and prepared in accordance with the Facility's approved closure plan and as reflected in the documents, statements, designs and plans contained in the final report entitled: Construction Documentation Report - Surface Impoundment Closure

Walter Kuenzi 11/3/89

Walter Kuenzi, P.E.
2103 Legendary Lane
Allison Park, PA 15101
(412)487-2798
November - 1989



OPERATOR CERTIFICATION OF CLOSURE

I, Matthew C. Plautz, P.E., Program Manager
(~~Owner~~ or Operator)

Beazer Materials and Services, Inc., 436 Seventh Ave., Pittsburgh, PA 15219
(Name and Address)

hereby state and certify that, to the best of my knowledge and belief, that the

Koppers Industries, Inc. Hazardous Waste Management Facility
Superior Wisconsin, Surface Impoundments EPA I.D. No. WID006179493
(Hazardous Waste Management Unit(s))

has been closed in accordance with the facilities closure plan, and that closure was completed on the 29th day of August, 19 89 .

Matthew C. Plautz
Signature

10/23/89
Date

6.0 DEED NOTICE

See the attached documentation detailing the status of the deed notice. The appropriate notification will be added to the property record within 60 days of certification.

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Phone: 412/825-9600 3000 Tech Center Dr., Monroeville, PA 15146 Fax: 412/825-9699

October 19, 1989

Mr. John Hinzmann, Jr.
Seaway Engineering Company
831 East Second Street
Duluth, Minnesota 55805

Subject: Deed Restriction for
Closed Impoundments

Dear John,

As discussed with your Keith Johnson on October 18, 1989, we are requesting a quotation for your firm to prepare a document to restrict the disturbance of lands which previously contained two impoundments. The document will be filed with the local governing body which has jurisdiction over the lands containing the Koppers Company plant south of Superior, Wisconsin.

The enclosed "Deed Notation for Closure of Surface Impoundments" describes the notice and restrictions that are to be recorded, the corners of the lands requiring the restrictions, and the necessary tie to the two permanent monuments. This enclosure presents suggestions for the deed notation. The actual document should conform to the requirements of the local authority. The document to be filed must be sealed by a registered Land Surveyor.

Request you prepare your quotation and relay the costs by telephone to me as soon as possible. Our goal is to receive a copy of the filing document on or before October 27, 1989.

If you have any questions, do not hesitate to call me for any required clarifications.

Very truly yours,

Richard L. Van Tassel

Enclosure

NOTATION TO DEED OF CLOSURE OF SURFACE IMPOUNDMENTS

KOPPERS COMPANY PLANT
HIGHWAY A, DOUGLAS COUNTY, WISCONSIN

SUGGESTED NOTATION TO THE DEED

The area within the limits of land use restrictions was formerly a waste management unit designated U.S. EPA Identification Number WID006179493. The use of the enclosed land area is restricted and the ground must not be disturbed without the approval of the Wisconsin Department of Natural Resources. Maintenance, inspections, and environmental sampling are to be performed in conformance with the approved closure plan.

This area previously contained two (2) impoundments that were part of a process waste water treatment system. The impounded waste waters, sediments, sludges, piping systems, and visibly contaminated soils have been removed in accordance with a closure plan approved by the Wisconsin Department of Natural Resources.

This plat has been filed and recorded with the "recorders office, in the Douglas County Courthouse, Superior Wisconsin" as follows:

Deed Book Volume No. _____, Page No. _____.

SUGGESTED COORDINATES OF LAND-USE RESTRICTION

Corner	East	North
1	1,480,445	546,600
2	1,480,685	546,600
3	1,480,685	546,215
4	1,480,445	546,215

TIES TO MONUMENTS

Describe the geometry to tie the restricted area to monuments situated just north and south of the closed impoundments, Monuments Nos. 1 and 2, respectively. These "ties" should also be included on the deed notice.

Prepared by R. Van Tassel (10-17-89)

KEYSTONE
ENVIRONMENTAL RESOURCES LTD.

SEAWAY ENGINEERING COMPANY
831 EAST SECOND STREET
DULUTH, MINNESOTA 55805
218/722-0547

October 24, 1989

Keystone Environmental Resources, Inc.
3000 Tech Center Drive
Monroeville, PA 15146

Attention: Richard L. VanTassel

Dear Richard:

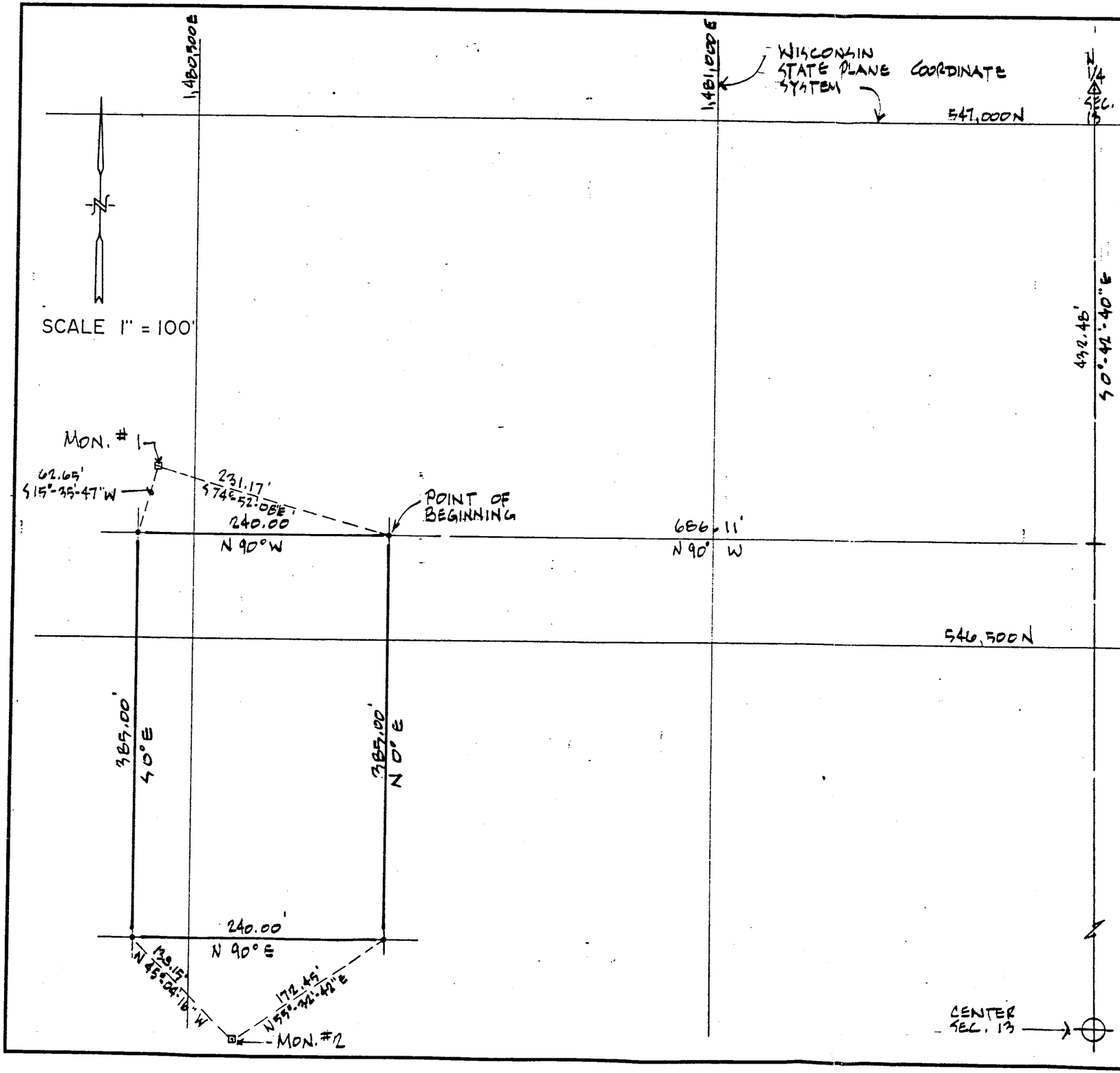
Transmitted herewith for your review are three copies of the sketch and description as per our phone conversation of 10/24/89.

Very truly yours,

Raymond O. Joki
SEAWAY ENGINEERING COMPANY

enclosure
cc: File #89044
ROJ:cm

Re: Purchase Order #1937



DESCRIPTION

A part of the NW¼ of Section 13, Township 48 North, Range 14 West, Town of Superior, Douglas County, Wisconsin, described as follows:

Commencing at the N¼ Corner of Section 13, thence Southerly along the Easterly line of the NW¼ on a bearing of South 0 degrees 42 minutes 40 seconds East for a distance of 432.48 feet to a point; thence Westerly on a bearing of North 90 degrees West for a distance of 686.11 feet to the POINT OF BEGINNING: thence continue Westerly on a bearing of North 90 degrees West for a distance of 240.00 feet to a point; thence Southerly on a bearing of South 0 degrees East for a distance of 385.00 feet to a point; thence Easterly on a bearing of North 90 degrees East for a distance of 240.00 feet to a point; thence Northerly on a bearing of North 0 degrees East for a distance of 385.00 feet to the POINT OF BEGINNING.

Containing 2.12 acres.

PRELIMINARY

SEAWAY ENGINEERING Co.
Consulting Engineers & Land Surveyors
Duluth Minnesota

DRAWN BY
CHECKED BY
DATE 10/04/99
SCALE 1" = 100'
REVISIONS
DATE
JOB NO.
SHEET #

A&E SUPPLY-DULUTH

7.0 POST-CLOSURE CARE

Post-closure care will be carried out in accordance with the description provided in Section IX "Post-Closure Care Requirements" of the "Closure and Post-Closure Plan for the Koppers Company, Inc. Hazardous Waste Management Facility - Superior, Wisconsin - Surface Impoundments - EPA I.D. No. WID006179493" dated August 27, 1987 and the Conditions of Approval as contained in report titled "Conditional Approval - Closure and Long-Term Care Plan - Koppers Co., Inc. - Surface Impoundment WID006179493 received October 5, 1987, and the changes set forth in the WDNR report titled "Conditional Closure and Long-Term Care Plan Approval Modification for the Koppers Co., Inc. - Surface Impoundments (WID006179493" received March 17, 1988.

ATTACHMENT 1

SLUDGE REMOVAL REPORT

INTRODUCTION

This report contains documentation of the sludge removal phase of the Superior impoundments which was performed prior to major closure activities managed by Keystone Environmental Resources, Inc. The report contains:

- A narrative description of the work performed (Prepared by Koppers plant manager Mr. David Shaw).
- A series of progress photographs.
- Copies of invoices processed between Koppers and its contractors (Rollins Environmental Services and Peoria Disposal Company).
- Copies of the Hazardous Waste Manifests covering shipments of the stabilized material.

LAGOON CLEANUP
SUPERIOR WI PLANT
September 1, 1988

NORTH LAGOON

Dewatering of the north lagoon was started in early May, 1988 and completed by June 5, 1988. This was accomplished by closing the crossover line into the south lagoon and using a low volume skimmer pump to transfer the water into the south lagoon. After the visibly clean water was removed a gear pump was used to pump the oily water back to the wastewater system through the old lagoon feed line. (Photos 1 & 2).

At completion of dewatering, the bottom had several weeks to dry. (Photos 3 & 4). Prior to starting the removal process, there was a wet oily sludge pocket that went from the southwest corner along the west side from the northwest corner and along the north bank to the northeast corner. The northeast corner had the largest volume of sludge (about 12" to 18" deep that covered an area of about 160 square feet).

Rollins Environmental Services, Inc., was given the contract to remove the waste from the site. A meeting was held on July 12, 1988 with Rich Strand and Brad Smith of Rollins, Jim Sykes of Pheifer Bros. Construction, and David Shaw of Koppers Company. Rollins subcontracted Pheifer Bros. to supply and operate the equipment used for solidification and removal of the sludge. The meeting was for the following:

1. Inspection of the site.

2. Line up supplies for cleanup.

3. To cover equipment decontamination procedures and view the area where the equipment would be decontaminated.

4. To line up admix for solidification.

5. To go over the health and safety plan.

Rollins equipment arrived on the site on Monday, July 18, 1988. They had a small cat and a backhoe. Both pieces of equipment had wide low compression tracks, both operators were experienced in waste cleanup and had the required forty hours of OSHA training prior to arrival at Superior.

Cleanup of the north lagoon was started at about 10:30 AM on Tuesday the 18th of July. Two loads of admix were dumped into the north lagoon (one in the northwest corner and one in the northeast corner). The cat operator made one shallow cut on the surface the first day and then allowed the bottom to dry before making a final cut (Photos 5 & 6).

The sludge was moved to the north and west sides of the lagoon. This allowed the dry sludge to be mixed with the wetter material and cut down on the usage of admix.

The material was then moved to the west side and then to the southwest corner of the lagoon, there it was stabilized by thoroughly mixing with the admix. The deeper northwest corner was dug down to where it appeared all visible contamination was removed (Photos 7 & 8).

Tuesday, the lagoon bottom was skimmed again with the bulldozer. At this time you could see oil in the clay cracks in the northwest corner, so more material was removed from this section. The bottom was also dressed with the bulldozer. Wednesday, more seepage was noted near the northeast corner so more material was removed (Photo 9).

On Thursday the contractors left the site at about 11:00 am. The north was clean except for removal of the accumulated material. We were not permitted to go to a landfill yet and the south lagoon still had water in it (Photo 10).

SOUTH LAGOON

We started spraying onto the sprayfield at a rate of 7,000 gallons per day on April 1, 1988. We sprayed at this rate until June 27, 1988. From June 27 to July 22, we sprayed 15,000 gallons per day. Chuck Olson, WDNR, and Greg Hill, WDNR, gave us permission to increase the discharge to 15,000 gallons per day so we would be able to meet the August 8th deadline for disposal of K001.

On July 23 we started pumping the water left in the south lagoon into the treating plant, by Monday July 25 the south lagoon was completely dewatered (Photo 11).

The sludge did not have a creosote smell, it smelled more like decayed organic material. The sludge was not oily except in the northeast corner where the crossover from the north lagoon entered the south lagoon.

The cleanup of the south lagoon began at about 9:00 am. on Monday, the 25th of July. Pat Murray, of Rollins, replaced Brad Smith as supervisor for Rollins. Admix was dumped in the northwest corner. Using the bulldozer, the admix and sludge was moved toward the east and south side of the lagoon (Photos 12 and 13).

The sludge was then moved into a narrow strip along the south side of the lagoon where it was worked toward the southwest corner of the lagoon. Admix was dumped into the southwest corner. The backhoe sat in the southwest corner and mixed the sludge as the bulldozer pushed it to him. The cleanup, except for removal of the soils, was complete by July 27, 1988 (Photos 14, 15, 16 and 17).

We began shipping waste on July 29, 1988. Trucks were loaded in this order:

July 28	3 trucks
July 29	19 trucks
July 30	14 trucks
August 1	17 trucks
August 2	9 trucks

A total of 62 truckloads of material was shipped from Superior.

The equipment was decontaminated August 3 and was removed from the site at about 2:00 pm. August 3, 1988.

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
NORTH LAGOON



PHOTO 1 SKIMMER



PHOTO 2 SKIMMER PUMP

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
NORTH LAGOON



PHOTO 3 BOTTOM SLUDGE



PHOTO 4 BOTTOM SLUDGE (CLOSE-UP)

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
NORTH LAGOON



PHOTO 5 DUMPING ADMIXTURE



PHOTO 6 PUSHING SLUDGE TO ADMIXTURE PILES

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
NORTH LAGOON



PHOTO 7 MIXING SLUDGE WITH ADMIXTURE



PHOTO 8 CLEANING BOTTOM TO FINAL GRADE



PHOTO 9 DEEPER SEEPAGE - N.E. CORNER



PHOTO 10 FINAL GRADE - ALL SLUDGE REMOVED

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
SOUTH LAGOON



PHOTO 11 LAGOON DEWATERED



PHOTO 12 PUSHING SLUDGE SOUTH AND EAST



PHOTO 13 PUSHING SLUDGE SOUTHWARD



PHOTO 14 SLUDGE MIXING - S.W. CORNER

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
SOUTH LAGOON



PHOTO 15 SLUDGE MIXING



PHOTO 16 PUSHING SLUDGE TO BACKHOE

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN
SOUTH LAGOON



PHOTO 17 LAGOON BOTTOM AFTER CLEANUP

ROLLINS ENVIRONMENTAL SERVICES (FS) INC.
135 E. St. Charles Rd., Unit C
Carol Stream, IL 60188

NO: 400428
CUST. NO: 260092
DATE: 8-19-88
PAGE: 1 of 1
Plus Attachment

INVOICE TO

Koppers Company, Inc.
Purchasing Dept.
801 Koppers Building
Pittsburgh, PA 15219
Attention: Jack L. Stephenson

RECEIVED FROM

CUSTOMER REFERENCE: P.O. 14-8-50523

STREAM NO. & DESCRIPTION: Project 6034 Superior, WI

CARRIER REFERENCE: Salesman 30/89

B/L NO. B/L DATE MFST. NO.	PRICE CODE	DESCRIPTION	QUANTITY	UM	UNIT PRICE	AMOUNT
	2150	TREATMENT, TRANSPORTATION, SITE SERVICES; All work necessary to remove waste from Koppers Company, Superior, WI Per attached Backup				
					(See Attachment)	
					TOTAL INVOICE	

cc: Koppers Company
Superior, WI

TERMS: Net due upon receipt of invoice. A service charge of 1.5% per month will be charged on past due amounts.

INQUIRIES: Please call Chris Klimusko at (312) 260-9470 with any questions.

REMIT TO: P. O. Boc 98793
Chicago, Illinois 60693

GL 5850 Detail 2

S&S Detail Blank

Lm 950 Dept BSD

70 3/83

CUSTOMER ORIGINAL

****
* INVOICE *
****

CUSTOMER: KOPPERS COMPANY, SUPERIOR, WI
CUSTOMER ORDER NO.: 14-8-50523
DATE: AUGUST 19, 1988

SALESMAN: GANCE/KURZWE
SALESMAN # 089/030

ITEM DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
MOBILIZATION	1	LS		
STABILIZATION	1358.04	TONS		
ADMIX USED	220.23	TONS		
PRIMARY DISPOSAL (PDC)	1358.04	TONS		
PRIMARY TRANSPORT	1358.04	TONS		
SECONDARY DISPOSAL (CWM)	0	TONS		
SECONDARY TRANSPORT	0	TONS		

DATE	ADMIX (LOADS)	ADMIX (TONS)	DISPOSAL (LOADS)	DISPOSAL (TONS)
13-Jul-88	6	138.37		
19-Jul-88	4	81.86		
29-Jul-88			3	68.71
30-Jul-88			18	401.92
01-Aug-88			14	292.99
02-Aug-88			20	460.205
03-Aug-88			5	96.45
04-Aug-88			2	37.76
	10	220.23	62	1358.04

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INVOICE 27112

Account No.	Supplier No./Vendor No.	Requisition No.	Purchase Order No.	Terms	Date
40179			[illegible]	Net 30	7/31/88

Date	Load Ticket No.	Quantity	Units	Hours	Travel Hrs.	Rate	Description	Amount
7/29/88	212485	20	Yards				Disposal	
	852							
7/30	853							
	854							
	855							
	856							
	857							
	858							
	859							
	860							
	861							
	862							
	863							
	864							
	865							
	866							
	867							
	868							
	869							
	870							
	872	420	Yards			6.06	TEPA Charges	

Previous Balance	Payments	Credits	Delinquency Charge	PLEASE PAY THIS AMOUNT

PLEASE RETAIN THIS ORIGINAL PORTION FOR YOUR RECORDS

A DELINQUENCY CHARGE WILL BE ADDED OF 1½% PER MONTH - 18% PER ANNUM.

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INV NO. 27112

Service Address: 880586 Koopers, Superior

Billing Address:
Koppers Company Inc.
Purchasing Agent
436 7th Ave.
Pittsburgh, PA 15219
Attn: Jack L. Stephenson

[illegible] 1988

TERMS: Net 30

Invoice Date: 7/31/88

Balance Due

Amount Paid
$

TO RECEIVE PROPER CREDIT PLEASE RETURN THIS PORTION WITH YOUR REMITTANCE.

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INVOICE 27405

Count No.	Supplier No./Vendor No.	Requisition No.	Purchase Order No.	Terms	Date
40179			14-8-50527	Net 30	8/15/88

Date	Load Ticket No.	Quantity	Units	Hours	Travel Hrs.	Rate	Description	Amount
8/01/88	2124871	20	Yards				Disposal	
	873	"						
	874	"						
	875	"						
	876	"						
	877	"						
	878	"						
	879	"						
	880	"						
	881	"						
	883	"						
	884	"						
	885	"						
	886	"						
8/02/88	882	"						
	887	"						
	888	"						
	889	"						
	890	"						
	891	"						
	892	"						
	893	"						
	894	"						
	895	"						
	896	"						
	897	"						
	898	"						

Previous Balance	Payments	Credits	Delinquency Charge	PLEASE PAY THIS AMOUNT
				CONT

PLEASE RETAIN THIS ORIGINAL PORTION FOR YOUR RECORDS

A DELINQUENCY CHARGE WILL BE ADDED OF 1½% PER MONTH - 18% PER ANNUM.

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INV NO. 27405

Service Address

880586- Superior

TERMS: Net 30

Invoice Date	8/15/88
Balance Due	CONT
Amount Paid	$

Billing Address

Koppers Company Inc.
Att: Jack Stephenson
Purchasing Agent
436 7th Ave
Pittsburgh, PA 15219

TO RECEIVE PROPER CREDIT PLEASE RETURN THIS PORTION WITH YOUR REMITTANCE.

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INVOICE 27405

Account No.	Supplier No./Vendor No.	Requisition No.	Purchase Order No.	Terms	Date
40179			14-8-50527	Net 30	8/15/88

Date	Load Ticket No.	Quantity	Units	Hours	Travel/Hrs.	Rate	Description	Amount
/2/88	2124899	20	Yards				Disposal	
	900	"						
	2128530	"						
	531	"						
	532	"						
	533	"						
	534	"						
/03/	535	"						
	537	"						
	538	"						
	540	"						
	541	"						
8/4/	536	"						
	539	"						
		820	Yards				IEPA Charges	

Previous Balance	Payments	Credits	Delinquency Charge	PLEASE PAY THIS AMOUNT
				▶

PLEASE RETAIN THIS ORIGINAL PORTION FOR YOUR RECORDS

A DELINQUENCY CHARGE WILL BE ADDED OF 1½% PER MONTH - 18% PER ANNUM.

Peoria Disposal Company

P.O. Box 9071 Peoria, Illinois 61614 309-686-8033

INV NO. 27405

ervice
ddress

880586-Superior

TERMS: Net 30

Invoice Date	8/15/88
Balance Due	
Amount Paid	$

ess

Koppers Company, Inc.
Attn: Jack Stephenson
Purchasing Agent
436 7th Ave.
Pittsburgh, PA 15219

40179

ECEIVE PROPER CREDIT PLEASE RETURN THIS PORTION WITH YOUR REMITTANCE.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 Manifest Document No. 00001

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name
Dart Trucking Co., Inc.

6. US EPA ID Number
OHD009865825

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4394 Southport Road
Peoria, IL 61615

10. US EPA ID Number
ILD000805812

A. Illinois Manifest Document Number: IL 2124851

B. Illinois Generator's ID: 1553031534

C. Illinois Transporter's ID: [illegible]

D. (800) 426-0895 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

G. Illinois Facility's ID: 1438120000

H. Facility's Phone: (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. RQ. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA/HW Number XXK061 Authorization Number 818058
b.					EPA/HW Number XX Authorization Number
c.					EPA/HW Number XX Authorization Number
d.					EPA/HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 28 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: NAVZA FIELDS — Signature — Date: Month Day Year 07 28 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Gen. US EPA ID#(Box1) and Gen. IL. ID#(BoxB) incorrect. - corrected 7-29-88 JJ. Address corrected(Box9) also.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: JAMES Douglas — Signature — Date: Month Day Year 07 29 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 EPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00002

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124852

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID [illegible]

5. Transporter 1 Company Name: Dart Trucking Co., Inc.

6. US EPA ID Number: OHD009865825

C. Illinois Transporter's ID [illegible]

7. Transporter 2 Company Name

8. US EPA ID Number

D. (800) 426-0895 Transporter's Phone

E. Illinois Transporter's ID [illegible]

9. Designated Facility Name and Site Address
Peoria Disposal Company
4394 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

F. ( ) Transporter's Phone

G. Illinois Facility's ID [illegible]

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	XX [illegible]
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above in Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	[signature]	07 28 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Alan Jay Furr	[signature]	07 28 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space Gen. US EPA ID #(Box 1) and Gen. IL. ID #(Box 8) incorrect. also address (Box 9) incorrect. - corrected 7-29-88 J.J.
Ill. Transporter's ID # was in wrong box - corrected 8-1-88 [illegible]

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
James Douglas	James Douglas	07 29 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00003 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124853

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9550[illegible]

5. Transporter 1 Company Name: Wills Trucking
6. US EPA ID Number: OHD068913409

C. Illinois Transporter's ID:

D. 800 348-405[illegible] Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4394 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1[illegible]

H. Facility's Phone: (309) 676-4[illegible]

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	XX
b.					XX
c.					XX
d.					XX

G. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature: [signature] | Date: Month Day Year 072888

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: JACK DeVries | Signature: [signature] | Date: Month Day Year 072888

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space Gen. US EPA ID # (Box 1) and Gen. IL. ID # (Box 8) incorrect also address (Box 9) incorrect. - corrected 7-29-88 J.J.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: James Douglas | Signature: [signature] | Date: Month Day Year 072988

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

#2

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~348~~ 493 | Manifest Document No. 00004

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number IL 2124854

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID 1 1 9 15 15 0 [illegible]

5. Transporter 1 Company Name: Liberty Transport
6. US EPA ID Number: ILD981955925

C. Illinois Transporter's ID [illegible]

7. Transporter 2 Company Name
8. US EPA ID Number

D. (309) 263-2700 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
43~~54~~ Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID 1 4 3 8 2 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0 2		XX
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 738

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Ken Puckett | Signature | Date: Month Day Year 07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Wrong numbers in Box 1, B, 9.
I made the corrections.
7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Stephanie Carter | Signature | Date: Month Day Year 07 30 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~345~~493 | Manifest Document No. 00005

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124855

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Jack Gray | 6. US EPA ID Number: IND042534875

C. Illinois Transporter's ID: 2 9 7

7. Transporter 2 Company Name | 8. US EPA ID Number

D. (219) 938-7020 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
3349 ~~4394~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 1 4 3 1 8 1 2 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number: X X K 0 0 1
b.					EPA HW Number: X X 8 8 0 5 8 6
c.					EPA HW Number: X X
d.					EPA HW Number: X X

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #514-6

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Billy D. Frederick | Signature: Billy D. Frederick | Date: Month Day Year 7 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Box 1, Box B, Box 9 was wrong.
I made the correction. S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Stephanie Carter | Signature: Stephanie Carter | Date: Month Day Year 07 30 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00006

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124356

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID

5. Transporter 1 Company Name: Liberty Transport | 6. US EPA ID Number: ILD981955925 | C. Illinois Transporter's ID

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (309) 263-2[illegible] Transporter's Phone | E. Illinois Transporter's ID

9. Designated Facility Name and Site Address
Peoria Disposal Company
4307 Southport Road
Peoria, IL 61615
| 10. US EPA ID Number: ILD000805812 | F. [illegible] | G. Illinois Facility's ID [illegible] | H. Facility's Phone (309) 676-[illegible]

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	XX
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 736

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	[signature]	07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Allen L. Gregory	[signature]	07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space
Wrong numbers in Box 1, B, 9
I made the corrections S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	[signature]	073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 6/61

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~48~~ 493 | Manifest Document No. 00007

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Jack Gray | 6. US EPA ID Number: IND042534875

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615
4349
| 10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124857
B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 2
C. Illinois Transporter's ID: 1 2 0 7
D. (219) 938-7020 Transporter's Phone
E. Illinois Transporter's ID
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 8
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	2.0	2	EPA/State Number XX K 0 0 1 Authorization Number 8 1 8 0 5 8 1 6
b.					EPA/State Number XX Authorization Number
c.					EPA/State Number XX Authorization Number
d.					EPA/State Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 504-3

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
James Murphy	James Murphy	07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space
Box 1, Box 8, Box 9 were wrong.
I made the Correction.
S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	Stephanie Carter	07 30 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~843~~ 493 Manifest Document No. 00008

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number IL 2124858

B. Illinois Generator's ID 9 5 5 0 3 1 5 3 6

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Dart Trucking Co., Inc.

6. US EPA ID Number: OHD009865825

C. Illinois Transporter's ID

D. (800)426-0895 Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4894~~ 4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID 1 4 3 8 1 2

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	8 8 0 5 8 6
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above
In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9084

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		0 7 2 9 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
George H. Hatfield	George H. Hatfield	7 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space
Box 1, Box 8, Box 9 was wrong.
I made the corrections.
S.C 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	Stephanie Carter	073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~418~~ 4934 — Manifest Document No. 00009
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124859

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 K

5. Transporter 1 Company Name: Dart Trucking Co., Inc.
6. US EPA ID Number: OHD009865825
C. Illinois Transporter's ID: 1 1 3 1
D. (800) 426-0895 Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. Illinois Transporter's ID
F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4384~~ Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
G. Illinois Facility's ID: 1 4 3 8 1 2 0 6 0 3
H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number: XX K 0 0 1; Authorization Number: 8 1 8 1 0 1 5 1 8 1 6
b.					EPA HW Number: XX; Authorization Number
c.					EPA HW Number: XX; Authorization Number
d.					EPA HW Number: XX; Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #9066

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Melvin E. Wingling — Signature — Date: Month Day Year 072988

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
BOX 1, BOX B, BOX 9 were wrong.
I made the correction. S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name — Signature — Date: Month Day Year 073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

P.O. BOX 19276 SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761 IL532-0610

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** LPC 62 8/81 Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~448~~493 | Manifest Document No. 00010 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number IL-2124869

B. Illinois Generator's ID 9 1 5 0 3 1 5 3 6

5. Transporter 1 Company Name: Wills Trucking | 6. US EPA ID Number: OHD068913409 | C. Illinois Transporter's ID 1 8 4 1 1 | D. (800) 348-4051 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615

4544

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID 1 4 3 6 2 0 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	XX 8 8 0 5 8 6
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #3029

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month 0 7 Day 2 9 Year 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: STAN SHAW | Signature: Stan Shaw | Date: Month 7 Day 2 9 Year 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Box 1, Box B, Box 9 were wrong.
I made the corrections.
SC. 7/30188

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19
Printed/Typed Name: Stephanie Carter | Signature | Date: Month 0 7 Day 3 0 Year 8 8

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

V.7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

32

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~9~~~~4~~~~6~~ Manifest Document No. 493 000171

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124861

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 1 9 5 5 0 1 3 1 5 3 6

5. Transporter 1 Company Name: Fort Transfer

6. US EPA ID Number: ILD062333752

C. Illinois Transporter's ID:

7. Transporter 2 Company Name

8. US EPA ID Number

D. (309) 263-2000 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4894~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 2

H. Facility's Phone: (309) 676-4393

GB 49

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2
b.				
c.				
d.				

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #88

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw
Signature: [signature]
Date: Month Day Year 0 7 2 9 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Richard Pfanz
Signature: Richard Pfanz
Date: Month Day Year 07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Box 1, Box B, Box 9 was wrong.
I made the correction.
S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Stephanie Carter
Signature: Stephanie Carter
Date: Month Day Year 073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~848~~ 493 | Manifest Document No. 00012 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124862

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 2 [illegible]

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD062333752 | C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (309) 263-2000 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ 4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 9 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number XX K 0 0 1 Authorization Number 8 8 0 5 8 6
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #87

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 0 7 2 9 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jim Herrman | Signature | Date: Month Day Year 0 7 2 9 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Box 1, Box B, Box 9 was wrong.
The correction was made.
S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Stephanie Carter | Signature | Date: Month Day Year 0 7 3 0 8 8

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179~~448 439~~493 | Manifest Document No.: 00073 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124863

B. Illinois Generator's ID: 9 5 5 0 3 5 3

4. Generator's Phone (715) 392-2221

C. Illinois Transporter's ID:

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD062333752 | D. (309) 263-2000 Transporter Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID | F. ( ) Transporter Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4394 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: IL 1 4 3 8 2 0 0 0 6 5

H. Facility's Phone: (309) 676-0363

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	XX
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #90

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: William Cravens | Signature | Date: Month Day Year 07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Made corrections in Box 1, B. 9.
Wrong EPA Generator's number.
Wrong Generator's USEPA ID No. Wrong address S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Stephanie Carter | Signature | Date: Month Day Year 07 30 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.
WID006179[illegible]493	00014		

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document No. IL 2124864

B. Illinois Generator's ID [illegible]

C. Illinois Transporter's ID [illegible]

D. (309) 263-2700 Transporter's Phone

E. Illinois Transporter's ID [illegible]

F. ( ) Transporter's Phone

G. Illinois Facility's ID [illegible]

H. Facility's Phone (309) 676-4893

5. Transporter 1 Company Name	6. US EPA ID Number
Liberty Transport	ILD981955925
7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address	10. US EPA ID Number
Peoria Disposal Company 4394 Southport Road Peoria, IL 61615	ILD000805812

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	XX [illegible]
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #737

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	[signature]	07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
LOUIS A. MADDOX	[signature]	07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space
Wrong numbers in Box 1, Box B
Wrong address in Box 9. I made the Correction. 7/30/88 S.C.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	[signature]	07 30 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.
WID006179~~848~~ 493	00013		

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124865

B. Illinois Generator's ID:

C. Illinois Transporter's ID:

D. (309) 263-2009 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

G. Illinois Facility's ID:

H. Facility's Phone (309) 676-4893

5. Transporter 1 Company Name: Fort Transfer
6. US EPA ID Number: ILD062333752

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615
43449

10. US EPA ID Number: ILD000805812

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	210	2	88058
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #92

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
RUSSELL DORAS		07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space
Box 1, Box 8, Box 9 were wrong.
Corrections were made.
S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter		07 30 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~948~~493 | Manifest Document No. 00016 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD062333752

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615
13449

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124866
B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 A
C. Illinois Transporter's ID: 1 2 4 1
D. (309) 263-2000 Transporter's Phone
E. Illinois Transporter's ID
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	D	T 20	2	EPA HW Number: XXK001 Authorization Number: 8180586
b.					EPA HW Number: XX Authorization Number:
c.					EPA HW Number: XX Authorization Number:
d.					EPA HW Number: XX Authorization Number:

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #94

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: LEO RUSSELL | Signature: Leo Russell | Date: Month Day Year 07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space
Box 1, Box, B, Box 9 were wrong.
I made the Correction S.C. 7/30/88

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Stephanie Carter | Signature: Stephanie Carter | Date: Month Day Year 073088

ILLINOIS: 217 / 782-6637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179943 — Manifest Document No. 00017

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124867

B. Illinois Generator's ID: 9 5 5 0 3 1 5 8 6

C. Illinois Transporter's ID: 2 2 4 7

D. (309) 263-2700 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

5. Transporter 1 Company Name: Liberty Transport — 6. US EPA ID Number: ILD981955925

7. Transporter 2 Company Name — 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4394~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 2 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number XXK001 / Authorization Number 888058
b.					EPA HW Number XX / Authorization Number
c.					EPA HW Number XX / Authorization Number
d.					EPA HW Number XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 732

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	David A. Shaw	072988

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
JIM CARRINGTON	Jim Carrington	072988

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	Stephanie Carter	073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179343 — Manifest Document No. 00018
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124868

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

C. Illinois Transporter's ID: 2 2 [illegible]

D. (309) 263-2700 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

5. Transporter 1 Company Name: Liberty Transport
6. US EPA ID Number: ILD981955925

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4394 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	20	2	EPA/State Number: XX K 0 0 1; Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: XX; Authorization Number:
c.					EPA HW Number: XX; Authorization Number:
d.					EPA HW Number: XX; Authorization Number:

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 735

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	[signature]	072988

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Virgil Anderson	[signature]	072988

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Stephanie Carter	[signature]	073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~8~~493 Out
Manifest Document No. 00019
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880
4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124869
B. Illinois Generator ID: 9 5 5 0 3 1 5 8 6 7
C. Illinois Transporter's ID: 2 2 4 7
D. (309) 263-2700 Transporter's Phone
E. Illinois Transporter's ID:
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 9
H. Facility's Phone: (309) 676-4893

5. Transporter 1 Company Name: Liberty Transport
6. US EPA ID Number: ILD981955925
7. Transporter 2 Company Name:
8. US EPA ID Number:
9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4864~~ Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	0 0 2 0	2	XX 8 8 8 5 6 6
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above
In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 733

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date Month Day Year
David A. Shaw	David A. Shaw	072988

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name: Jerry A Bennett	Signature: Jerry A Bennett	Date Month Day Year: 072988
18. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name	Signature	Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.		
Printed/Typed Name: Stephanie Carter	Signature: Stephanie Carter	Date Month Day Year: 073088

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86)

Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[redacted]493 — Manifest Document No. 00020

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124870

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 9

5. Transporter 1 Company Name: Wills Trucking

6. US EPA ID Number: OHD068913409

C. Illinois Transporter's ID: 4 8 4 1

D. (800) 348-4051 Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
7349[redacted] Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA HW Number: XX K 0 0 1 Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck #3038

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 29 88

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Ron Thomas — Signature — Date: Month Day Year 07 29 88

TRANSPORTER

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Stephanie Carter — Signature — Date: Month Day Year 07 30 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

IL532-0610

LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

UNIFORM HAZARDOUS WASTE MANIFEST

EPA Form 8700-22 (Rev. 9-86)

Form Approved. OMB No. 2050-0039, Expires 9-30-89

1. Generator's US EPA ID No. WID006179493 — Manifest Document No. 00021 — 2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124871

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Jack Gray — 6. US EPA ID Number: IND042534875 — C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name — 8. US EPA ID Number — D. (219) 938-7020 Transporter's Phone — E. Illinois Transporter's ID

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812 — F. ( ) Transporter's Phone — G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 3 — H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	818-015-8
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 603-1

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 29 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JAMES WENDORSKI — Signature — Date: Month Day Year 07 29 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. — Signature — Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS: OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management C[illegible]

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[redacted]493 — Manifest Document No. 100022

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124872

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Jack Gray — 6. US EPA ID Number: IND042534875

C. Illinois Transporter's ID: [redacted]297

7. Transporter 2 Company Name — 8. US EPA ID Number

D. (219) 938-7020 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
3[redacted] Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	EPA/HW Number XX K 0 0 1 Authorization Number 8 8 0 5 8 6
b.					EPA/HW Number XX Authorization Number
c.					EPA/HW Number XX Authorization Number
d.					EPA/HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # G35

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month 07 Day 29 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Timothy Esch — Signature — Date: Month 07 Day 29 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Stephanie Carter — Signature: Stephanie Carter — Date: Month 07 Day 30 Year 88

IN ILLINOIS: 217 / 782-3687 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 — Manifest Document No. 000233 — 2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124873

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 1 5 3 6 2

5. Transporter 1 Company Name: Dant Trucking — 6. US EPA ID Number: OHD 009865825

C. Illinois Transporter's ID: 1 4 3 3 1

7. Transporter 2 Company Name — 8. US EPA ID Number

D. (2) 0 5 3 3 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number: XXK001 / Authorization Number: 880586
b.					EPA HW Number: XX / Authorization Number:
c.					EPA HW Number: XX / Authorization Number:
d.					EPA HW Number: XX / Authorization Number:

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # 9556

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: DAVID FIELDS — Signature — Date: Month Day Year 073088

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: James Jones Jr. — Signature — Date: Month Day Year 080188

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.
WID006179493	00024		

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124874

B. Illinois Generator's ID: 2 5 5 0 3

5. Transporter 1 Company Name: Dart Trucking
6. US EPA ID Number: IOHD 009865825
C. Illinois Transporter's ID:

7. Transporter 2 Company Name
8. US EPA ID Number
D. Illinois Transporter's ID:
E. Illinois Transporter's ID:

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
F. Illinois Facility's ID:
G. Illinois Facility's Phone: (309) 676-

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2
b.				
c.				
d.				

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # 9649

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
ALAN JAY FURR		07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
James Jones Jr.		080188

733-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

OPERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This [illegible] or operator of not to [illegible] Center.

Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner
*this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00025

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124875

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Dart Trucking | 6. US EPA ID Number: OHD 009865825 | C. Illinois Transporter's ID: 1 4 3 1

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (314) 533-1841 Transporter's Phone | E. Illinois Transporter's ID: 1 4 3 0

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	EPA HW Number: XXK001 / Authorization Number: 8 8 0 5 1 6
b.					EPA HW Number: XX / Authorization Number
c.					EPA HW Number: XX / Authorization Number
d.					EPA HW Number: XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # 5084

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 30 88

TRANSPORTER
17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Jesse E Bones | Signature | Date: Month Day Year 7 30 88
18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY
19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. | Signature | Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 — Manifest Document No. 00026

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Jack Gray — 6. US EPA ID Number: IND 042534875

7. Transporter 2 Company Name — 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124876
B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6
C. Illinois Transporter's ID:
D. ( ) Transporter's Phone
E. Illinois Transporter's ID:
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	D.T	20	2	EPA HW Number: XXK001 / Authorization Number: 88058
b.					EPA HW Number: XX / Authorization Number:
c.					EPA HW Number: XX / Authorization Number:
d.					EPA HW Number: XX / Authorization Number:

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # G03-2

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year: 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Patrick Fisher — Signature — Date: Month Day Year: 7 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. — Signature — Date: Month Day Year: 08 01 88

ILLINOIS: 217/782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

...Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner ...operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management ...inter.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 — Manifest Document No. 00027
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124877

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 4

5. Transporter 1 Company Name: Jack Gray — 6. US EPA ID Number: IND 042 534 875

C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name — 8. US EPA ID Number

D. (219) 938 [illegible] Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
[illegible] Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	20	2	EPA HW Number: XXK001 / Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: XX / Authorization Number
c.					EPA HW Number: XX / Authorization Number
d.					EPA HW Number: XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # 644-04

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Kenneth E Koopman — Signature: Kenneth E Koopman — Date: Month Day Year 07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson — Signature: Janeen Wilson — Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00028

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: JACK Gray

6. US EPA ID Number: IND 042534875

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124878

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

C. Illinois Transporter's ID

D. Transporter's Phone

E. Illinois Transporter's ID

F. Transporter's Phone

G. Illinois Facility's ID: 1 4 3 8 2 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	EPA HW Number: XX K 0 0 1 Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
TRUCK # 644-05

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month 07 Day 30 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: RALPH E. SAMBERS | Signature | Date: Month 7 Day 30 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month 08 Day 01 Year 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

EV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86)

Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00029

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number IL 2124879

B. Illinois Generator's ID 9 5 5 0 3 1 5 3 6 2

5. Transporter 1 Company Name: Jack Gray | 6. US EPA ID Number: IND 042534875

C. Illinois Transporter's ID 1 2 9 7

D. (219) 938-7050 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	20	2	EPA HW Number XX K 0 0 1 Authorization Number 8 8 0 5 8 6
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 644-03

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Ed Loomis | Signature: Ed Loomis | Date: Month Day Year 7 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 Dest — Manifest Document No. 00030

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124880

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: D Dart

6. US EPA ID Number: OHD 009 865 825

C. Illinois Transporter's ID:

D. (216) 533 9941 Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 S

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	20	2	XX 8 8 0 5 8 6
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 5077

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year: 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: NORMAN FLEMING — Signature — Date: Month Day Year: 07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: James Jones Jr. — Signature — Date: Month Day Year: 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

P.O. BOX 19276

IL532-0610

LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00031 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124881

B. Illinois Generator's ID: 9 5 5 0 3 1 5 6 6

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009 658 25 | C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (216) 533 7841 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 4390 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 9 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number XX K 0 0 1 / Authorization Number 8 8 0 5 8 6
b.					EPA HW Number XX / Authorization Number
c.					EPA HW Number XX / Authorization Number
d.					EPA HW Number XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 926

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Alan Moulton | Signature | Date: Month Day Year 07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. | Signature | Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management ...nter.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493	Manifest Document No. 00032	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124882

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 5

5. Transporter 1 Company Name: DART
6. US EPA ID Number: OHD 009865825
C. Illinois Transporter's ID: 1 1 4 3 1
D. (216) 533-9841 Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. Illinois Transporter's ID
F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. RQ. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	20	2	EPA/HW Number XX K 0 0 1 Authorization Number 8 8 3 5 8 6
b.					EPA/HW Number XX Authorization Number
c.					EPA/HW Number XX Authorization Number
d.					EPA/HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9241

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
John R Smith	John R Smith	07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Janeen Wilson	Janeen Wilson	08 02 88

IL OIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

ST UTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management er.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610

LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~8~~493 | Manifest Document No. 00033 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124883

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 3 5 0 3 1 5 3 8

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009 865 825

C. Illinois Transporter a ID: E 4 3 7

D. (3 1 6) 5 3 3 9 1 1 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4304~~ Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 6 0 3

H. Facility's Phone: (309) 676-~~0983~~

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA/Other Number: XX K 0 0 1
b.					EPA/Other Number: XX
c.					EPA/Other Number: XX
d.					EPA/Other Number: XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above
In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9089

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
John Howard	John Howard	07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
James Jones Jr.	James Jones Jr.	08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00034 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124884

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 1 9 5 5 0 3 1 5 3 6 6

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009865825 | C. Illinois Transporter's ID: IL 533

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (216) 533-9411 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
4349 ~~4304~~ Peoria Disposal Company
Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number: XX K 0 0 1 Authorization Number: 8 8 0 5 3 6
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9255

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	David A. Shaw	07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
QUILLER C. PERKINS	Quiller C. Perkins	73088

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
James Jones Jr.	James Jones Jr.	08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00035 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124885

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 4

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: ILD 009865825 | C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (217) 533-9841 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
4349 ~~4304~~ Peoria Disposal Company
Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 2 0 0 0 3

H. Facility's Phone: (309) 676-4899

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	XX K001
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above in Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9101

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOHN Felix | Signature | Date: Month Day Year 07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

#16

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00036 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124886

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009 486 825 | C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number | D. ( ) Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number: XXK069 / Authorization Number: 8805836
b.					EPA HW Number: XX / Authorization Number
c.					EPA HW Number: XX / Authorization Number
d.					EPA HW Number: XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 5012

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 30 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Norman Fleming JR | Signature: Norman Fleming JR | Date: Month Day Year 07 30 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: James Jones Jr. | Signature: James Jones Jr. | Date: Month Day Year 08 01 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179[illegible]493 | Manifest Document No. 00037 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD 062337752

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349[illegible] Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124887
B. Illinois Generator's ID: 9 5 5 0 3 5 3 6
C. Illinois Transporter's ID: [illegible]
D. (309) 263-2000 Transporter's Phone
E. Illinois Transporter's ID
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA HW Number: X X K 0 0 1; Authorization Number: 8 9 0 5 8 6
b.					EPA HW Number: X X; Authorization Number
c.					EPA HW Number: X X; Authorization Number
d.					EPA HW Number: X X; Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 90

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 08018[illegible]

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: William Cravens | Signature: William Cravens | Date: Month Day Year 08018[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr | Signature: James Jones Jr | Date: Month Day Year 080288

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700/22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179343493 | Manifest Document No. 00038

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124888

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: Liberty Transport | 6. US EPA ID Number: ILD 981955925 | C. Illinois Transporter's ID

D. (309) 263-3700 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ 4349 Southport Road
Peoria, IL 61615
| 10. US EPA ID Number: ILD000805812 | G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number XX K001 Authorization Number 880586
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 737

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 07 01 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: LOUIS A. MADDOX | Signature | Date: Month Day Year 07 01 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. | Signature: James Jones Jr. | Date: Month Day Year 08 02 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00039 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD 062 333 752

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124889
B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6
C. Illinois Transporter's ID
D. Transporter Phone
E. Illinois Transporter's ID
F. Transporter Phone
G. Illinois Facility's ID
H. Facility's Phone (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA HW Number: XX K 0 0 1; Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: XX; Authorization Number
c.					EPA HW Number: XX; Authorization Number
d.					EPA HW Number: XX; Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 87

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 0 8 0 1 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: CHARLES WILKERSON | Signature | Date: Month Day Year 0 8 0 1 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. | Signature | Date: Month Day Year 0 8 0 8 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86)

Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~512~~493 | Manifest Document No. 00040

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number IL 2124890

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name Fort Transfer

6. US EPA ID Number IID053333752

C. Illinois Transporter's ID

D. (309) Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4394~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number ILD000805812

G. Illinois Facility's ID 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA (HW) Number XX K001 8 8 0 5 8 6
b.					EPA (HW) Number XX
c.					EPA (HW) Number XX
d.					EPA (HW) Number XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 94

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		08 01 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
LEO RUSSELL	Leo Russell	08 01 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
James Jones Jr.	James Jones Jr.	08 02 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management after.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~8~~493 Manifest Document No. 00041

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Liberty Transportation

6. US EPA ID Number: ILD 981955925

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4000~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124891

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 8 9

C. Illinois Transporter's ID: 2297

D. (309) 263-3700 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	2.0	2	EPA/State Number XX K 0 0 1 Authorization Number 8 8 6 5 8 6
b.					EPA/State Number XX Authorization Number
c.					EPA/State Number XX Authorization Number
d.					EPA/State Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 731

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date Month Day Year
David A. Shaw		08 01 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year
FLOYD WINKEL		080188

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date Month Day Year
James Jones Jr.	James Jones Jr.	080288

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~338~~ 493 — Manifest Document No. 00042

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124892

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 E

5. Transporter 1 Company Name: Liberty Trans Port — 6. US EPA ID Number: IID 981955925

C. Illinois Transporter's ID

7. Transporter 2 Company Name — 8. US EPA ID Number

D. (309) 263-2700 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 ~~4894~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
GENERATOR	a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number: X X K 0 0 1 * Authorization Number: 8 8 0 5 8 6
	b.					EPA HW Number: X X Authorization Number
	c.					EPA HW Number: X X Authorization Number
	d.					EPA HW Number: X X Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 738

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw — Signature — Date: Month Day Year 0 8 0 1 8 8

TRANSPORTER			
17. Transporter 1 Acknowledgement of Receipt of Materials			Date
Printed/Typed Name: Ken Puckett	Signature		Month Day Year 0 8 0 1 8 8
18. Transporter 2 Acknowledgement of Receipt of Materials			Date
Printed/Typed Name	Signature		Month Day Year

FACILITY		
19. Discrepancy Indication Space		
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.		Date
Printed/Typed Name: James Jones Jr.	Signature: James Jones Jr.	Month Day Year 0 8 0 2 8 8

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~8~~ 4~~8~~9 | Manifest Document No. 00043

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number IL 2124893

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: Liberty Transport | 6. US EPA ID Number: TID981955925 | C. Illinois Transporter's ID D347

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (309)263-2700 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4304~~ Southport Road
Peoria, IL 61615
4349
| 10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4883

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number XX K 0 0 1 Authorization Number 8 8 0 5 8 6
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

GENERATOR

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 736

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date Month Day Year
David A. Shaw		0 8 0 1 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year
Allen L. Gregory		0 8 0 1 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date Month Day Year
James Jones Jr.	James Jones Jr.	0 8 0 2 8 8

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~8~~493 | Manifest Document No. 00044

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Fort Transfer | 6. US EPA ID Number: ILD062333752

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615
B49

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124894

B. Illinois Generator's ID: 9 5 5 0 3 1 5 8 6 9

C. Illinois Transporter's ID:

D. (309) 3C3-9660 Transporter Phone

E. Illinois Transporter's ID:

F. ( ) Transporter Phone

G. Illinois Facility's ID: 1 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2
b.				
c.				
d.				

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed in Item #14
1 = Gallons 2 = Cubic

15. Special Handling Instructions and Additional Information
Truck # 87

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		08018

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Jim Herrman		08018

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Janeen Wilson	Janeen Wilson	080288

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

40

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179~~3~~3493 — Manifest Document No. 00045

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124895

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 4

5. Transporter 1 Company Name: FORT Transfer — 6. US EPA ID Number: IID 000 333 752

C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name — 8. US EPA ID Number

D. ( ) Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
~~4394~~ Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA HW Number: X X K 0 0 1 Authorization Number: 8 8 0 5 8 6
b.					EPA HW Number: X X Authorization Number
c.					EPA HW Number: X X Authorization Number
d.					EPA HW Number: X X Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 88

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw — Signature — Date: Month 08 Day 01 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Richard Pfanz — Signature: Richard Pfanz — Date: Month 08 Day 01 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson — Signature: Janeen Wilson — Date: Month 08 Day 02 Year 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

P.O. BOX 19276 ... SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

IL532-0610

LPC 62 8/81

UNIFORM HAZARDOUS WASTE MANIFEST

EPA Form 8700-22 (Rev. 9-86)

Form Approved. OMB No. 2050-0039, Expires 9-30-89

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.
WID006179493	00046		

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124896

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

C. Illinois Transporter's ID:

D. (800) 348-1054 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone (309) 676-4893

5. Transporter 1 Company Name: Wills Trucking
6. US EPA ID Number: ILD 068913409

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA HW Number: XX K 0 0 1
b.					Authorization Number: 8 8 0 5 8 6
c.					EPA HW Number: XX
d.					Authorization Number
					EPA HW Number: XX
					Authorization Number
					EPA HW Number: XX
					Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 3029

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: STAN SHAW | Signature: Stan Shaw | Date: Month Day Year 08 01 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year 8 0 1 8 8

FACILITY

19. Discrepancy Indication Space: Inserted year in box 16. 8-2-88 JW

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 08 02 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

STATE OF ILLINOIS

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00047
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2124897

B. Illinois Generator's ID: 9 5 5 0 3 1 5 8 6

4. Generator's Phone (715) 392-2221

C. Illinois Transporter's ID:

5. Transporter 1 Company Name: Wills Trucking | 6. US EPA ID Number: OHD068913409

D. (800) 348 405 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0.0.1	D. T	2 0	2	EPA HW Number: XX K 0 0 1 Authorization Number: 8 8 0 5 7 8
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 3038

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month 0 8 Day 0 1 Y 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Ron Thomas | Signature | Date: Month 0 8 Day 0 1 Y 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson | Signature | Date: Month 0 8 Day 0 2 Y 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-26

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00048 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2124898

B. Illinois Generator's ID: 9550315367

C. Illinois Transporter's ID: 0143

D. 016 533 9841 Transporter's Phone

E. Illinois Transporter's ID:

F. ( ) Transporter's Phone

5. Transporter 1 Company Name: Dart | 6. US EPA ID Number: CHD 009865825

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1438120003

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	D. T	20	2	EPA HW Number XXK001 Authorization Number 8801586
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 7084

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 08 01 88

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: George H. Hatfield | Signature: George H. Hatfield | Date: Month Day Year 08 01 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

TRANSPORTER

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 080288

FACILITY

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

RE

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-8

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00049 | 2. Page 1 of 1 | Information in the shaded areas is required by Federal law, but is requi by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Dart | 6. US EPA ID Number: OHD 009 658 25

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124899
B. Illinois Generator's ID: 9 5 5 0 3
C. Illinois Transporter's ID:
D. (216) 533-98[illegible] Transporter's Phon
E. Illinois Transporter's ID:
F. ( ) Transporter's Phon
G. Illinois Facility's ID: 1 2 3 8 2 0 0 0
H. Facility's Phone: (309) 676-[illegible]

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	XX [illegible]
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above
In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information

Truck # 7066

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 0 8 0 1 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 0 8 0 2 8 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and [illegible] Center.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00050 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: DHD 009865825

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2124908
B. Illinois Generator's ID: 9550310536
C. Illinois Transporter's ID: 1431
D. (a) IQ 533 984 | Transporter's Phone
E. Illinois Transporter's ID
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1438120070
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	D. T	20	2	EPA HW Number: XXK001 / Authorization Number: 8805866
b.					EPA HW Number: XX / Authorization Number:
c.					EPA HW Number: XX / Authorization Number:
d.					EPA HW Number: XX / Authorization Number:

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9088

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 08 01 88

TRANSPORTER
17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: William J. Sturm Jr. | Signature | Date: Month Day Year 08 01 88
18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY
19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 08 02 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This ... Center.

STATE OF ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

P.O. BOX 19276

IL532-0610

LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00051 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2128530

B. Illinois Generator's ID: 9 5 5 0 3 5 3 6

5. Transporter 1 Company Name: Liberty Transportation | 6. US EPA ID Number: ILD981955925 | C. Illinois Transporter's ID:

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (309) 263-3700 Transporter's Phone | E. Illinois Transporter's ID:

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

F. ( ) Transporter's Phone

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 6

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	XX
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above
In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 733

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 08 01 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry A Bennett | Signature | Date: Month Day Year 08 02 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 08 02 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

EV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493
Manifest Document No.: 00052
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128531

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Liberty Transport
6. US EPA ID Number: ILD 981955925
C. Illinois Transporter's ID: 2247
D. (309) 263-2701 Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. Illinois Transporter's ID
F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number: XXK001 Authorization Number: 8805816
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 732

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR
Printed/Typed Name: David A. Shaw
Signature:
Date: Month Day Year: 08 01 88

TRANSPORTER
17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JIM CARRINGTON
Signature: Jim Carrington
Date: Month Day Year: 08 01 88
18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year:

FACILITY
19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson
Signature: Janeen Wilson
Date: Month Day Year: 08 02 88

ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493
Manifest Document No.: 00053
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128532

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 6 3 3

5. Transporter 1 Company Name: Liberty Transport
6. US EPA ID Number: ILD 981955935
C. Illinois Transporter's ID: D 2 5 1
D. (309) 263-2700 Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. Illinois Transporter's ID
F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number: XXK001 Authorization Number: 8805866
b.					EPA HW Number: XX Authorization Number
c.					EPA HW Number: XX Authorization Number
d.					EPA HW Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 735

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw		08 01 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name: Virgil Anderson	Signature: Virgil Anderson	Date: 08 01 88
18. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name	Signature	Date

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Janeen Wilson	Janeen Wilson	08 02 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

EV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00054 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2128533

B. Illinois Generator's ID: 9550315361

5. Transporter 1 Company Name: Dart | 6. US EPA ID Number: OHD009865825 | C. Illinois Transporter's ID: 11413

D. ( ) Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1438120000

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	D. T	20	2	XX K001 884058
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item #14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9649

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Ye 08028

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: ALAN JAY FURR | Signature | Date: Month Day Ye 08028

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Ye

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: James Jones Jr. | Signature: James Jones Jr. | Date: Month Day Ye 080228

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00055

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2128534

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009865825 | C. Illinois Transporter's ID: [illegible] | D. [illegible] Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	XX 0 0 0 8 8 0 5 8 6
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9556

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature: [signature] | Date: Month Day Year 0 8 0 2 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: DAVIS FIELDS | Signature: David Fields | Date: Month Day Year 080288

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: James Jones Jr. | Signature: James Jones Jr. | Date: Month Day Year 080288

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WID006179493 | Manifest Document No. 00056 | 2. Page 1 of 1 | Information in the shaded areas is required by Federal law, but is requ by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128535

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3

5. Transporter 1 Company Name: Wills Trucking | 6. US EPA ID Number: OHD 068 91 3409

C. Illinois Transporter's ID

7. Transporter 2 Company Name | 8. US EPA ID Number

D. (800) 348 4051 Transporter's Phone

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number XX K 001 Authorization Number 8 8 0 5 8
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 3068

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Ye)
David A. Shaw		08 02 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Ye)
ROB CHAPPER	Rob Chapper	08 02 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Ye)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Ye)
JAMES JONES	James Jones	08038

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY · DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00057
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

5. Transporter 1 Company Name: Dart
6. US EPA ID Number: OHD 007 976 582 5

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812

A. Illinois Manifest Document Number: IL 2128536
B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6
C. Illinois Transporter's ID: 1 4 1 3
D. (216) 533-9891 Transporter's Phone
E. Illinois Transporter's ID:
F. ( ) Transporter's Phone
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0
H. Facility's Phone: (309) 676-4893

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D. T	2 0	2	EPA/State Number: XXK 0 0 0 Authorization Number: 8 8 0 5 8 6
b.					EPA/State Number: XX Authorization Number
c.					EPA/State Number: XX Authorization Number
d.					EPA/State Number: XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above in Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 5077

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Year 0 8 0 2 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: NORMAN FLEMING | Signature: Norman Fleming SR | Date: Month Day Year 0 8 0 2 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Year 0 8 0 4 8 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00058 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128537

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 4 5 3 6

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: OHD 009865825 | C. Illinois Transporter's ID: 1 1 9 3

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (216) 533-7841 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	210	2	EPA (HW) Number XXK001 Authorization Number 8801588
b.					EPA (HW) Number XX Authorization Number
c.					EPA (HW) Number XX Authorization Number
d.					EPA (HW) Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 5084

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: David A. Shaw | Signature | Date: Month Day Yea 08 02 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Jesse E. Bone | Signature: Jesse E. Bone | Date: Month Day Yea 08 02 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date: Month Day Yea

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson | Signature: Janeen Wilson | Date: Month Day Yea 080388

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is n required by Federal law, but is requir by Illinois law.
WID006179493	00059		

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

4. Generator's Phone (715) 392-2221

A. Illinois Manifest Document Number: IL 2128538

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6

5. Transporter 1 Company Name: Dart

6. US EPA ID Number: IAD009765825

C. Illinois Transporter's ID: [illegible]

D. (216) 533-9841 Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. Illinois Transporter's ID

F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	EPA HW Number XX K 0 7 0 Authorization Number 8 8 0 5 8
b.					EPA HW Number XX Authorization Number
c.					EPA HW Number XX Authorization Number
d.					EPA HW Number XX Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 1262

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Y)
David A. Shaw	[signature]	08028

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Y)
Alan Moulton	[signature]	08028

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Y)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Y)
Janeen Wilson	[signature]	08038

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-267

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610 #54
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00060 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128539

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 4 5 3 6 7

5. Transporter 1 Company Name: Dart | 6. US EPA ID Number: OHD 009855825 | C. Illinois Transporter's ID | D. (216) 533 9741 Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 2 0 0 0

H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	001	DT	20	2	XX
b.					XX
c.					XX
d.					XX

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 5012

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: David A. Shaw | Signature | Date: Month 08 Day 02 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Norman Fleming JR | Signature | Date: Month 08 Day 02 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name: Janeen Wilson | Signature | Date: Month 08 Day 04 Year 88

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

STATE OF ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) **EPA Form 8700-22 (Rev. 9-86)** Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493 | Manifest Document No.: 00061 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128540

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3

5. Transporter 1 Company Name: DART | 6. US EPA ID Number: IOHD009865825 | C. Illinois Transporter's ID: [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number | D. (716) 533-9141 Transporter's Phone | E. Illinois Transporter's ID | F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615

10. US EPA ID Number: ILD000805812

G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3

H. Facility's Phone: 309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA HW Number: XX K 0 0 1 / Authorization Number: 8 8 6 5 3 6
b.					EPA HW Number: XX / Authorization Number
c.					EPA HW Number: XX / Authorization Number
d.					EPA HW Number: XX / Authorization Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 7089

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Date (Month Day Year)
David A. Shaw	[signature]	0 8 0 2 8 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
John Howard	John Howard	0 8 0 2 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Janeen Wilson	Janeen Wilson	0 8 0 3 8 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

REV. 7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL

2200 CHURCHILL ROAD, SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
P.O. BOX 19276

IL532-0610
LPC 62 8/81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-86) Form Approved. OMB No. 2050-0039, Expires 9-30-89

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WID006179493
Manifest Document No.: 00062
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but is required by Illinois law.

GENERATOR

3. Generator's Name and Mailing Address
Koppers Company, Inc.
PO Box 397, Superior, WI 54880

A. Illinois Manifest Document Number: IL 2128541

4. Generator's Phone (715) 392-2221

B. Illinois Generator's ID: 9 5 5 0 3 1 5 3 6 7

5. Transporter 1 Company Name: Dart
6. US EPA ID Number: OHD 009 858 25
C. Illinois Transporter's ID: 1 1 4 3
D. (216) 533 9841 Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. Illinois Transporter's ID
F. ( ) Transporter's Phone

9. Designated Facility Name and Site Address
Peoria Disposal Company
4349 Southport Road
Peoria, IL 61615
10. US EPA ID Number: ILD000805812
G. Illinois Facility's ID: 1 4 3 8 1 2 0 0 0 3
H. Facility's Phone: (309) 676-4893

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. R.Q. Hazardous Waste, Solid, N.O.S. ORM-E, NA-9189 (K001)	0 0 1	D T	2 0	2	EPA/HW XX K 0 8 8 6 8 8
b.					EPA/HW XX Authorized Number
c.					EPA/HW XX Authorized Number
d.					EPA/HW XX Authorized Number

J. Additional Descriptions for Materials Listed Above
Lagoon Bottom Sediment Sludge

K. Handling Codes for Wastes Listed Above In Item # 14
1 = Gallons 2 = Cubic Yards

15. Special Handling Instructions and Additional Information
Truck # 9255

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: David A. Shaw
Signature:
Date: Month 0 8 Day 0 2 Year 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: QUILLER C. PERKINS
Signature:
Date: Month 8 Day 2 Year 8 8

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: Janeen Wilson
Signature: Janeen Wilson
Date: Month 0 8 Day 0 3 Year 8 8

IN ILLINOIS: 217 / 782-3637 *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* OUTSIDE ILLINOIS: 800 / 424-8802 or 202 / 426-2675

DISTRIBUTION: PART - 1 GENERATOR PART - 2 IEPA PART - 3 FACILITY PART - 4 TRANSPORTER PART - 5 IEPA PART - 6 GENERATOR

/.7

GENERATOR COPY — PART 1-DO NOT REMOVE PART 1 FROM SET UNTIL COMPLETED.

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111½ Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

ATTACHMENT 2

CLOSURE CONSTRUCTION PHOTOGRAPHS

KOPPERS SUPERIOR PLANT
SUPERIOR, WISCONSIN



PHOTO 1 PROOF-ROLLING SUBGRADE



PHOTO 2 REMOVING BURIED PIPES



PHOTO 3 EXCAVATING CENTER DIKE



PHOTO 4 FIRST LAYER OF UNCLASSIFIED SOIL FILL



PHOTO 5 SPREADING AND COMPACTING UNCLASSIFIED SOIL FILL



PHOTO 6 UNCLASSIFIED SOIL FILL ZONE



PHOTO 7 CLAY BARRIER SOIL CONSTRUCTION



PHOTO 8 FINAL GRADING AND COMPACTING CLAY BARRIER SOIL



PHOTO 9 SAND CUSHION AND ANCHOR TRENCH ALONG WEST EDGE OF CAP



PHOTO 10 SAND CUSHION AND ANCHOR TRENCH ALONG EAST EDGE OF CAP



PHOTO 11 SPREADING SAND CUSHION SOIL



PHOTO 12 HDPE LINER IN PLACE ALONG SOUTH EDGE OF CAP



PHOTO 13 LINER PLACED ON SAND CUSHION AND IN ANCHOR TRENCH



PHOTO 14 LAST LINER PANELS PLACED ON NORTHERN END OF CAP



PHOTO 15 COMPLETED LINER INSTALLATION



PHOTO 16 FUSION WELDING OF THE LINER

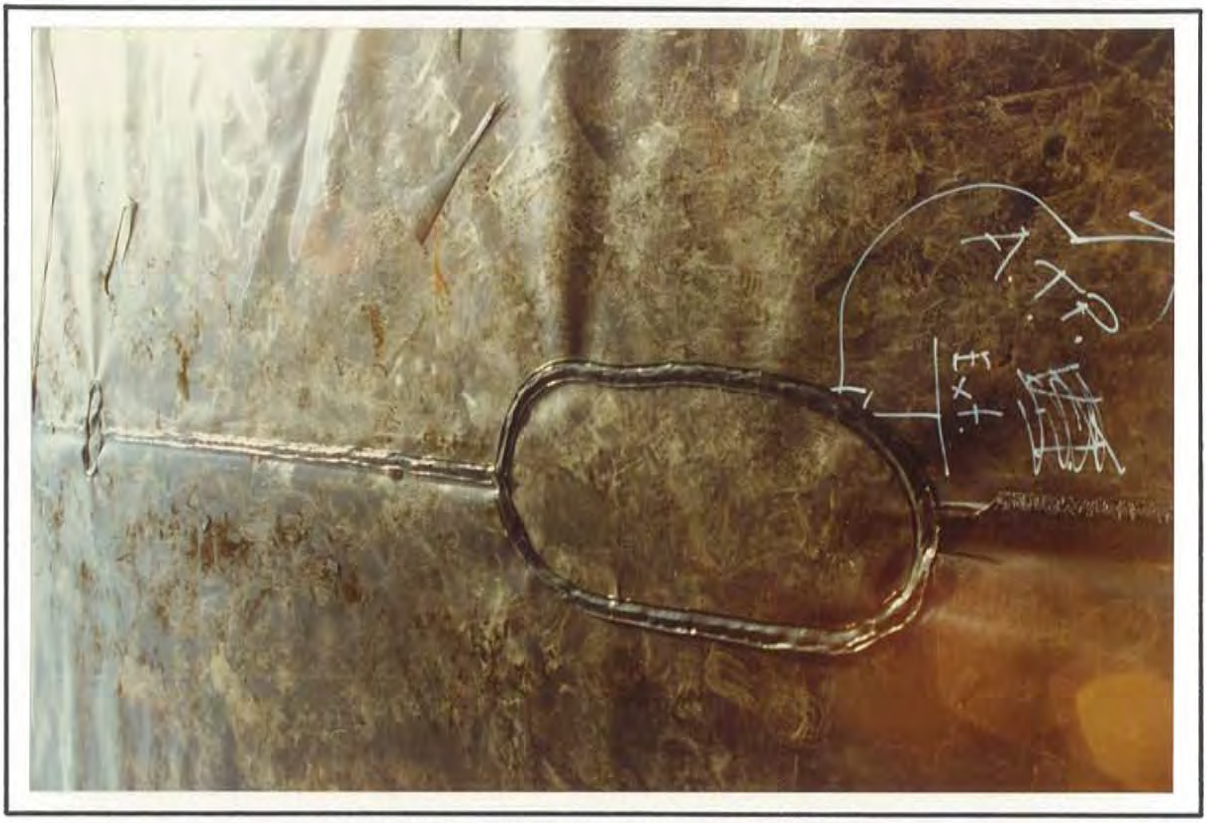


PHOTO 17 EXTRUSION PATCH IN LINER

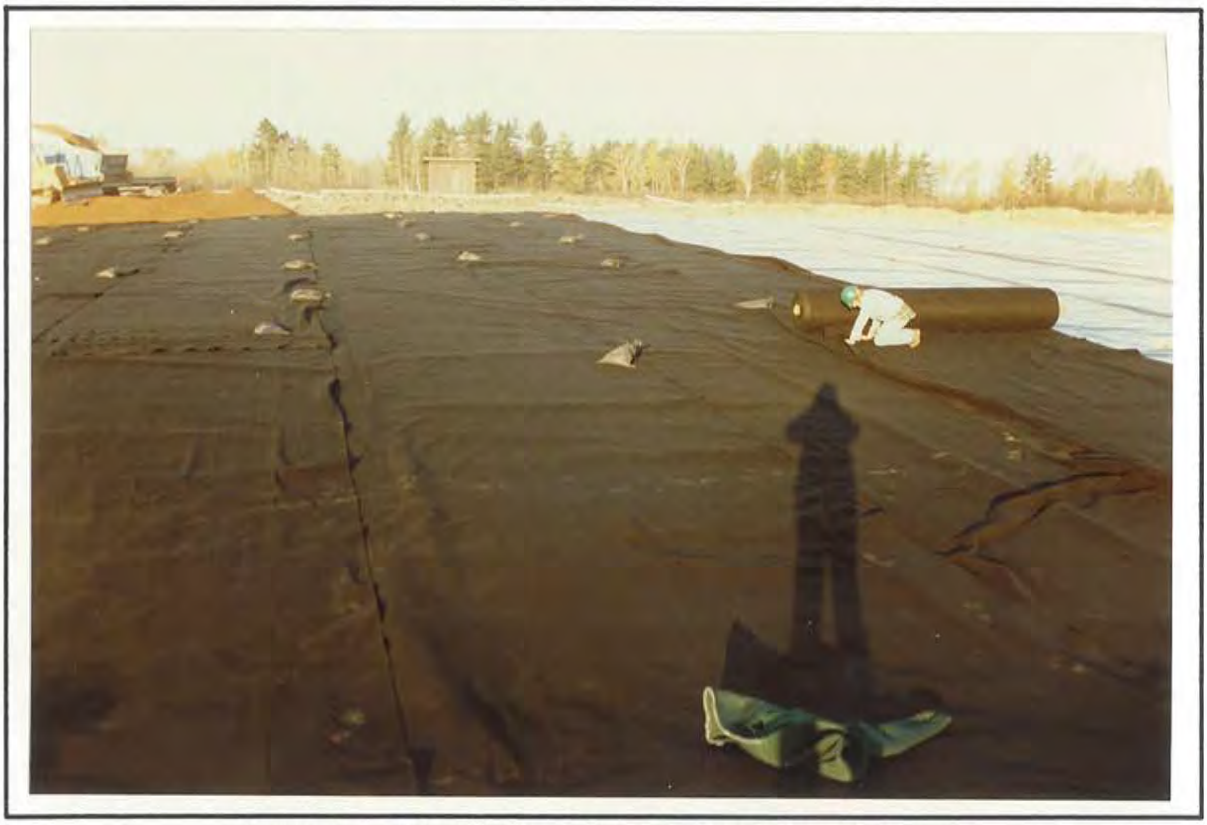


PHOTO 18 GEOTEXTILE (FILTER FABRIC) PLACEMENT



PHOTO 19 DRAINAGE PIPE PLACEMENT



PHOTO 20 DRAINAGE LAYER MATERIAL PLACED ON GEOTEXTILE



PHOTO 21 DRAINAGE LAYER MATERIAL WITH GEOTEXTILE



PHOTO 22 PLACING, SPREADING AND COMPACTING THE UNCLASSIFIED FILL



PHOTO 23 CHECKING ELEVATIONS OF UNCLASSIFIED SOIL FILL



PHOTO 24 PLACING TOPSOIL LAYER



PHOTO 25 SNOW COVERED TOPSOIL
END OF CONSTRUCTION FOR 1988



PHOTO 26 OVERVIEW OF COMPLETED CAP (LOOKING NORTH)



PHOTO 27 COMPLETED CAP (LOOKING SOUTH)



PHOTO 28 CONSTRUCTION OF DRAINAGE IMPROVEMENTS



PHOTO 29 DRAINAGE CHANNEL AT WEST CAP EDGE (LOOKING SOUTH)

Box 30046

VOLUME II
APPENDICES

CONSTRUCTION DOCUMENTATION REPORT
SURFACE IMPOUNDMENT CLOSURE
KOPPERS INDUSTRIES, INC.
SUPERIOR, WISCONSIN

Prepared for:

BEAZER MATERIALS AND SERVICES, INC.
PITTSBURGH, PENNSYLVANIA

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
3000 TECH CENTER DRIVE
MONROEVILLE, PENNSYLVANIA 15146

PROJECT NO: 178275-04

NOVEMBER 1989

DCC#R299

TABLE OF CONTENTS

VOLUME II

APPENDICES

A Boring Logs/Well Construction Diagrams

B Subgrade Laboratory Analytical Results

C Keystone Inspection Reports

D Daily Field Reports

E Field and Laboratory Test Results

F Materials and Suppliers List

G Synthetic Membrane Certification Report

APPENDIX A

BORING LOGS/WELL CONSTRUCTION DIAGRAMS

Boring R-5D
Borings LB-1 through LB-12
Borings BB-1 and BB-2
Wells MW-1S, MW-4S and MW-4D

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: R-5D

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: APRIL 7, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S	2,4,4	Stiff, red-brown CLAY, trace light gray silt pockets
10	S	2,2,3	@ 10-11.5 ft. no silt pockets observed @ 10 ft. 2" thick section with little organics (plant material)
	S	2,2,3	@ 15 ft. 1" thick zone of gray clay @ 15-20 ft. clay is soft but pliable
20	S	1,1,1	@ 20-40 ft. clay is soft
	S	1,2,1	
30	S	1,2,3	
	S	1,2,4	
	S	1,4,3	
	S	1,2,4	
40			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: R-5D

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: APRIL 7, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S	2,3,4	Soft, red-brown CLAY, trace light gray silt pockets
	S	2,4,5	
	S	1,1,8	
	S	3,3,5	
	S	1,3,3	
	S	1,3,5	
50	S	1,5,6	
	S	2,4,6	
	S	2,4,7	
	S	1,1,4	
	S	4,4,7	Green-gray CLAY, trace silt, thin lenses
	S	----	Soft, red-brown CLAY, trace light gray silt pockets
60			Green-gray CLAY, trace silt
			Bottom of Boring at 59 feet
70			
80			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-1

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY AND SILT, trace light gray silt pockets/streaks, trace organics (plant material)
	S		
	S		Red-brown CLAY, trace light gray silt pockets/streaks
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-2

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown stiff CLAY, trace light gray silt pockets/streaks
	S		
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-3

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY, trace light gray silt pockets/streaks, trace dark brown streaks
	S		
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-4

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown stiff CLAY, trace light gray silt pockets/streaks
	S		
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-5

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY, trace light gray silt pockets/streaks
	S		@ 0-1 ft. trace fine sand
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-6

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY, trace light gray silt pockets/streaks
	S		@ 2-3 ft. trace organics
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-7

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY, trace light gray silt pockets/streaks
	S		
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-8

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Red-brown CLAY, trace light gray silt pockets/streaks
	S		
	S		
			Bottom of Boring 3.0 Feet
5			
10			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-9

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Hard red-brown SILTY CLAY, trace to little silt, trace to little organics (plant fragments and decomposed plant material)
	S		
	S		
5			
	S		
	S		
	S		
	S		
10	S		
	S		
			Bottom of Boring 11.5 Feet
15			
20			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-10

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Hard red-brown CLAY AND SILT, trace to little organics (plant fragments and decomposed plant material)
	S		
	S		@ 3-4.5 ft. trace orange-brown silt
5	S		Red-brown CLAY, trace light gray silt pockets trace organics (plant fragments)
	S		
	S		
	S		
10	S		
	S		
			Bottom of Boring 12.0 Feet
15			
20			

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR Keystone Koppers

LOCATION Superior, WI Elev.

Job No. 1479

Boring No. MW-1S

GROUND WATER — While drilling — Before casing removal — After casing removal — Time after drilling — Depth to water — Depth to cave-in

Start 11-15-88
Unit D-50
Chief DZ

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS
						Brown, Black Red CLAY
1	M		3			
		5	7	.8	12	
2	M	4	5			
		7		.5	12	
3	M		4			
		6	7	1.0	13	Red CLAY
4	M	3	3			
		5		1.0	8	Redish Brown CLAY
5	M		4			
		4	4	1.5	8	
6	M	3	3			
		4		1.5	7	Brown CLAY
7	M		4			
		4	6	1.5	10	
8	M	1	3			
		4		1.0	7	

7.5'

10.0'

15.0'

E.O.B. @ 22.5'

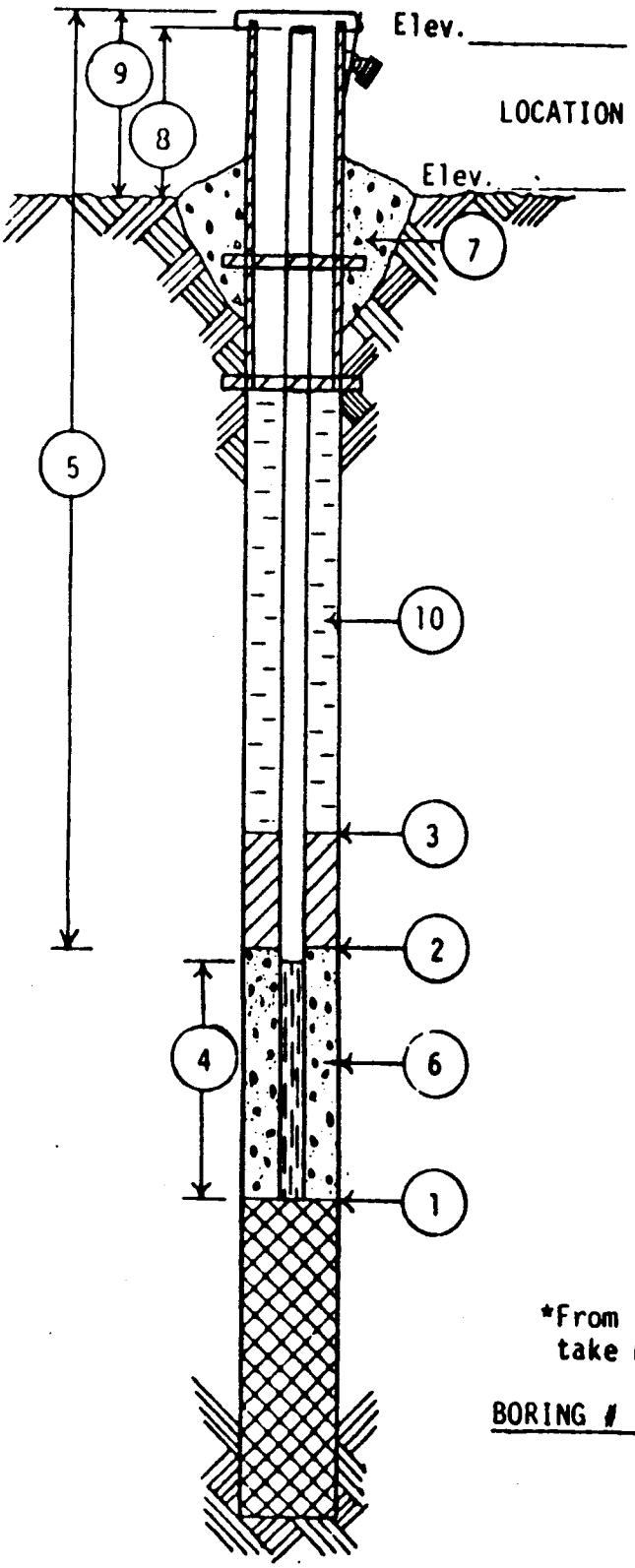
Well Set @ 22.0'

Casing/Probe Weight 140# Drop 30"

Unconfined Strength | Boulders | Blows on Casing Size | Blows on Probe Size | Drilling Method 4¼ HS

5 10 15 20 25 30 35 40 45

WELL DETAIL INFORMATION SHEET



JOB NO. 1479

BORING NO. MW-1S

DATE 11-15-88

CHIEF D.Z.

LOCATION Superior, WI

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.

(1) DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 22.0 FEET.

(2) DEPTH OF BOTTOM OF SEAL (if installed) 9.5 FEET.

(3) DEPTH TO TOP OF SEAL (if installed) 7.5 FEET.

(4) LENGTH OF WELL POINT, (PVC WELL SCREEN) OR SLOTTED PIPE 10.0 FEET. (Circle One)

(5) TOTAL LENGTH OF PIPE 14.5 FEET @ 2 IN. DIAMETER.

(6) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand.

(7) CONCRETE CAP, (YES) NO (Circle One)

(8) HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

(9) PROTECTIVE CASING? (YES) NO (Circle One)
HEIGHT ABOVE GROUND 2.5'.
LOCKING CAP? (YES) NO (Circle One)

(10) TYPE OF BACKFILL: Cement/Bentonite Grout

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR Keystone Koppers

LOCATION Superior, WI Elev.

Job No. 1479

Boring No. MW-4S

GROUND WATER	While drilling	14.5'	Time after drilling	¼ hr.	24 hrs.
	Before casing removal		Depth to water	15.4'	14.4'
	After casing removal		Depth to cave-in	23.7'	

Start 11-14-88
Unit D-50
Chief DZ

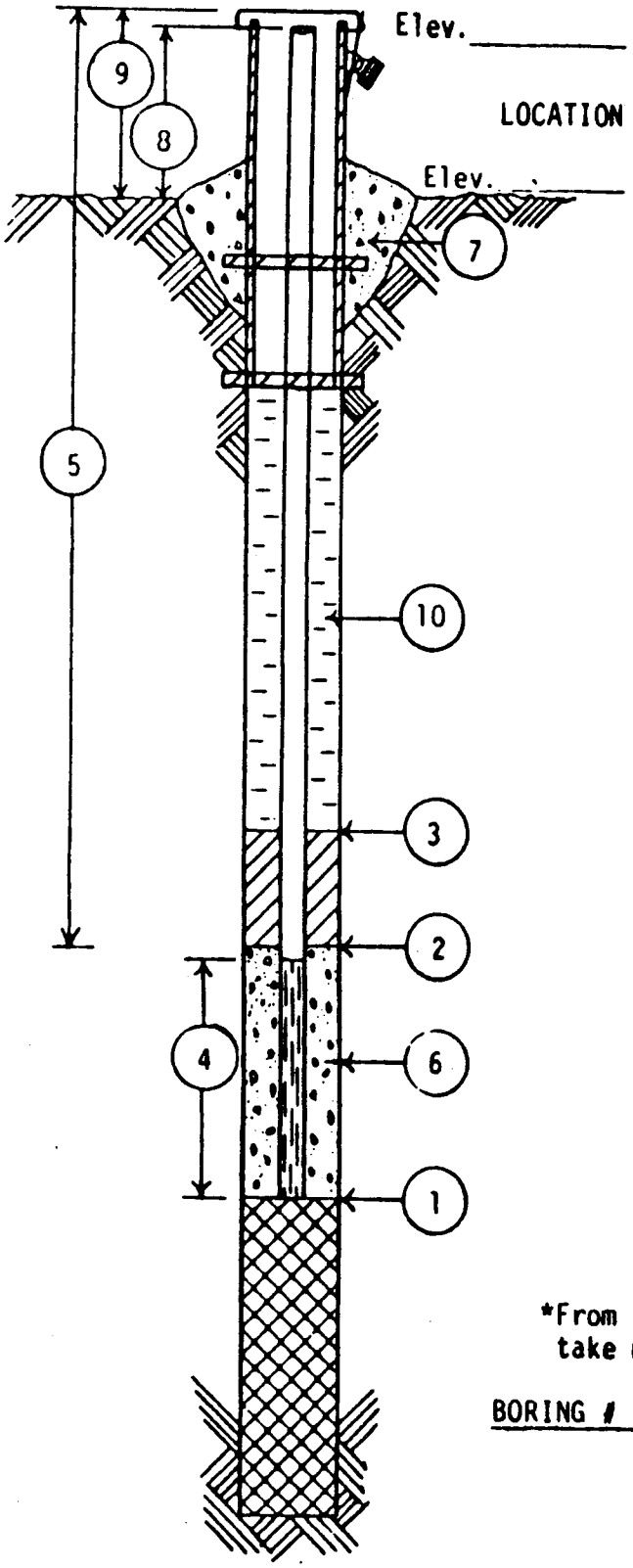
Casing/Probe
Weight 140#
Drop 30"

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS
1	M		2			Brown Red CLAY
		4	5	.5	9	
2	M	2	2			
		4		1.0	6	
3	M		5			
		6	9	1.5	15	
4	M	2	3			
		6		1.2	9	
5	M		3			
		5	6	.5	11	
6	M	2	3			
		4		1.5	7	
7	M		5			
		6	9	1.3	15	
8	M	1	2			
		5		1.5	7	
						22.0'
9	W		33			Red Silty Clayey M-F SAND
		14	15		29	
						25.0'
10	W	18	22			Red CLAY, W/Trc. Gravel
		25		1.5	47	Red/Brn M-F 26.0' SAND
						E.O.B. @ 27.5'
						Well Set @ 21.5'

Unconfined Strength | Boulders | Blows on: Casing Size | Probe Size | Drilling Method: 4¼" HSA

5 10 15 20 25 30 35 40 45

WELL DETAIL INFORMATION SHEET



JOB NO. 1479

BORING NO. MW-4S

DATE 11-14-88

CHIEF D.Z.

LOCATION Superior, WI

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.

(1) DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 21.5 FEET.

(2) DEPTH OF BOTTOM OF SEAL (if installed) 9.0 FEET.

(3) DEPTH TO TOP OF SEAL (if installed) 7.0 FEET.

(4) LENGTH OF WELL POINT, (PVC WELL SCREEN,) OR SLOTTED PIPE 10.0 FEET. (Circle One)

(5) TOTAL LENGTH OF PIPE 13.5 FEET @ 2 IN. DIAMETER.

(6) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand.

(7) CONCRETE CAP, (YES) NO (Circle One)

(8) HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

(9) PROTECTIVE CASING? (YES) NO (Circle One)
HEIGHT ABOVE GROUND 2.5'.
LOCKING CAP? (YES) NO (Circle One)

(10) TYPE OF BACKFILL: Cement/Bentonite Grout

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS

WISCONSIN TEST DRILLING

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR Keystone — Koppers

LOCATION — Superior, WI — Elev.

Job No. 1479

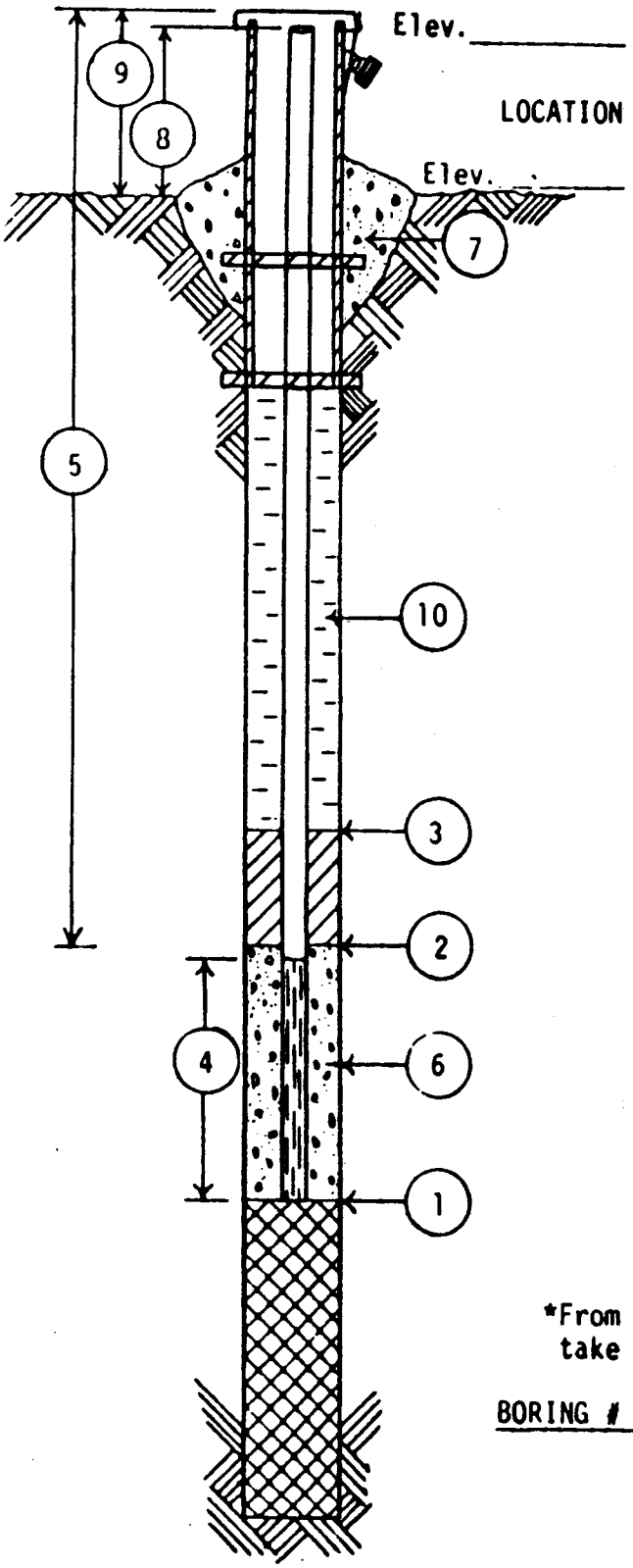
Boring No. MW-4D

GROUND WATER: While drilling ____ Time after drilling ____ ____
Before casing removal ____ Depth to water ____ ____
After casing removal ____ Depth to cave-in ____ ____

Start 11-15-88
Unit D-50
Chief DZ

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size —	Blows on Probe Size —	Drilling Method
						(See Log MW-4)						4¼" HSA
						5						
						10						
						15						
						20						
						25						
						27.0'						
1	W		15			M-F SAND, Trace of Gravel						
		8	16	1.5	24							
						30 30.0'						
2		10	13			NO RECOVERY						
		11		0	24							
3			9									
		15	10	0	25							
						35 35.0'						
4	W	15	40			M-F SAND						
		42		1.5	82							
						37.5'						
5	W		22			Brown Red SAND						
		30	32	1.5	62							
						40 40.0'						
6	W	35	37			Brown SAND, Trace of Gravel						
		42		1.5	79							
7	W		33									
		30	36	1.5	66							
						44.0'						
						45 Red CLAY						
8	W	15	12									
		17		1.0	29	E.O.B. @ 46.5'						
						Well Set @ 45.3'						

WELL DETAIL INFORMATION SHEET



JOB NO. 1479

BORING NO. MW-4D

DATE 11-15-88

CHIEF D.Z.

LOCATION Superior, WI

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.

(1) DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 45.3 FEET.

(2) DEPTH OF BOTTOM OF SEAL (if installed) 32.0 FEET.

(3) DEPTH TO TOP OF SEAL (if installed) 30.0 FEET.

(4) LENGTH OF WELL POINT, (PVC WELL SCREEN) OR SLOTTED PIPE 10.0 FEET. (Circle One)

(5) TOTAL LENGTH OF PIPE 37.8 FEET @ 2 IN. DIAMETER.

(6) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand.

(7) CONCRETE CAP, (YES) NO (Circle One)

(8) HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

(9) PROTECTIVE CASING? (YES) NO (Circle One)
HEIGHT ABOVE GROUND 2.5'.
LOCKING CAP? (YES) NO (Circle One)

(10) TYPE OF BACKFILL: Cement/Bentonite Grout

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS

WISCONSIN TEST DRILLING

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: BB-2

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 4, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		FILL (black sand, slag and cinders)
	S		
	S		Stiff red-brown CLAY, trace light gray silt pockets/streaks
5	S		
	S		@ 5.5-8.5 ft. trace fine sand lenses
	S		
	S		
			Bottom of Boring 8.5 Feet
10			
15			
20			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-11

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		Hard red-brown SILT AND CLAY TO SILTY CLAY, trace organics (plant fragments and decomposed plant material), trace light gray silt pockets
	S		
5	S		
	S		
	S		Red-brown CLAY, trace light gray silt pockets
	S		
10	S		
			Bottom of Boring 10.5 Feet
15			
20			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: LB-12

Project: Superior **Location: Superior, WI**

Drilling Method: HOLLOW STEM AUGER
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 3, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		FILL (red sand, some organics)
	S		Red-brown SILTY CLAY, trace light gray silt pockets, trace organics (decomposed organics)
	S		
5			
	S		@5.5-7.5 ft. trace organics (plant fragments)
	S		
	S		
	S		
10	S		@ 9.5-11.5 ft. trace fine sand lenses up to 1" thick
	S		
			Bottom of Boring 11.5 Feet
15			
20			

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Boring Log: BB-1

Project: Superior **Location: Superior, WI**

Drilling Method: SPLIT SPOON
Driller: WISCONSIN TEST DRILLING, INC.
Geologist: D. SMITH
Date: AUGUST 4, 1988

Sample collection
G-grab T-shelby tube
S-splitspoon C-rock core

Strata Depth	Sample Depth	Blow Count	Description
	S		FILL (black sand, slag and cinders)
	S		
	S		Stiff red-brown CLAY, trace light gray silt pockets/streaks
5			
	S		
	S		
			Bottom of Boring 8.5 Feet
10			
15			
20			

APPENDIX B

SUBGRADE LABORATORY ANALYTICAL RESULTS

LB-1 through LB-8: 0.0-1.0 feet
LB-9: 8.5-9.5 feet, LB-10: 9.0-10.0 feet
LB-11: 7.5-8.5 feet, LB-12: 8.5-9.5 feet
BB-1 and BB-2: 6.5-7.5 feet

KEYSTONE ENVIRONMENTAL RESOURCES

Interoffice Correspondence

To	D. Smith	From	R. D. Hepner
Location	Monroeville	Location/	Monroeville
Subject	Superior (178275)	Date	September 6. 1988

Attached are the results of the analyses on the Lagoon Soil samples received on August 6, 1988.

R. D. Hepner

RDH/wce

Attachment

cc: R. Anderson

CHAIN OF CUSTODY RECORD

PLANT CODE

PROJECT NAME: Soils Subgrade / Superior Lagoon Closure background samples

SAMPLERS (Signature): Diane Smith

STA. NO.	DATE	TIME	COMP.	GRAB	WELL	STATION LOCATION	NUMBER OF CONTAINERS	TPH (8310)	Phenols (8040)	oil & grease	As	Cr	Cu	Pb	Zn	CONDUCTIVITY	pH	REMARKS OR OBSERVATIONS
LB-1	8-3-88	9 am	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-2	"	9 am	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-3	"	9 am	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-4	"	9 am	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-5	"	3:30 pm	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-6	"	3:30 pm	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-7	"	3:30 p.m	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-8	"	3:30 pm	✓			0-1'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-9	"	Noon	✓			8.5-9.5'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-10	"	12:30 pm	✓			9-10'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-11	"	2:30 p.m.	✓			7.5-8.5'	1	✓	✓	✓	✓	✓	✓	✓	✓			
LB-12	"	5:30 pm	✓			8.5-9.5'	1	✓	✓	✓	✓	✓	✓	✓	✓			
BB-1	8-4-88	6 pm	✓			6.5-7.5'	1	✓	✓	✓	✓	✓	✓	✓	✓			
BB-2	8-4-88	6:00 pm	✓			6.5-7.5'	1	✓	✓	✓	✓	✓	✓	✓	✓			

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Diane Smith	8-8-88		Fedex				
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date: 8-8-88	Time: 10:10		

Ice Chest Temp	Ice Chest	Chain of Custody
13 °C	#	Tag #

*DISTRIBUTION: Original accompanies shipment; Copy to Coordinator Field Files.

PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

PLANT CODE | PROJECT NAME: Superior Sprayfield closure soils / sprayfield background samples

SAMPLERS (Signature): Diane Smith

STA. NO.	DATE	TIME	COMP.	GRAB	WELL	STATION LOCATION	NUMBER OF CONTAINERS	PAH (8310)	Phenols (8040)	TOC	As	Cr	Cu	Store the dioxins for now (Standby)	CONDUCTIVITY	pH	REMARKS OR OBSERVATIONS
SB-1	8-4-88	3 pm	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-2	8-5-88	9 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-3	"	10 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-4	"	11 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-5	"	noon	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-6	8-4-88	3 pm	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-7	8-5-88	9 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-8	"	10 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-9	"	11 am	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
SB-10	"	noon	✓			0-1'		✓	✓	✓	✓	✓	✓		✓	✓	
BB-1	8-4-88	[illegible] p.m.	✓			[illegible] 3-5.5'		✓	✓	✓	✓	✓	✓		✓	✓	
BB-2	8-4-88	5:30 p.m.	✓			[illegible] 2-3'		✓	✓	✓	✓	✓	✓		✓	✓	

Separate Letter ASK Ron Manuels (9455) Left Front

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Diane Smith	8-5-88	pm	Fedex				
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Ice Chest Temp	Ice Chest
				8-6-88	1010	14 °C	#

Chain of Custody Tag #

*DISTRIBUTION: Original accompanies shipment; Copy to Coordinator Field Files.

KEYSTONE ENVIRONMENTAL RESOURCES, INC
NARRATIVE - INORGANIC ANALYSIS

I GENERAL

A. WORK ORDER M8808039

B. SAMPLE NUMBERS 88080217-242

C. SHIPPING PROBLEMS None

II PREPARATION

A. DIGESTION PROBLEMS None

III ANALYSIS

A. ANALYSIS PROBLEMS Arsenic analysis-several samples had to be diluted 5X because of matrix interference.

OTHER PROBLEMS None

Charles W. Miller
PREPARATION LABORATORY MANAGER

David J. Brennan
INORGANIC ANALYSIS MANAGER

KEYSTONE ENVIRONMENTAL RESOURCES. INC.
NARRATIVE - ORGANIC ANALYSIS

I GENERAL

A. WORK ORDER M8808039

B. SAMPLE NUMBERS 88080217-242

C. SHIPPING PROBLEMS None

II PREPARATION

A. EXTRACTION PROBLEMS None

III ANALYSIS

A. ANALYSIS PROBLEMS None

COMMENTS All Organic results are on an as received basis.

PREPARATION LABORATORY MANAGER

ORGANIC ANALYSIS MANAGER

KEYSTONE ENVIRONMENTAL RESOURCES. INC.
NARRATIVE - CONVENTIONAL SOIL ANALYSIS

I GENERAL

A. WORK ORDER M8808039

B. SAMPLE NUMBERS 88080217-242

C. SHIPPING PROBLEMS None

II ANALYSIS

A. ANALYSIS PROBLEMS None

OTHER PROBLEMS None

Charles J. Kelley

CONVENTIONAL SOIL ANALYSIS MANAGER

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE OF CONTENTS — PRODUCED ON 09/06/88 AT 14:41 — PAGE

SAMPLE #	SOURCE	DESCRIPT	DATE-COL	DATE-REC	ORD #
88080217	LB-1 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080218	LB-2 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080219	LB-3 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080220	LB-4 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080221	LB-5 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080222	LB-6 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080223	LB-7 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080224	LB-8 0-1'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080225	LB-9 8.5-9.5	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080226	LB-10 9-10'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080227	LB-11 7.5-8.5'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080228	LB-12 8.5-9.5'	SUPERIOR LAGOON SOIL	08/03/88	08/06/88	M8808039
88080229	BB-1 6.5-7.5'	SUPERIOR LAGOON SOIL	08/04/88	08/06/88	M8808039
88080230	BB-2 6.5-7.5'	SUPERIOR LAGOON SOIL	08/04/88	08/06/88	M8808039
88080231	SB-1 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080232	SB-2 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080233	SB-3 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080234	SB-4 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080235	SB-5 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080236	SB-6 0-1'	SUPERIOR LAGOON SOIL	08/04/88	08/06/88	M8808039
88080237	SB-7 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080238	SB-8 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080239	SB-9 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080240	SB-10 0-1'	SUPERIOR LAGOON SOIL	08/05/88	08/06/88	M8808039
88080241	BB-1 3.5-5'	SUPERIOR LAGOON SOIL	08/04/88	08/06/88	M8808039
88080242	BB-2 2-3'	SUPERIOR LAGOON SOIL	08/04/88	08/06/88	M8808039

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 1: SUMMARY OF ANALYTICAL DATA — PRODUCED ON 09/06/88 AT 14:58 — PAGE

SAMPLE #	RSLT. LNE		SOURCE
% SOLIDS			
88080217	% Solids @103 C..... :	70.1	LB-1 0-1'
88080218	% Solids @103 C..... :	72.0	LB-2 0-1'
88080219	% Solids @103 C..... :	68.7	LB-3 0-1'
88080220	% Solids @103 C..... :	74.0	LB-4 0-1'
88080221	% Solids @103 C..... :	72.7	LB-5 0-1'
88080222	% Solids @103 C..... :	68.5	LB-6 0-1'
88080223	% Solids @103 C..... :	75.6	LB-7 0-1'
88080224	% Solids @103 C..... :	70.3	LB-8 0-1'
88080225	% Solids @103 C..... :	77.4	LB-9 8.5-9.5
88080226	% Solids @103 C..... :	77.7	LB-10 9-10'
88080227	% Solids @103 C..... :	73.5	LB-11 7.5-8.5'
88080228	% Solids @103 C..... :	73.2	LB-12 8.5-9.5'
88080229	% Solids @103 C..... :	73.2	BB-1 6.5-7.5'
88080230	% Solids @103 C..... :	73.6	BB-2 6.5-7.5'
88080231	% Solids @103 C..... :	67.4	SB-1 0-1'
88080232	% Solids @103 C..... :	62.9	SB-2 0-1'
88080233	% Solids @103 C..... :	57.9	SB-3 0-1'
88080234	% Solids @103 C..... :	64.3	SB-4 0-1'
88080235	% Solids @103 C..... :	58.6	SB-5 0-1'
88080236	% Solids @103 C..... :	69.2	SB-6 0-1'
88080237	% Solids @103 C..... :	60.0	SB-7 0-1'
88080238	% Solids @103 C..... :	57.3	SB-8 0-1'
88080239	% Solids @103 C..... :	59.7	SB-9 0-1'
88080240	% Solids @103 C..... :	65.3	SB-10 0-1'
88080241	% Solids @103 C..... :	75.6	BB-1 3.5-5'
88080242	% Solids @103 C..... :	73.9	BB-2 2-3'
TOTAL ORGANIC CARBON			
88080231	% TOC..... :	1.53	SB-1 0-1'
88080232	% TOC..... :	1.48	SB-2 0-1'
88080233	% TOC..... :	1.85	SB-3 0-1'
88080234	% TOC..... :	1.21	SB-4 0-1'
88080235	% TOC..... :	1.98	SB-5 0-1'
88080236	% TOC..... :	2.25	SB-6 0-1'
88080237	% TOC..... :	1.17	SB-7 0-1'
88080238	% TOC..... :	1.58	SB-8 0-1'
88080239	% TOC..... :	1.50	SB-9 0-1'
88080240	% TOC..... :	1.29	SB-10 0-1'
88080241	% TOC..... :	0.01	BB-1 3.5-5'
88080242	% TOC..... :	0.03	BB-2 2-3'

The above results are on an as received basis.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 1: SUMMARY OF ANALYTICAL DATA — PRODUCED ON 09/06/88 AT 14:58 — PAGE

SAMPLE #	RSLT. LNE		SOURCE
OIL & GREASE, TOTAL RECOVERABLE, GRAVIMETRIC			
88080217	Oil & Grease, mg/Kg.	376	LB-1 0-1'
88080218	Oil & Grease, mg/Kg.	<50.0	LB-2 0-1'
88080219	Oil & Grease, mg/Kg.	176	LB-3 0-1'
88080220	Oil & Grease, mg/Kg.	59.4	LB-4 0-1'
88080221	Oil & Grease, mg/Kg.	<50.0	LB-5 0-1'
88080222	Oil & Grease, mg/Kg.	73.6	LB-6 0-1'
88080223	Oil & Grease, mg/Kg.	<50.0	LB-7 0-1'
88080224	Oil & Grease, mg/Kg.	<50.0	LB-8 0-1'
88080225	Oil & Grease, mg/Kg.	215	LB-9 8.5-9.5
88080226	Oil & Grease, mg/Kg.	<50.0	LB-10 9-10'
88080227	Oil & Grease, mg/Kg.	<50.0	LB-11 7.5-8.5'
88080228	Oil & Grease, mg/Kg.	<50.0	LB-12 8.5-9.5'
88080229	Oil & Grease, mg/Kg.	<50.0	BB-1 6.5-7.5'
88080230	Oil & Grease, mg/Kg.	<50.0	BB-2 6.5-7.5'
CONDUCTIVITY			
88080231	Soil Cond., umhos/cm.	445	SB-1 0-1'
88080232	Soil Cond., umhos/cm.	700	SB-2 0-1'
88080233	Soil Cond., umhos/cm.	625	SB-3 0-1'
88080234	Soil Cond., umhos/cm.	510	SB-4 0-1'
88080235	Soil Cond., umhos/cm.	725	SB-5 0-1'
88080236	Soil Cond., umhos/cm.	700	SB-6 0-1'
88080237	Soil Cond., umhos/cm.	590	SB-7 0-1'
88080238	Soil Cond., umhos/cm.	850	SB-8 0-1'
88080239	Soil Cond., umhos/cm.	550	SB-9 0-1'
88080240	Soil Cond., umhos/cm.	825	SB-10 0-1'
88080241	Soil Cond., umhos/cm.	197	BB-1 3.5-5'
88080242	Soil Cond., umhos/cm.	205	BB-2 2-3'
pH			
88080231	Soil pH, units.....	6.67	SB-1 0-1'
88080232	Soil pH, units.....	7.35	SB-2 0-1'
88080233	Soil pH, units.....	6.54	SB-3 0-1'
88080234	Soil pH, units.....	6.20	SB-4 0-1'
88080235	Soil pH, units.....	6.88	SB-5 0-1'
88080236	Soil pH, units.....	7.50	SB-6 0-1'
88080237	Soil pH, units.....	7.00	SB-7 0-1'
88080238	Soil pH, units.....	7.10	SB-8 0-1'
88080239	Soil pH, units.....	6.67	SB-9 0-1'
88080240	Soil pH, units.....	7.76	SB-10 0-1'
88080241	Soil pH, units.....	8.51	BB-1 3.5-5'
88080242	Soil pH, units.....	8.49	BB-2 2-3'

The above results are on an as received basis.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 2: SUMMARY OF METALS DATA PRODUCED ON 09/06/88 AT 14:54 PAGE

SAMPLE #	RSLT. LNE		SOURCE
ARSENIC (TOTAL)			
88080217	Arsenic, ug/Kg..... :	1930	LB-1 0-1'
88080218	Arsenic, ug/Kg..... :	2130	LB-2 0-1'
88080219	Arsenic, ug/Kg..... :	<1000	LB-3 0-1'
88080220	Arsenic, ug/Kg..... :	<5000	LB-4 0-1'
88080221	Arsenic, ug/Kg..... :	1780	LB-5 0-1'
88080222	Arsenic, ug/Kg..... :	<5000	LB-6 0-1'
88080223	Arsenic, ug/Kg..... :	1810	LB-7 0-1'
88080224	Arsenic, ug/Kg..... :	<5000	LB-8 0-1'
88080225	Arsenic, ug/Kg..... :	<5000	LB-9 8.5-9.5
88080226	Arsenic, ug/Kg..... :	1670	LB-10 9-10'
88080227	Arsenic, ug/Kg..... :	3150	LB-11 7.5-8.5'
88080228	Arsenic, ug/Kg..... :	<5000	LB-12 8.5-9.5'
88080229	Arsenic, ug/Kg..... :	1080	BB-1 6.5-7.5'
88080230	Arsenic, ug/Kg..... :	<5000	BB-2 6.5-7.5'
88080231	Arsenic, ug/Kg..... :	2930	SB-1 0-1'
88080232	Arsenic, ug/Kg..... :	<5000	SB-2 0-1'
88080233	Arsenic, ug/Kg..... :	<5000	SB-3 0-1'
88080234	Arsenic, ug/Kg..... :	<5000	SB-4 0-1'
88080235	Arsenic, ug/Kg..... :	<5000	SB-5 0-1'
88080236	Arsenic, ug/Kg..... :	<5000	SB-6 0-1'
88080237	Arsenic, ug/Kg..... :	5050	SB-7 0-1'
88080238	Arsenic, ug/Kg..... :	3320	SB-8 0-1'
88080239	Arsenic, ug/Kg..... :	<5000	SB-9 0-1'
88080240	Arsenic, ug/Kg..... :	<5000	SB-10 0-1'
88080241	Arsenic, ug/Kg..... :	<5000	BB-1 3.5-5'
88080242	Arsenic, ug/Kg..... :	<5000	BB-2 2-3'

The above results are on a dry weight basis.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 2: SUMMARY OF METALS DATA — PRODUCED ON 09/06/88 AT 14:54 — PAGE

SAMPLE #	RSLT. LNE		SOURCE
CHROMIUM (TOTAL)			
88080217	Chromium, ug/Kg..... :	36100	LB-1 0-1'
88080218	Chromium, ug/Kg..... :	31900	LB-2 0-1'
88080219	Chromium, ug/Kg..... :	29700	LB-3 0-1'
88080220	Chromium, ug/Kg..... :	31800	LB-4 0-1'
88080221	Chromium, ug/Kg..... :	30000	LB-5 0-1'
88080222	Chromium, ug/Kg..... :	40200	LB-6 0-1'
88080223	Chromium, ug/Kg..... :	42200	LB-7 0-1'
88080224	Chromium, ug/Kg..... :	40900	LB-8 0-1'
88080225	Chromium, ug/Kg..... :	45600	LB-9 8.5-9.5
88080226	Chromium, ug/Kg..... :	37900	LB-10 9-10'
88080227	Chromium, ug/Kg..... :	38800	LB-11 7.5-8.5'
88080228	Chromium, ug/Kg..... :	38800	LB-12 8.5-9.5'
88080229	Chromium, ug/Kg..... :	40900	BB-1 6.5-7.5'
88080230	Chromium, ug/Kg..... :	32400	BB-2 6.5-7.5'
88080231	Chromium, ug/Kg..... :	43400	SB-1 0-1'
88080232	Chromium, ug/Kg..... :	43400	SB-2 0-1'
88080233	Chromium, ug/Kg..... :	45300	SB-3 0-1'
88080234	Chromium, ug/Kg..... :	40600	SB-4 0-1'
88080235	Chromium, ug/Kg..... :	40800	SB-5 0-1'
88080236	Chromium, ug/Kg..... :	39500	SB-6 0-1'
88080237	Chromium, ug/Kg..... :	37300	SB-7 0-1'
88080238	Chromium, ug/Kg..... :	41000	SB-8 0-1'
88080239	Chromium, ug/Kg..... :	40400	SB-9 0-1'
88080240	Chromium, ug/Kg..... :	39000	SB-10 0-1'
88080241	Chromium, ug/Kg..... :	44300	BB-1 3.5-5'
88080242	Chromium, ug/Kg..... :	35700	BB-2 2-3'

The above results are on a dry weight basis.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 2: SUMMARY OF METALS DATA — PRODUCED ON 09/06/88 AT 14:54 — PAGE

SAMPLE #	RSLT. LNE		SOURCE
COPPER (TOTAL)			
88080217	Copper, ug/Kg..... :	84600	LB-1 0-1'
88080218	Copper, ug/Kg..... :	43500	LB-2 0-1'
88080219	Copper, ug/Kg..... :	45800	LB-3 0-1'
88080220	Copper, ug/Kg..... :	41400	LB-4 0-1'
88080221	Copper, ug/Kg..... :	43500	LB-5 0-1'
88080222	Copper, ug/Kg..... :	49100	LB-6 0-1'
88080223	Copper, ug/Kg..... :	44000	LB-7 0-1'
88080224	Copper, ug/Kg..... :	53900	LB-8 0-1'
88080225	Copper, ug/Kg..... :	50700	LB-9 8.5-9.5
88080226	Copper, ug/Kg..... :	47300	LB-10 9-10'
88080227	Copper, ug/Kg..... :	49100	LB-11 7.5-8.5'
88080228	Copper, ug/Kg..... :	50000	LB-12 8.5-9.5'
88080229	Copper, ug/Kg..... :	48000	BB-1 6.5-7.5'
88080230	Copper, ug/Kg..... :	40100	BB-2 6.5-7.5'
88080231	Copper, ug/Kg..... :	41600	SB-1 0-1'
88080232	Copper, ug/Kg..... :	41200	SB-2 0-1'
88080233	Copper, ug/Kg..... :	47800	SB-3 0-1'
88080234	Copper, ug/Kg..... :	37000	SB-4 0-1'
88080235	Copper, ug/Kg..... :	44100	SB-5 0-1'
88080236	Copper, ug/Kg..... :	47500	SB-6 0-1'
88080237	Copper, ug/Kg..... :	37600	SB-7 0-1'
88080238	Copper, ug/Kg..... :	43900	SB-8 0-1'
88080239	Copper, ug/Kg..... :	43100	SB-9 0-1'
88080240	Copper, ug/Kg..... :	40700	SB-10 0-1'
88080241	Copper, ug/Kg..... :	47700	BB-1 3.5-5'
88080242	Copper, ug/Kg..... :	46800	BB-2 2-3'

The above results are on a dry weight basis.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

TABLE 2: SUMMARY OF METALS DATA PRODUCED ON 09/06/88 AT 14:55 PAGE

SAMPLE #	RSLT. LNE		SOURCE
LEAD (TOTAL)			
88080217	Lead, ug/Kg..... :	24300	LB-1 0-1'
88080218	Lead, ug/Kg..... :	6910	LB-2 0-1'
88080219	Lead, ug/Kg..... :	12900	LB-3 0-1'
88080220	Lead, ug/Kg..... :	6650	LB-4 0-1'
88080221	Lead, ug/Kg..... :	6840	LB-5 0-1'
88080222	Lead, ug/Kg..... :	8210	LB-6 0-1'
88080223	Lead, ug/Kg..... :	6790	LB-7 0-1'
88080224	Lead, ug/Kg..... :	9140	LB-8 0-1'
88080225	Lead, ug/Kg..... :	10700	LB-9 8.5-9.5
88080226	Lead, ug/Kg..... :	9020	LB-10 9-10'
88080227	Lead, ug/Kg..... :	7680	LB-11 7.5-8.5'
88080228	Lead, ug/Kg..... :	7720	LB-12 8.5-9.5'
88080229	Lead, ug/Kg..... :	76680	BB-1 6.5-7.5'
88080230	Lead, ug/Kg..... :	6700	BB-2 6.5-7.5'
ZINC (TOTAL)			
88080217	Zinc, ug/Kg..... :	65400	LB-1 0-1'
88080218	Zinc, ug/Kg..... :	50000	LB-2 0-1'
88080219	Zinc, ug/Kg..... :	43500	LB-3 0-1'
88080220	Zinc, ug/Kg..... :	49700	LB-4 0-1'
88080221	Zinc, ug/Kg..... :	48900	LB-5 0-1'
88080222	Zinc, ug/Kg..... :	59700	LB-6 0-1'
88080223	Zinc, ug/Kg..... :	54600	LB-7 0-1'
88080224	Zinc, ug/Kg..... :	61600	LB-8 0-1'
88080225	Zinc, ug/Kg..... :	59800	LB-9 8.5-9.5
88080226	Zinc, ug/Kg..... :	49200	LB-10 9-10'
88080227	Zinc, ug/Kg..... :	59600	LB-11 7.5-8.5'
88080228	Zinc, ug/Kg..... :	56300	LB-12 8.5-9.5'
88080229	Zinc, ug/Kg..... :	60600	BB-1 6.5-7.5'
88080230	Zinc, ug/Kg..... :	50800	BB-2 6.5-7.5'

The above results are on a dry weight basis.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080217

Source: LB-1 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	341
2,4-Dinitrophenol	163
2-Chlorophenol	<50.0
2-Nitrophenol	381
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	619
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	869
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080218

Source: LB-2 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080219

Source: LB-3 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	191
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	200
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	310
Phenol	50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080220

Source: LB-4 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:<50.0
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:897
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:265
Phenol.....	:<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080221

Source: LB-5 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	88.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080222

Source: LB-6 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:<50.0
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:<100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:316
Phenol.....	:528

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080223

Source: LB-7 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	178
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080224

Source: LB-8 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:<50.0
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:<100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:197
Phenol.....	:223

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080225

Source: LB-9 8.5-9.5
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:165
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:207
2,4-Dinitrophenol.....	:702
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:355
Phenol.....	:<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080226

Source: LB-10 9-10'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:502
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:<100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:<100
Phenol.....	:396

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080227

Source: LB-11 7.5-8.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:<50.0
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:<100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:<100
Phenol.....	:71.2

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080228

Source: LB-12 8.5-9.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	185

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080229

Source: BB-1 6.5-7.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080230

Source: BB-2 6.5-7.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	872

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080231

Source: SB-1 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:7210
2,4,6-Trichlorophenol.....	:<1000
2,4-Dichlorophenol.....	:<500
2,4-Dimethylphenol.....	:<500
2,4-Dinitrophenol.....	:<1000
2-Chlorophenol.....	:<500
2-Nitrophenol.....	:<500
2-Methyl-4,6-dinitrophenol..	:5880
4-Nitrophenol.....	:4270
4-Chloro-3-methylphenol.....	:<500
Pentachlorophenol.....	:79200
Phenol.....	:<500

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080232

Source: SB-2 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:755
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:387
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:<100
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:4090
Phenol.....	:909

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080233

Source: SB-3 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	844
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	941
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	1720
Phenol	79.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080234

Source: SB-4 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	1360
Phenol	727

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080235

Source: SB-5 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	391
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	569
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	1490
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080236

Source: SB-6 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	33000
2,4,6-Trichlorophenol	<1000
2,4-Dichlorophenol	<500
2,4-Dimethylphenol	<500
2,4-Dinitrophenol	8900
2-Chlorophenol	<500
2-Nitrophenol	<500
2-Methyl-4,6-dinitrophenol	45200
4-Nitrophenol	23300
4-Chloro-3-methylphenol	<500
Pentachlorophenol	47000
Phenol	<500

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080237

Source: SB-7 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	56300
2,4,6-Trichlorophenol	<1000
2,4-Dichlorophenol	<500
2,4-Dimethylphenol	<500
2,4-Dinitrophenol	<1000
2-Chlorophenol	<500
2-Nitrophenol	<500
2-Methyl-4,6-dinitrophenol	94600
4-Nitrophenol	57300
4-Chloro-3-methylphenol	5390
Pentachlorophenol	195000
Phenol	<500

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080238

Source: SB-8 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	17200
2,4,6-Trichlorophenol	<1000
2,4-Dichlorophenol	<500
2,4-Dimethylphenol	<500
2,4-Dinitrophenol	<1000
2-Chlorophenol	<500
2-Nitrophenol	<500
2-Methyl-4,6-dinitrophenol	24100
4-Nitrophenol	13600
4-Chloro-3-methylphenol	1180
Pentachlorophenol	39800
Phenol	<500

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080239

Source: SB-9 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<1000
2,4,6-Trichlorophenol.....	:<1000
2,4-Dichlorophenol.....	:<500
2,4-Dimethylphenol.....	:<500
2,4-Dinitrophenol.....	:<1000
2-Chlorophenol.....	:<500
2-Nitrophenol.....	:<500
2-Methyl-4,6-dinitrophenol..	:<1000
4-Nitrophenol.....	:<1000
4-Chloro-3-methylphenol.....	:<500
Pentachlorophenol.....	:41600
Phenol.....	:<500

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080240

Source: SB-10 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol...	:<100
2,4,6-Trichlorophenol.....	:<100
2,4-Dichlorophenol.....	:<50.0
2,4-Dimethylphenol.....	:<50.0
2,4-Dinitrophenol.....	:<100
2-Chlorophenol.....	:<50.0
2-Nitrophenol.....	:<50.0
2-Methyl-4,6-dinitrophenol..	:<100
4-Nitrophenol.....	:393
4-Chloro-3-methylphenol.....	:<50.0
Pentachlorophenol.....	:7270
Phenol.....	:<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080241

Source: BB-1 3.5-5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	<50.0
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	112
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

TABLE 3: SUMMARY OF 8040 DATA

Sample: 88080242

Source: BB-2 2-3'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/12/88
Date Analyzed: 09/01/88

Clean up Method

silica gel clean-up ___yes ___no
florisil clean-up ___yes ___no
alumina clean-up ___yes ___no
sulfur clean-up ___yes ___no

Acid Extractable Phenolics

2,3,5,6-Tetrachlorophenol	<100
2,4,6-Trichlorophenol	<100
2,4-Dichlorophenol	<50.0
2,4-Dimethylphenol	<50.0
2,4-Dinitrophenol	<100
2-Chlorophenol	147
2-Nitrophenol	<50.0
2-Methyl-4,6-dinitrophenol	<100
4-Nitrophenol	<100
4-Chloro-3-methylphenol	<50.0
Pentachlorophenol	<100
Phenol	<50.0

The above results are reported in ug/Kg.

All 8040 identifications are from retention data only.

KEYSTONE ENVIRONMENTAL RESOURCES, INC

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080217

Source: LB-1 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___no
florisil clean-up	___yes	___no
alumina clean-up	___yes	___no
sulfur clean-up	___yes	___no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	4180
Acenaphthylene	381
Anthracene	2540
Benzo(a)anthracene	1380
Benzo(a)pyrene	490
Benzo(b)fluoranthene	871
Benzo(g,h,i)perylene	727
Benzo(k)fluoranthene	338
Chrysene	2020
Dibenz(ah)anthracene	1470
Fluoranthene	7360
Fluorene	3800
Indeno(123-cd)pyrene	392
Phenanthrene	14300
Pyrene	5900

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	2240

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080218

Source: LB-2 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	<100
Acenaphthylene	:	<100
Anthracene	:	<50.0
Benzo(a)anthracene	:	<2.00
Benzo(a)pyrene	:	<2.00
Benzo(b)fluoranthene	:	<2.00
Benzo(g,h,i)perylene	:	<5.00
Benzo(k)fluoranthene	:	<2.00
Chrysene	:	<15.0
Dibenz(ah)anthracene	:	<3.00
Fluoranthene	:	45.0
Fluorene	:	22.4
Indeno(123-cd)pyrene	:	<5.00
Phenanthrene	:	127
Pyrene	:	25.8

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	<100
Naphthalene	:	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080219

Source: LB-3 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up ✓ yes ___ no
florisil clean-up ___ yes ___ no
alumina clean-up ___ yes ___ no
sulfur clean-up ___ yes ___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	3430
Acenaphthylene	:	784
Anthracene	:	4770
Benzo(a)anthracene	:	2470
Benzo(a)pyrene	:	890
Benzo(b)fluoranthene	:	1520
Benzo(g,h,i)perylene	:	1140
Benzo(k)fluoranthene	:	589
Chrysene	:	3400
Dibenz(ah)anthracene	:	2320
Fluoranthene	:	13300
Fluorene	:	8290
Indeno(123-cd)pyrene	:	630
Phenanthrene	:	23600
Pyrene	:	10100

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	<100
Naphthalene	:	5380

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080220

Source: LB-4 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	119
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	<2.00
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	60.1
Fluorene	37.8
Indeno(123-cd)pyrene	<5.00
Phenanthrene	187
Pyrene	29.3

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	312

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080221

Source: LB-5 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___no
florisil clean-up	___yes	___no
alumina clean-up	___yes	___no
sulfur clean-up	___yes	___no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	186
Acenaphthylene	<100
Anthracene	90.7
Benzo(a)anthracene	21.7
Benzo(a)pyrene	7.58
Benzo(b)fluoranthene	12.9
Benzo(g,h,i)perylene	21.5
Benzo(k)fluoranthene	4.94
Chrysene	29.3
Dibenz(ah)anthracene	32.1
Fluoranthene	147
Fluorene	136
Indeno(123-cd)pyrene	7.56
Phenanthrene	501
Pyrene	111

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	548

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080222

Source: LB-6 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	1170
Acenaphthylene	<100
Anthracene	1070
Benzo(a)anthracene	339
Benzo(a)pyrene	100
Benzo(b)fluoranthene	172
Benzo(g,h,i)perylene	165
Benzo(k)fluoranthene	66.9
Chrysene	452
Dibenz(ah)anthracene	321
Fluoranthene	2010
Fluorene	1210
Indeno(123-cd)pyrene	98.0
Phenanthrene	5070
Pyrene	1520

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	1350

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080223

Source: LB-7 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	51.1
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	<2.00
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	36.5
Fluorene	113
Indeno(123-cd)pyrene	<5.00
Phenanthrene	298
Pyrene	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	405

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080224

Source: LB-8 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/27/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	52.4
Benzo(a)anthracene	4.59
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	2.58
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	59.1
Fluorene	131
Indeno(123-cd)pyrene	<5.00
Phenanthrene	372
Pyrene	37.5

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	509

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080225

Source: LB-9 8.5-9.5
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up ✓ yes ___ no
florisil clean-up ___ yes ___ no
alumina clean-up ___ yes ___ no
sulfur clean-up ___ yes ___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	24300
Acenaphthylene	:	7260
Anthracene	:	5220
Benzo(a)anthracene	:	2660
Benzo(a)pyrene	:	674
Benzo(b)fluoranthene	:	1210
Benzo(g,h,i)perylene	:	744
Benzo(k)fluoranthene	:	459
Chrysene	:	2980
Dibenz(ah)anthracene	:	1470
Fluoranthene	:	15100
Fluorene	:	15900
Indeno(123-cd)pyrene	:	448
Phenanthrene	:	45000
Pyrene	:	11500

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	165
Naphthalene	:	36500

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080226

Source: LB-10 9-10'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	81.9
Benzo(a)anthracene	46.7
Benzo(a)pyrene	25.2
Benzo(b)fluoranthene	67.8
Benzo(g,h,i)perylene	74.4
Benzo(k)fluoranthene	20.4
Chrysene	60.1
Dibenz(ah)anthracene	104
Fluoranthene	118
Fluorene	173
Indeno(123-cd)pyrene	54.6
Phenanthrene	567
Pyrene	97.2

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	127

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080227

Source: LB-11 7.5-8.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	<2.00
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	24.0
Fluorene	<20.0
Indeno(123-cd)pyrene	<5.00
Phenanthrene	70.3
Pyrene	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080228

Source: LB-12 8.5-9.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/03/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___no
florisil clean-up	___yes	___no
alumina clean-up	___yes	___no
sulfur clean-up	___yes	___no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	<2.00
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	<20.0
Fluorene	<20.0
Indeno(123-cd)pyrene	<5.00
Phenanthrene	<50.0
Pyrene	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080229

Source: BB-1 6.5-7.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up ✓ yes ___ no
florisil clean-up ___ yes ___ no
alumina clean-up ___ yes ___ no
sulfur clean-up ___ yes ___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	<100
Acenaphthylene	:	<100
Anthracene	:	<50.0
Benzo(a)anthracene	:	<2.00
Benzo(a)pyrene	:	<2.00
Benzo(b)fluoranthene	:	<2.00
Benzo(g,h,i)perylene	:	<5.00
Benzo(k)fluoranthene	:	<2.00
Chrysene	:	<15.0
Dibenz(ah)anthracene	:	<3.00
Fluoranthene	:	<20.0
Fluorene	:	<20.0
Indeno(123-cd)pyrene	:	<5.00
Phenanthrene	:	<50.0
Pyrene	:	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	<100
Naphthalene	:	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080230

Source: BB-2 6.5-7.5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	2.27
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	20.7
Fluorene	<20.0
Indeno(123-cd)pyrene	<5.00
Phenanthrene	<50.0
Pyrene	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

KEYSTONE ENVIRONMENTAL RESOURCES, INC

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080231

Date Collected: 08/05/88
Date Received: 08/06/88

Source: SB-1 0-1'
Description: SUPERIOR LAGOON SOIL

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	267
Benzo(a)anthracene	1710
Benzo(a)pyrene	1140
Benzo(b)fluoranthene	2710
Benzo(g,h,i)perylene	2150
Benzo(k)fluoranthene	949
Chrysene	3300
Dibenz(ah)anthracene	3710
Fluoranthene	4300
Fluorene	73.7
Indeno(123-cd)pyrene	1300
Phenanthrene	265
Pyrene	3510

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	196

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080232

Source: SB-2 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/28/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	1050
Benzo(a)anthracene	432
Benzo(a)pyrene	329
Benzo(b)fluoranthene	794
Benzo(g,h,i)perylene	640
Benzo(k)fluoranthene	265
Chrysene	761
Dibenz(ah)anthracene	954
Fluoranthene	829
Fluorene	97.6
Indeno(123-cd)pyrene	389
Phenanthrene	323
Pyrene	878

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	102

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

KEYSTONE ENVIRONMENTAL RESOURCES, INC

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080233

Date Collected: 08/05/88
Date Received: 08/06/88

Source: SB-3 0-1'
Description: SUPERIOR LAGOON SOIL

Date Extracted: 08/10/88
Date Analyzed: 08/29/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	127
Acenaphthylene	<100
Anthracene	189
Benzo(a)anthracene	414
Benzo(a)pyrene	299
Benzo(b)fluoranthene	598
Benzo(g,h,i)perylene	463
Benzo(k)fluoranthene	167
Chrysene	489
Dibenz(ah)anthracene	688
Fluoranthene	361
Fluorene	<20.0
Indeno(123-cd)pyrene	275
Phenanthrene	89.1
Pyrene	585

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080234

Source: SB-4 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/29/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	<100
Acenaphthylene	:	<100
Anthracene	:	<50.0
Benzo(a)anthracene	:	28.2
Benzo(a)pyrene	:	17.3
Benzo(b)fluoranthene	:	37.1
Benzo(g,h,i)perylene	:	41.3
Benzo(k)fluoranthene	:	12.7
Chrysene	:	42.6
Dibenz(ah)anthracene	:	73.4
Fluoranthene	:	69.0
Fluorene	:	<20.0
Indeno(123-cd)pyrene	:	26.6
Phenanthrene	:	<50.0
Pyrene	:	64.4

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	<100
Naphthalene	:	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080235

Source: SB-5 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/29/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	836
Acenaphthylene	<100
Anthracene	144
Benzo(a)anthracene	346
Benzo(a)pyrene	194
Benzo(b)fluoranthene	405
Benzo(g,h,i)perylene	331
Benzo(k)fluoranthene	140
Chrysene	383
Dibenz(ah)anthracene	569
Fluoranthene	817
Fluorene	80.7
Indeno(123-cd)pyrene	205
Phenanthrene	459
Pyrene	703

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080236

Source: SB-6 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/10/88
Date Analyzed: 08/29/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	657
Acenaphthylene	<100
Anthracene	284
Benzo(a)anthracene	2000
Benzo(a)pyrene	1350
Benzo(b)fluoranthene	3030
Benzo(g,h,i)perylene	2560
Benzo(k)fluoranthene	924
Chrysene	3400
Dibenz(ah)anthracene	4220
Fluoranthene	2890
Fluorene	495
Indeno(123-cd)pyrene	1660
Phenanthrene	203
Pyrene	3040

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080237

Source: SB-7 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/29/88

Clean up Method

silica gel clean-up	✓ yes	___no
florisil clean-up	___yes	___no
alumina clean-up	___yes	___no
sulfur clean-up	___yes	___no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	687
Acenaphthylene	128
Anthracene	1700
Benzo(a)anthracene	2620
Benzo(a)pyrene	1300
Benzo(b)fluoranthene	3610
Benzo(g,h,i)perylene	2640
Benzo(k)fluoranthene	1270
Chrysene	4740
Dibenz(ah)anthracene	3780
Fluoranthene	8370
Fluorene	130
Indeno(123-cd)pyrene	1660
Phenanthrene	408
Pyrene	7730

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	231

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080238

Source: SB-8 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/30/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	507
Acenaphthylene	199
Anthracene	1710
Benzo(a)anthracene	1610
Benzo(a)pyrene	756
Benzo(b)fluoranthene	1780
Benzo(g,h,i)perylene	1400
Benzo(k)fluoranthene	596
Chrysene	2060
Dibenz(ah)anthracene	2130
Fluoranthene	2640
Fluorene	82.1
Indeno(123-cd)pyrene	986
Phenanthrene	326
Pyrene	2150

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	302

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080239

Source: SB-9 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/30/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	5040
Acenaphthylene	535
Anthracene	26300
Benzo(a)anthracene	6440
Benzo(a)pyrene	2420
Benzo(b)fluoranthene	5350
Benzo(g,h,i)perylene	4550
Benzo(k)fluoranthene	1950
Chrysene	8830
Dibenz(ah)anthracene	6880
Fluoranthene	32800
Fluorene	4460
Indeno(123-cd)pyrene	3170
Phenanthrene	11800
Pyrene	22800

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	1240

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080240

Source: SB-10 0-1'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/05/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/30/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	578
Benzo(a)pyrene	536
Benzo(b)fluoranthene	1600
Benzo(g,h,i)perylene	1400
Benzo(k)fluoranthene	420
Chrysene	1110
Dibenz(ah)anthracene	1940
Fluoranthene	338
Fluorene	<20.0
Indeno(123-cd)pyrene	986
Phenanthrene	<50.0
Pyrene	749

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	169

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080241

Source: BB-1 3.5-5'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/30/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	:	<100
Acenaphthylene	:	<100
Anthracene	:	<50.0
Benzo(a)anthracene	:	<2.00
Benzo(a)pyrene	:	<2.00
Benzo(b)fluoranthene	:	<2.00
Benzo(g,h,i)perylene	:	<5.00
Benzo(k)fluoranthene	:	<2.00
Chrysene	:	<15.0
Dibenz(ah)anthracene	:	<3.00
Fluoranthene	:	<20.0
Fluorene	:	<20.0
Indeno(123-cd)pyrene	:	<5.00
Phenanthrene	:	<50.0
Pyrene	:	28.1

Other Polynuclear Aromatic Compounds tested:

Carbazole	:	<100
Naphthalene	:	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

TABLE 4: SUMMARY OF 8310 DATA

Sample: 88080242

Source: BB-2 2-3'
Description: SUPERIOR LAGOON SOIL

Date Collected: 08/04/88
Date Received: 08/06/88

Date Extracted: 08/11/88
Date Analyzed: 08/30/88

Clean up Method

silica gel clean-up	✓ yes	___ no
florisil clean-up	___ yes	___ no
alumina clean-up	___ yes	___ no
sulfur clean-up	___ yes	___ no

Polynuclear Aromatic Hydrocarbons

Acenaphthene	<100
Acenaphthylene	<100
Anthracene	<50.0
Benzo(a)anthracene	<2.00
Benzo(a)pyrene	<2.00
Benzo(b)fluoranthene	<2.00
Benzo(g,h,i)perylene	<5.00
Benzo(k)fluoranthene	<2.00
Chrysene	<15.0
Dibenz(ah)anthracene	<3.00
Fluoranthene	<20.0
Fluorene	<20.0
Indeno(123-cd)pyrene	<5.00
Phenanthrene	<50.0
Pyrene	<20.0

Other Polynuclear Aromatic Compounds tested:

Carbazole	<100
Naphthalene	<100

The above results are reported in ug/Kg.

All 8310 identifications are from retention data only.

APPENDIX C

KEYSTONE INSPECTION REPORTS

PRECONSTRUCTION MEETINGS

KOPPERS COMPANY, INC.
SUPERIOR, WI

SURFACE IMPOUNDMENT CLOSURE
EPA I.D. NO. WID006179463
PROJECT 178275-04

MEETING NO. 1

DATE: Wednesday, September 7, 1988

LOCATION: J. R. Jensen's office - Superior, Wisconsin

PRESENT: Keith Jensen - President, Jensen & Son
David Shaw - Plant Manager, Koppers Company, Inc.
Walt Kuenzi - Project Manager, Keystone Environmental Resources, Inc.

The following items were discussed.

1.1 **Koppers Team** - David Shaw, Koppers Plant Manager, will serve as Construction Coordinator and Resident Inspector. Assisting him locally will be Fred TePaske from STS (soil testing, etc.) and John Hinzmann from Seaway Engineering (surveying). Also serving to assist in overall project conformance, technical approvals, and certifications will be Richard Van Tassel and Walt Kuenzi from Keystone Environmental Resources, Inc.

1.2 **Contractor's Team** - Keith Jensen outlined his firm's plans for manning the project. Dale Piper will serve as site foreman, with equipment operators Bruce Buchanan and Clyde Fuller, laborers Joe Kutzler and Van Korhonen serving as the field nucleus. Truck drivers and hauling will be sublet to a local trucking firm. Keith and Jeff Jensen will serve as backup. Floyd Johnson will also assist as required.

1.3 **Scope of Work** - The plans and specifications were thoroughly reviewed to clear up any questions. The division of work (contractor's work, owner's work, work by others) was reiterated and the sequencing of all activities was established.

1.4 **Borrow Pits** - Keith Jensen, from J. R. Jensen & Son, Inc. (contractor), explained that obtaining clay from Koppers plant site would present problems that favor alternate sources. As a result, it was agreed to abandon plans to secure Koppers supplied clay. Potential sources of drainage materials and topsoil were also discussed. Samples of these materials were already on hand for inspection.

1.5 **Schedule** - A bar graph schedule was developed for all major categories of work after details pertaining to each element were reviewed, time estimates established, etc. Copy of the schedule is attached.

1.6 **Reporting** - It was agreed that David Shaw would prepare the **Daily Field Letter** and fax it to Monroeville each day. The purpose of this letter is to document all field activities, keep others informed, and to serve as part of the final construction report. A blank copy of this form is attached.

1.6.1 **Progress Meetings** - Weekly construction meetings will be called by David Shaw to review schedule, cost, and resolve any problems. Representatives from Jensen, STS, and possibly Seaway are to attend. Keystone representation will also occur at certain milestones. The Construction Coordinator will prepare and distribute a written report of each meeting.

1.7 **HDPE Liner** - Contractor advised that the liner work would be subcontracted to GeoSynthetics, Inc. (GSI), an experienced liner installer. The material would be procured from National Seal Company. Mr. Robert Brost of GSI was contacted (414/542-5523) to reconfirm that the work has been authorized, that shop production of the material should be released, etc. Mr. Brost was also reminded to submit various information to Koppers for transmittal to Wisconsin's DNR. (Koppers will follow up with a letter direct to GSI highlighting what is required).

1.8 **Geotextiles** - Contractor offered to supply a fabric manufactured by TREVIRA, style no. 1135. Several alternate geotextiles may also be submitted for consideration.

1.9 **Health & Safety** - It was acknowledged that all members of contractor's field personnel would receive the basic 24-hour Hazardous Workers Operations Training, and that all requirements of the project Health and Safety Plan that formed part of the bid document would be followed.

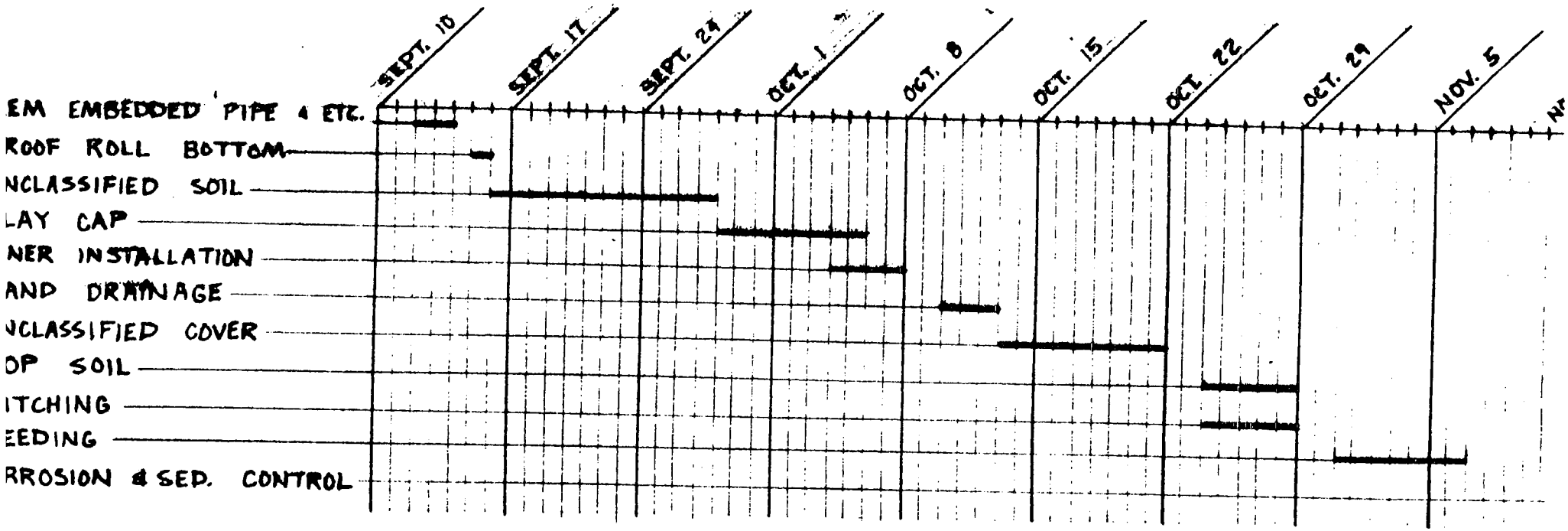
David Shaw
Koppers Company, Inc.

WK:ss
Attachments
cc: W. Kuenzi
R. Morosky
J. L. Stephenson
R. Van Tassel
J. R. Jensen & Son
STS Consultants
Seaway Engineering

KOPPERS

WORK SCHEDULE
POND CLOSURE

DATE: 9-9-88



FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. _____

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: _____ /DATE: _____

WEATHER: _____

TEMP. Lo_____ Hi_____

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES

TOTAL _____ MEN

EQUIPMENT IN USE: _____

FIELD TESTING/SAMPLING ACTIVITIES: _____

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC. _____

SUPERIOR PROJECT DIRECTORY

PROJECT NO 178275-04

CONSTR COORDINATOR & RESIDENT INSPECTOR (also owners repr & Koppers Plant Mgr) — DAVID SHAW (715) 392-22
back-up: WARREN DOLSE
back-up: JOHN HELLE

CONTRACTOR FOR FILL & CAP
J.R JENSEN & SONS INC.
814 21st AVE EAST
SUPERIOR WI 54880
tel (715) 398-6626

president: KEITH JENSEN
back up JEFF JENSEN
back up FLOYD JOHNSO
field supr - DALE PIPER
equip operator - BRUCE BUCHK
" " - CLYDE FULLE
laborer JOE KUTZLE
" VAN KORHON
hauling - sublet

(HDPE LINER TO BE FURNISHED & INSTALLED BY A SUB-CONTRACTOR TO JENSEN)

TESTING LAB FOR SOILS & COMPACTION — FRED TEPASK
STS CONSULTANTS
2820 BELKNAP ST
SUPERIOR WI 54880
Tel (715) 392-9006

SURVEYOR (SURVEY AFTER EACH UNIT OF WORK) — John HINZMA
SEAWAY ENGINEERING & LAND CO
831 E 2ND ST.
DULUTH MN 55805
Tel (218) 722 0547

KEYSTONE CONTACTS.
RON MOROSKY 412-733-9445

DICK VAN TASSEL " " 9531

WALT KUENZI " " 9489

KOPPERS PURCHASING DEPT " 227-2718

PRECONSTRUCTION MEETINGS

KOPPERS COMPANY, INC.
SUPERIOR, WI

SURFACE IMPOUNDMENT CLOSURE
EPA I.D. NO. WID006179463
PROJECT 178275-04

MEETING NO. 2

DATE: Thursday, September 8, 1988

LOCATION: STS's office and lab, Superior, WI.

PRESENT: Fred TePaske, STS Consultants
R. Van Tassel and Walt Kuenzi - Keystone Environmental Resources, Inc.

2.1 Keystone Environmental Resources, Inc. has retained STS Consultants (geotechnical group) to provide sampling, laboratory analysis, field testing, and observation of construction during various phases of the work to assure conformance with plans and specifications.

2.2 Mr. Fred TePaske was given a thorough overview of the project (scope of work, key participants, etc.). The sequence of field activities and the construction schedule were covered to clearly show STS what would be expected as to the extent of their participation (testing and inspection frequencies, etc.). Mr. TePaske advised that STS services would be provided in a timely fashion to serve the project needs.

2.3 "Reporting requirements" were covered with STS, and they are to report to David Shaw each time they visit the site. In addition to providing information for the Daily Field Letter, STS is to provide both Shaw and Kuenzi, from Keystone, with prompt copies of all test results, reports, and recommendations.

2.4 The availability of unclassified fill, clay, drainage, and topsoil were discussed. The need for early sampling and analysis was readily acknowledged. Mr. TePaske's experience in the Superior area will be beneficial in identifying suitable borrow sources.

2.5 The afternoon was spent in visiting the job site and later to visit a potential borrow pit area to obtain unclassified fill and clay samples. A possible source of drainage material was also visited but the preliminary consensus was not favorable (material too fine with too much silt). Contractor was subsequently advised to submit or identify alternate sources for the drainage material.

2.6 The meeting with STS was concluded with a reiteration of scheduled site activities that will require STS's presence starting with proof-rolling - scheduled for Wednesday, September 14, 1988.

R. Van Tassel, P.E.
Keystone Environmental Resources, Inc.

W. Kuenzi, P.E.
Keystone Environmental Resources, Inc.

WK:ss

PRECONSTRUCTION MEETINGS

KOPPERS COMPANY, INC.
SUPERIOR, WI

SURFACE IMPOUNDMENT CLOSURE
EP I.D. NO. WID006179463
PROJECT 178275-04

MEETING NO. 3

DATE: Friday, September 9, 1988

LOCATION: Seaway Engineering Company, Duluth, MN

PRESENT: John Hinzmann, Jr. - Seaway
R. Van Tassel, Walt Kuenzi - Keystone Environmental Resources, Inc.

3.1 Keystone representatives met with Seaway to review the project and cover the survey services that will be required to satisfy the needs of the work plan. Reference drawings and specifications will be mailed to Seaway shortly.

3.2 Basic surveying services will establish points to be used to set up grids and cross-section locations. In addition to the initial survey to establish elevations after proof-rolling, Seaway will visit the site periodically as required to confirm proper grade elevations at the completion of placing each class of material. Seaway will also perform quantity computations to determine actual volume on of material in-place for review and approval of Keystone.

3.3 Organizational relationships between Koppers, Keystone, Jensen, and STS were covered. It was agreed that Seaway's day-to-day contact should be directly with David Shaw, while copies of all field notes, surveys, and quantity determinations should be given both to David Shaw and to W. Kuenzi from Keystone.

3.4 John Hinzmann, Jr. was advised to block out time on Seaway's weekly work schedule to serve the needs of the Koppers project. Their first visit to the site is scheduled tentatively for September 14, 1988, to survey the impoundment immediately after proof-rolling. Seaway requested that they be given two/three days notice in advance for future site visits.

R. Van Tassel, P.E.
Keystone Environmental Resources, Inc.

W. Kuenzi, P.E.
Keystone Environmental Resources, Inc.

WK:ss

APPENDIX D

DAILY FIELD REPORTS

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 1

TO: REMEDIAL SERVICES

FROM: Joseph E. Rozum

LOCATION: MRC A408

LOCATION: SUPERIOR

SUBJECT: PROJECT NO. 178275-04

DATE: SEPT 7, 1988

WEATHER: EXCELLENT

TEMP. Lo 46 Hi 66

CONTRACTOR	NO. MEN	SUMMARY OF ACTIVITIES
JENSEN & SON	6	FIRST DAY OF
KOPPERS	1	HAZWOP TRAINING.
		@ DAYS INN. SUPERIOR
		CONDUCTED BY KEYST
		H&S REPRS JIM
		THOMAS & JOE ROZU

TOTAL _____ MEN

EQUIPMENT IN USE: 16mm projector, VIDEO's, OVERheads, complete Array of Personal Protective Equipment (PPE) and monitoring Equipment.

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: FED-EX SHIPMENTS TO PLANT (KOPPERS) @ SUPERIOR TO BE ADDRESSED AS FOLLOWS

KOPPERS CO/ JUNCT COUNTY ROAD A & Z / SUPERIOR WI 54880

PRECONSTR MTG @ JENSEN'S OFFICE

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 2

TO: REMEDIAL SERVICES

FROM: J. M. THOMAS, II

LOCATION: MRC A408

LOCATION: SUPERIOR

SUBJECT: PROJECT NO. 178275-04

DATE: SEPT 8, 1988

WEATHER: _____

TEMP. Lo____ Hi____

CONTRACTOR	NO. MEN	SUMMARY OF ACTIVITIES
JENSEN & SON	5	SECOND DAY OF HAZWOPER TRAINING AT DAYS INN, SUPERIOR CONDUCTED BY KEYSTONE (JOE ROZUM & JIM THOMAS)

TOTAL _____ MEN

EQUIPMENT IN USE: 16mm projector, VIDEO'S OVERHEADS, Complete ARRAY of PPE AND monitoring EQUIPMENT

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: R. VAN TASSEL & WIKUENZI MET W/ STS. VISITED PLANT SITE & VISITED CLAY BORROW SITE FOR SAMPLES. ALSO VISITED BORROW AREA FOR DRAINAGE MATERIALS

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 3

TO: REMEDIAL SERVICES

FROM: Joseph E. Rozum

LOCATION: MRC A408

LOCATION: Superior W.I.

SUBJECT: PROJECT NO. 178275-04

DATE: SEPT. 9, 1988

WEATHER: EXCELLENT - Steady 25mph wind TEMP. Lo 48 Hi 76

CONTRACTOR	NO. MEN	SUMMARY OF ACTIVITIES
Jensen & Son	6	Third Day of
Koppers	1	HAZWOPER TRAINING
		@ Days Inn Superior WI
		Conducted by Keystone
		& Health & Safety - TRAINER
		Joe Rozum

TOTAL _____ MEN

EQUIPMENT IN USE: 16 mm projector VIDEO's, overheads, complete ARRAY of PPE and monitoring equipment

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: R. VAN DASSEL & W. KUENZI MET W/ SEAWAY ENGRG CO (JOHN HINZMANN) TO DISCUSS SURVEY NEEDS ALSO HELD SUMMARY PRECONSTR MTG W/ JENSEN TEAM, STS, & KEYSTONE REPRS.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 4 A

TO: REMEDIAL SERVICES

FROM: John Heller

LOCATION: MRC A408

LOCATION: Superior WI

SUBJECT: PROJECT NO. _____

DATE: 9-12-88

WEATHER: Overcast-/cool

TEMP. Lo 52 Hi 62

CONTRACTOR	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jenson	3	Dug 2 manholes out and removed piping between the lagoons. Late in the day soil compaction and leveling was started. PIPING that runs to pump house was uncovered and is ready to be cut out.

TOTAL 3 MEN

EQUIPMENT IN USE: Backhoe, Soil compactor, Bulldozer

FIELD TESTING/SAMPLING ACTIVITIES: None

COMMENTS:

BY: John Heller

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 4B

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: MONDAY /DATE: 9-12-33

WEATHER: Cloudy, Cool

TEMP. Lo 40 Hi 67

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J.R. JENSEN & SON	3	REMOVED IMBEDDED PIPE
		PROOF ROLL COMPLETED AREAS

TOTAL 3 MEN

EQUIPMENT IN USE: 1 - BACK-HOE
1 - D-6 DOZER
1 - SHEEPS FOOT COMPACTOR

FIELD TESTING/SAMPLING ACTIVITIES:
NONE

COMMENTS: /VISITORS/PHOTOS/TAKEN/ETC. KEITH JENSEN, JEFF JENSEN } J.R. JENSEN & SON
FIRST DAY OF WORK - COMPLETED WET AT SPOTS

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 5

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: TUESDAY /DATE: 9-13-55

WEATHER: BRIGHT, CLEAR, SUNNY

TEMP. Lo 42 Hi 65

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J. R. JENSEN & SON	3	REMOVED IMBEDDED PIPE
		PROOF ROLLED IMPROVEMENT

TOTAL 3 MEN

EQUIPMENT IN USE: 1 - BACK HOE
1 - D-6 DOZER
1 - SHEEPSFOOT COMPACTOR

FIELD TESTING/SAMPLING ACTIVITIES:
NONE

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC. JEFF JENSEN - J. R. JENSEN & SO.
COMPOUND DRYING OUT WITH GOOD WEATHER - SUNNY / CLEAR
DUE IN 9-14-55

D. F. C.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 6

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Wed. /DATE: 9-14-88

WEATHER: BRIGHT, CLEAR, SUNNY

TEMP. Lo 46 Hi 68

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J.R. JENSEN & SON	5	COMPLETED PROOF ROLL OF IMPOUNDMENT BEGAN PLACING UNCLASSIFIED SOIL
SEAWAY ENGINEERING CO	3	COMPLETED POST PROOF-ROLLING SURVEY
ST.S	1	CONDUCTED SURVEY OF WORK BEING DONE AND MADE CERTAIN RECOMMENDATIONS TO JEFF JENSEN CONCERNING SAME

TOTAL 9 MEN

EQUIPMENT IN USE: 1- D-6 DOZER

1- SHEEPSFOOT COMPACTOR

2- DUMP-TRUCKS

FIELD TESTING/SAMPLING ACTIVITIES: FRED TE PASKE CONDUCTED SOME COMPACTION TEST AND DETERMINED THAT TWO PASSES WITH THE SHEEPSFOOT COMPACTOR WERE REQUIRED. IN ADDITION, DUE TO THE MOISTURE CONTENT OF THE BACK-F IT WAS NECESSARY TO DISC MATERIAL TO IMPROVING DRYING CONDITIONS.

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

AN ESTIMATED 300 CY'S OF MATERIAL WAS PLACED IN IMPOUNDMENT. TESTING OF AIR W/ HNU METER WAS CONDUCTED WITH NEGATIVE RESULTS.

BY: W.D. F

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 7

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: THURSDAY /DATE: 9-15-88

WEATHER: Cool, OVERCAST

TEMP. Lo 50 Hi 62

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.P. JENSEN & SON	4	PLACING & COMPACTING UNCLASSIFIED SOIL
STS	1	TESTING COMPACTION
GLOBE TRUCKING	2	TRANSPORTING UNCLASSIFIED SOIL
CHARLES ALLEN TRUCKING	1	
WALT MOSS TRUCKING	1	
M & C TRUCKING	1	

TOTAL 10 MEN

EQUIPMENT IN USE: 1 - D-6 DOZER, 1 - SCRAPER, 1 - D-6 DOZER W/ DISC, 5 - DUMP TRUCKS, 1 - SHEEPS FOOT COMPACTOR

FIELD TESTING/SAMPLING ACTIVITIES: FIELD TO PASS CONDUCTED A TOTAL OF 12 COMPACTION TESTS OVER TWO LIFTS. ALL TEST MET OR EXCEEDED SPECIFICATIONS. TESTING OF AIR W/ HNU METER WAS CONDUCTED WITH NEGATIVE RESULTS.

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

AN ESTIMATED 1100 CY'S OF UNCLASSIFIED FILL WAS PLACED IN IMPOUNDMENT. WORKED FROM 7:00 AM TO 6:30 PM JOHN HELLER (KOPPERS) HAS BEEN TAKING PHOTOS OF JOB

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 8

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: FRIDAY /DATE: 9-16-88

WEATHER: RAIN

TEMP. Lo 56 Hi ____

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
		NO WORK THIS DATE DUE TO INCLEMENT WEATHER

TOTAL ____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 9

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday DATE: 9/19/88

WEATHER: Rain

TEMP. Lo 54 Hi ____

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
NO Work this date due to inclement Weather		

TOTAL ____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 29

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thursday /DATE: 10-13-6

WEATHER: Cool Clear

TEMP. Lo 37 Hi 62

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
GSI	4	tested seams repaird places where samples were taken and sealed any seams that leaked

TOTAL 4 MEN

EQUIPMENT IN USE: Extrusion gun
Air tester
Vacumm tester

FIELD TESTING/SAMPLING ACTIVITIES:

tested seams with air & vacuum

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 30

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Friday /DATE: 10-4-8[illegible]

WEATHER: Warm clear

TEMP. Lo 40 Hi 68

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
JR Jensen	5	Hauled sand for
Grube	2	drainage layer laid
Mess	1	out drain pipe, laid
M+C	1	out geo tex layer

TOTAL 9 MEN

EQUIPMENT IN USE: D-6 cat
Small cat
5 trucks

FIELD TESTING/SAMPLING ACTIVITIES:
none

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

D-Dl Sh 1

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 10

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. [illegible]

DAY: Tuesday /DATE: 9/20/88

WEATHER: Cool, overcast

TEMP. Lo 40 Hi 48

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J R Jensen & Sons	4	We received 3.71 inches of rain last night, Jensens crew unloaded geo-fabric and stripped the east dike of veg. They were going to disk the bottom if the sun came out - it didn't. We are in the process of dewatering the lagoon

TOTAL 4 MEN

EQUIPMENT IN USE: 2 - D-6 Dozer

FIELD TESTING/SAMPLING ACTIVITIES: NONE

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Weather is supposed to clear tonight but another front is supposed to be in Thursday with possible rain.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 11

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Wed's /DATE: 9/21/8

WEATHER: Cool Overcast

TEMP. Lo 45 Hi 57

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jenson + Son	2	Disked center area to dry, left before 10:30 A came back later in day and sealed the disked area

TOTAL 2 MEN

EQUIPMENT IN USE: [redacted] 1-D-6 Dozer w/Disc

FIELD TESTING/SAMPLING ACTIVITIES: NONE

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

20% chance of rain tonight

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 12

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thurs /DATE: 9/22/88

WEATHER: Wet, Fog, cool, 100% Humidity TEMP. Lo 50 Hi ____

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J R Jensen & Son	0	will not work today due to weather

TOTAL 0 MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES: None

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC. Supposed to clear up this after noon

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 13

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Friday /DATE: 9/23/6

WEATHER: dry windy

TEMP. Lo 49 Hi 60

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J R Jenson & Son	2	worked the area with a disk, moved the wetter clay on the side of the b recompacted the disked clay
STS	1	

TOTAL 2 MEN

EQUIPMENT IN USE: 1 D-6 Dozer w Disc
1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES: Fred T. Paske conducted the final 3 test on the third lift, all test met or exceeded specifications

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 14

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Sat /DATE: 9/24/8

WEATHER: dry clear except a short rain shower around noon

TEMP. Lo 50 Hi 65

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen & Son	4	Placing & compacted unclassified soil, portion of the east bank in the impoundment
Mass Trucking		
Allan Trucking		
Grube Trucking		

TOTAL 4 MEN

EQUIPMENT IN USE: 1-D-6 Dozer with Disc 5 trucks

1-D-6 Dozer

1 sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

No testing

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

An estimated 744 C.Y's unclassified fill was placed in the impoundment

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 15

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 9/25/88

WEATHER: Cool wet rained Sunday night + 50% chance for today cloudy

TEMP. Lo 45 Hi [redacted]

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen	2	Scrapped back areas for soil testing, then went home.
STS	1	

TOTAL 3 MEN

EQUIPMENT IN USE: D-6 Dozer

FIELD TESTING/SAMPLING ACTIVITIES:

STS ran 10 test on the two lifts put in saturday (4 + 5 th lifts) all test met or exceeded specifications

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

will let it dry today supposed to clear up to night

FAX DAILY TO W. KUENZI

cc: R. Vanessel

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. [redacted]15

TO: REMEDIAL SERVICES FROM: David Shaw

LOCATION: MRC A408 LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04 DAY: Tuesday /DATE: 9/26/88

WEATHER: Cool Cloudy TEMP. Lo 47 Hi 57

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen	4	Placing + compacting uncontaminated soil
STS	1	648 Yards of material placed
Moss	1	
Allan	1	
Grube	1	

TOTAL 9 MEN

EQUIPMENT IN USE: 1 - D-6 Dozer with Disc 4 trucks

1 D-6 Dozer

1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

STS Ran & test all ment or exceeded specifications

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

took photos

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 16

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Wed /DATE: 9/27/8[illegible]

WEATHER: Cool Cloudy

TEMP. Lo 32 Hi 49

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jansen	3	Placing and Compactin
STS	1	unclassified soil pushing
Mass	1	east dike into impoundment
Alker	1	744 yards of material
Grube	3	placed

TOTAL 9 MEN

EQUIPMENT IN USE: 1 D-6 Dozer with Disc 5 Trucks
1 D-6 Dozer
1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

STS ran 4 test all met or exceeded specs

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 17

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thur /DATE: 9/27/88

WEATHER: Rain

TEMP. Lo 43 Hi 59

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
		Did Not work

TOTAL _____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 18

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: FRI /DATE: 9/30/8

WEATHER: Cloudy Cool

TEMP. Lo 42 Hi 58

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen	2	Shaped Fill to grade

TOTAL 2 MEN

EQUIPMENT IN USE: 1 D-6 Dozer with Disc
1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

NONE

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 19

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Sat /DATE: 10-1-[redacted]

WEATHER: Cloudy Cool

TEMP. Lo 35 Hi 50

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jensen	2	Shaped fill to grade

TOTAL 2 MEN

EQUIPMENT IN USE: 1 D-6 Dozer with Disc
1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

None

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 20

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Sun /DATE: 10-2-8

WEATHER: Cloudy Cool

TEMP. Lo 37 Hi 49

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jansen	2	Finish putting unclassified material to contours shown on plan

TOTAL 2 MEN

EQUIPMENT IN USE: 1 D-6 Dozer with Disc
1 Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

None

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 21

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 10-3-88

WEATHER: Wet

TEMP. Lo 30 Hi 51

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
		Rained Sunday night allowed the area to dry

TOTAL ____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS; /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 22

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Tuesday DATE: 10-4-8

WEATHER: Cool Cloudy

TEMP. Lo 25 Hi 49

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J R. Jensen & Sons	3	Started on the clay
STS	1	cap put in about
Grbe	3	3/4 of a lift
Moss	1	86 truck loads of
M+C	1	material (1032 yards

TOTAL 9 MEN

EQUIPMENT IN USE: D-6 Cat with Disc 5 Trucks
1 Sheep foot compactor
D-6 Cat

FIELD TESTING/SAMPLING ACTIVITIES:

3 Field samples by STS all test passed sent in lab samples

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

took photos

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 23

TO: REMEDIAL SERVICES FROM: David Shaw

LOCATION: MRC A408 LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04 DAY: Wed's /DATE: 10-5-8

WEATHER: Cool Sunny TEMP. Lo 21 Hi 47

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen & Sons	2	Worked in clay
STS	1	Cap completed first
Gould	3	lift & about 3/4 of
Moss	1	2d lift
M&C	1	96 truck loads (1152 yds)

TOTAL 8 MEN

EQUIPMENT IN USE: D-6 Cat

Sheeps foot Compactor

FIELD TESTING/SAMPLING ACTIVITIES:

4 Field test by STS all test passed

Sent in lab Samples

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 24

TO: REMEDIAL SERVICES FROM: David Shaw

LOCATION: MRC A408 LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04 DAY: Thurs /DATE: 10-6-88

WEATHER: Cool Sunny TEMP. Lo 30 Hi 54

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
T. R. Jensen & Sons	2	Worked on clay
STS	1	Comp
Grube	48	
Mass	1	103 truck loads (1236 yd
M+C	1	

TOTAL 9 MEN

EQUIPMENT IN USE: D-6 Cat
Sheeps foot Compacter

FIELD TESTING/SAMPLING ACTIVITIES:

3 Field test by STS + lab Samples

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

cc R. Morosky
R VanTassel

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 25

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Fri /DATE: 10-7-88

WEATHER: Cool Sunny

TEMP. Lo 42 Hi 61

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J R. Jensen	3	Worked on and
Grube	3	Finished clay cap
Moss	1	brought to grade
M+C	1	65 loads of clay (780 cy
		5 trucks

TOTAL 8 MEN

EQUIPMENT IN USE: D-6 cat
Sheeps Foot Compactor
Road grader

FIELD TESTING/SAMPLING ACTIVITIES:

None

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 26

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 10/10/88

WEATHER: Clear Sunny

TEMP. Lo 43 Hi 54

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J R. Jensen	3	Brought in sand to
GST	4	smooth out rough spots
		in clay cap started
		digg trench for liner
		GSI assessed job + got ready Equip.

TOTAL 7 MEN

EQUIPMENT IN USE: Back hoe
Roadgrader

FIELD TESTING/SAMPLING ACTIVITIES:

5 Compaction test by STS and two lab samples taken, took samples of HDP Liner

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken site visit by Dick VanTassel

FAX DAILY TO W. KUENZI

RECEIVED
OCT 19 1988
KEYSTONE ENVIRONMENTAL RESOURCES, INC.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Tues /DATE: 10/11/88

WEATHER: Cool Clear

TEMP. Lo 27 Hi 53

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen	4	cut trench, finished grading cap, used backh to unroll HDP liner G.S installed 16 panels and sealed 16 seams
GSI	4	

TOTAL 8 MEN

EQUIPMENT IN USE: Backhoe, Roadgrader, Front end loader

GSI used two Seamers

FIELD TESTING/SAMPLING ACTIVITIES:

STS observed seaming process -

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

R. Van Tassel on site to observe liner placement work in progress. Temperature 41°F above ground @ 9:00 am when the geomembrane test strip was run Seaming panels about 10:30

11/10.5

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 28

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Weds DATE: 10/12/18

WEATHER: Cool Clear

TEMP. Lo 18 Hi 54

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen	2	Installed rest of
GSI	4	panels and started
		testing seams

TOTAL 6 MEN

EQUIPMENT IN USE: two Seamers
Front end loader

FIELD TESTING/SAMPLING ACTIVITIES:

STS took seam samples

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Did not start seaming until temp above liner reached 44° Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 31

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 10-17-88

WEATHER: _____

TEMP. Lo 39 Hi 47

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J-R Jensen	3	Hauled Sand for drainage layer and put out Geotextile
Gnbt	3	
Mass	1	
M+C	1	

TOTAL 8 MEN

EQUIPMENT IN USE: 2 Dozers
5 Trucks

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 32

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: TUE /DATE: 10-18-88

WEATHER: Light rain

TEMP. Lo 37 Hi 48

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jenco	4	
Seaway Eng		
		Finished hauling SAND for DRAINAGE Layer. Seaway Eng shot elevations on South PART of lagoons. Started putting geo-tex layer and clay cap on South lagoons

TOTAL 4 MEN

EQUIPMENT IN USE: 2 - Dozers - Trucks hauling

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 33

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Wed /DATE: 10/19/0

WEATHER: Cool

TEMP. Lo 37 Hi 42

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jansen	4	Graded sand layer and installed two drain outlets into west ditch

TOTAL 4 MEN

EQUIPMENT IN USE: Small Cat backhoe

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 34

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thur /DATE: 10/20/88

WEATHER: _____

TEMP. Lo 22 Hi 35

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J R Jensen	2	Hauled clay for the unclassified and the drainage layer compacted clay
Grubb	3	
Moss	1	
MRC	1	

TOTAL 7 MEN

EQUIPMENT IN USE: D-6 cat

sheeps foot compactor

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Jim Butcher (Koppers) Rob Anderson Keystone took photos

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 35

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Friday /DATE: 10/29/

WEATHER: Rainy

TEMP. Lo 24 Hi 40

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
Did Not Work		

TOTAL ____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KOENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 36

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 10/24/9

WEATHER: Cool / over cast

TEMP. Lo 33 Hi 41

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jensen	2	hauled for about
Grube	3	three hours in morning
Mass	1	the backhoe at the
M+C	1	borrow bit broke down
		5 Trucks

TOTAL 7 MEN

EQUIPMENT IN USE: D-6
Sheeps foot

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.
Took Photos

D. Shaw

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 37

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Tuesday /DATE: 10/25/88

WEATHER: Cold

TEMP. Lo 29 Hi 32

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J R Jansen	2	
Grube	7	hauled & compacted
Moss	2	unclassified with 11
M+C	2	trucks completed the
		first lift 255 truck
		loads

TOTAL 13 MEN

EQUIPMENT IN USE: D-6 Cat

Sheeps foot

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC. Used 11 trucks

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 38

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Weds /DATE: 10/26/99

WEATHER: Cool

TEMP. Lo 22 Hi 32

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R Jansa	3	hauled and completed
Grobe	1	unclassified with
Mass	2	11 trucks, almost
M+C	2	completed unclassified

TOTAL ~~14~~ 11 MEN

EQUIPMENT IN USE: D-6 Cat

Sheeps foot

FIELD TESTING/SAMPLING ACTIVITIES:

STS Rep 5 test all passed

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

~~STS Rep 5 test~~ Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 37

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thur /DATE: 10/27/8

WEATHER: Rain

TEMP. Lo 27 Hi 37

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J. R Jansen	3	
Cribb	7	Worked until about
Mass	2	10:00 AM hauling &
M & C	2	compacted unclass. fill
		was rained out

TOTAL 15 MEN

EQUIPMENT IN USE: D-6
sheeps foot

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 40

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Friday /DATE: 10/28/88

WEATHER: Cool

TEMP. Lo 31 Hi 40

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J R Jansen	2	
Grube	3	Finished unclass. fill
Moss	1	layer & dressed
M+C	1	to grade

TOTAL 7 MEN

EQUIPMENT IN USE: D-6 sheepsfoot

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

D Shaw

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 41

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 10/31/8

WEATHER: Cool Damp

TEMP. Lo 27 Hi 45

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
J. R. Jensen	2	ran 11 trucks hauled top soil until 200 PM borrow site became too soft to get trucks out
Garbe 3		
CM Wall Inc		
Cur / Corp		
McKinney		
M Germano		
Olson-2		
Alm-2		

TOTAL 13 MEN

EQUIPMENT IN USE: D-6 cat 11 trucks

FIELD TESTING/SAMPLING ACTIVITIES:

Seaway Eng ran elevations on unclassified Fill

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

DAILY FIELD LETTER

REMEDIAL SERVICES

LTR. NO. 42

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Tuesday /DATE: Nov 1

WEATHER: _____

TEMP. Lo_____ Hi_____

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
		Did not work equipment problem could not get into borrow site

TOTAL _____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 43

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Wed /DATE: Nov 2

WEATHER: Cool Cloudy

TEMP. Lo 28 Hi 42

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
JR Jansen	2	hauled in [redacted] top
11 trucks as		Sand 146 loads
in Report 42		

TOTAL 13 MEN

EQUIPMENT IN USE: D-6 used in afternoon

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 44

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Thur /DATE: Nov 3

WEATHER: Cool Cloudy

TEMP. Lo 25 Hi 40

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J.R. Jensen 11 trucks	2	hauled top soil + graded

TOTAL 13 MEN

EQUIPMENT IN USE: D-6

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 45

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Nov 4 /DATE: Friday

WEATHER: Cool misty rain in afternoon

TEMP. Lo 28 Hi 45

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
T.R. Jensen 11 truks	2	Finished hauling top soil and worked to rough grade

TOTAL 13 MEN

EQUIPMENT IN USE: D-6 cat 11 truks

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

Photos taken

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 46

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Monday /DATE: 11/7/88

WEATHER: Cool/ Snow on ground

TEMP. Lo 24 Hi 39

CONTRACTOR/S	NO. MEN	SUMMARY OF ACTIVITIES
J R Jensen	2	Worked on the ditch that Runs on the east side of old lagoon

TOTAL 2 MEN

EQUIPMENT IN USE: D-6 + Ditching backhoe

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

FAX DAILY TO W. KUENZI

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
DAILY FIELD LETTER
REMEDIAL SERVICES

LTR. NO. 47

TO: REMEDIAL SERVICES

FROM: David Shaw

LOCATION: MRC A408

LOCATION: Superior, WI

SUBJECT: PROJECT NO. 178275-04

DAY: Tuesday /DATE: 11/8/9

WEATHER: _____

TEMP. Lo_____ Hi_____

CONTRACTOR/s	NO. MEN	SUMMARY OF ACTIVITIES
		Did Not Work

TOTAL _____ MEN

EQUIPMENT IN USE:

FIELD TESTING/SAMPLING ACTIVITIES:

COMMENTS: /VISITORS/PHOTOS TAKEN/ETC.

W. Kuenzi inspected site w/ D. Shaw. Also, had review mtg. w/ STS (Te Paske) & later w/ Jensen Const. regarding completion of the work (disk, seed, & mulch (Defer til spring '89)

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers

Day/Date 9-7-88

Location Superior, Wisc.

Weather/Temp Sunny 70's

Contractor J. R. Jenson

Client Keystone

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage _____

Arrive Job _____

Depart Job _____

Total Hours on Job 1.0

Lab Time _____

Travel Time _____

TOTAL CHARGEABLE HOURS 1.0

4 HOUR MINIMUM ✓

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Called Contr. to see about source for materials, so we can get samples; start testing. Did not have any sources lined up. Also talked to Walter Kulonz from Keystone, met on 9-8 to go over job requirement, also talked about testing of materials.

*☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By Fred LaPorte
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers

Day/Date 9-9-88

Location Superior, Wisc

Weather/Temp. Sunny 70's

Contractor J.L. Jansen

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage

Arrive Job 12:30

Depart Job 2:30

Total Hours on Job 2.0

Lab Time

Travel Time

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 2.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to Pre-Construction Meeting, went over design, material, testing, job requirement & other things. Returned to office.

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 945800

Project Koppers
Location Superior, Wisc.
Contractor R. Johnson & Son

Day/Date 9-8-82
Weather/Temp Sunny 70's
Client Keystone

Equipment Rental
Tolls $
Parking $
Mileage 50

Arrive Job 11:00 1:00
Depart Job 12:00 5:00
Total Hours on Job 5.0
Lab Time
Travel Time

TOTAL CHARGEABLE HOURS — 4 HOUR MINIMUM
5.0 ✓

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Met with Walter K. & Dick V.T., went over plans & Types of Materials, Also job Requirement. Went to Johnson office & Talked to Keith & went to plant & looked over site. Went to Clay Borrow site & took sample of clay with Auger. Went to Pattison Area to look at Material for Drainage layer, Material was Fine Sand. Returned to Plant; Then Back to office.

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By Fred LeRoux
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers

Day/Date 9-12-88

Location Superior, Wisc.

Weather/Temp.

Contractor J.R. JENSON

Client KEYSTONE

Equipment Rental

Arrive Job

Tolls $

Depart Job

Shipping $ 18.80

Total Hours on Job

Mileage

Office Time 1.0

Travel Time

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS ✓ 1.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

TALKED TO Keith Jenson ABOUT SOURCE of GP Type MATERIAL & WHAT it WAS - CAN NOT FIND Pit. WROTE up INSTRUCTION for CLAY, PACKAGED & SHIPPED TO MINN.

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By Fred Schaub
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project KOPPERS CO.

Day/Date 9-14-88

Location SUPERIOR, WISC.

Weather/Temp. SUNNY - 70'S

Contractor J.R. JOHNSON

Client KEYSTONE

Equipment Rental

Arrive Job 3:30

Depart Job 4:30

Tolls $

Total Hours on Job 1.0

Parking $

Lab Time

Mileage 20

Travel Time 05

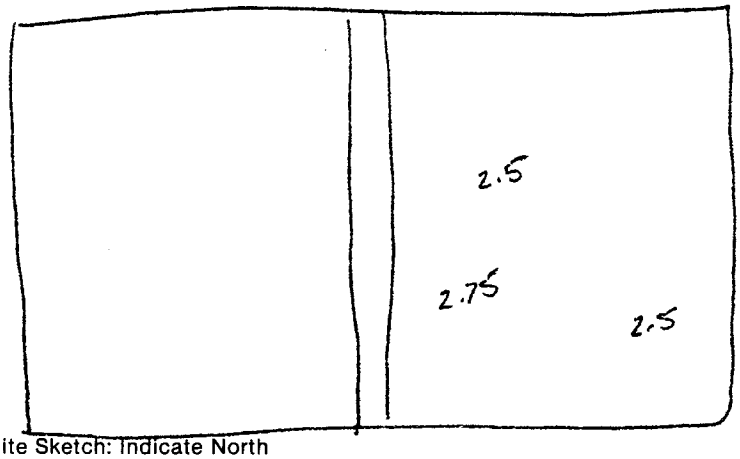
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.5 ✓

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, OBSERVED PLACEMENT OF FIRST LIFT OF CLAY, IN SOUTH CELL, CONDUCTED PENETROMETER TO GET IDEA OF HOW IT WAS COMPACTING - TALKED TO CONTR; DONNY FRANKS, CLAY WAS A LITTLE ON WET SIDE, HAD READINGS OF 2.5 TO 2.75 AFTER 2 PASSES WITH SHEEPS FOOT, RETURNED TO OFFICE.



Site Sketch: Indicate North

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 9A580

Project Koppers Co.

Day/Date 9-15-88

Location Superior, Wisc.

Weather/Temp. Cloudy - 60's

Contractor J. R. Jenson.

Client Keystone

Equipment Rental Nuclome 3.0 Hrs

Arrive Job 3:00

Tolls $

Depart Job 5:30

Parking $

Total Hours on Job 2.5

Mileage 20

Lab Time

Travel Time 0.5

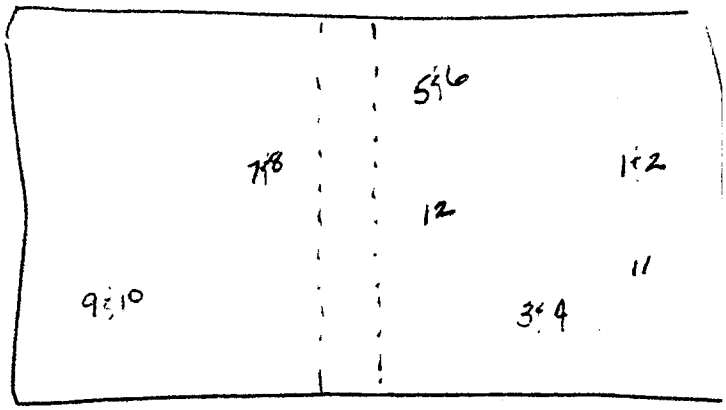
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM ✓

3.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated

Went to site, conducted in Field Density Test on Soil Fill, All met 95% Compaction Requirement, Tests were conducted on 3 lifts on North side; 2 lifts on South side. Talked to Contr; Donny Franks with Keystone. Returned to office.



*☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North →

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 9-19-88

Location Superior, Wisc

Weather/Temp. Rain 60's

Contractor T. L. Johnson

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 9:00

Depart Job 10:00

Total Hours on Job 1.0

~~Lab~~ Office Time 3.0

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM ✓

40

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, Checked ponds after rain, we not in bad shape. Returned to office. Checked over Field Density Tests, Drawed location Plan & Reviewed W.S./DNR Conditional Approval & other paper work

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kopper Co.

Day/Date 9-20-88

Location Superior, Wisc.

Weather/Temp. Cloudy 60's

Contractor J. F. Johnson

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 9:30

Depart Job 11:00

Total Hours on Job 1.5

Lab Time 2.0

Office Travel Time 1.0

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 2.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated

WENT TO SITE, TALKED TO CONTR. WERE PUMPING WATER OUT OF PONDS AFTER RAIN (2.5+") LAST NIGHT. ALSO LOOKED AT SAMPLE FOR DRAINAGE LAYER & TALKED ABOUT TOPSOIL. CONDUCTED GRADATION ON DRAINAGE MATERIAL, CALLED DICK. U.T. WITH RESULTS, WANT US TO GO TO PIT & LOOK OVER, ALSO GOT SAMPLE & CONDUCT OTHER TEST. ALSO WANTED TO KNOW IF WE COULD CONDUCT TEST ON HDPE & NEED CU ON DRAINAGE MATERIAL. TALKED TO JIM O. ABOUT GRADATION & TEST ON HDPE.

*☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 9-21-88

Location Superior, Wisc.

Weather/Temp. Cloudy 50's

Contractor T. K. Johnson

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 85

Arrive Job 10:00 1:30

Depart Job 10:00 3:30
1 2

Total Hours on Job 3.0

Office Lab Time 1.0

Travel Time 2.0

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 6.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated

WENT TO SITE, WERE TRING TO WORK CLAY. TALKED TO CONTR ABOUT DRAINAGE MATERIAL, SET TIME TO GO LOOK AT PITS. RETURNED TO OFFICE. DRAWED CURVE & COMPUTED UNIFORMITY OF COEFFICIENT ON DRAINAGE SAMPLE. DROVE TO PIT & MET CONTR., LOOKED AT TWO PITS & TOOK SAMPLE, RETURNED TO OFFICE.

*☐Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kopper Co.

Day/Date 9-22-88

Location Superior, Wisc.

Weather/Temp. LT RAIN 50'S

Contractor J. L. Jonson

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage

Arrive Job

Depart Job

Total Hours on Job

Lab Time 6.0

Office ~~Travel~~ Time 1.0

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 1.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

TALKED TO CONTR ABOUT TOPSOIL & DRAINAGE MATERIAL. TALKED TO DICK JAN TASSEL ABOUT DRAINAGE MATERIAL, FABRIC & OTHER ITEMS ABOUT JOB. CONDUCTED STD PROCTOR ON DRAINAGE & PERMEABILITY ON DRAINAGE MATERIAL.

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.
Day/Date 9-23-88
Location Superior, Wisc.
Weather/Temp. Sunny 60's
Contractor J. R. Johnson
Client Keystone

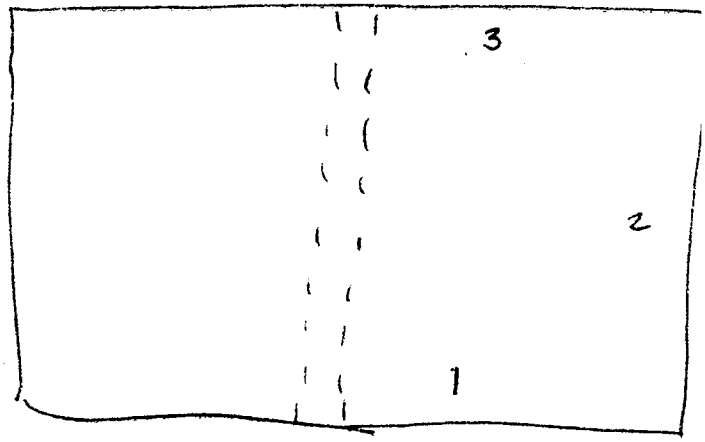
Equipment Rental Nuclear 2.5 Hrs
Tolls $
Parking $
Mileage 40

Arrive Job 9:30 4:00
Depart Job 11:30 (2.0) 6:00 (2)
Total Hours on Job 5.5
Office ~~Lab~~ Time 1.0
Travel Time 0.5

TOTAL CHARGEABLE HOURS — 4 HOUR MINIMUM: 5.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Computed form on drainage material from Bellwood Pit, went to site talked to Contr, was doing material, picked up sample of soil fill for lab test; talked to Dave Shaw; returned to office. Talked to Contr, will not be using material from Bellwood Pit, went to site observed rolling of clay for soil fill on North 1/2, conducted 3 field density test, were 95% or better talked to Contr & returned to office.



Site Sketch: Indicate North → N

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Field Representative
Position
Company

By Fred Kebodeaux
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers

Day/Date Mon / 9-26-88

Location Superior, WI

Weather/Temp. Cloudy - 50

Contractor Jensen

Client Keystone

Equipment Rental Nuke 3.0 hrs

Arrive Job 0800

Tolls $ —

Depart Job 1030

Parking $ —

Total Hours on Job 2.5

Mileage 20

Lab Time 0.5

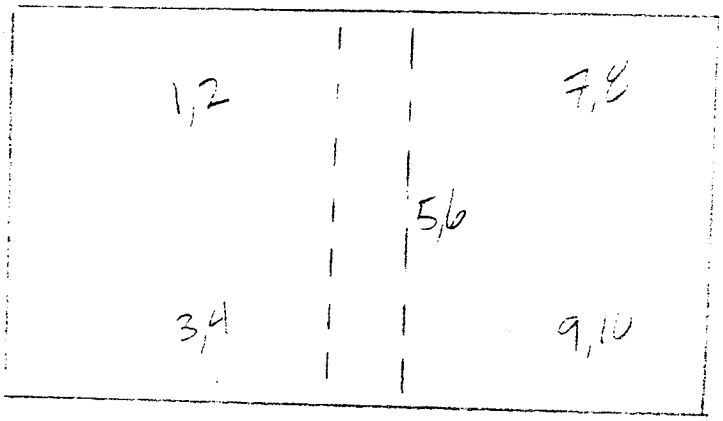
Travel Time 0.5

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 3.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimate

Performed ten (10) field density tests on 4th and 5th lifts of unclassified soil fill placed on 9/24/88. All test results met project compaction requirements. No work today because of wet weather. Also obtained bag samples of soil fill from 4th and 5th lifts for laboratory testing.



*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North N →

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 9458D

Project Koppers
Location Superior, WI
Contractor Jensen

Day/Date Tues 9-27-
Weather/Temp. Cldy / 60's
Client Keystone

Equipment Rental Nuke: 4.0 hrs
Tolls $ —
Parking $ —
Mileage 50

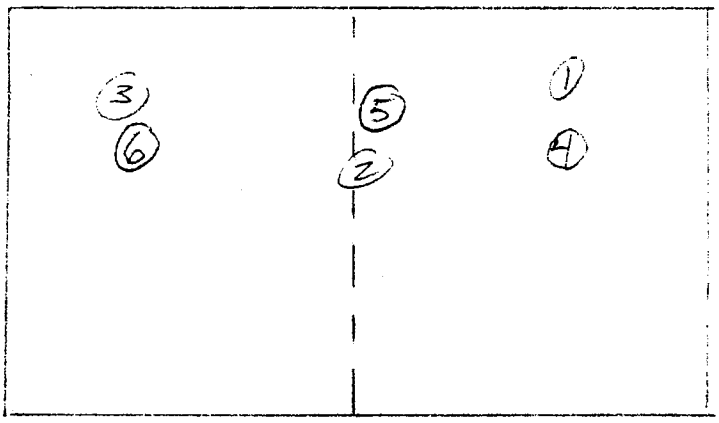
Arrive Job	1230	1430	1750
Depart Job	1300	1530	1825
Total Hours on Job	0.5	1.0	0.75
Lab Time	—	0.5	0.75
Travel Time	—	1.0	0.75

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM: 4.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimate

Three Site Visits This Date: 1) Contractor was placing 6th lift of soil fill in west half of cell, dissing east half of cell - scheduled field density tests for late 2) Performed 3 field density tests on 6th lift of soil fill in west half of cell - results satisfactory. Obtained bag sample representing 6th lift. Contractor was beginning 7th lift of soil fill in west half and dissing east half of cell. 3) Performed 3 field density tests on 7th lift of soil fill in west half of cell - results satisfactory. Obtained bag sample of soil fill from 7th lift.



*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

N →

Field Representative _____
Position _____
Company _____

By _____
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kappers

Day/Date Wed/9-28-88

Location Superior, WI

Weather/Temp. Cldy/50's

Contractor Jensen

Client Keystone

Equipment Rental Nuke: 3,5 mos.

Tolls $ —

Parking $ —

Mileage 30

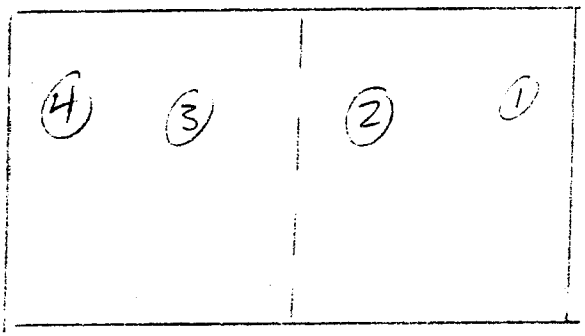
Arrive Job	0930	1330
Depart Job	1100	1430
Total Hours on Job	1,5	1,0
Lab Time	1,0	1,5
Travel Time	—	1,0

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS: 6,0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimate

Two site visits during placement and compaction of 8th lift of unclassified soil fill in west half of cell. Performed four (4) field density tests w/ satisfactory results and obtained bag sample of 8th lift. Obtained quantity of liner and fabric on website and phoned information to Dick Van Tassel w/ Keystone. Lab time for various phone calls regarding laboratory testing of liner.



*☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North N

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers
Location Superior
Contractor Jensen

Day/Date Thurs / 9-29-88
Weather/Temp. Cldy / 50's
Client Keystone

Equipment Rental —
Tolls $ —
Parking $ —
Mileage 10

Arrive Job
Depart Job
Total Hours on Job 2
Lab Time
Travel Time 2

TOTAL CHARGEABLE HOURS (4 HOUR MINIMUM): 4.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

No work on-site due to overnight rain. Obtained sample of proposed drainage fill from Jensen's office, performed gradation on same, phone call w/ Dick Van Tassel @ Keystone,

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 9-30-88

Location Superior, Wisc.

Weather/Temp. Cloudy 60's

Contractor J.L. Johnson

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 10:00

Depart Job 11:30

Total Hours on Job 1.5

Lab Time

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, Wood working on Oring Material, Talked to Contr & Returned to office

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-3-96

Location Superior, Wisc.

Weather/Temp. Cloudy 40's

Contractor A. E. Harison

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 10:00

Depart Job 11:00

Total Hours on Job 1.0

~~Lab~~ Office Time 1.5

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

2.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, WERE NOT WORKING, WAS WET, TALKED TO CONTR, IS CLOSE TO CLAY (CAP E/O), START CLAY ON WED IF WEATHER OK. ALSO DRAINAGE MATERIAL. TALKED TO DICK VAN TASSEL ABOUT DRAINAGE MATERIAL, WANTS MORE SAMPLES FOR GRADATIONS. TOLD HIM RUN FORM. ALSO ABOUT TESTING OF HDPE. # of TEST REQUIRED & WANTS PRICE PER TEST. CALLED CONTR ABOUT GETTING MORE SAMPLES FOR DRAINAGE MATERIAL.

☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-4-88

Location Superior, Wisc.

Weather/Temp. Sunny 50's

Contractor L. P. Larson

Client Keystone

Equipment Rental Nuclome 2.0 Hrs

Tolls $

Parking $

Mileage 20

Arrive Job 2:00

Depart Job 6:00

Total Hours on Job 3.0

Lab Time

Travel Time

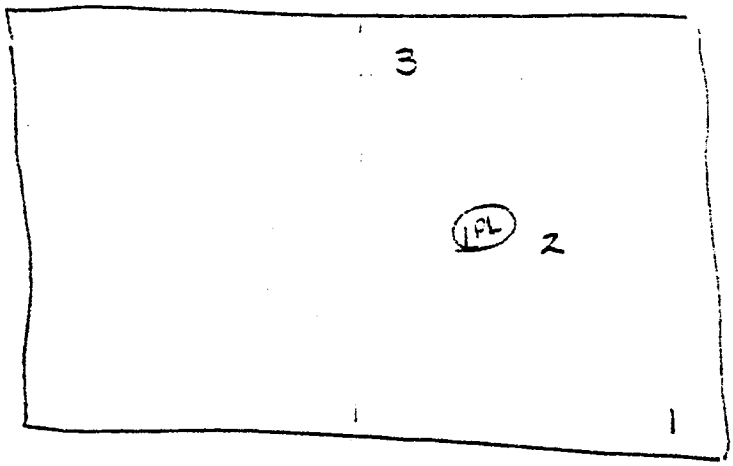
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

3.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Talked to Dick and Tassel, about work on job, Testing on HDPE. Went to site, Conducted 3 Field Density Test on 1st lift of Clay Barrier Material on North Pit, Also Took Sample for Perm; other lab Test. Picked up Samples of Drainage Material; Returned to office



*☐Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North →

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

~~STS~~ Construction Services Group
Field Report

Project No. 94580

Project Kodders Co

Day/Date 10-5-82

Location Superior, Wisc

Weather/Temp. Sunny 50's

Contractor J.K. Larson

Client Keystone

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage _____

Arrive Job _____

Depart Job _____

Total Hours on Job _____

~~Lab~~ Office Time 1.0

Travel Time _____

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Talked to Dick Van Tassel; Contr. about work on job.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 91580

Project KODDERS CO

Day/Date 10-6-92

Location SUPERIOR, WISC

Weather/Temp. SUNNY 50'S

Contractor P. K. NELSON

Client KEYSTONE

Equipment Rental NUCLEAR 2.0 HRS

Arrive Job 9:30

Depart Job 12:30

Tolls $

Parking $

Mileage 30

Total Hours on Job 3.0

~~Lab~~ Office Time 1.0

Travel Time

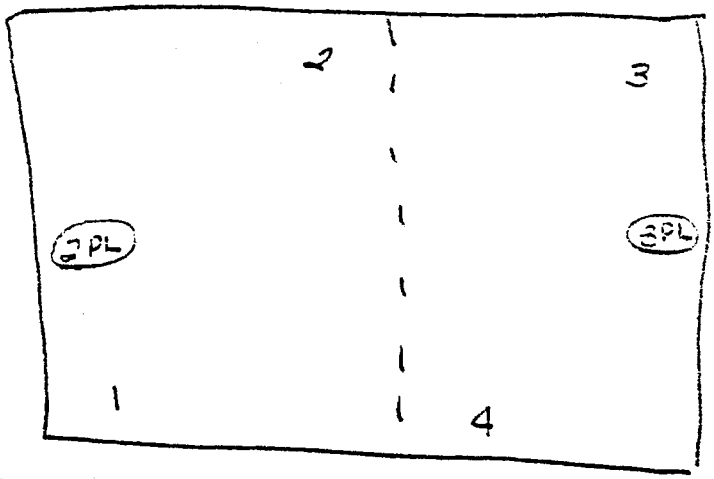
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

4.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO BORROW PIT, PICKED UP SAMPLE FOR LAB TEST. WENT TO SITE CONDUCTED 2 FIELD DENSITY ON 1ST LIFT OF CLAY BARRIER ON SOUTH HALF, ALSO TOOK THIN SAMPLE FOR PERM; LAB TESTS. CONDUCTED 2 FIELD DENSITY ON 2ND LIFT OF CLAY BARRIER ON NORTH HALF; TOOK THIN SAMPLE FOR PERM - LAB TEST. TALKED TO D. SHAW; CONTR. RETURNED TO OFFICE; MADE CALLS ON TESTING OF HDPE.



Site Sketch: Indicate North

N →

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-7-88

Location Superior, Wisc.

Weather/Temp. SUNNY 60'S

Contractor J. R. JOHNSON

Client KEYSTONE

Equipment Rental Ducktor 1.5 Hrs

Arrive Job 9:00

Depart Job 12:30

Tolls $

Parking $

Total Hours on Job 3.5

Mileage 30

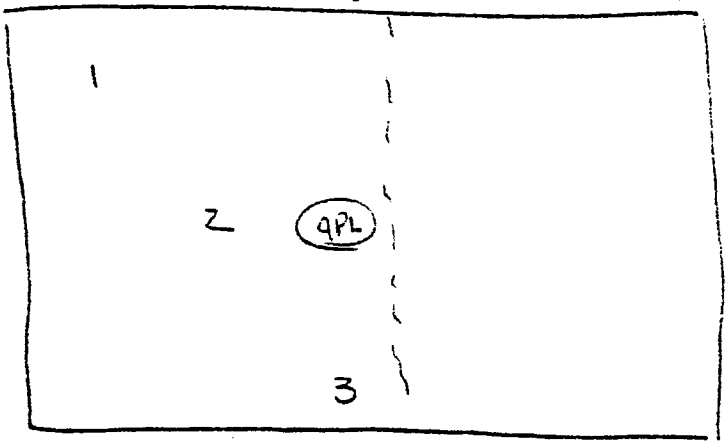
~~Lab~~ Office Time 2.5

Travel Time

TOTAL CHARGEABLE HOURS (4 HOUR MINIMUM): 6.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO BORROW P.I. PICKED UP SAMPLE FOR LAB TESTS. WENT TO SITE, CONDUCTED 3 FIELD DENSITY TEST ON SECOND LIFT OF CLAY EMBANKMENT ON SOUTH HALF, ALSO TOOK TUBE FOR PERM. LAB TEST. TALKED TO CONTR. D. SHAW ABOUT WORK & TESTING RETURNED TO OFFICE & GOT SAMPLES READY FOR TESTING. CALLED DICK JAN JASSOY ABOUT WORK & TESTING ALSO RESULTS OF DRAINAGE MATERIAL. WANTS PERM CONDUCTED. DID SOME PAPER WORK & CALLED MINN. ABOUT TESTING & RESULTS



*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North → N

Field Representative

Position

Company

By Fred Lepak
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-8-82

Location Superior, Wisc

Weather/Temp. Cloudy 50's

Contractor A. R. Jenson

Client KEYSTONE

Equipment Rental Nuclear 2.0 hrs

Arrive Job 9:20

Depart Job 11:30

Tolls $

Parking $

Mileage 20

Total Hours on Job 2.0

Lab Time 4.0

~~Travel~~ Office Time 2.0

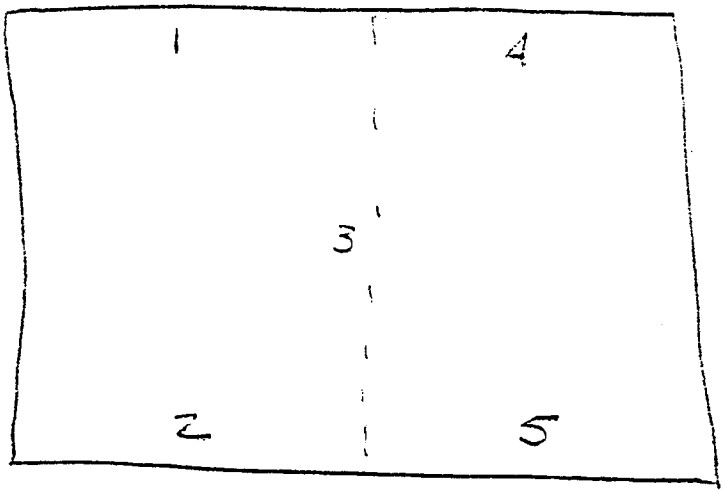
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

4.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, CONDUCTED FIELD DENSITY TEST ON 3 lift of CLAY BARRIER. RETURNED TO office. SET up FOR FORM ON DRAINAGE MATERIAL & CONDUCTED FORM AT 95% DENSITY. CHECKED OVER FIELD DENSITY RESULTS: PLOTTED TEST LOCATION - ALSO PLOTTED LABORATORY SAMPLE LOCATIONS. WROTE UP F.D. RESULTS FOR SOIL FILL & CLAY BARRIER.



Site Sketch: Indicate North

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Field Representative

Position

Company

By Fred Letourneau

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-10-96

Location Superior, Wisc

Weather/Temp. Sunny 40's

Contractor J.F. Horton

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 9:00

Depart Job 12:00

Total Hours on Job 3.0

Lab Time 4.0

~~Travel Time~~ Office 1.0

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

4.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, TOOK SAMPLES FROM THIRD LAYER OF CLAY BARRIER MATERIAL FOR PROCTOR'S & LAB TESTS. TALKED WITH DICK VAN TASSEL; OBSERVED PLACEMENT OF FINE SAND FOR LOWERING COARSE. TOOK SAMPLES OF HOPE FOR LAB TESTING. RETURNED TO OFFICE & DID SOME PAPER WORK, SET UP SAMPLE #2 FOR DRAINAGE LAYER & COMPLETED PERMIT AND FAX

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94520

Project KOPPERS CO.

Day/Date 10-11-96

Location SUPERIOR, WISC.

Weather/Temp. SUNNY 40's

Contractor J.R. ALLISON

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 40

Arrive Job 10:30 3:30

Depart Job 2:00 (1½) 6:00 (2½)

Total Hours on Job 4.0

Lab Time 2.0

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

6.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

PACKAGE SAMPLES OF HOPE ; MAIL OUT. DID PATCH WORK ; MADE COPIES OF TEST RESULTS - WENT TO SITE, TALKED TO DICK JAN TASCH ABOUT HOPE PLACEMENT ; OBSERVED PLACEMENT ; SEAMING OF HOPE. RETURNED TO OFFICE. WENT BACK TO SITE ; OBSERVED PLACEMENT ; SEAMING OF HOPE - MADE 15 SEAMS, FIELD LOCATED SEAMS ; RETURNED TO OFFICE.

* ☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 945880

Project KOPPERS Co.

Day/Date 10-12-88

Location SUPERIOR, WISC

Weather/Temp. SUNNY 60'S

Contractor A.R. JOHNSON

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 7:30

Depart Job 6:30

Total Hours on Job 11.0

Lab Time

Travel Time

TOTAL CHARGEABLE HOURS — 4 HOUR MINIMUM: 11.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, CONTR (GSI) STARTED LAYOUT TO HOPE. WAITED [redacted] PER TOMS TO REACH 40°, [redacted] AT 9:15 RAN TEST SEAMS; FIELDS CHECKED, WERE OK. STARTED TO SEAMING, DID 9 SEAMS. STARTED TO AIR TESTS HAD PROBLEMS GETTING AIR TESTS. 6 SEAMS WERE OK; PARTS OF 2 OTHER SEAMS TESTED OK - WILL HAVE TO VACUUM BOXED. SEAM 9 HAS TO BE EXTRUDED FOR THE FULL LENGTH MEASURED LOCATION of Field SEAM; RETURNED TO OFFICE

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kodiak Co.

Day/Date 10-13-92

Location Superior, Wisc.

Weather/Temp. Sunny 60's

Contractor A.R. Hanson

Client Keystone

Equipment Rental

Arrive Job 3:30

Tolls $

Depart Job 5:30

Parking $

Total Hours on Job 2.0

Mileage 20

Lab Time

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

2.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, talked to GSI went over repairs to seams, checked all seams for repairs & noted. Returned to office.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-14-88

Location Superior, Wisc.

Weather/Temp. Sunny 60's

Contractor J.F. Jonson

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 80

Arrive Job 9:00

Depart Job 10:30

Total Hours on Job 1.5

Lab Time

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site observed placement of fabric & drainage material, talked to contr. & returned to office.

*☐Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.
Day/Date 10-17-88
Location Superior, Wisc
Weather/Temp. LT RAIN 40's
Contractor A.R. Jansen
Client Keystone

Equipment Rental
Tolls $
Parking $
Mileage 40

Arrive Job 8:00 12:30
Depart Job 9:30 2:00
Total Hours on Job 3.0
Lab Time 2.0
Travel Time

TOTAL CHARGEABLE HOURS: 3.0 (4 HOUR MINIMUM)

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, OBSERVED PLACEMENT OF GEO. FABRIC & DRAINAGE MATERIAL. TALKED TO CONTR & TOOK SAMPLE OF DRAINAGE MATERIAL FOR LAB TESTS & RETURNED TO OFFICE.
WENT TO SITE OBSERVED PLACEMENT OF GEO. FABRIC & CHECKED LAPS, ALSO OBSERVED PLACEMENT OF DRAINAGE MATERIAL & RETURNED TO OFFICE.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94560

Project KODIERS CO.

Day/Date 10-18-88

Location SUPERIOR, WISC

Weather/Temp. Cloudy 40's

Contractor J.R. ALLISON

Client KEYSTONE

Equipment Rental NUCLEAR 2 HRS

Tolls $ _____

Parking $ _____

Mileage 40

Arrive Job 6:00 3:00

Depart Job 9:30 4:30

Total Hours on Job 3.0

Lab Time 2.0

Travel Time _____

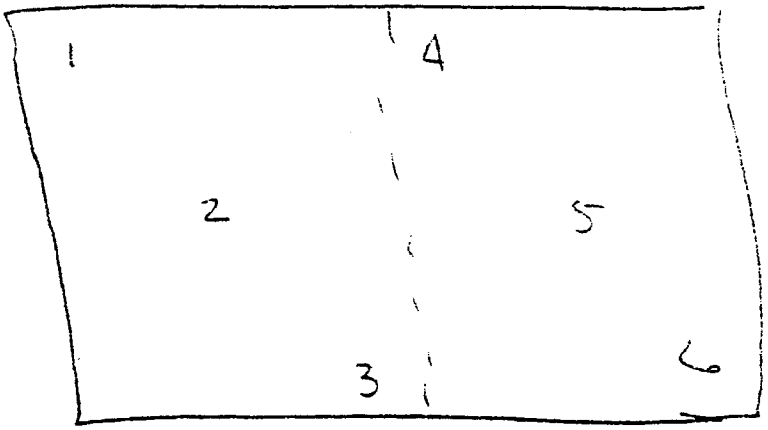
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

3.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE CONDUCT 3 FIELD DENSITY ON SOUTH HALF OF DRAINAGE LAYER, PICKED UP SAMPLE OF DRAINAGE MATERIAL FOR LAB TEST. RETURNED TO OFFICE CONDUCTED GRADATION. RETURNED TO SITE CHECKED LAPS ON FABRIC; CONDUCTED 3 FIELD DENSITY ON NORTH HALF; RETURNED



*☐ Field Test Data is Estimated
Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.
Day/Date 10-19-88
Location Superior Wisc.
Weather/Temp. Sunny 40's
Contractor S. K. Johnson
Client Keystone

Equipment Rental
Tolls $
Parking $
Mileage $ 20

Arrive Job 8:00
Depart Job 9:30
Total Hours on Job 1.5
Lab Time
Travel Time

TOTAL CHARGEABLE HOURS — 4 HOUR MINIMUM: 1.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, working on grading drainage ditch & placing fabric. Talked to Contr & returned to office; Call Dick Chm Thrsdy.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project KODDERS CO.

Day/Date 10-24-88

Location ~~Superior, Wisc.~~

Weather/Temp. Cloudy 30's

Contractor J.R. Jackson

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 8:00

Depart Job 10:00

Total Hours on Job 2.0

~~Lab~~ Office Time 2.0

Travel Time

TOTAL CHARGEABLE HOURS 4.0 (4 HOUR MINIMUM)

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, CHECKED PLACEMENT OF FABRIC & START OF SOIL COVER MATERIAL. HAD PROBLEMS WITH EQUIPMENT, TALKED TO CONTR. RETURNED TO OFFICE. TALKED TO ERIC SNOW ABOUT [redacted] RESULTS OF HDPE TESTS. ALSO TALKED TO DICK UHRL TASSOL ABOUT 216. ALSO TALKED TO MINN. OFFICE ABOUT TEST RESULTS.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 91580

Project Koppers Co.

Day/Date 10-25-88

Location Superior, Wisc.

Weather/Temp. Cloudy 40's

Contractor T.R. Dawson.

Client Keystone

Equipment Rental Nuclear 2.0 Hrs

Arrive Job 8:30 1:30

Depart Job 10:00 3:30

Tolls $

Parking $

Mileage 40

Total Hours on Job 3.5

Lab Time

Travel Time

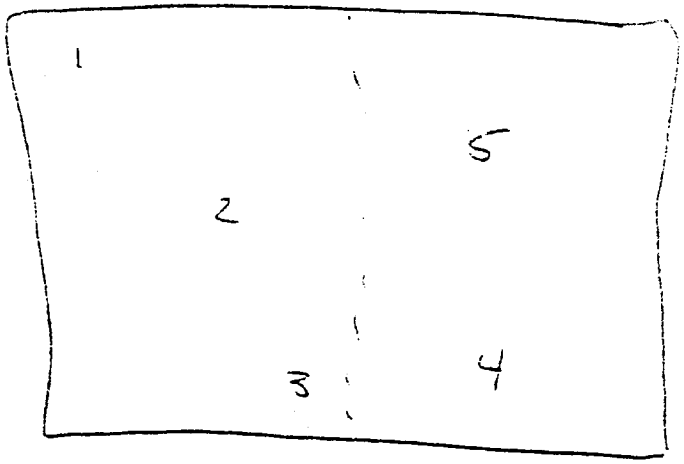
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

3.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, Checked placement of Fabric & Soil Cover, Talked to Contr. Returned, went to site, Conduct Field Density Test on 1st lift of Soil Cover Work ok. Talked to Contr & Returned to office.



Site Sketch: Indicate North

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kaiser Co.

Day/Date 10-26-88

Location Superior, Wisc

Weather/Temp. Sunny 40's

Contractor J. R. Jensen

Client Keystone

Equipment Rental Auclaire 2 Hrs

Arrive Job 8:00 12:30

Tolls $ _____

Depart Job 9:30 2:00

Parking $ _____

Total Hours on Job 3 1/2

Mileage 40

Lab Time _____

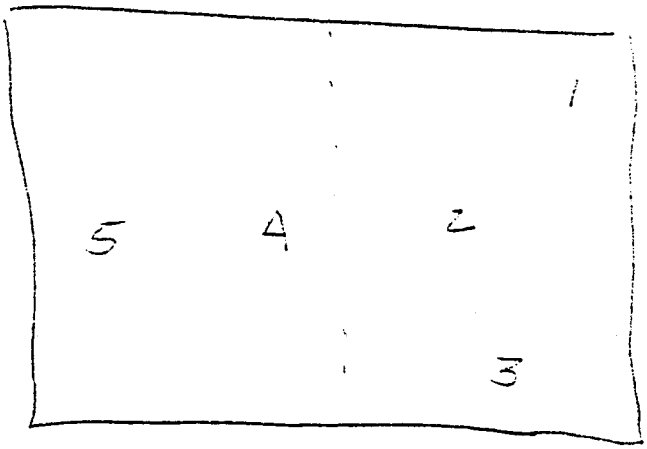
Travel Time _____

TOTAL CHARGEABLE HOURS 3.5

4 HOUR MINIMUM

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site Checked Frost, was 0 to 1/2" of Frost started placing 2nd lift of cover material. Returned to office. Went to site, Checked on placement of cover soil. Compaction density test were ok. Talked to Contr. Returned to office.



*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North N →

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-27-88

Location Superior, Wisc

Weather/Temp. Cloudy - Lt rain 40's

Contractor L. K. Comstock

Client Kekstone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 9:00

Depart Job 10:30

Total Hours on Job 1.5

~~Lab~~ Office Time 3.0

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

4.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, observed placement of cover soil material; talked to cont. Returned to office, wrote up tests results; plotted test location, made copies & mailed out.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group

Field Report

Project No. 94580

Project Koppers Co.

Day/Date 10-28-88

Location Superior, Wisc

Weather/Temp. Sunny 20's

Contractor L.R. Hanson

Client Keystone

Equipment Rental Nuclear 2 Hrs

Tolls $

Parking $

Mileage 20

Arrive Job 8:00

Depart Job 10:00

Total Hours on Job 2.0

~~Lab~~ Office Time 0.5

Travel Time

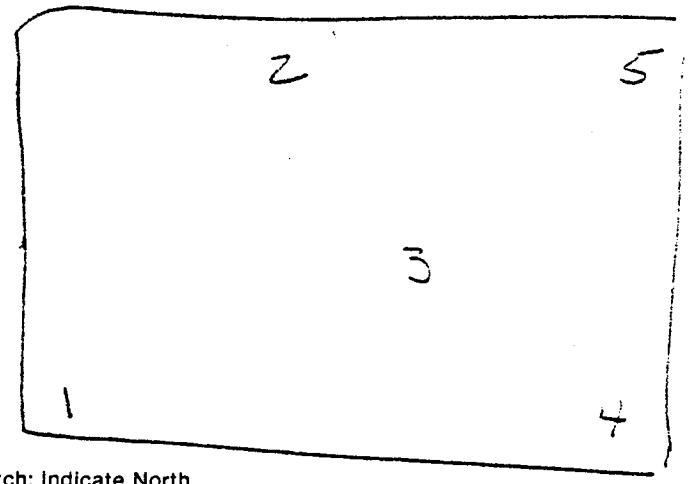
TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

2.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, Talked to Freeman about topsoil tests results Finishing cover soil in S.W Corner. Conducted Field Density test on 3rd lift of cover soils, were ok. Talked to Dick Van Tassel about work on job.



☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By Fred Lehmke

STS Consultants, Ltd.

WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project KODDERS CO.

Day/Date 11-1-88

Location SUPERIOR, WISC.

Weather/Temp. Cloudy 40's

Contractor L. K. JENSON

Client KEYSTONE

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 6:00

Depart Job 9:00

Total Hours on Job 1.0

~~Lab~~ Office Time 1.0

Travel Time

TOTAL CHARGEABLE HOURS 4 HOUR MINIMUM 2.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, WERE NOT WORKING. RETURNED TO OFFICE. TALKED TO DAVE SHAW, ALSO DID SOME PAPER WORK.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Kellers Co.

Day/Date 11-2-82

Location Superior, Wisc.

Weather/Temp. Cloudy 40's

Contractor J. R. Nelson

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 8:00

Depart Job 9:30

Total Hours on Job 1.5

~~Lab~~ Office Time 1.0

Travel Time

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

2.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, observed placement of Topsoil. Talked to Contr, Returned to office, worked on paper work; Talked to Dick Van Tassel about Topsoil & seeding.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Location Superior WI

Contractor J.R. Jensen

Day/Date Thurs 11-3-22

Weather/Temp. Hi 30's Partly cloudy

Client Key Stone

Equipment Rental —

Tolls $ —

Parking $ —

Mileage 20

Arrive Job 8:30

Depart Job 10:00

Total Hours on Job 1.5

Lab Time —

Travel Time —

4 HOUR MINIMUM

TOTAL CHARGEABLE HOURS 1.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Talked with Contractor, observed topsoil fill operation, took our sample of topsoil for testing.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 11-4-88

Location Superior, Wisc.

Weather/Temp. Cloudy 30's

Contractor L.R. Jones

Client Keystone

Equipment Rental

Tolls $

Parking $

Mileage 20

Arrive Job 5:30

Depart Job 10:00

Total Hours on Job 1.5

~~Lab~~ Office Time 2.0

Travel Time

TOTAL CHARGEABLE HOURS (4 HOUR MINIMUM): 3.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site observed placement of Topso.l - Talked to Contr. Also picked up samples for lab Tests returned to office. Made calls about test results on Hopper soils, Did some paper work

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.
Day/Date 11-7-88
Location Superior, Wisc.
Weather/Temp. Cloudy 30's
Contractor J.R. Jonson
Client KEYSTONE

Equipment Rental Nuclone 25Hes
Tolls $
Parking $
Mileage 20

Arrive Job 8:30
Depart Job 11:00
Total Hours on Job 2.5
~~Lab~~ Office Time 0.5
Travel Time

TOTAL CHARGEABLE HOURS — 4 HOUR MINIMUM: 3.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

WENT TO SITE, CONDUCTED 10 FIELD DENSITY TEST ON TOPSOIL, WERE OK. TALKED TO CONTR. & FOREMAN TO OFFICE.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 11-8-88

Location Superior, Wisc.

Weather/Temp. Cloudy 40's

Contractor J. R. Jansen

Client Keystone

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage 20

Arrive Job 8:30

Depart Job 10:00

Total Hours on Job 1.5

~~Lab~~ Office Time 2.0

Travel Time _____

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

3.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Went to site, was nobody around, returned to office. Worked on paper work.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.
Day/Date 11-9-88
Location Superior, Wisc.
Weather/Temp. Cloudy 30's
Contractor J.R. Jonson
Client Keystone

Equipment Rental
Tolls $
Parking $
Mileage

Arrive Job
Depart Job
Total Hours on Job
~~Lab~~ Office Time 6.0
Travel Time

TOTAL CHARGEABLE HOURS (4 HOUR MINIMUM): 6.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Reviewed job & test results with Walt K. Wrote up Field Density test on Topsoil & Plotted test locations. Went over all test results & put in Groups & Checked Results.

* ☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative
Position
Company

By
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 11-10-88

Location Superior, WISC.

Weather/Temp. _____

Contractor J. R. Johnson

Client KEYSTONE

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage _____

Arrive Job _____

Depart Job _____

Total Hours on Job _____

~~Lab~~ Office Time 1.0

Travel Time _____

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Checked over Test Result & Set up Form

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By Fred Schenker
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 91580

Project Koppers Co.

Day/Date 11-14-88

Location Superior, Wisc.

Weather/Temp. _____

Contractor J.R. Johnson

Client KEYSTONE

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage _____

Arrive Job _____

Depart Job _____

Total Hours on Job _____

~~Lab~~ Office Time 1.0

Travel Time _____

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

1.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Checked Test Results & D/O paper work

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

STS Construction Services Group
Field Report

Project No. 94580

Project Koppers Co.

Day/Date 12-5-88

Location Superior, WISC

Weather/Temp. ———

Contractor J.R. Johnson

Client KEYSTONE

Equipment Rental _____

Tolls $ _____

Parking $ _____

Mileage _____

Arrive Job _____

Depart Job _____

Total Hours on Job _____

~~Lab~~ Office Time 2.0

Travel Time _____

TOTAL CHARGEABLE HOURS

4 HOUR MINIMUM

2.0

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Checking Test Results & Getting Copies Ready to Send

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative _____

Position _____

Company _____

By _____

STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD



STS Consultants Ltd.
Consulting Engineers

Field and Laboratory Test Results

Koppers Company, Inc.
Surface Impoundment Closure
Superior, Wisconsin

Koppers Company, Inc.

Appendix

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

December 20, 1988

Mr. Jack Stephenson
Koppers Company, Inc.
801 Koppers Building
436 - 7th Avenue
Pittsburgh, PA 15219

STS Project 94580

Re: Field and Laboratory Test Results for the Koppers Company, Inc.
Surface Impoundment Closure in Superior, Wisconsin

Dear Mr. Stephenson:

Transmitted herewith, please find the results of our field and laboratory testing services performed for the above-referenced project. Our scope of work for this project was outlined in STS Proposal P-2092 dated August 25, 1988. Authorization to proceed was received with Keystone Environmental Resources, Inc. Purchase Order No. 10-8-30704 dated November 22, 1988. A brief overview of the field and laboratory testing services performed is given below.

The geotechnical engineering services provided for the closure project can be divided into two general categories:

1. Laboratory testing to evaluate the engineering characteristics of proposed borrow materials prior to construction.
2. Field and laboratory testing to check the quality of the "as-built" closure construction.

The enclosed test results are organized according to these two general categories. The test results are also divided into six groups representing the five soil layer components of the closure earthwork plus a group of geotextile laboratory test results for the HDPE liner. The laboratory test samples representing the five soil components of the closure are identified as follows:

Layer Description	Identification
Unclassified Soil Fill	A1
Clay Barrier	A2
Drainage Layer	A3
Cover Soil	A4
Topsoil	A5

The borrow source evaluation for each layer typically consisted of testing two samples designated B1 and B2. The laboratory testing performed for the borrow source evaluations consisted of Standard Proctor moisture density relationships and grain size analyses for all soil types plus Atterberg limits tests for cohesive soils. Permeability testing of laboratory compacted specimens of the clay barrier (A2) and drainage layer (A3) borrow samples was conducted in order to determine if the remolded permeabilities fulfilled the project requirements. The topsoil material was also tested to determine pH and fertilization requirements.

The field and laboratory testing of the "as-built" construction included field density testing of each compacted lift and laboratory testing of individual soil samples representing each lift. The laboratory soil testing typically consisted of grain size, Atterberg limit and permeability testing as required to confirm the soil properties identified during the laboratory testing of borrow source samples. The identification of laboratory soil samples representing "as-built" construction includes identification of the component layer and lift number, i.e., sample A1-C5 represents the fifth lift of unclassified soil fill. Field density test and laboratory sample locations are shown schematically on individual test location plans.

Geotextile laboratory testing of the HDPE liner included determination of melt index, environmental stress crack resistance, thickness, density, modulus of elasticity and tensile strength with percent elongation properties. This series of tests was performed on specimens which represented both of the two batches of liner product delivered to the job site. The integrity of the liner seams was also evaluated by field leak testing which was observed by our senior technician and laboratory testing of four seam samples. The laboratory testing of the liner seam samples included determination of bonded seam strength and peel adhesion. The seam sample locations are shown on a diagram which precedes the laboratory test results.

Based on the results of our field and laboratory testing program, it is our opinion that the closure has been constructed in general conformance with the project requirements and specifications. All field and laboratory testing performed for this project was performed in general conformance with applicable ASTM Specifications.

If there are any questions regarding the contents of this letter or the attached test results, or if we can be of further assistance in any way, please feel free to contact us.

Respectfully,

STS CONSULTANTS, LTD.

Melvin B. Smith, P.E.
Project Engineer

James H. Overtoom, P.E.
Principal Engineer

MBS/dn
Encs.

A1 - UNCLASSIFIED SOIL FILL

Borrow Source Evaluation

- Proctor Test Results
- Grain Size/Atterberg Limits Test Results

Field/Laboratory Testing of "As-Built" Construction

- Field Density Test Locations
- Field Density Test Results
- Laboratory Test Sample Locations
- Grain Size/Atterberg Limits Test Results

STS Consultants, Ltd.
3650 Annapolis Lane
Minneapolis, MN 55447-5434
(612) 559-1900

2820 Belknap Street
Superior, WI 54880
(715) 392-9006

108 Chestnut Street
Virginia, MN 55792
(218) 741-8804

COMPACTION CONTROL REPORT
Laboratory Compaction Test Data

Project: Koppers Closure Date: 9/16/88 STS Job#: 94580

Description of soil: Clay, trace sand - red brown

Material mark: A1-B1 (Unclassified Soil Fill) Classification: CH

Source of Material: Ray Konen on Highway "C", Douglas County, Wisconsin

Natural water content: -- % Natural dry density: -- pcf Specific gravity: 2.58

Liquid limit: 80.8 % Plastic limit: 24.5 % Plasticity index: 56.3

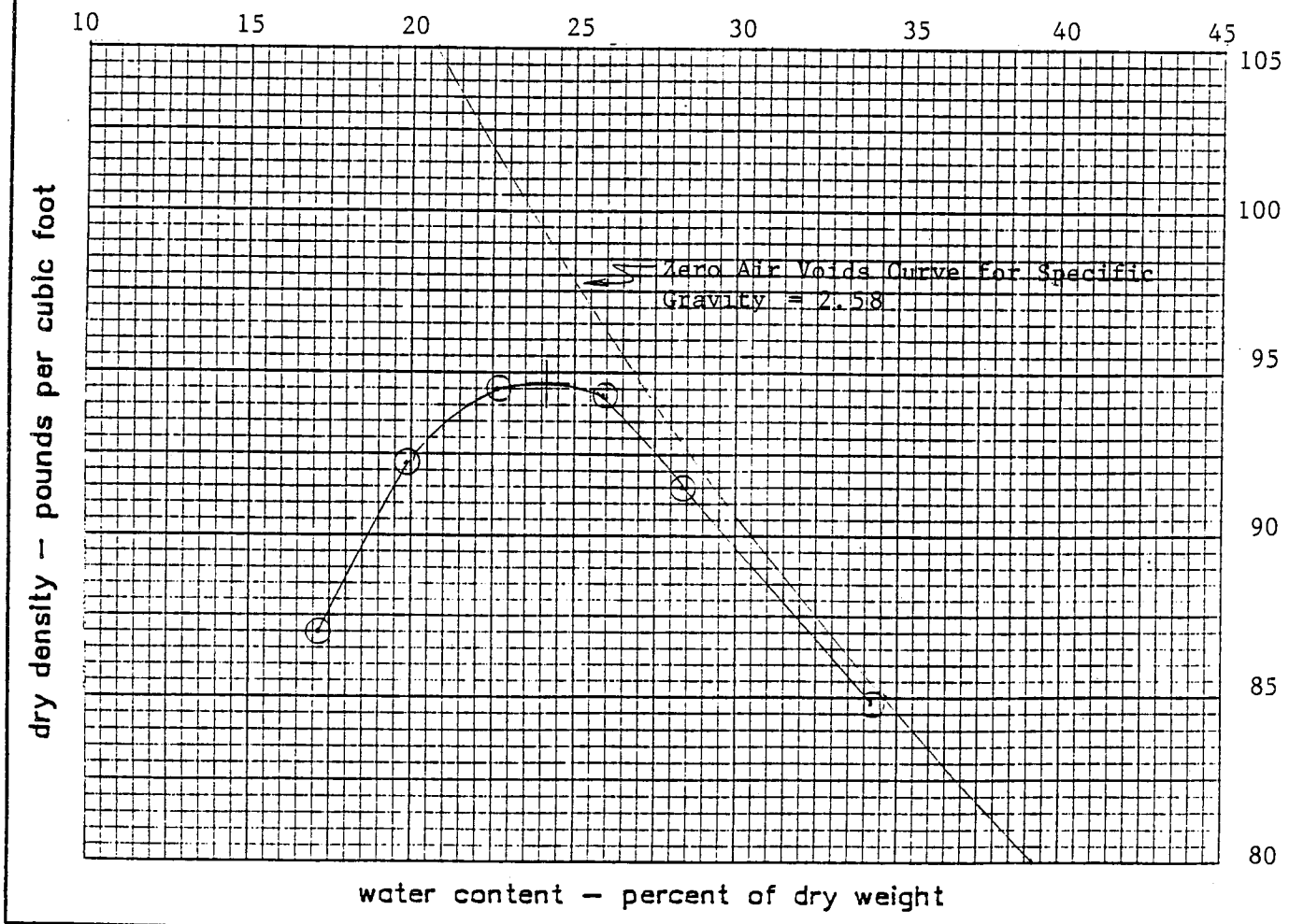
Test procedure used: Standard Proctor, ASTM D-698, Method A

TEST RESULTS

Maximum dry density: 94.6 pcf

Optimum water content: 24.1 %

(at a wet density of: 117.4 pcf)



STS Consultants, Ltd.
3650 Annapolis Lane
Minneapolis, MN 55447-5434
(612) 559-1900

2820 Belknap Street
Superior, WI 54880
(715) 392-9006

108 Chestnut Street
Virginia, MN 55792
(218) 741-8804

COMPACTION CONTROL REPORT
Laboratory Compaction Test Data

Project: Koppers Closure Date: 10/4/88 STS Job#: 94580

Description of soil: Clay, trace sand - red brown

Material mark: A1-B2 (Unclassified Soil Fill) Classification: CH

Source of Material: Rav Konen on Highway "C", Douglas County, Wisconsin

Natural water content: -- % Natural dry density: -- pcf Specific gravity: 2.68

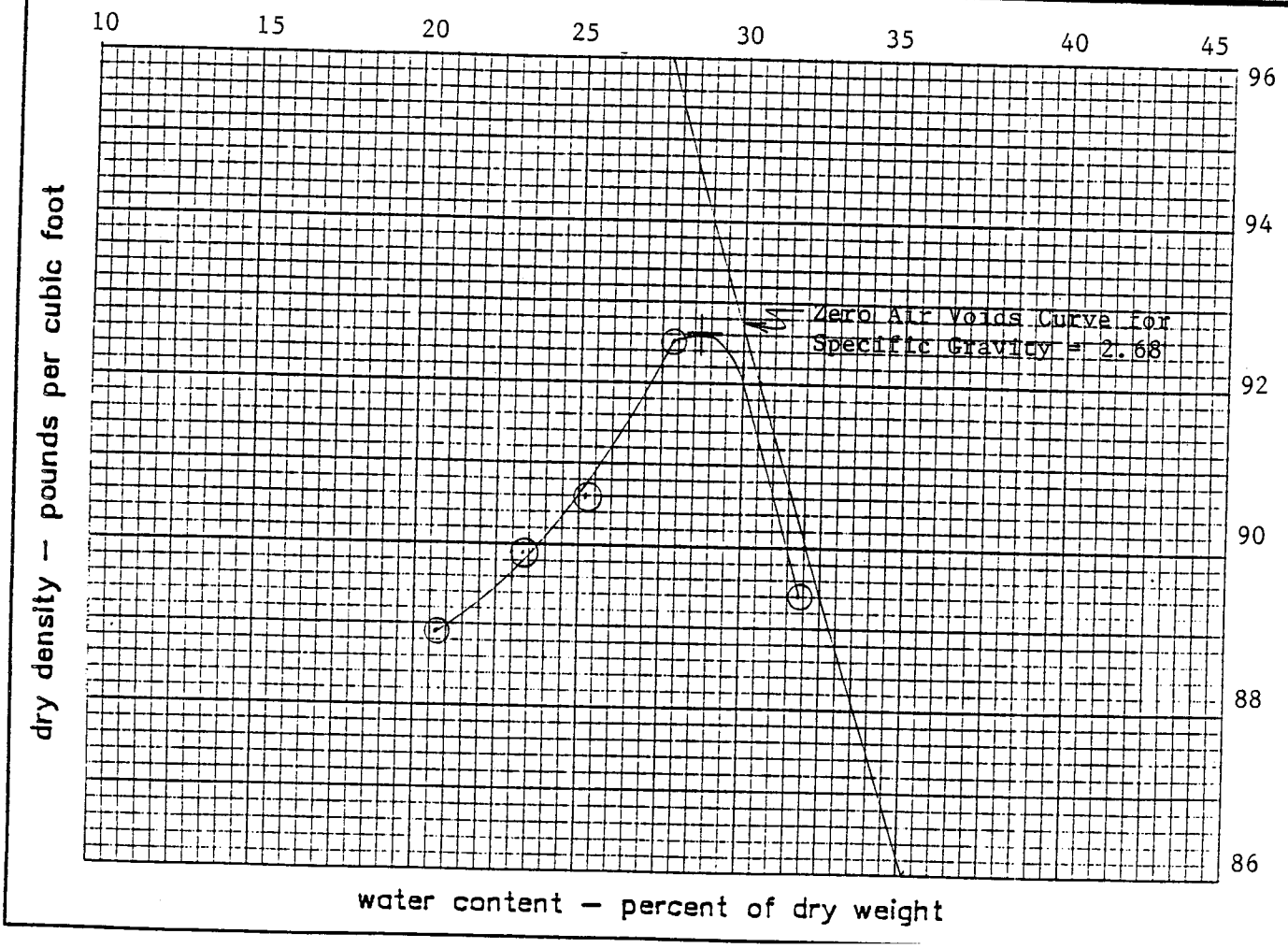
Liquid limit: 70.7 % Plastic limit: 22.6 % Plasticity index: 48.1

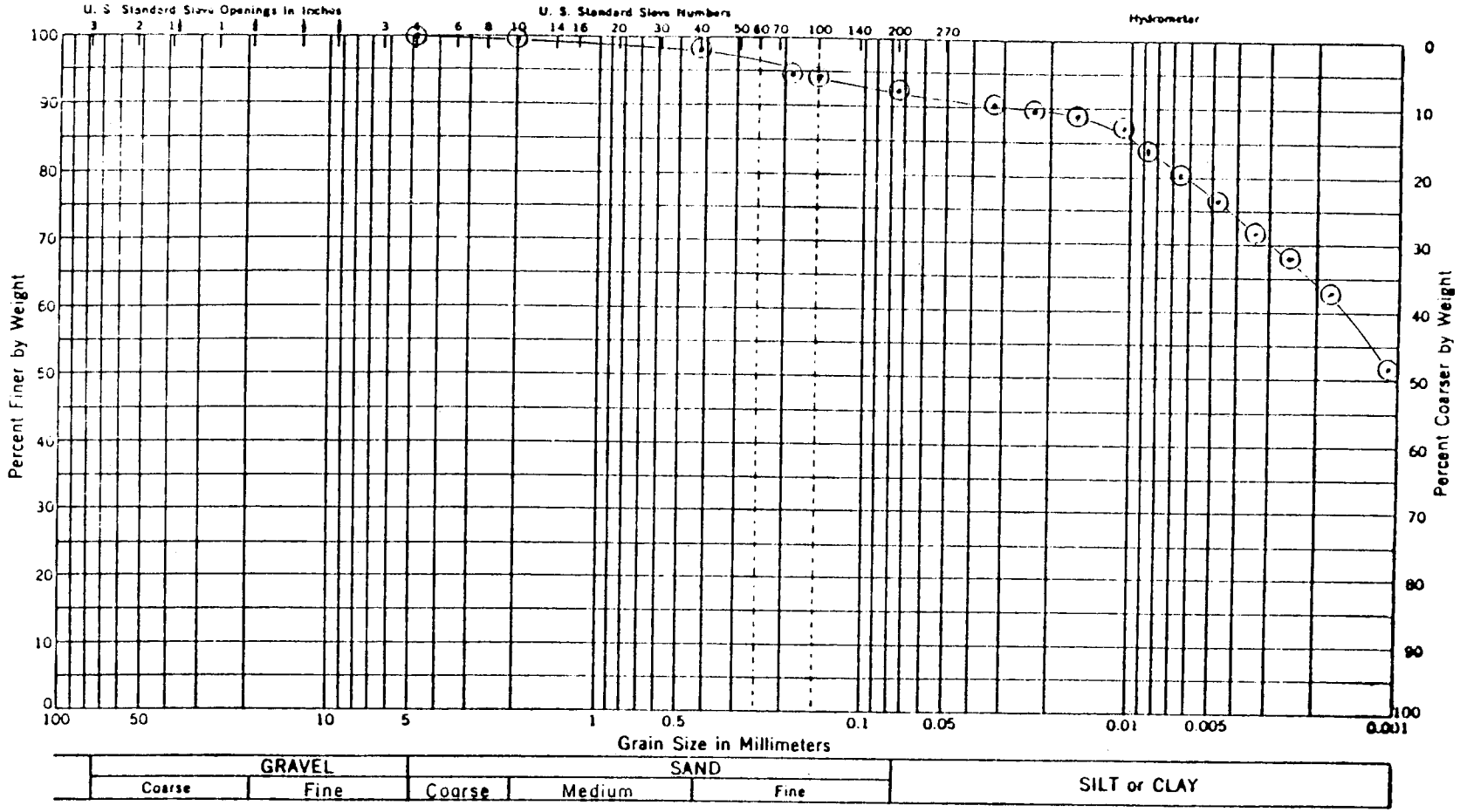
Test procedure used: Standard Proctor, ASTM D-698, Method A

TEST RESULTS

Maximum dry density: 92.6 pcf Optimum water content: 28.6 %

(at a wet density of: 119.1 pcf)



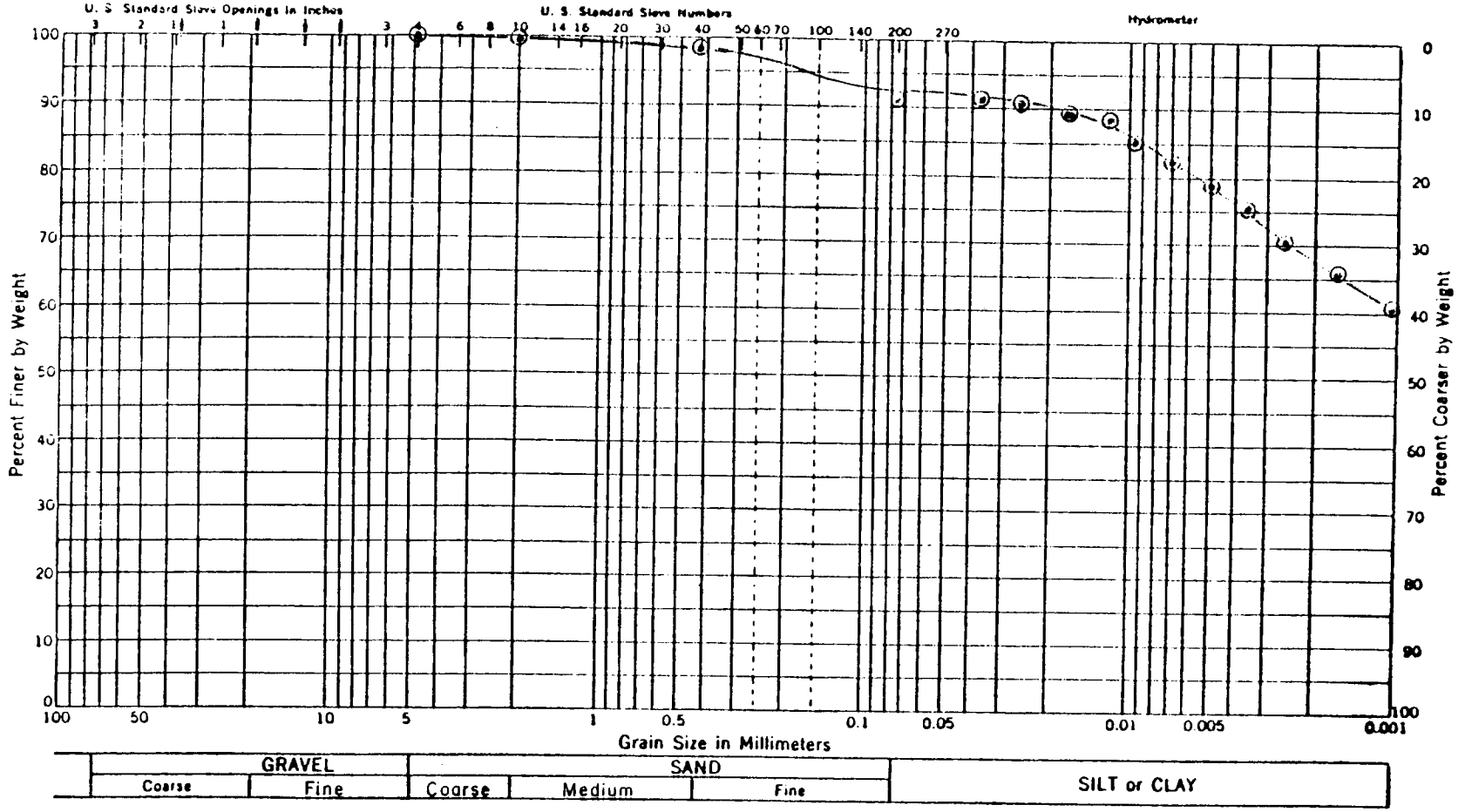


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-B2	--	70.7	22.6	48.1	Clay, Trace Sand - (CH)

Grain Size Distribution
Unclassified Soil Fill - Borrow #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10/20/88	94580

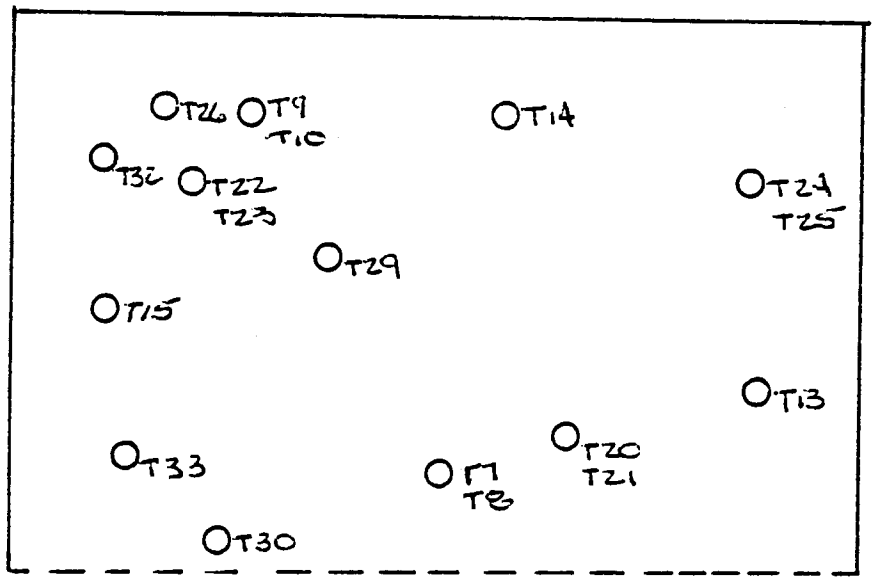


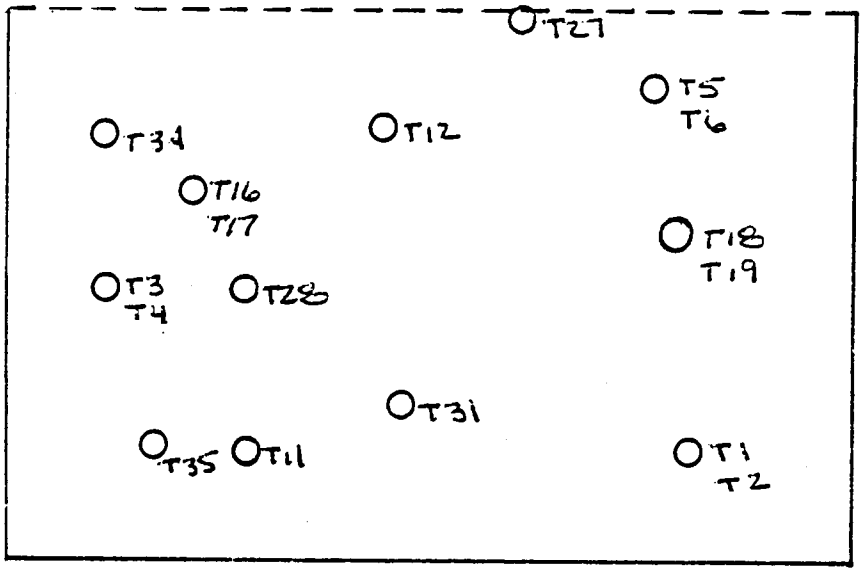
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-B1	--	80.8	24.5	56.3	Clay, Trace Sand - (CH)

Grain Size Distribution
Unclassified Soil Fill - Borrow #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	JHO	9/19/88	94580





O-Field Density Test - Soil Fill

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT	9-19-88	94580	no scale

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location: Surface Impoundment Closure, Koppers Co., Superior, Wisc.
Architect or Engineer: Keystone Environmental Resources, Inc.
Contractor: J. R. Jensen
STS job number: 94580 Month: Sept. Year: 1988
Other project number: 178275-04

Test No.	Date	Location	Lift No. or ~~Elevation~~	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
1	9-15	See Plan	1ST	A1-B1	94.6	119.0	27.5	93.3	98	
2	"	"	2ND	"	"	115.1	27.5	90.3	95	
3	"	"	1ST	"	"	115.3	27.0	90.8	96	
4	"	"	2ND	"	"	118.3	28.9	91.8	97	
5	"	"	1ST	"	"	116.9	27.2	91.9	97	
6	"	"	2ND	"	"	115.1	27.9	90.0	95	
7	"	"	1ST	"	"	118.8	28.6	92.4	97	
8	"	"	2ND	"	"	115.6	28.6	89.9	95	
9	"	"	1ST	"	"	116.1	29.0	90.0	95	
10	"	"	2ND	"	"	115.0	27.8	90.0	95	
11	"	"	3th	"	"	115.6	28.6	89.9	95	
12	"	"	3th	"	"	116.3	28.1	90.8	96	
13	9-23	"	3th	"	"	116.6	28.3	90.9	96	
14	"	"	3th	"	"	115.0	27.9	89.9	95	
15	"	"	3th	"	"	118.9	29.1	92.1	97	
16	9-26	"	5th	"	"	119.0	28.5	92.6	98	
17	"	"	4th	"	"	122.3	27.4	96.0	100	
18	"	"	5th	"	"	117.9	30.9	90.1	95	
19	"	"	4th	"	"	123.0	26.9	96.9	100	
20	"	"	5th	"	"	117.7	29.1	91.2	96	
21	"	"	4th	"	"	115.2	27.9	90.1	95	

Soil Fill

Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other ☐
Compaction Required 95 %

* Water content shown as percent of dry weight.

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location SURFACE IMPOUNDMENT CLOSURE, KOPPERS CO. SUPERIOR, WISC.
Architect or Engineer KEYSTONE ENVIRONMENTAL RESOURCES, INC.
Contractor L. R. LEWSEN
STS job number 94580 Month SEPT. Year 1988
Other project number 178275-04

Test No.	Date	Location	Lift No. ~~or Elevation~~	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
22	9-26	SEE PLAN	5th	A1-81	94.6	118.3	29.4	91.4	97	
23	"	"	4th	"	"	119.6	29.4	92.4	98	
24	"	"	5th	"	"	116.2	28.4	90.5	95	
25	"	"	4th	"	"	117.6	27.6	92.2	97	
26	9-27	"	6th	"	"	116.5	29.6	89.9	95	
27	"	"	6th	"	"	115.8	28.7	90.0	95	
28	"	"	6th	"	"	117.3	29.2	90.8	95	
29	"	"	7th	"	"	116.2	28.8	90.2	95	
30	"	"	7th	"	"	117.5	30.3	90.2	95	
31	"	"	7th	"	"	117.2	27.7	91.8	97	
32	9-28	"	8th	"	"	118.4	31.9	89.8	95	
33	"	"	8th	"	"	116.4	27.4	91.4	97	
34	"	"	8th	"	"	116.8	27.5	91.6	97	
35	"	"	8th	"	"	116.2	29.5	89.7	95	

Soil Fill

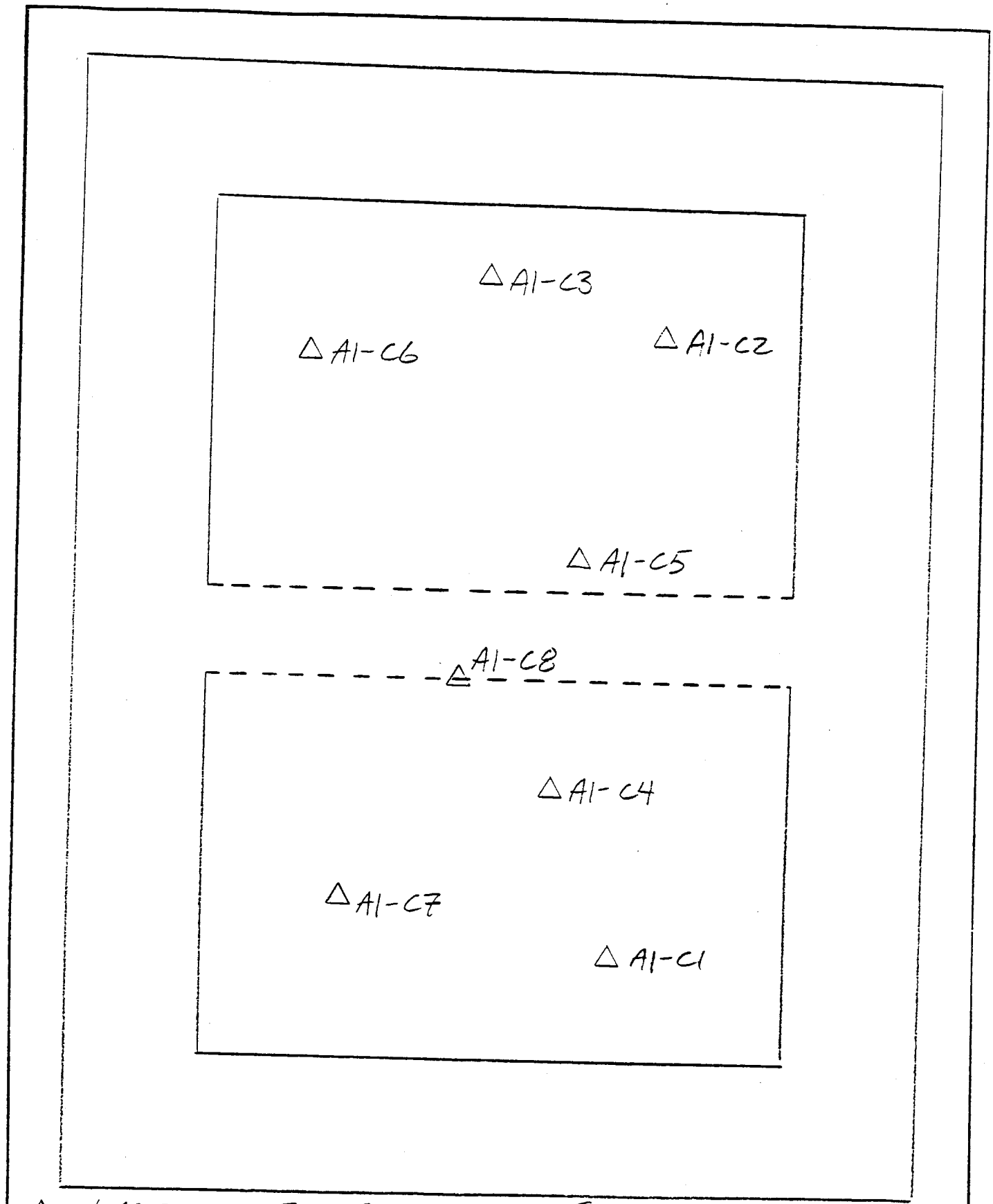
Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other _____ ☐
Compaction Required 95 %

* Water content shown as percent of dry weight.

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒



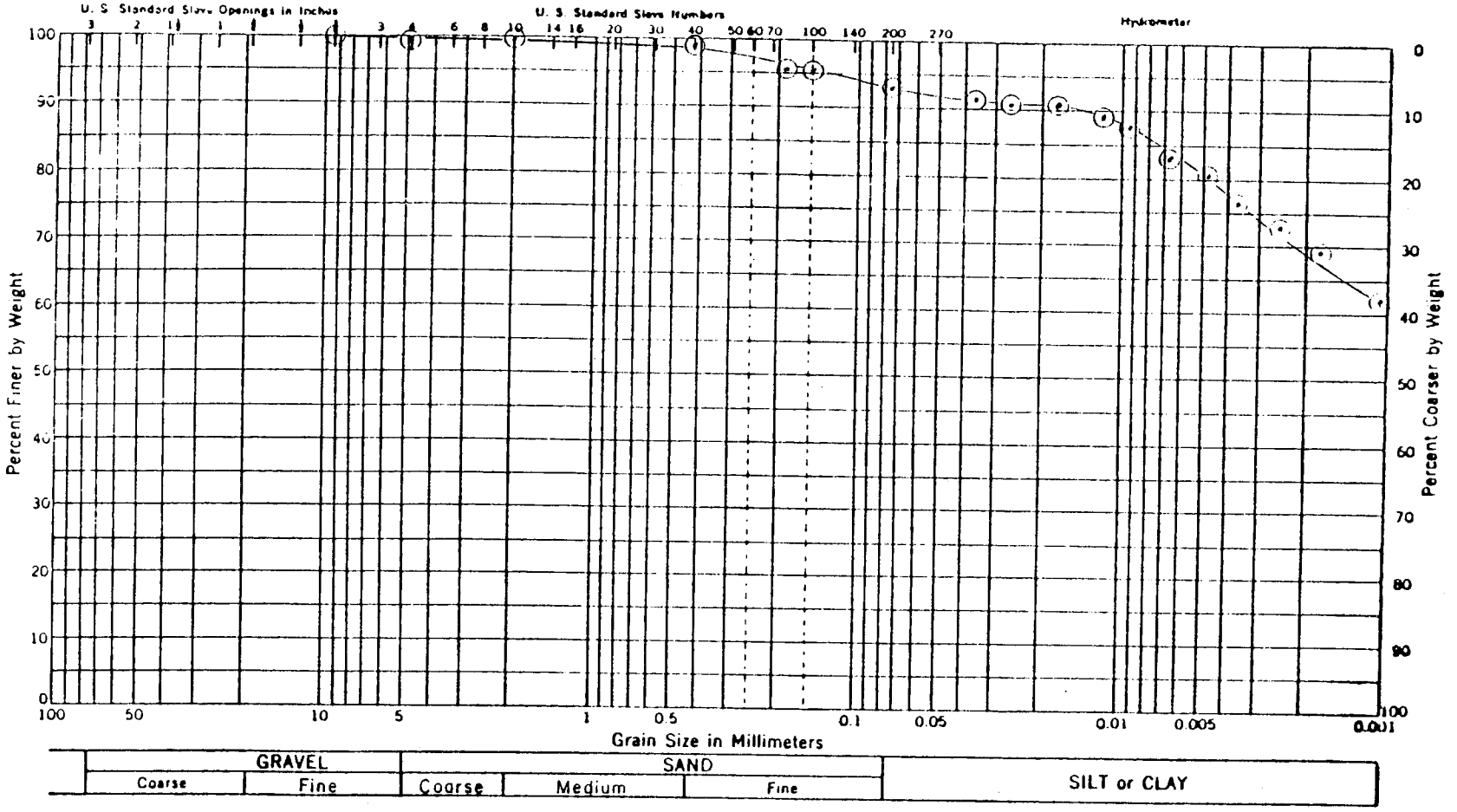
△ - LABORATORY TEST SAMPLE - SOIL FILL

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT	9-19-88	94580	no scale

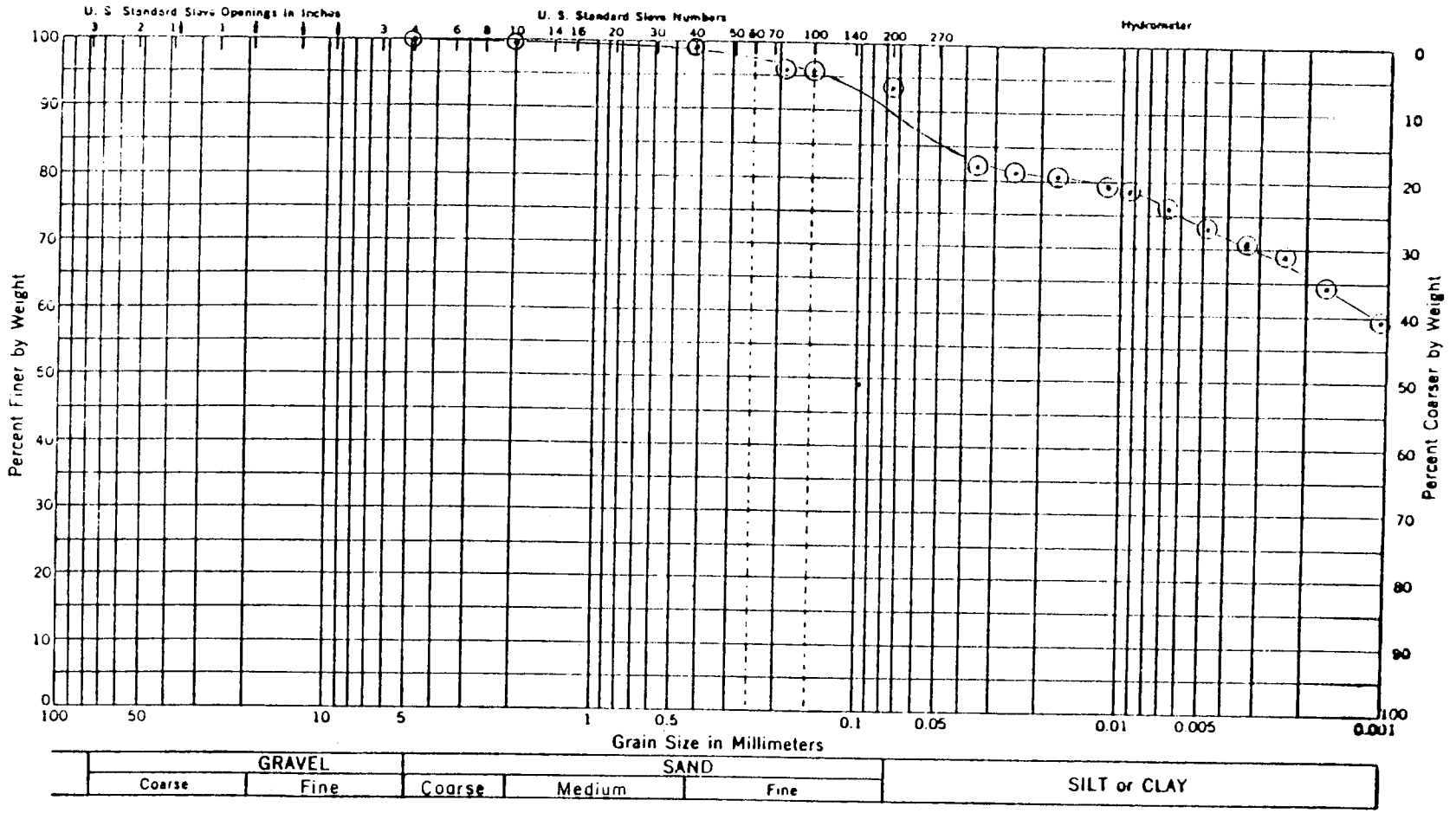


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C1	---	70.6	25.7	44.9	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #1
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580



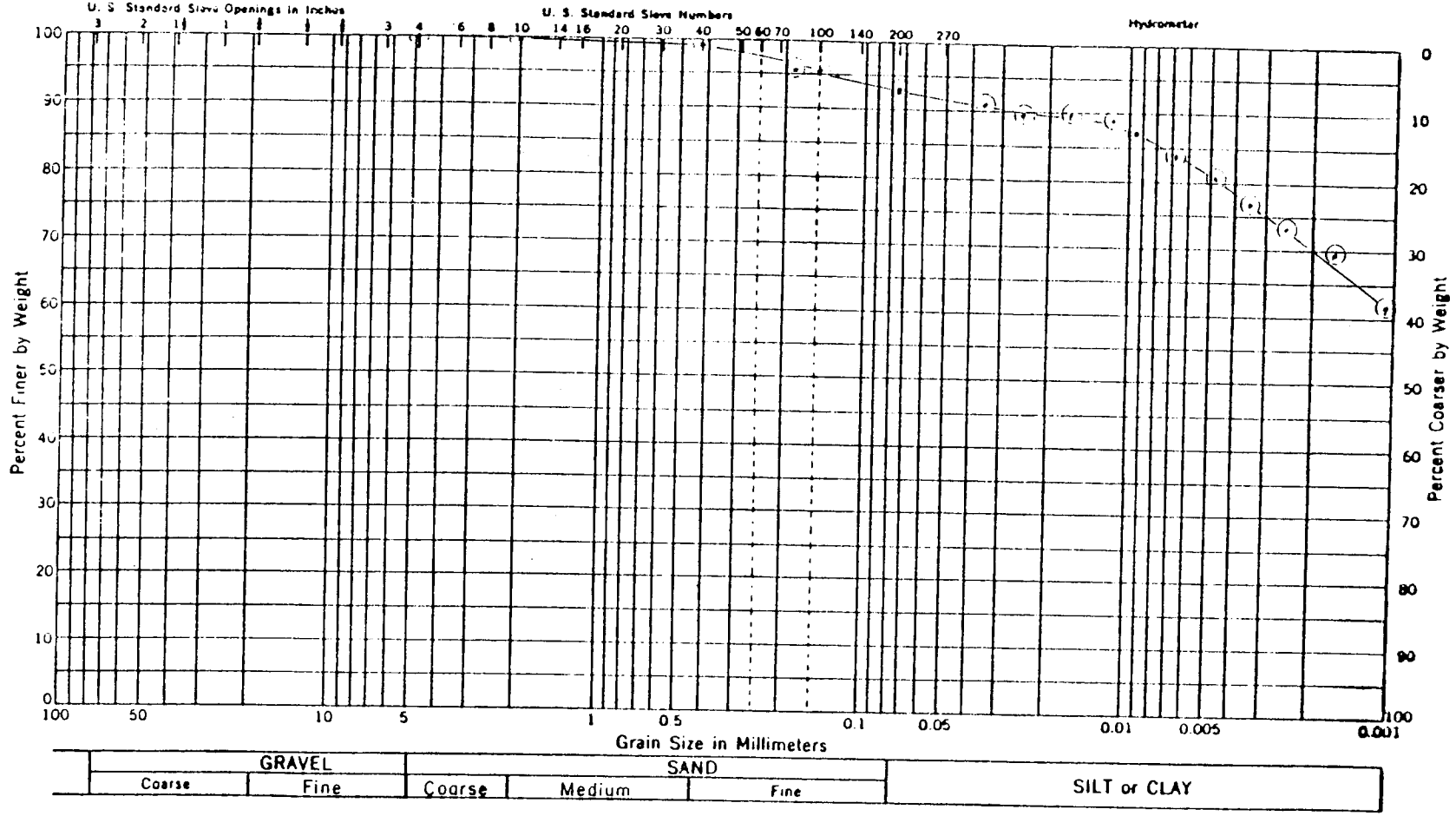
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C2	-----	71.4	25.3	46.1	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #2
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C3	------	74.0	24.4	49.6	Clay, trace sand - (CH)

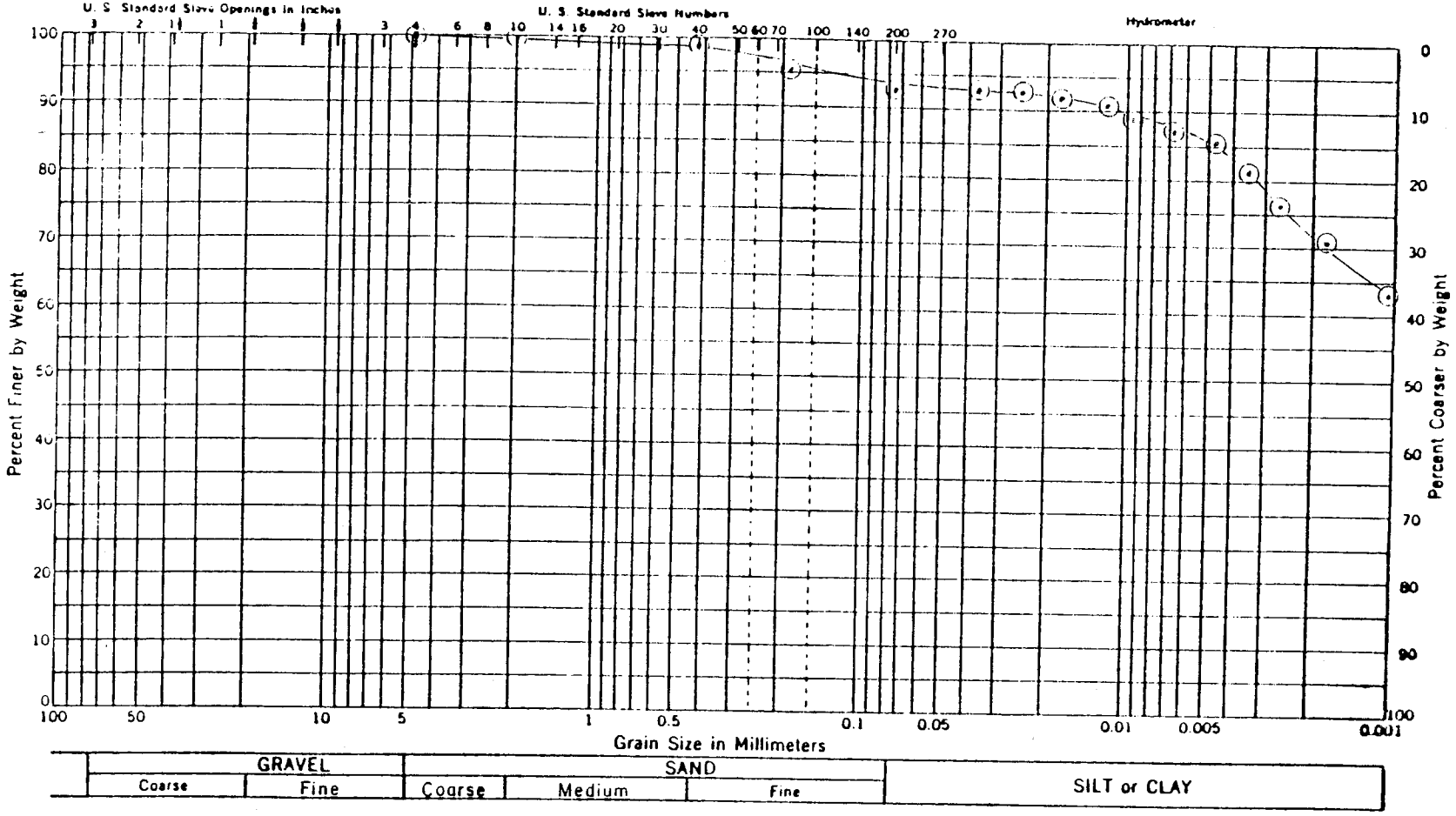
Grain size distribution
unclassified soil fill-lift #3
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580

REV. 12/1/75
D-5026/8N

UNIFIED CLASSIFICATION SYSTEM

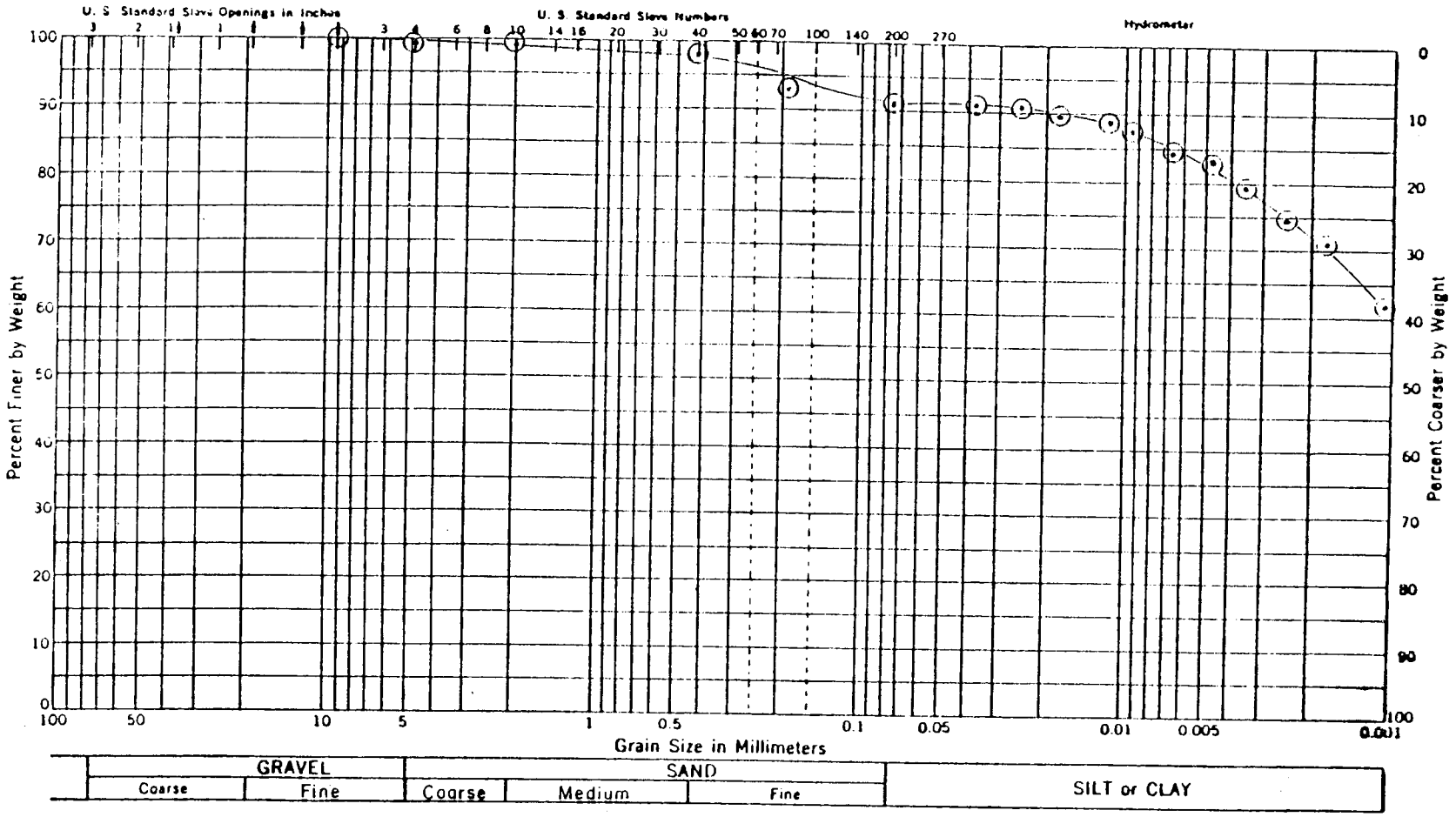


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C4	-----	68.4	24.5	43.9	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #4
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580

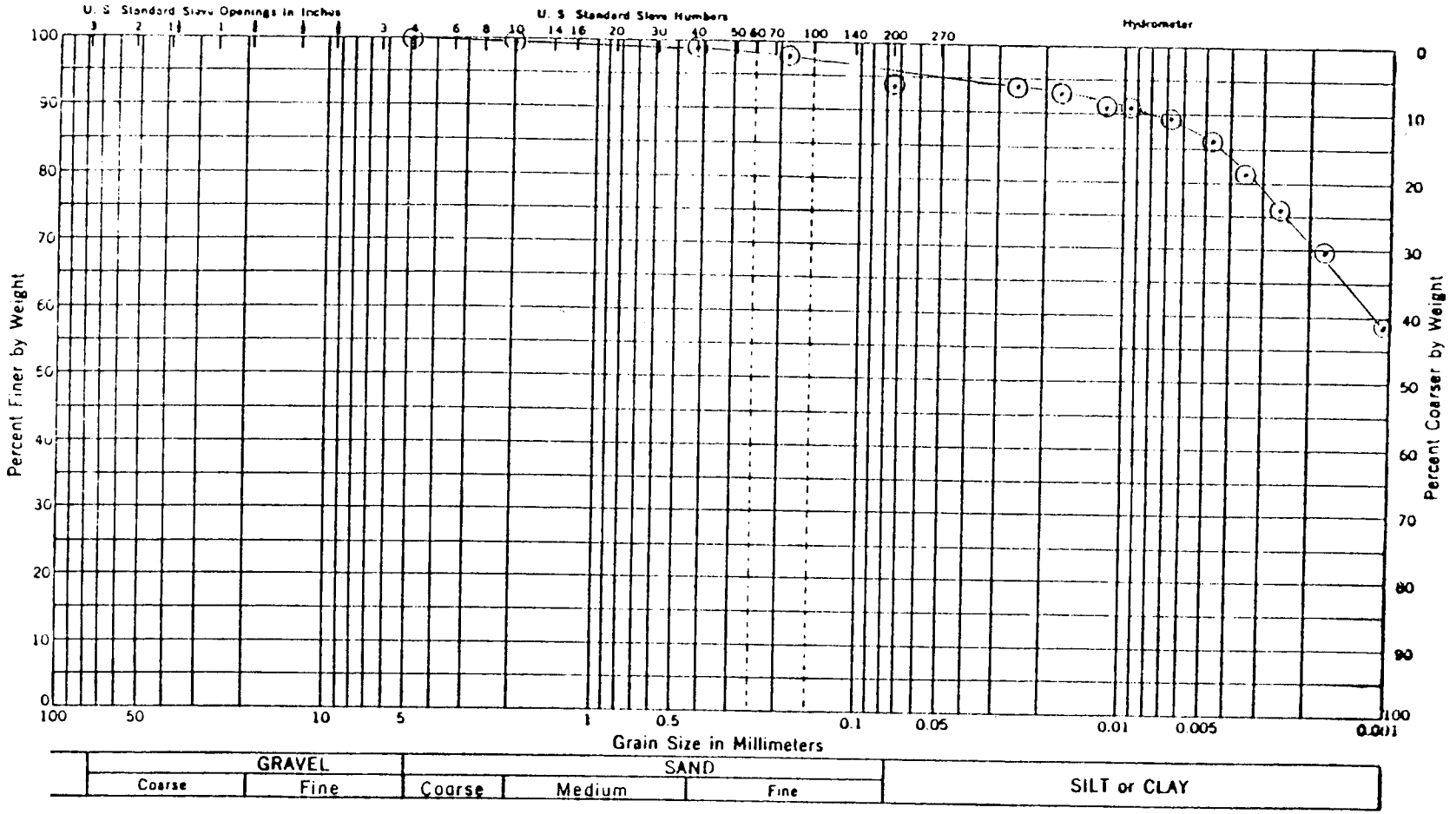


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C5	-----	82.4	24.3	58.1	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #5
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580



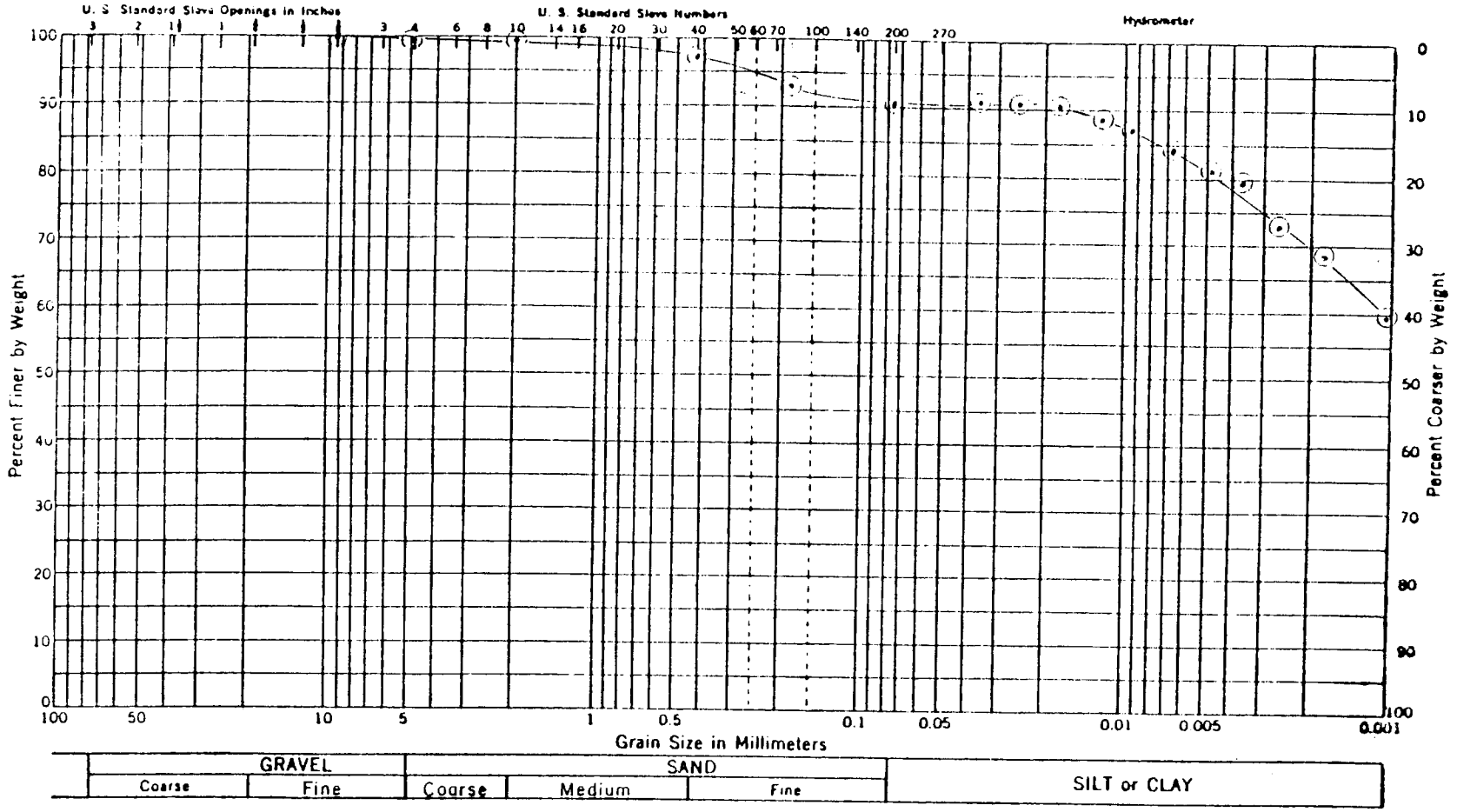
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C6	----	70.7	22.0	48.7	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #6
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C7	-----	73.3	23.1	50.2	Clay, trace sand - (CH)

Grain size distribution
unclassified soil fill-lift #7
Koppers closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	10-20-88	94580

A2 - CLAY BARRIER

Borrow Source Evaluation

- Proctor Test Results
- Grain Size/Atterberg Limits Test Results
- Permeability Test Results

Field/Laboratory Testing of "As-Built" Construction

- Field Density Test Locations
- Field Density Test Results
- Laboratory Test Sample Locations
- Grain Size/Atterberg Limits Test Results
- Permeability Test Results

STS Consultants, Ltd.
3650 Annapolis Lane
Minneapolis, MN 55447-5434
(612) 559-1900

2820 Belknap Street
Superior, WI 54880
(715) 392-9006

108 Chestnut Street
Virginia, MN 55792
(218) 741-8804

COMPACTION CONTROL REPORT
Laboratory Compaction Test Data

Project: Koppers Closure Date: 10/14/88 STS Job#: 94580

Description of soil: Clay, Trace sand - Red Brown

Material mark: A2-B1 (Clay Barrier) Classification: CH

Source of Material: Ray Konen on Highway "C", Douglas County, Wisconsin

Natural water content: -- % Natural dry density: -- pcf Specific gravity: 2.66 (est.)

Liquid limit: 91.0 % Plastic limit: 26.2 % Plasticity index: 64.8

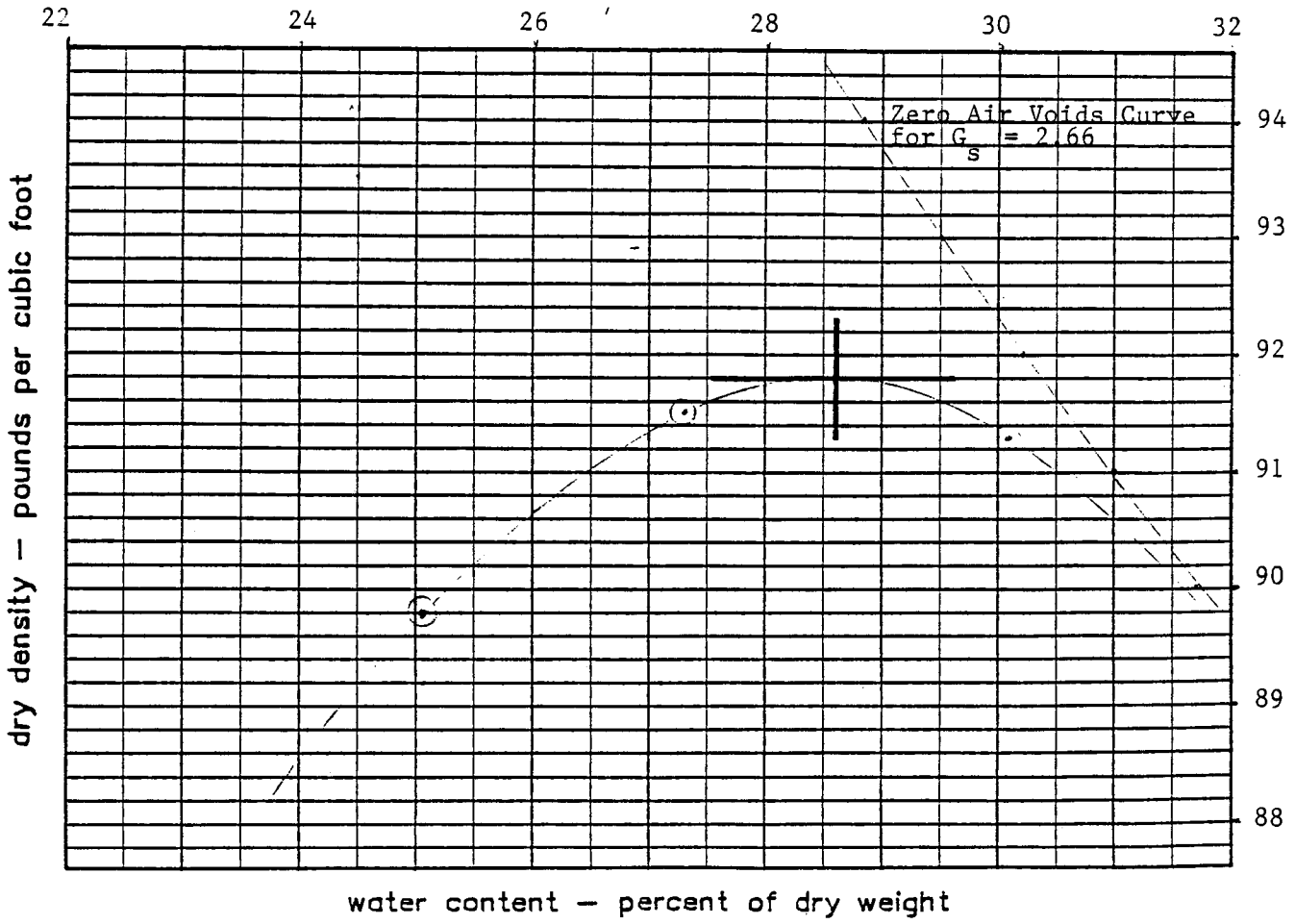
Test procedure used: Standard Proctor, ASTM D-698, Method A

TEST RESULTS

Maximum dry density: 91.8 pcf

Optimum water content: 28.6 %

(at a wet density of: 118.1 pcf)



STS Consultants, Ltd.
3650 Annapolis Lane
Minneapolis, MN 55447-5434
(612) 559-1900

2820 Belknap Street
Superior, WI 54880
(715) 392-9006

108 Chestnut Street
Virginia, MN 55792
(218) 741-8804

COMPACTION CONTROL REPORT
Laboratory Compaction Test Data

Project: Koppers Closure Date: 10/14/88 STS Job#: 94580

Description of soil: Clay, Trace Sand - Red Brown

Material mark: A2-B2 (Clay Barrier) Classification: CH

Source of Material: Ray Konen on Highway "C", Douglas County, Wisconsin

Natural water content: -- % Natural dry density: -- pcf Specific gravity: 2.61 (est.)

Liquid limit: 79.4 % Plastic limit: 24.0 % Plasticity index: 55.4

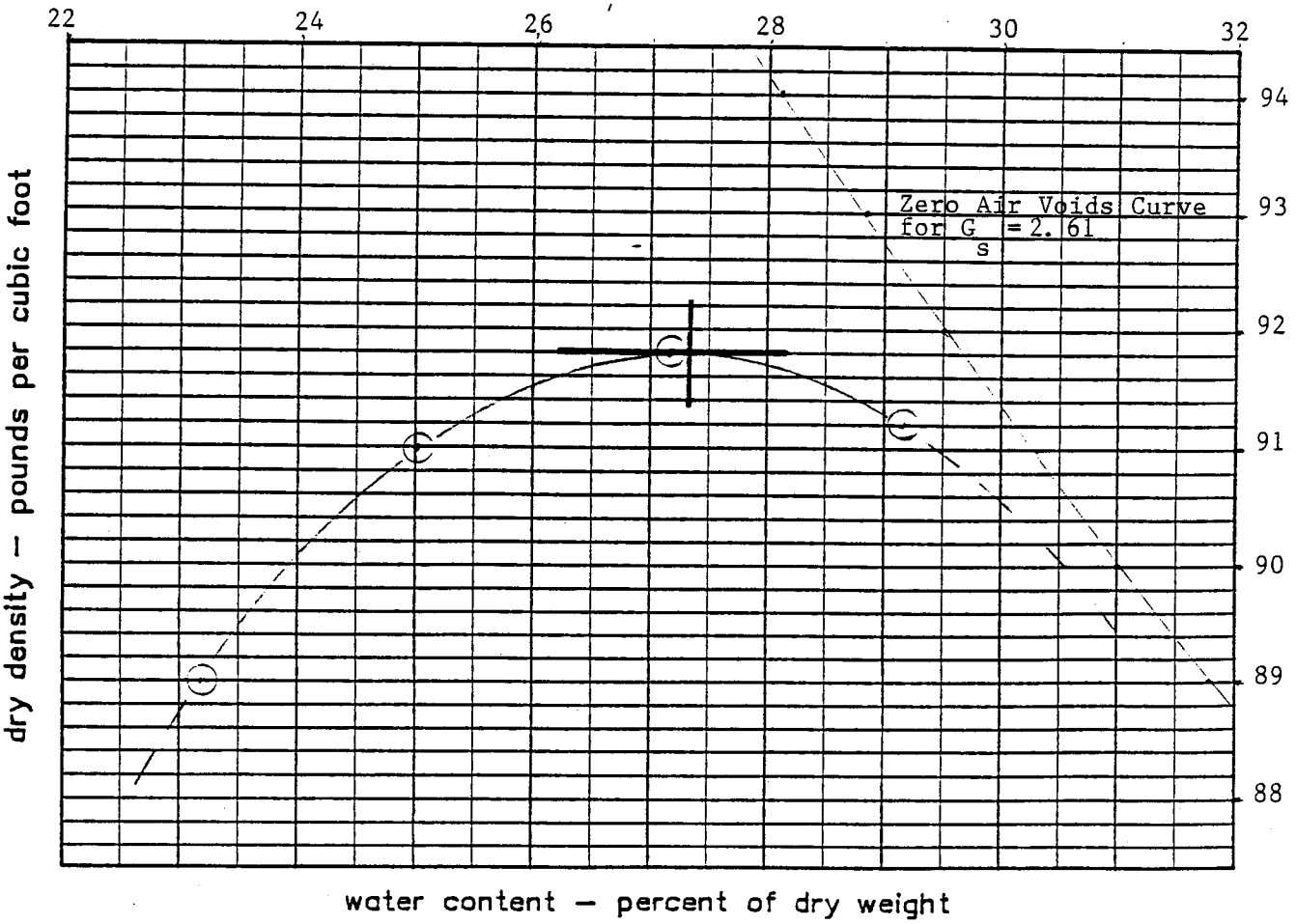
Test procedure used: Standard Proctor, ASTM D-698, Method A

TEST RESULTS

Maximum dry density: 91.8 pcf

Optimum water content: 27.3 %

(at a wet density of: 116.9 pcf)



STS Consultants Ltd.
Consulting Engineers
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-B1

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Borrow #1

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 87.4

WATER CONTENT, INITIAL (%): 28.5

WATER CONTENT, FINAL (%): --

PERCENT COMPACTION: 95

CALCULATED PERMEABILITY: Average 2.81×10^{-8} cm/sec

TESTED BY: Robert Elder

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-B2

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Borrow #2

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 86.6

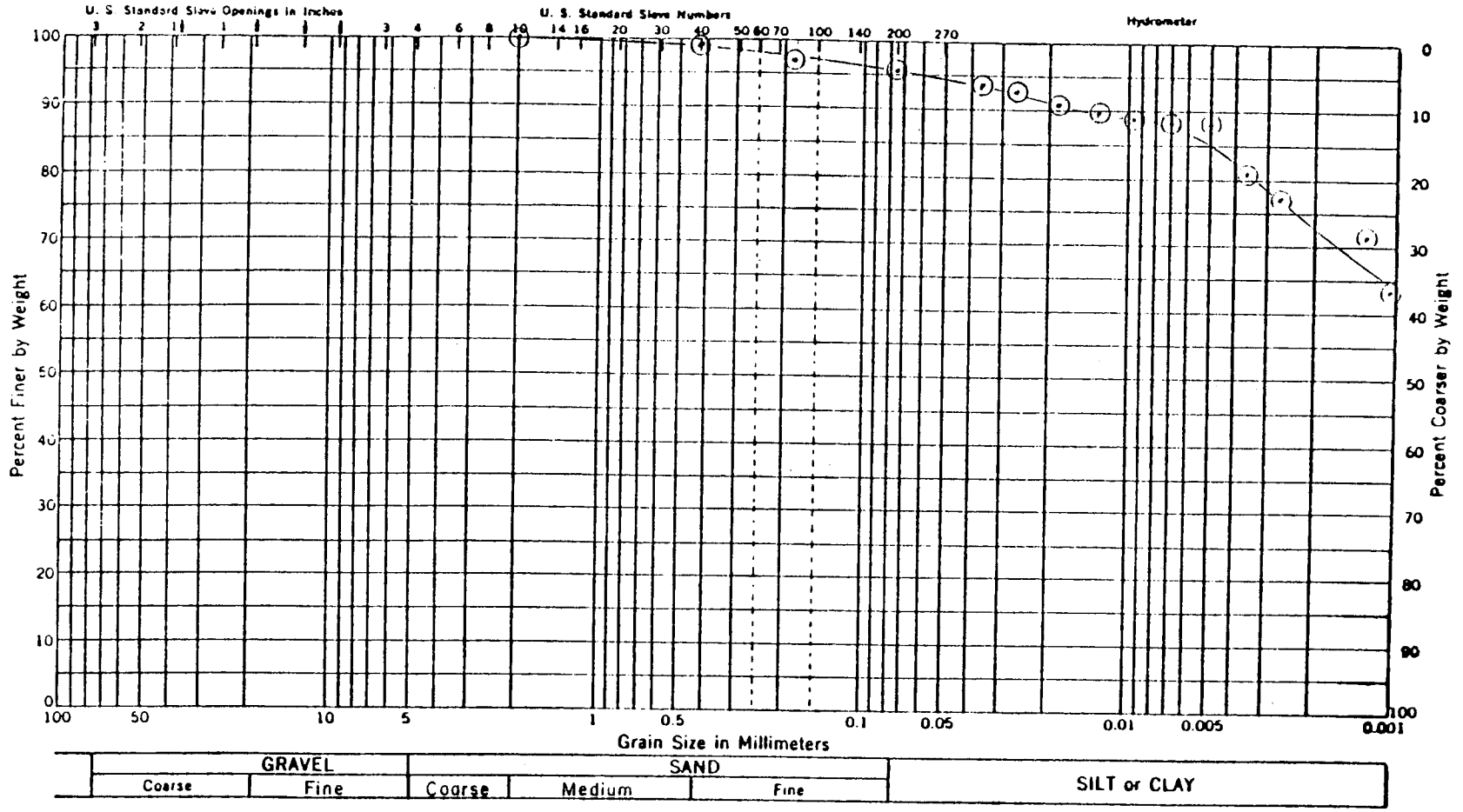
WATER CONTENT, INITIAL (%): 31.8

WATER CONTENT, FINAL (%): --

PERCENT COMPACTION: 94

CALCULATED PERMEABILITY: Average 2.59×10^{-9} cm/sec

TESTED BY: Robert Elder

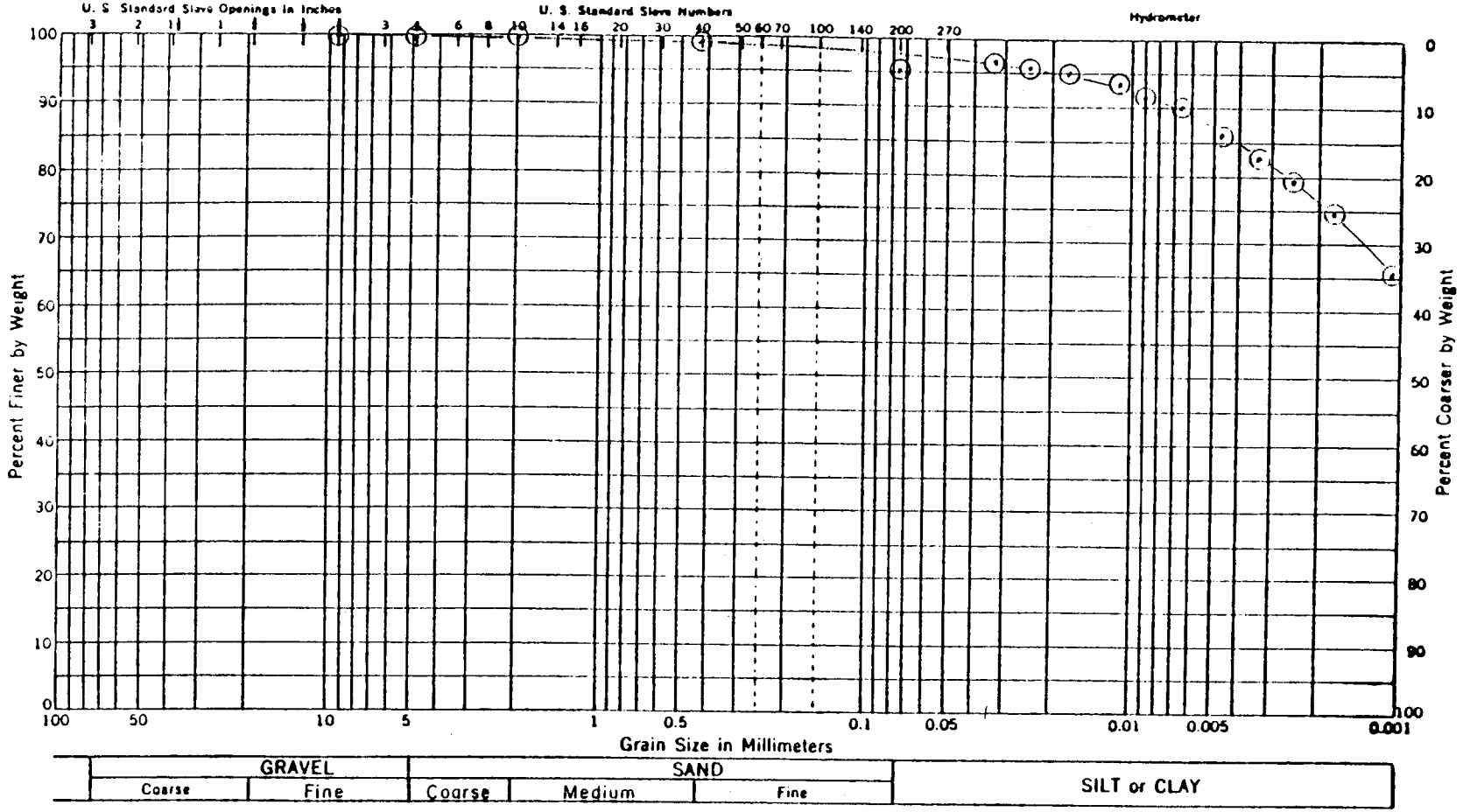


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-B1	--	91.0	26.2	64.8	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Borrow #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580



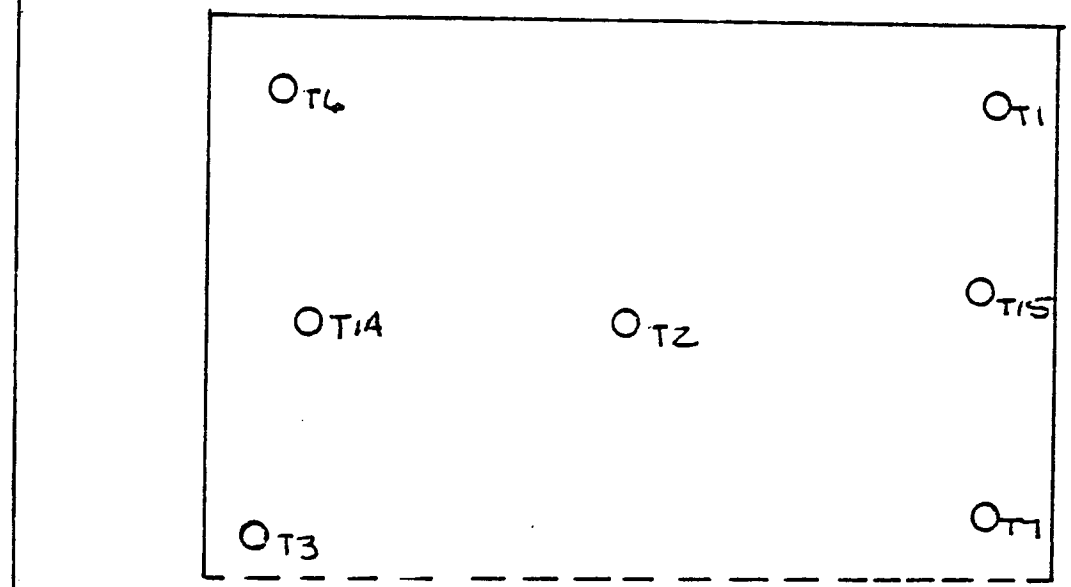
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-B2	--	79.4	24.0	55.4	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Borrow #2
Koppers Closure
Superior, Wisconsin

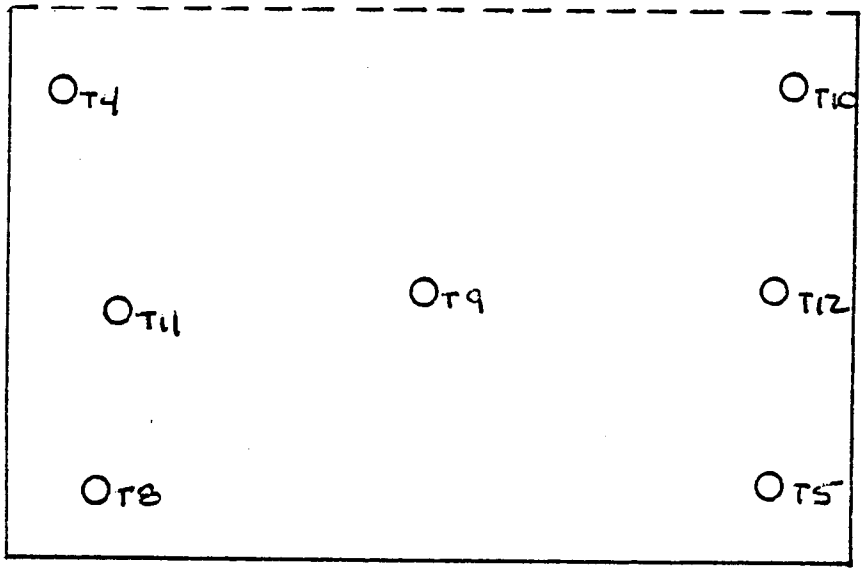
STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580

REV. 12/1/75
IN 5526 78 M



T13



O-Field Density Test - Clay Barrier

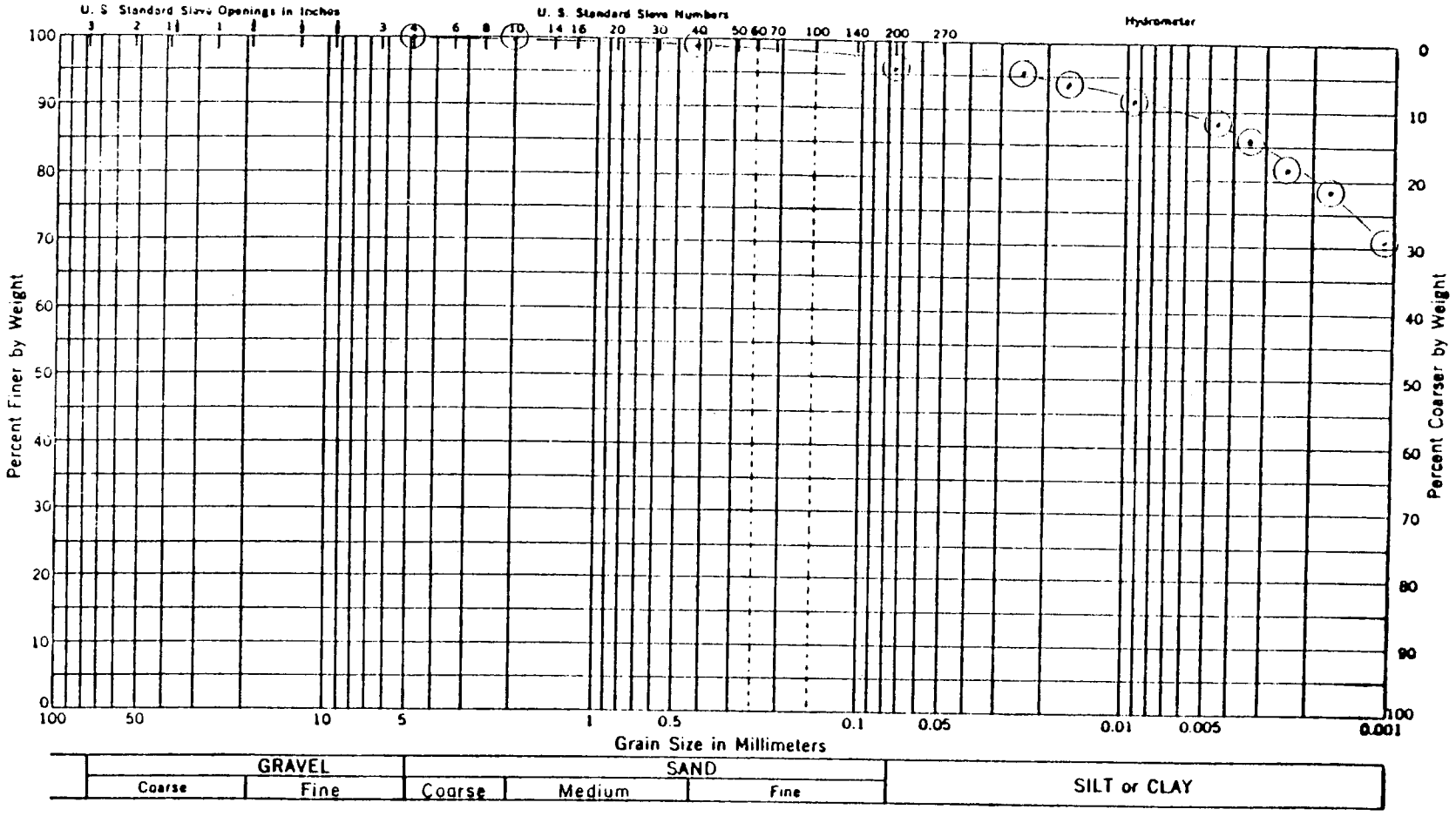
TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT	9-19-88	94580	no scale

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A1-C8	--	95.8	28.8	67.0	Clay, Trace Sand - (CH)

Grain Size Distribution
Unclassified Soil Fill Lift #8
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/10/88	94580

REV. 2/1/75

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location SURFACE IMPOUNDMENT CLOSURE, KOPPER CO. SUPERIOR, WISC.
Architect or Engineer KEYSTONE ENVIRONMENTAL RESOURCES, INC.
Contractor J. R. JENSEN
STS job number 94580 Month OCT. Year 1988
Other project number 178275-0A

Test No.	Date	Location	Lift No. or ~~Elevation~~	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
1	10-4	SEE PLAN	1ST	A1-B1	94.6	118.5	30.9	90.5	95	
2	"	"	"	"	"	117.5	30.0	90.4	95	
3	"	"	"	"	"	118.2	30.5	90.6	95	
4	10-6	"	"	"	"	119.8	23.9	96.7	100	
5	"	"	"	"	"	117.9	27.8	92.3	97	
6	"	"	2ND	"	"	117.1	29.8	90.2	95	
7	"	"	"	"	"	115.5	28.0	90.2	95	
8	10-7	"	"	"	"	117.8	27.1	92.7	98	
9	"	"	"	"	"	119.1	27.4	93.5	98	
10	"	"	"	"	"	118.6	28.8	92.1	97	
11	10-8	"	3TH	"	"	117.9	27.3	92.6	97	
12	"	"	"	"	"	116.0	28.2	90.5	95	
13	"	"	"	"	"	118.4	28.3	92.3	97	
14	"	"	"	"	"	119.7	28.7	93.0	98	
15	"	"	"	"	"	116.6	28.8	90.5	95	

CLAY BARRIER

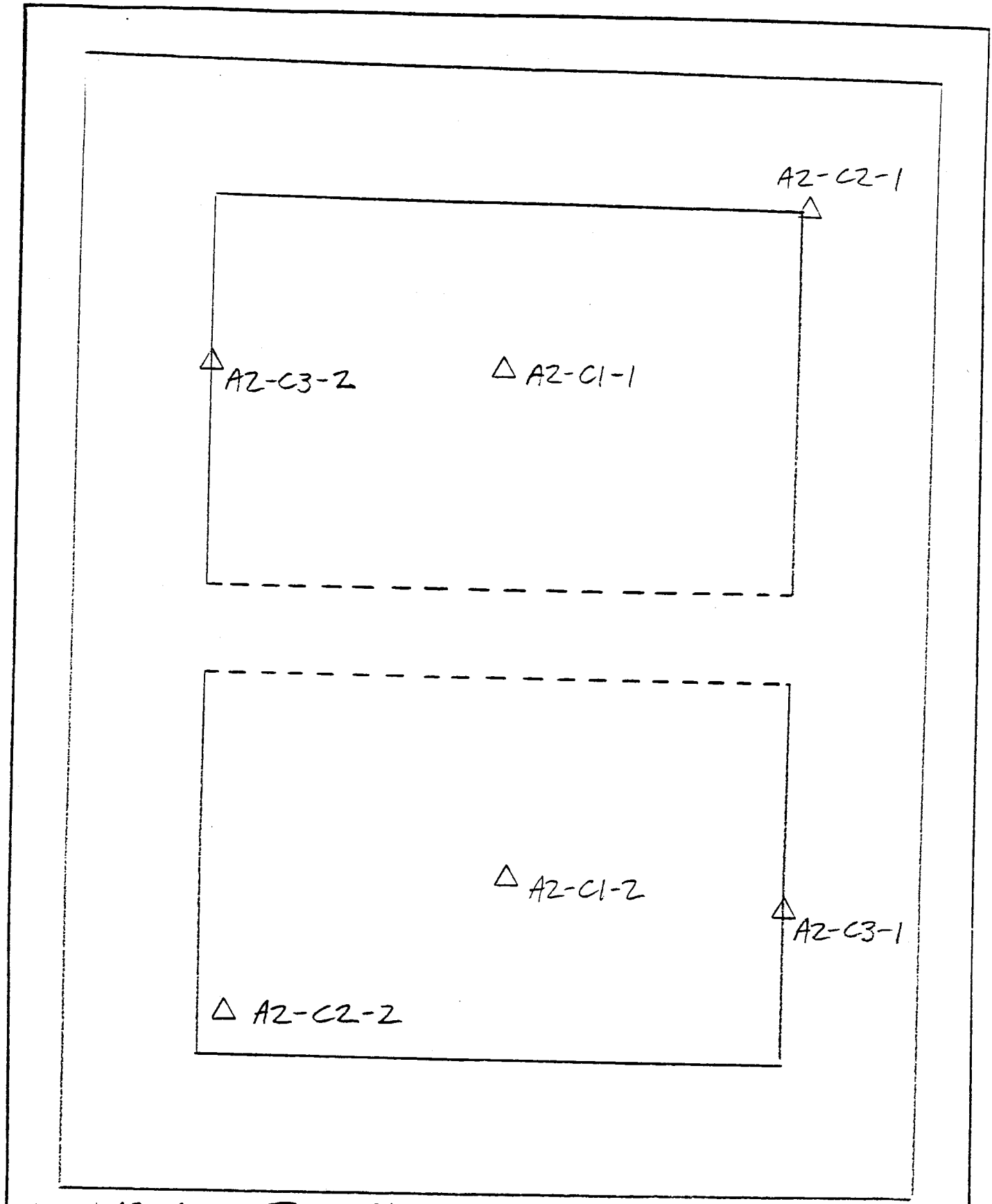
* Water content shown as percent of dry weight.

Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other _____ ☐
Compaction Required 95 %

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒



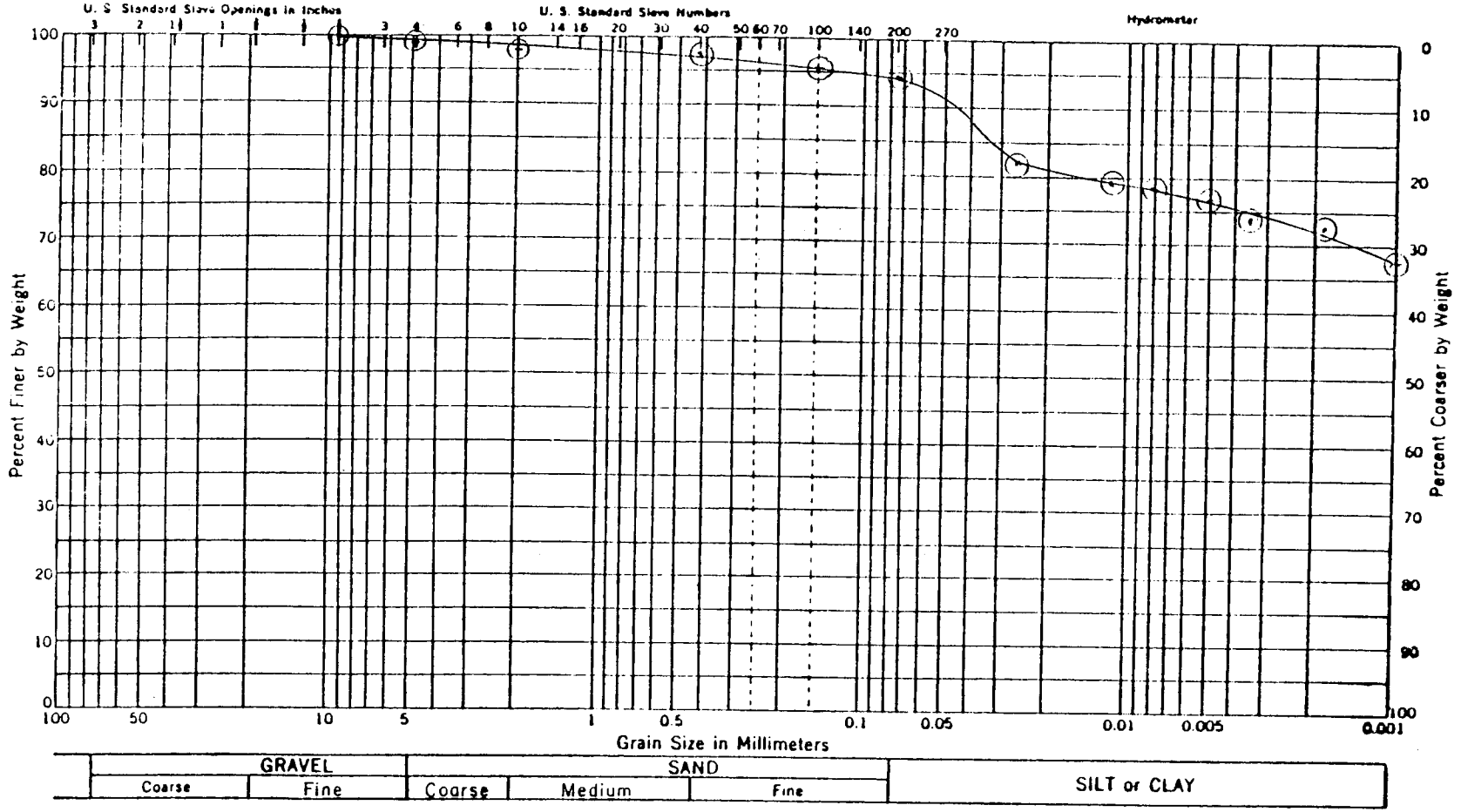
△ - LABORATORY TEST SAMPLE - CLAY BARRIER

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT | 9-19-88 | 94580 | no scale

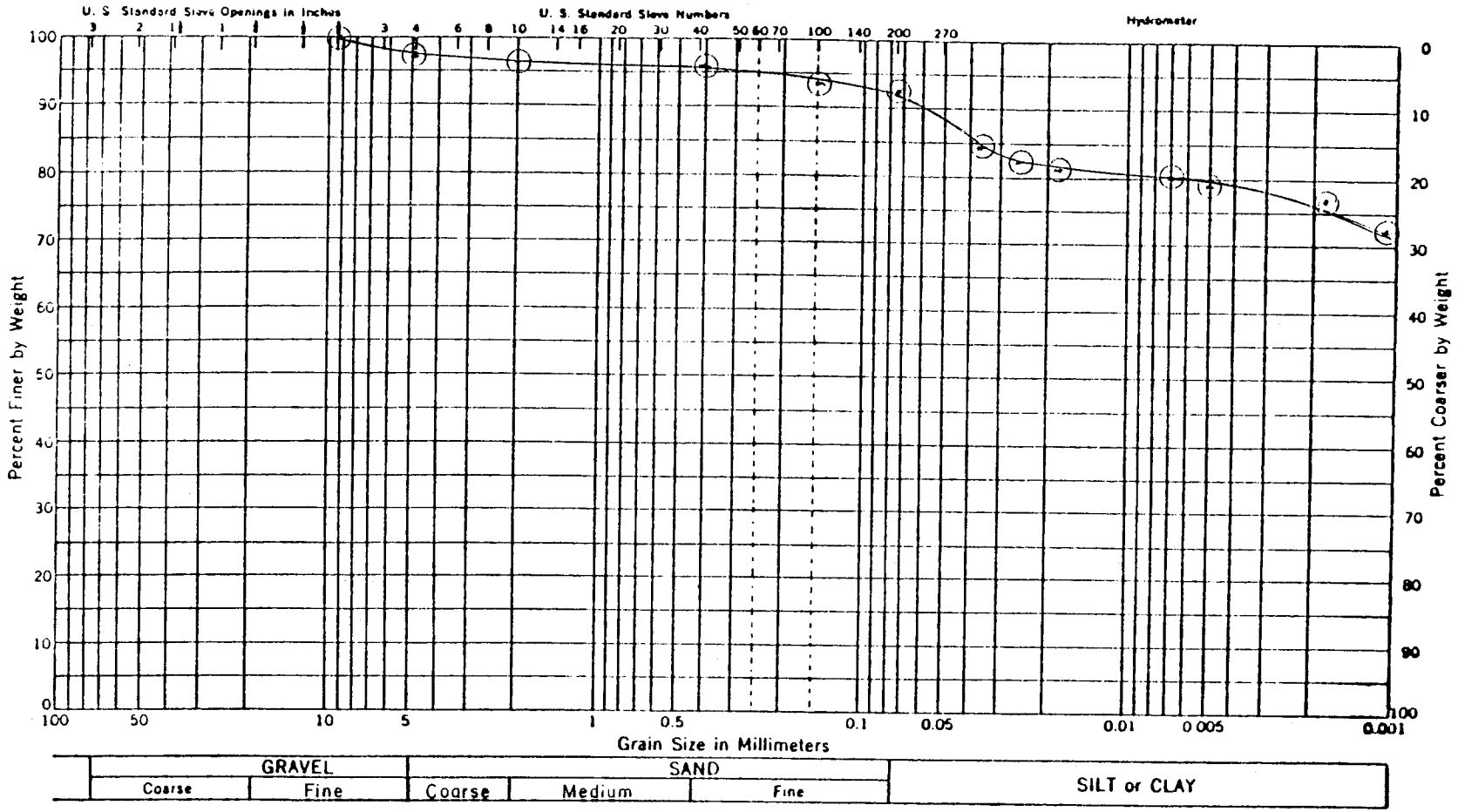


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C1-1	40	76	26	50	Clay, Trace Sand and Gravel - (CH)

Grain Size Distribution
Clay Barrier - Lift #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580



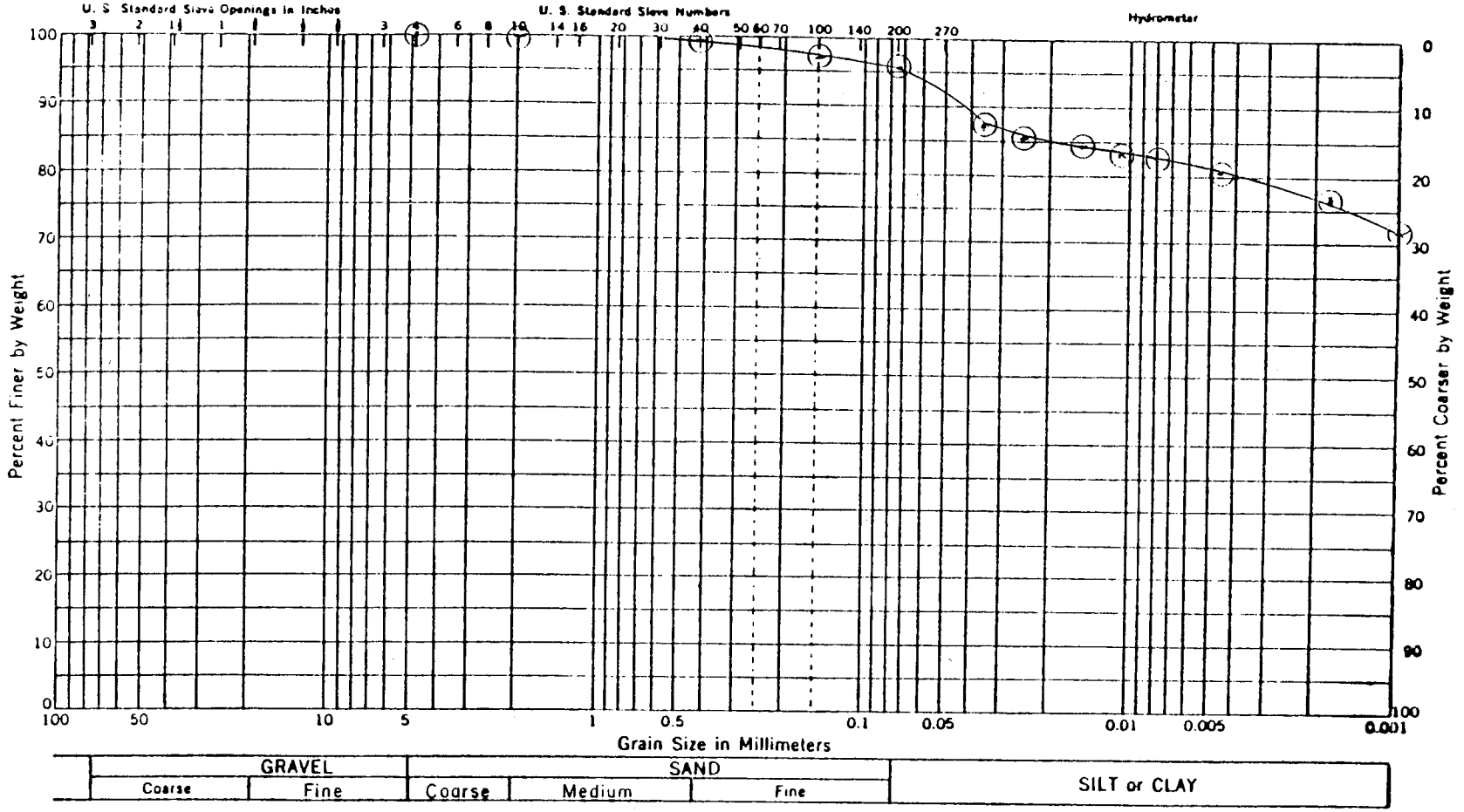
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C1-2	32.4	90	29	61	Clay, Trace Sand and Gravel - (CH)

Grain Size Distribution
Clay Barrier - Lift #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

REV 12/1/75
DS-302-78M

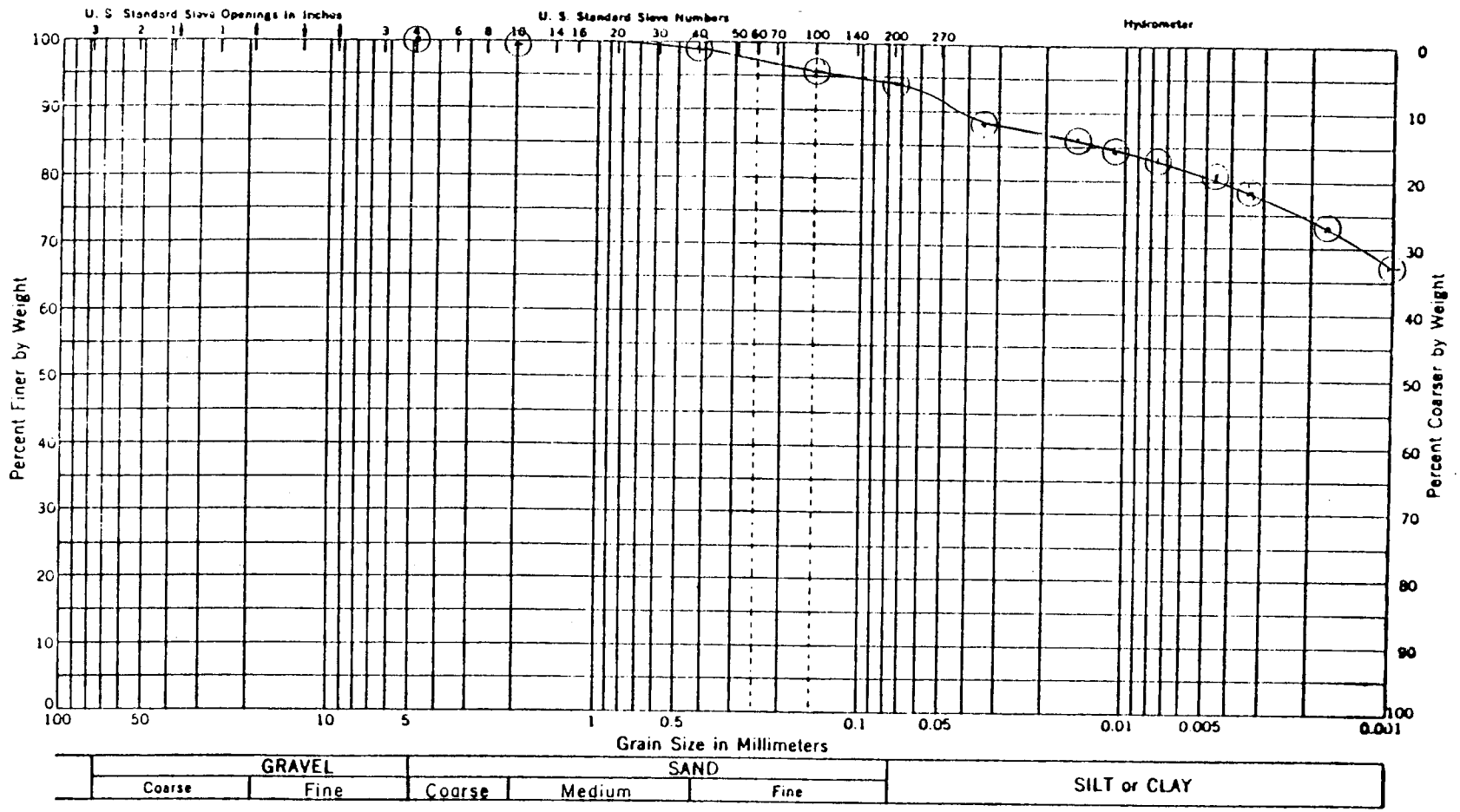


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C2-1	29.3	84	29	55	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Lift #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580



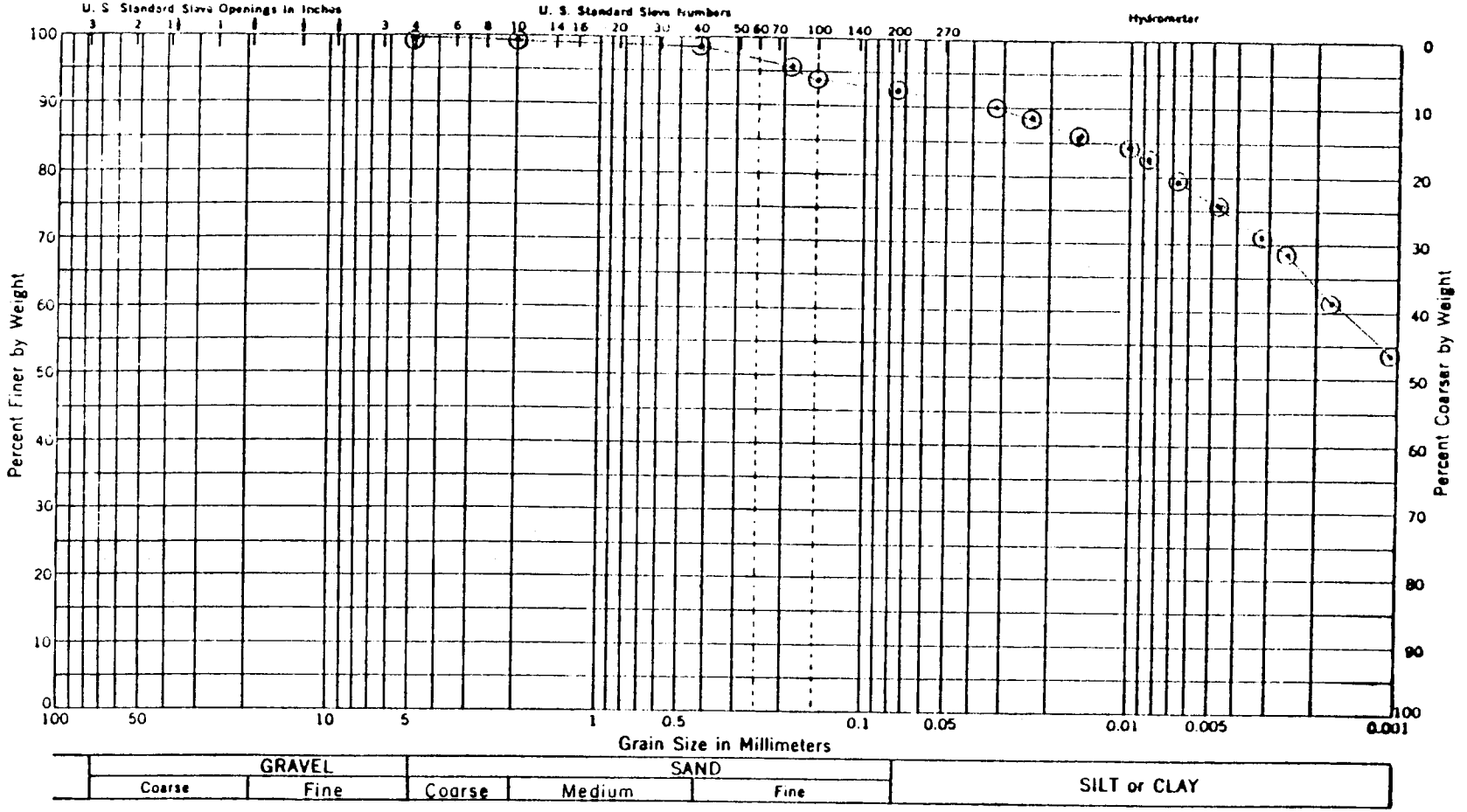
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C2-2	33.5	84	29	55	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Lift #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

UNIFIED CLASSIFICATION SYSTEM



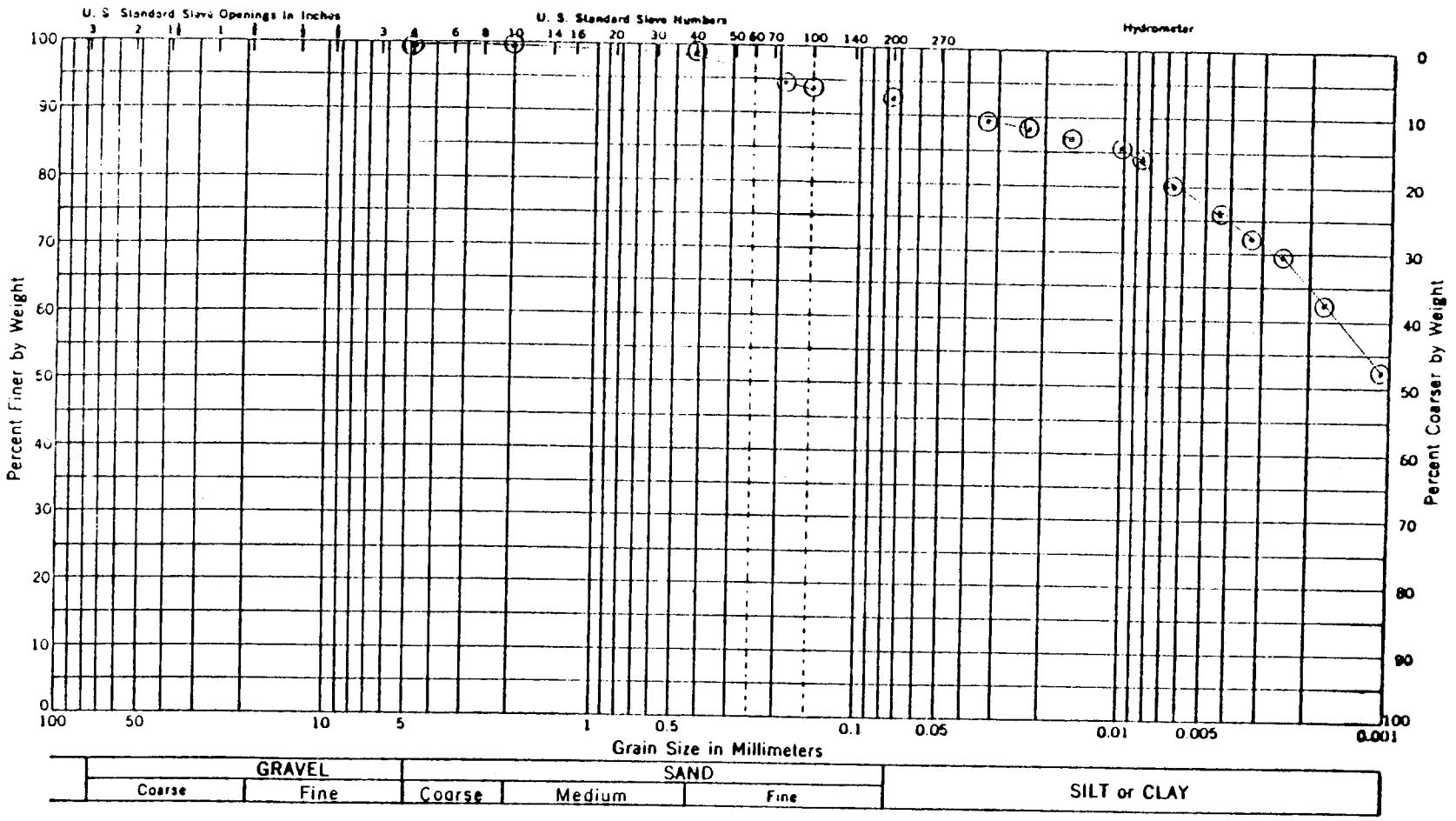
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C3-1		81.3	24.6	56.7	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Lift 3
Koppers Co. Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
FT	MBS	11/21/88	94580

REV 12/1/75
Form 2078M



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A2-C3-2		80.1	24.2	55.9	Clay, Trace Sand - (CH)

Grain Size Distribution
Clay Barrier - Lift 3
Koppers Co. Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
F.T.	MBS	11/21/88	94580

REV 12/1/75
BB5626/8M

APPENDIX E

FIELD AND LABORATORY TEST RESULTS

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-C1-1

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Lift #1

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 80.9

WATER CONTENT, INITIAL (%): --

WATER CONTENT, FINAL (%): 40.0

PERCENT COMPACTION: 84

CALCULATED PERMEABILITY: Average 4.0×10^{-9} cm/sec

TESTED BY: Bob Peeters

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-C1-1

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Lift #1

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 91.0

WATER CONTENT, INITIAL (%): --

WATER CONTENT, FINAL (%): 32.4

PERCENT COMPACTION: 96

CALCULATED PERMEABILITY: Average 2.3×10^{-9} cm/sec

TESTED BY: Bob Peeters

STS Consultants Ltd.
Consulting Engineers
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-C2-1

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Lift #2

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 94.3

WATER CONTENT, INITIAL (%): --

WATER CONTENT, FINAL (%): 29.3

PERCENT COMPACTION: 100

CALCULATED PERMEABILITY: Average 2.5×10^{-9} cm/sec

TESTED BY: Bob Peeters

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 11/21/88

ARCH/ENG. Keystone Environmental

REPORT NO. A2-C2-2

PERMEABILITY TEST RESULTS

TEST LOCATION: Clay Barrier - Lift #2

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY DENSITY (lbs/ft.^{3}): 85.9

WATER CONTENT, INITIAL (%): --

WATER CONTENT, FINAL (%): 33.5

PERCENT COMPACTION: 91

CALCULATED PERMEABILITY: Average 2.5×10^{-9} cm/sec

TESTED BY: Bob Peeters

STS Consultants Ltd.
Consulting Engineers
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Co. Closure — STS JOB NO. 94580

LOCATION Superior, Wisconsin — DATE 11-25-88

ARCH/ENG Keystone Environmental Resources, Inc. — REPORT NO. A2-C3-1

PERMEABILITY TEST RESULTS

TEST LOCATION: See Plan, Lift 3

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY WEIGHT (lbs/ft^3): 91.4

WATER CONTENT, INITIAL (%): 28.1

WATER CONTENT, FINAL (%): 29.0

PERCENT COMPACTION: 96.6

CALCULATED PERMEABILITY: Average 7.36×10^{-8} cm/sec

TESTED BY: Fred TePaske

STS Consultants Ltd.
Consulting Engineers
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Co. Closure STS JOB NO. 94580

LOCATION Superior, Wisconsin DATE 11-25-88

ARCH/ENG. Keystone Environmental Resources, Inc. REPORT NO. A2-C3-2

PERMEABILITY TEST RESULTS

TEST LOCATION: See Plan, Lift 3

MATERIAL: Clay, Trace Sand

SOIL CLASSIFICATION: CH

TEST TYPE: Falling Head

UNIT DRY WEIGHT (lbs/ft^3): 92.0

WATER CONTENT, INITIAL (%): 28.5

WATER CONTENT, FINAL (%): 29.1

PERCENT COMPACTION: 97.3

CALCULATED PERMEABILITY: Average 1.70×10^{-9} cm/sec

TESTED BY: Fred TePaske

A3 - DRAINAGE LAYER

Borrow Source Evaluation

- Proctor Test Results
- Grain Size Test Results
- Permeability Test Results

Field/Laboratory Testing of "As-Built" Construction

- Field Density Test Locations
- Field Density Test Results
- Laboratory Test Sample Locations
- Grain Size Test Results

SIS Consultants Inc.
Geotechnical Engineering
and Material Testing
2820 Beiknap Street
Superior, Wisconsin 54880
(715) 392-9006

Minneapolis, Minnesota 55447
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

Date 9-22-88

Job No. 94580

COMPACTION CONTROL REPORT

1. Laboratory Compaction Test Data

A. Description of Soil: FINE TO COARSE BROWN SAND, SOME GRAVEL

Material Mark A3-B1 Classification SP AASHO BPR

Source of Material Bellwood Road, Section 17, Beuke Township, Douglas Co.

Natural Water Content _____ % Natural Dry Density _____ PCF Specific Gravity _____

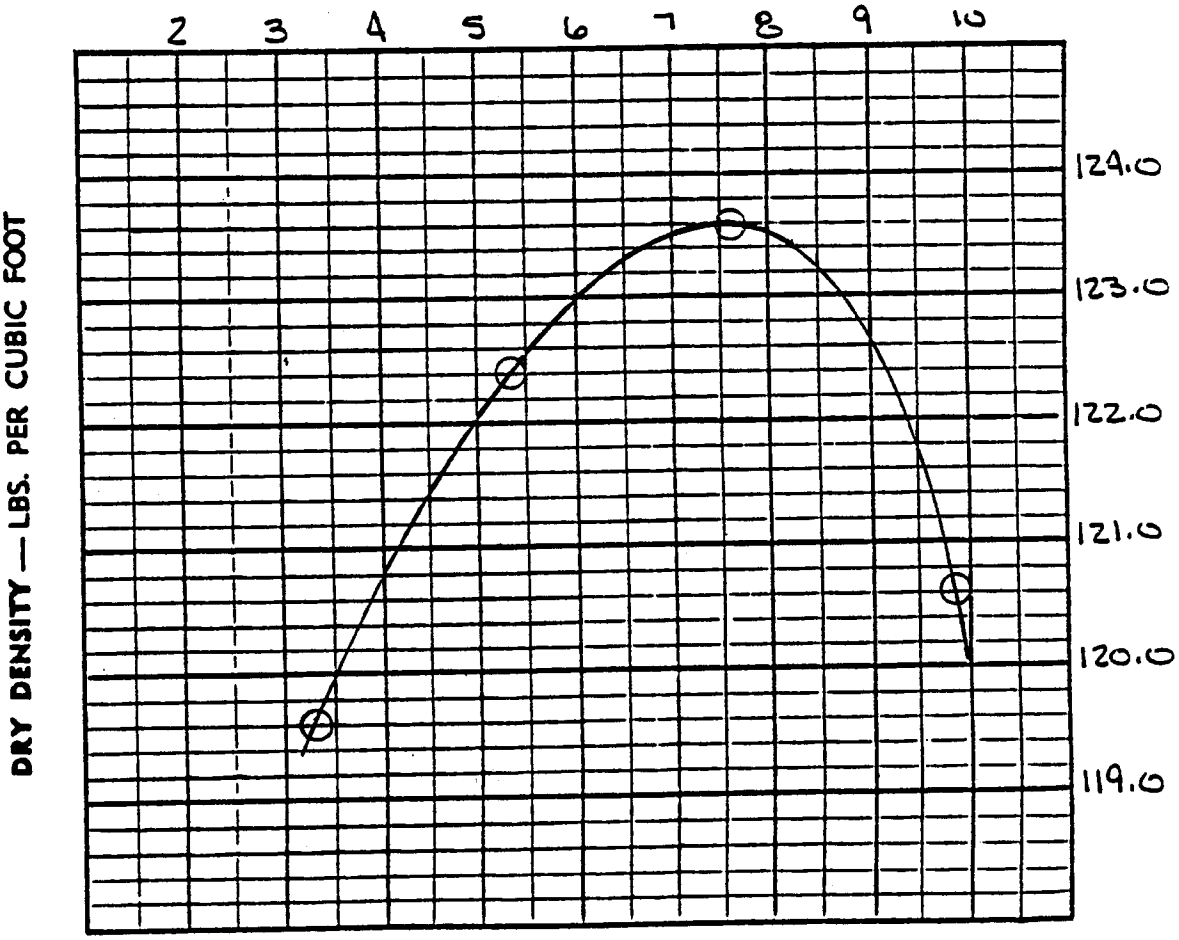
Liquid Limit _____ % Plastic Limit _____ % Plasticity Index _____

B. Test Procedure Used: ASTM D698 METHOD D

C. Test Results:

Optimum Water Content 7.7 %

Maximum Dry Density 123.6 PCF (at a Wet Density of 133.1 PCF)



SES Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

5680 Annapolis Lane
Minneapolis, Minnesota 55447
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

Date 10-8-88

Job No. 94580

COMPACTION CONTROL REPORT

1. Laboratory Compaction Test Data

A. Description of Soil: FINE TO COARSE BROWN SAND, TRACE GRAVEL

Material Mark A3-B2 Classification SP AASHO BPR

Source of Material ALLEN P.I., HWY B, DOUGLAS CO.

Natural Water Content _____ % Natural Dry Density _____ PCF Specific Gravity _____

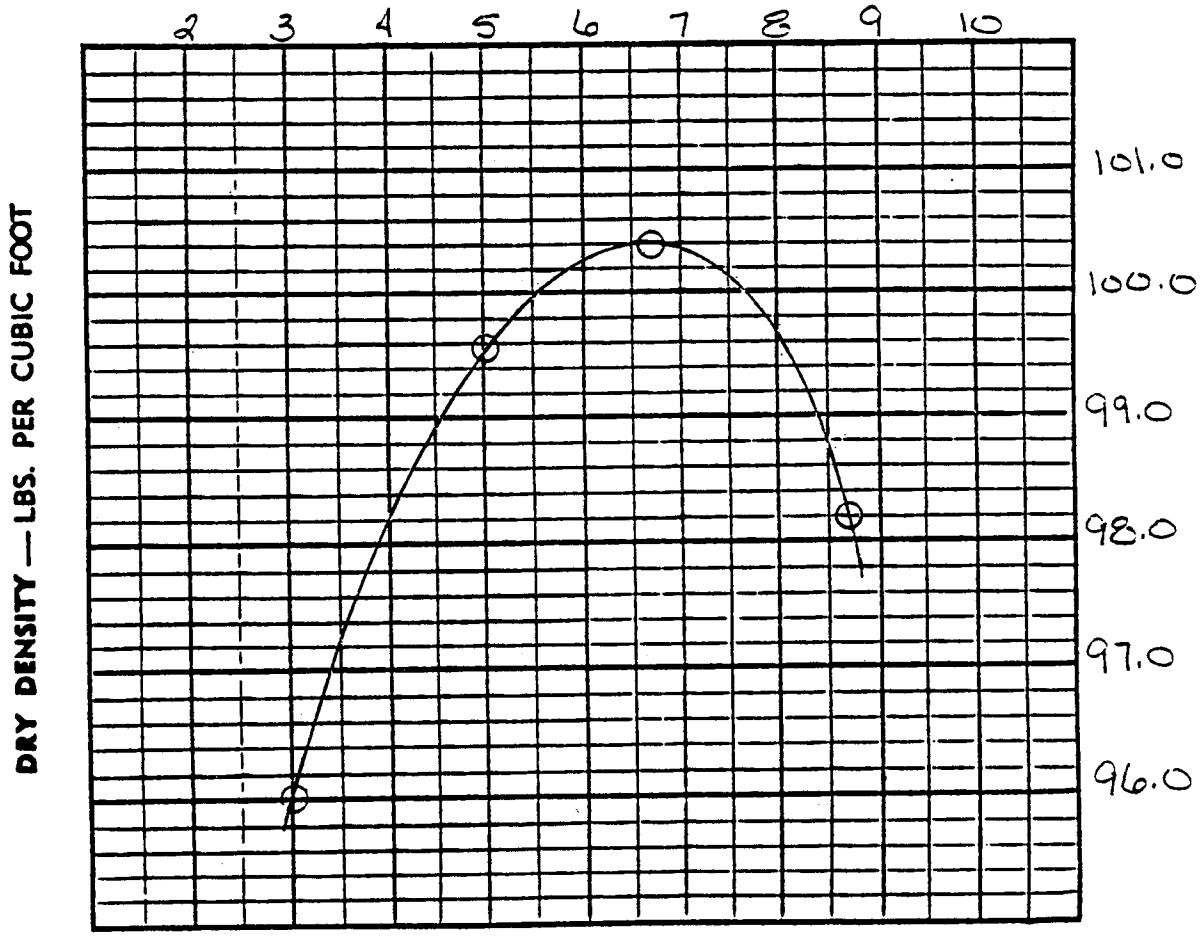
Liquid Limit _____ % Plastic Limit _____ % Plasticity Index _____

B. Test Procedure Used: ASTM 698 METHOD C

C. Test Results:

Optimum Water Content 6.8 %

Maximum Dry Density 100.4 PCF (at a Wet Density of 107.2 PCF)



Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

Minneapolis, Minnesota 55447
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

Date 10-8-88

Job No. 94580

COMPACTION CONTROL REPORT

1. Laboratory Compaction Test Data

A. Description of Soil: FINE TO COARSE BROWN SAND, TRACE TO SOME GRAVEL

Material Mark A3-B3 Classification SP AASHO BPR

Source of Material ALLEN PIT, HWY 8, DOUGLAS CO.

Natural Water Content _____ % Natural Dry Density _____ PCF Specific Gravity _____

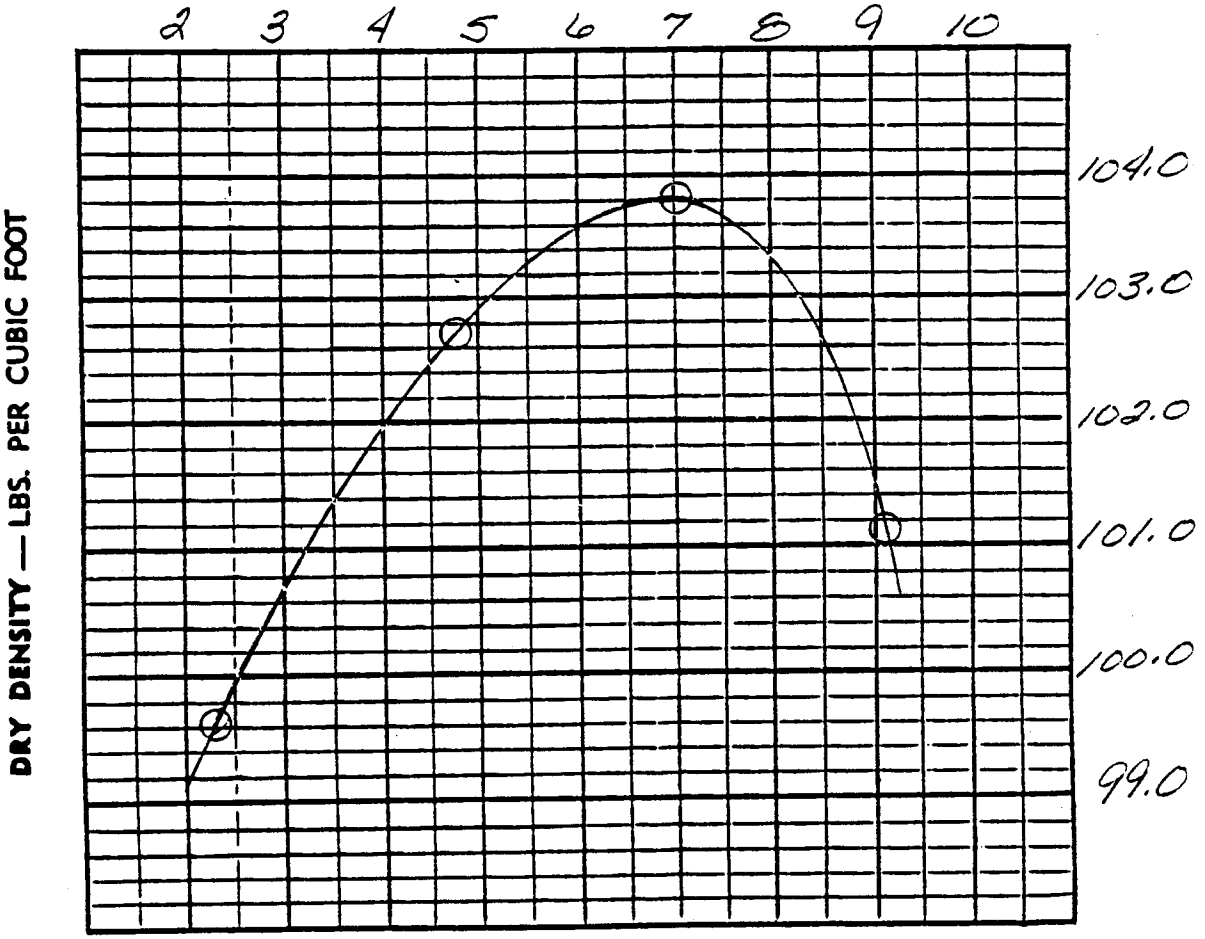
Liquid Limit _____ % Plastic Limit _____ % Plasticity Index _____

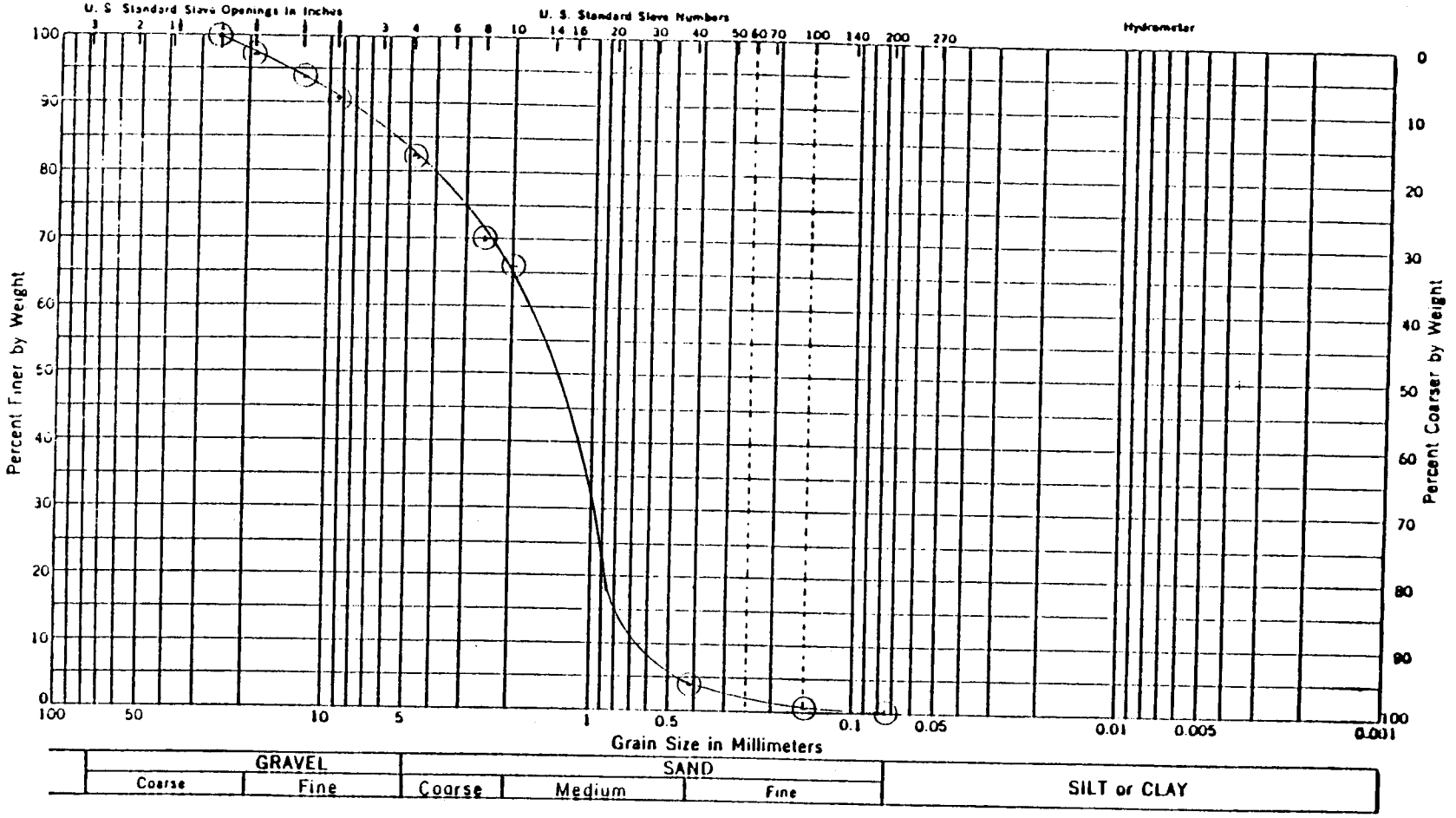
B. Test Procedure Used: ASTM D698 METHOD C

C. Test Results:

Optimum Water Content 7.0 %

Maximum Dry Density 103.8 PCF (at a Wet Density of 111.1 PCF)





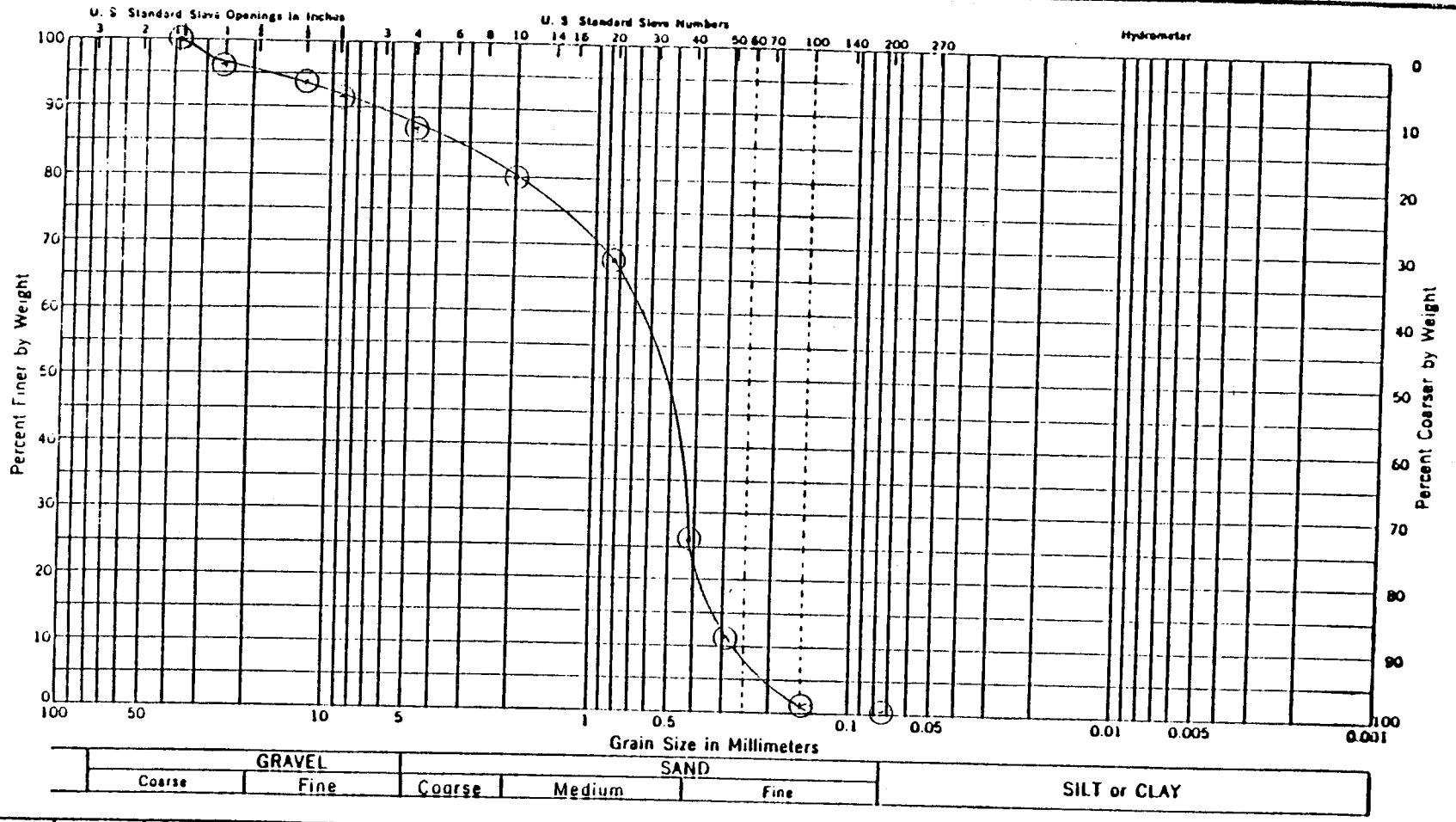
Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-B1*	0.65	0.9	1.8	2.8	0.69	Fine to coarse Sand, little fine to coarse Gravel - (SP)

*Material not used

Grain Size Distribution
Drainage Material - Borrow #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

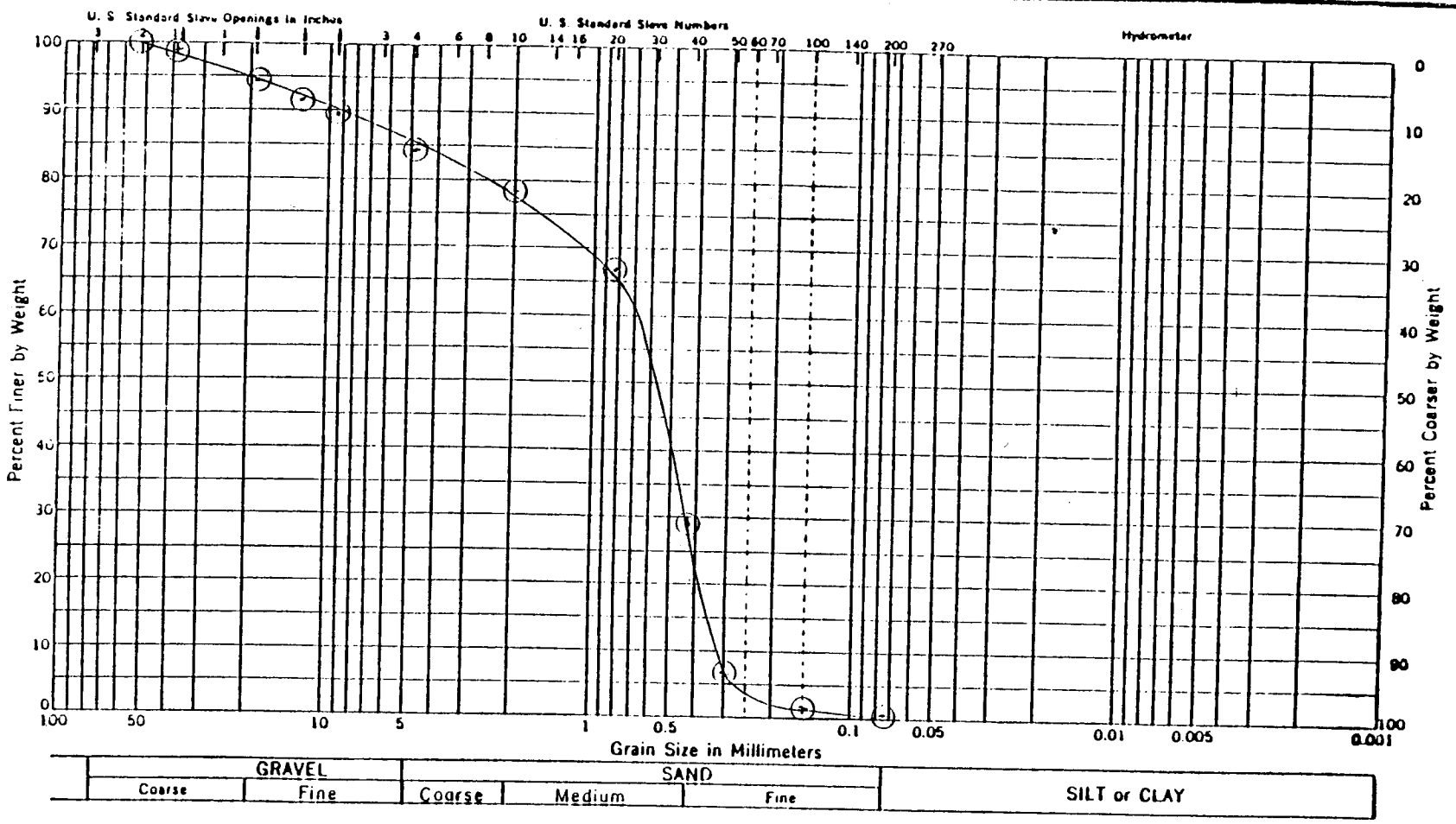


Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-B2	0.27	0.41	0.65	2.4	0.96	Fine to coarse Sand, Little fine to coarse Gravel - (SP)

Grain Size Distribution
Drainage Material - Borrow #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

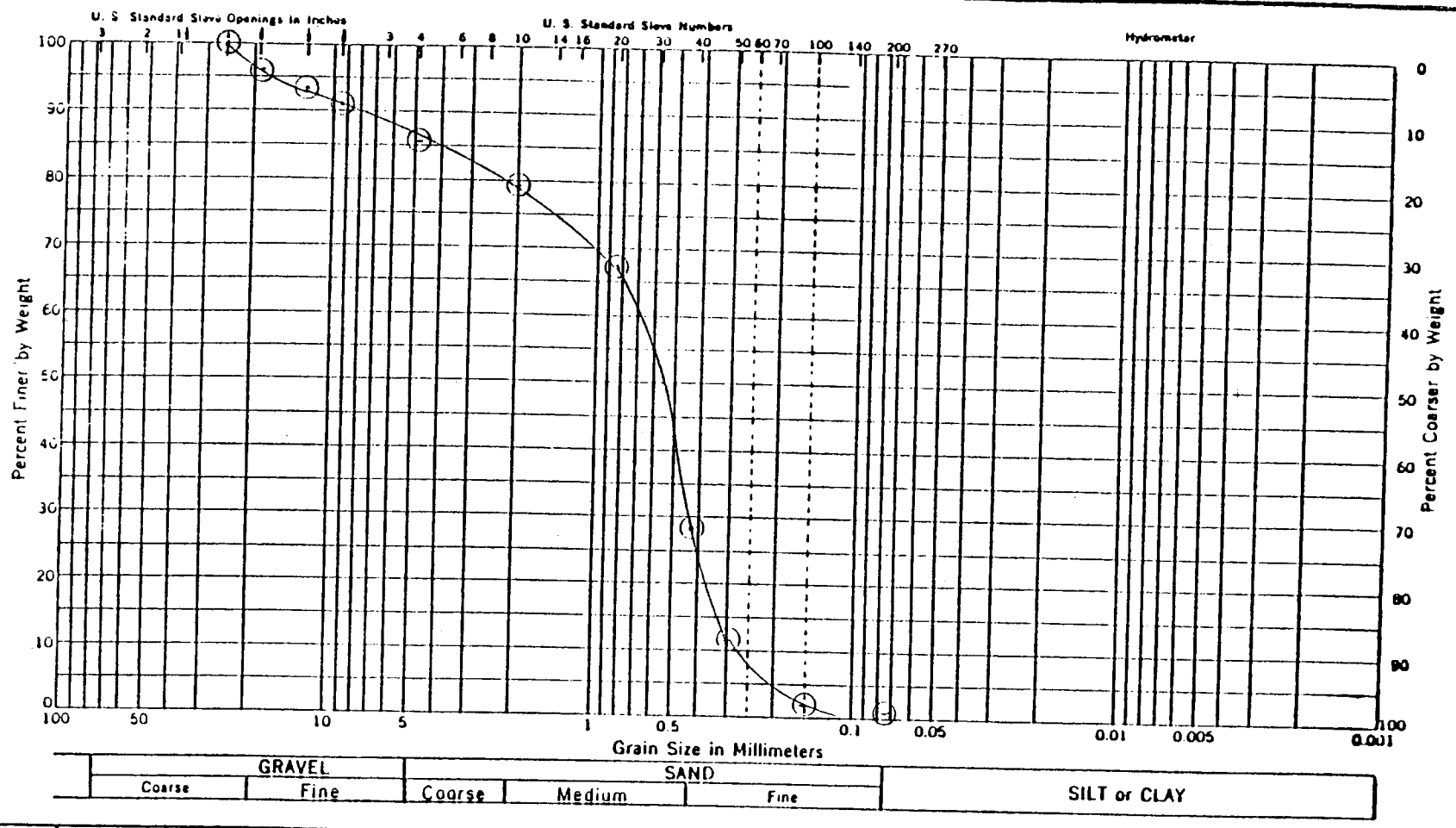


Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-B3	0.31	0.42	0.68	2.2	0.84	Fine to coarse Sand, Little fine to coarse Gravel - (SP)

Grain Size Distribution
Drainage Material - Borrow #3
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580



Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-B4	0.28	0.42	0.69	2.5	0.91	Fine to coarse Sand, Little fine to coarse Gravel - (SP)

Grain Size Distribution
Drainage Material - Borrow #4
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 9/22/88

ARCH/ENG. Keystone Environmental

REPORT NO. A3-B1*

PERMEABILITY TEST RESULTS

TEST LOCATION: Bellwood Pit Material - Drainage Material - Borrow #1

*Material not used

MATERIAL: Fine to Coarse Brown Sand, Little fine to coarse Gravel

SOIL CLASSIFICATION: SP

TEST TYPE: Constant Head

UNIT DRY DENSITY (lbs/ft.^{3}): 117.5

WATER CONTENT, INITIAL (%): 7.1

WATER CONTENT, FINAL (%): 9.5

PERCENT COMPACTION: 95.0

CALCULATED PERMEABILITY: 4.42×10^{-2} cm/sec

TESTED BY: Fred TePaske

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 10/10/88

ARCH/ENG. Keystone Environmental

REPORT NO. A3-B2

PERMEABILITY TEST RESULTS

TEST LOCATION: Allen Pit Material - Drainage Material - Borrow #2

MATERIAL: Fine to Coarse Brown Sand, Little fine to coarse Gravel

SOIL CLASSIFICATION: SP

TEST TYPE: Constant Head

UNIT DRY DENSITY (lbs/ft.^{3}): 95.8

WATER CONTENT, INITIAL (%): 6.5

WATER CONTENT, FINAL (%): 10.1

PERCENT COMPACTION: 95.4

CALCULATED PERMEABILITY: 1.47×10^{-2} cm/sec

TESTED BY: Fred TePaske

STS Consultants Ltd.
Consulting Engineers

2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

PROJECT NAME Koppers Company Closure

STS JOB NO. 94580

LOCATION Superior, Wisconsin

DATE 10/10/88

ARCH/ENG. Keystone Environmental

REPORT NO. A3-B3

PERMEABILITY TEST RESULTS

TEST LOCATION: Allen Pit Material - Drainage Material - Borrow #3

MATERIAL: Fine to Coarse Brown Sand, Little fine to coarse Gravel

SOIL CLASSIFICATION: SP

TEST TYPE: Constant Head

UNIT DRY DENSITY (lbs/ft.^{3}): 98.9

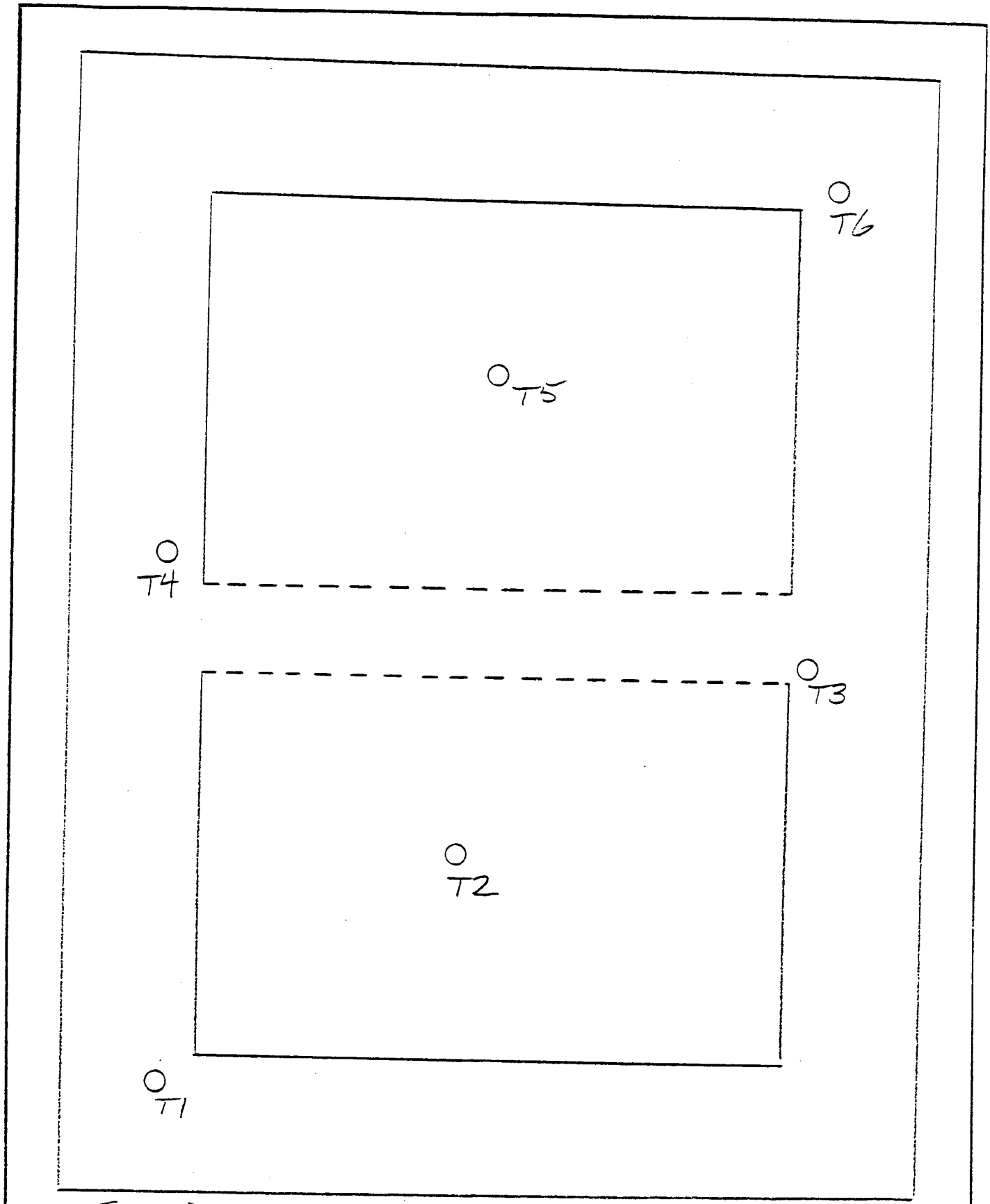
WATER CONTENT, INITIAL (%): 7.2

WATER CONTENT, FINAL (%): 9.8

PERCENT COMPACTION: 95.3

CALCULATED PERMEABILITY: 3.89×10^{-2} cm/sec

TESTED BY: Fred TePaske



O - FIELD DENSITY TEST - DRAINAGE LAYER

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT	9-19-88	94580	no scale

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location SURFACE IMPOUNDMENT CLOSURE, KOPPERS CO. SUPERIOR, WISC.
Architect or Engineer KEYSTONE ENVIRONMENTAL RESOURCES, INC.
Contractor J. L. JENSEN
STS job number 94580 Month OCTOBER Year 1988
Other project number 178275-04

Test No.	Date	Location	Lift No. or Elevation	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
1	10-18	SEE PLAN	GRADE	A3-B2	100.4	101.6	6.3	95.6	95	
2	"	"	"	"	"	102.3	6.1	96.4	96	
3	"	"	"	"	"	101.3	6.1	95.5	95	
4	"	"	"	"	"	102.7	6.6	96.3	96	
5	"	"	"	"	"	102.0	6.6	95.7	95	
6	"	"	"	"	"	101.8	6.5	95.6	95	

DRAINAGE LAYER

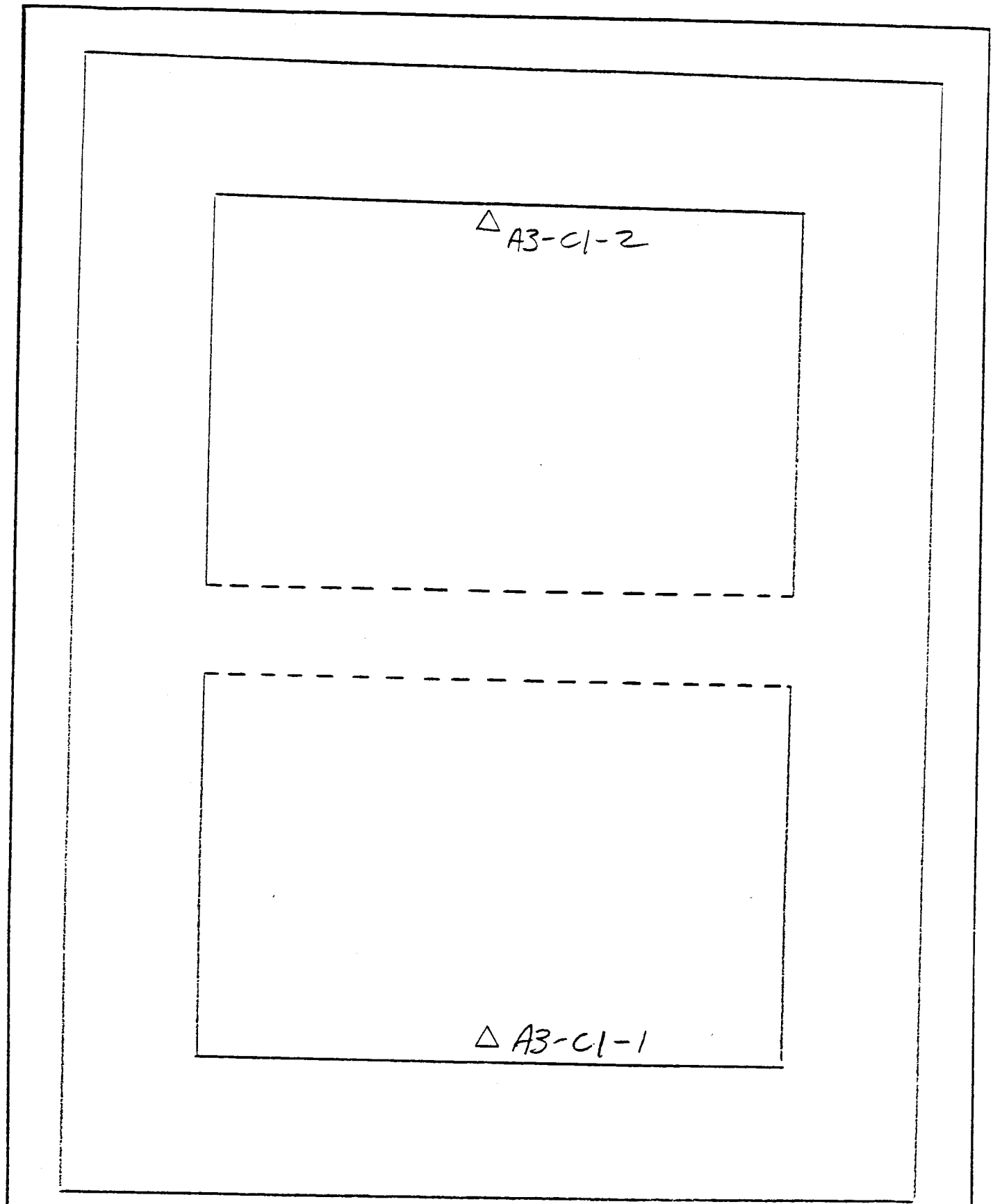
Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other ☐
Compaction Required 95 %

* Water content shown as percent of dry weight.

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒



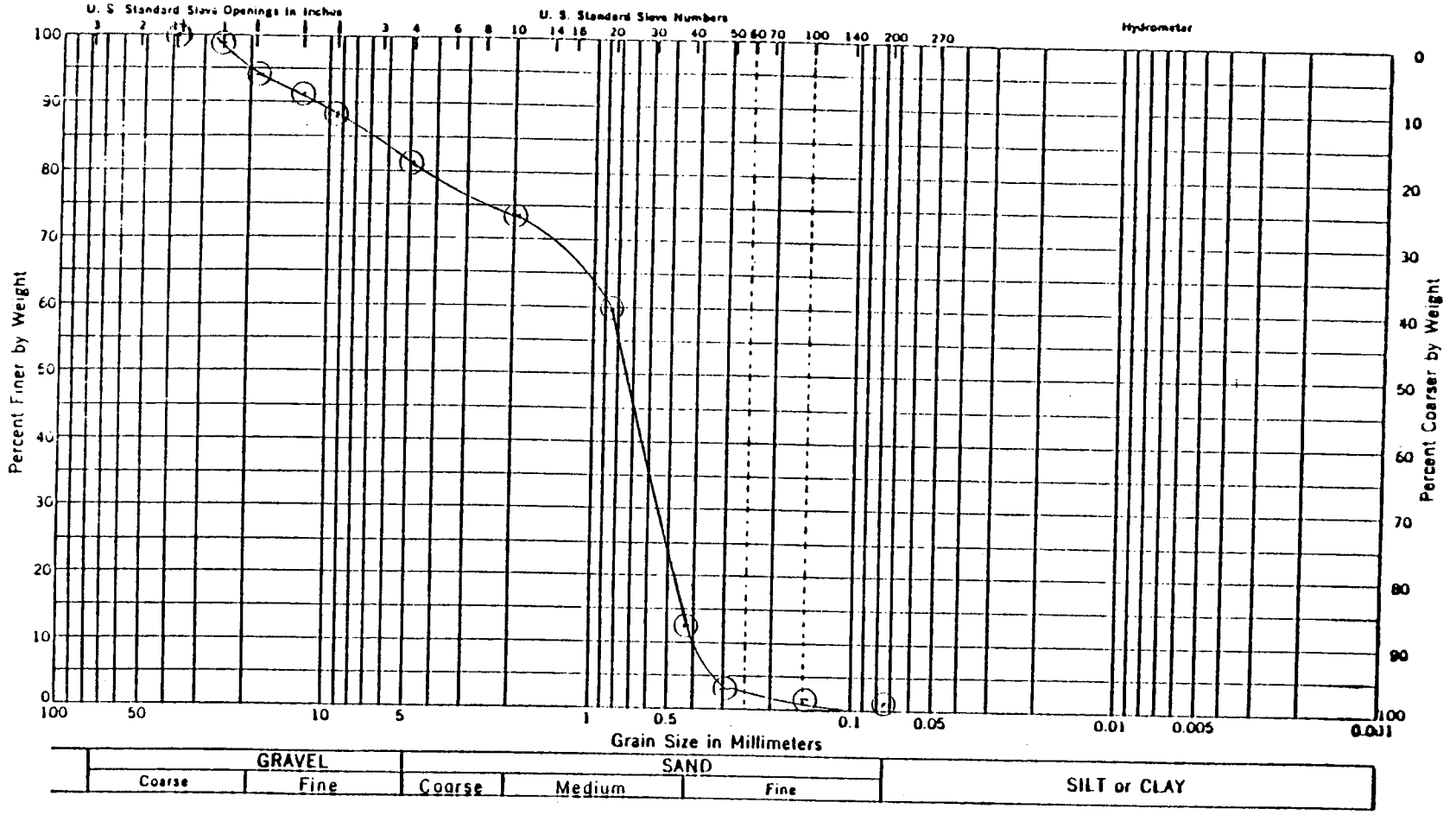
△ - LABORATORY TEST SAMPLE - DRAINAGE LAYER

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT | 9-19-88 | 94580 | no scale

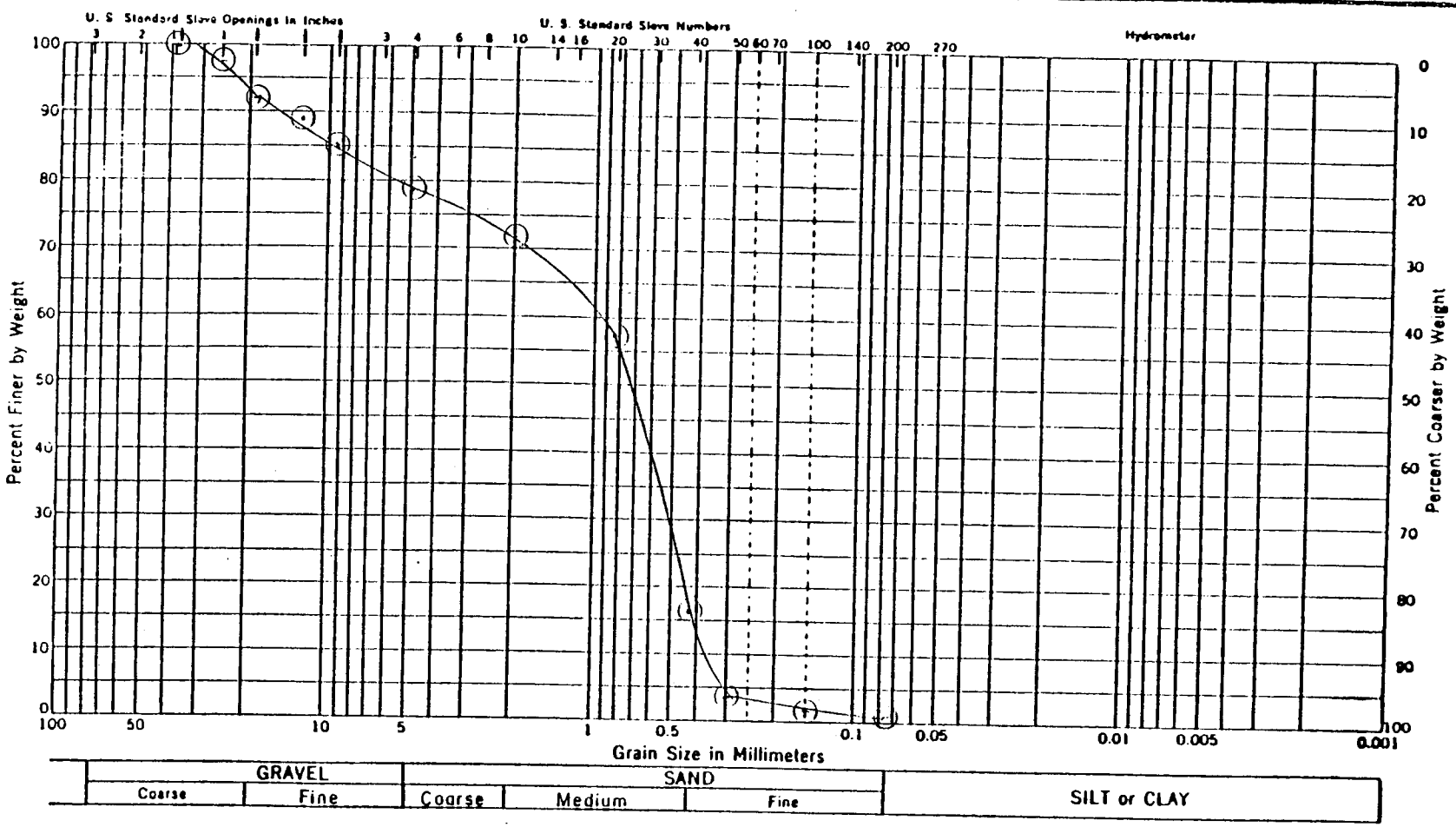


Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-C1-1	0.40	0.54	0.82	2.1	0.89	Fine to coarse Sand, Little fine to coarse Gravel - (SP)

Grain Size Distribution
Drainage Material - Lift #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580



Sample No.	D_{10}	D_{30}	D_{60}	C_u	C_c	CLASSIFICATION
A3-C1-2	0.38	0.5	0.9	2.4	0.73	Fine to coarse Sand, Some fine to coarse Gravel - (SP)

Grain Size Distribution
Drainage Material - Lift #1
Koppers Closure
Superior, Wisconsin

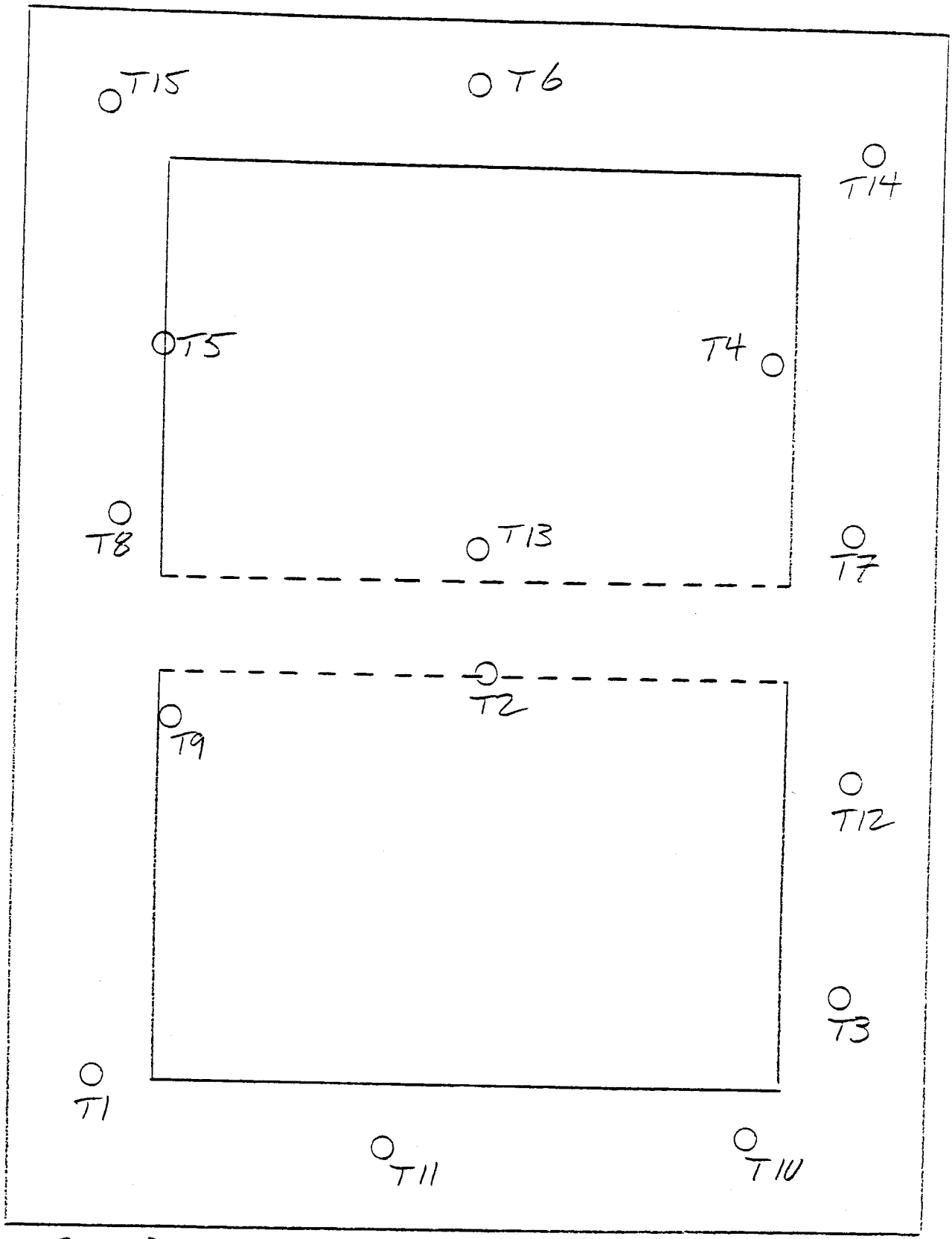
STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	12/19/88	94580

A4 - COVER SOIL

Field/Laboratory Testing of "As-Built" Construction

- Field Density Test Locations
- Field Density Test Results
- Laboratory Test Sample Locations
- Grain Size/Atterberg Limits Test Results



○ – FIELD DENSITY TEST – COVER SOIL

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT | 9-19-88 | 94580 | no scale

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location: Surface Impoundment Closure, Koppers Co. Superior, Wisc
Architect or Engineer: KEYSTONE ENVIRONMENTAL RESOURCES, INC.
Contractor: J. R. Larsen
STS job number: 94580 Month: OCTOBER Year: 1985
Other project number: 178275-04

Test No.	Date	Location	Lift No. ~~or Elevation~~	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
1	10-25	SEE PLAN	1ST	A1-B1	94.6	118.4	28.3	92.3	97	
2	"	"	"	"	"	117.0	27.5	91.8	97	
3	"	"	"	"	"	115.3	25.7	91.7	97	
4	"	"	"	"	"	115.4	27.8	90.3	95	
5	"	"	"	"	"	117.6	27.1	92.5	97	
6	10-26	"	2ND	"	"	116.7	29.1	90.4	95	
7	"	"	"	"	"	117.2	29.8	90.3	95	
8	"	"	"	"	"	118.3	29.6	91.3	96	
9	"	"	"	"	"	117.7	28.5	91.6	97	
10	"	"	"	"	"	116.9	28.7	90.8	96	
11	10-28	"	3RD	"	"	119.3	28.8	92.6	97	
12	"	"	"	"	"	117.5	28.8	91.2	96	
13	"	"	"	"	"	117.0	28.3	91.2	96	
14	"	"	"	"	"	118.4	28.1	92.4	97	
15	"	"	"	"	"	116.7	28.2	91.0	96	

Cover Soil

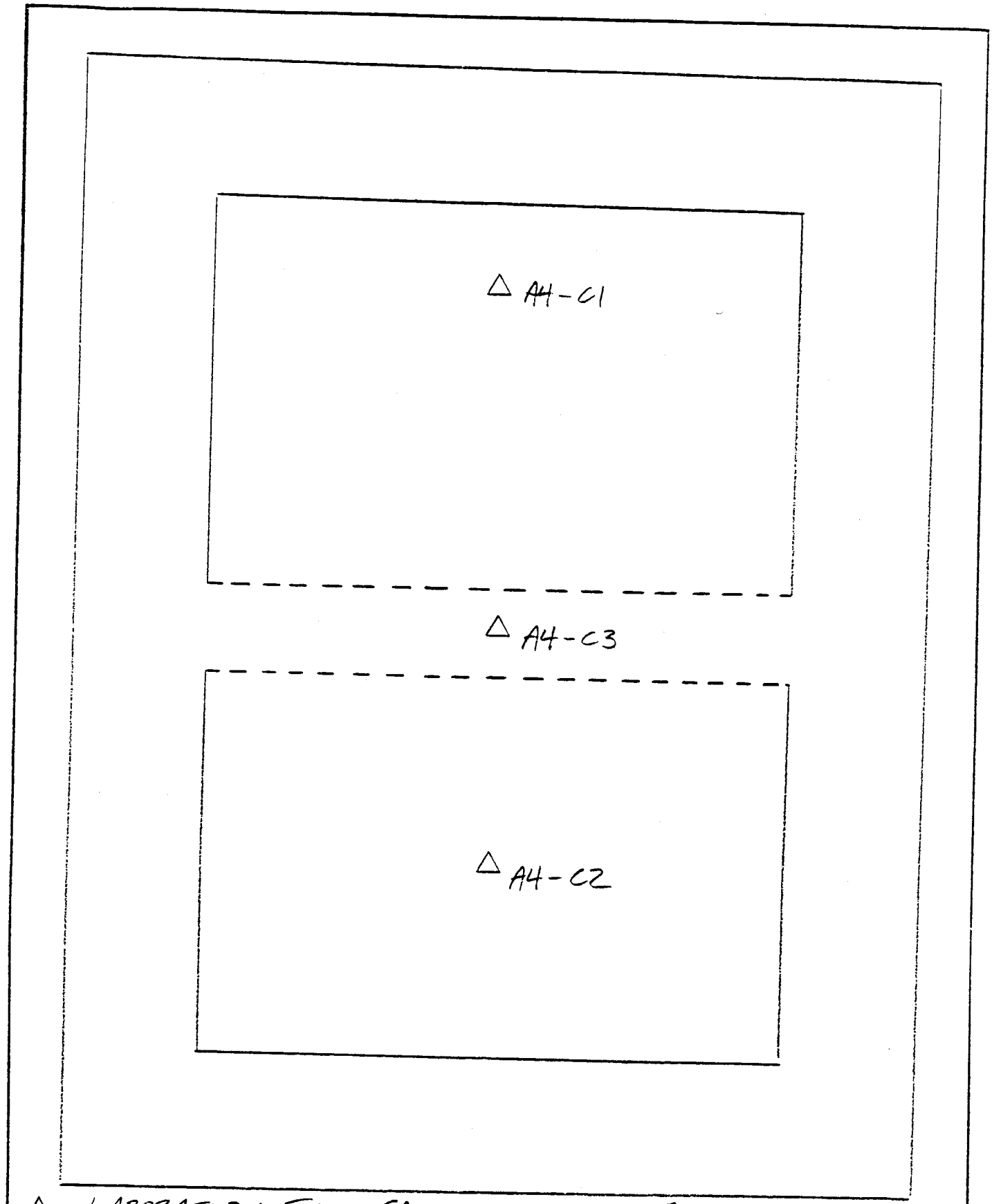
* Water content shown as percent of dry weight.

Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other _____ ☐
Compaction Required 95 %

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒



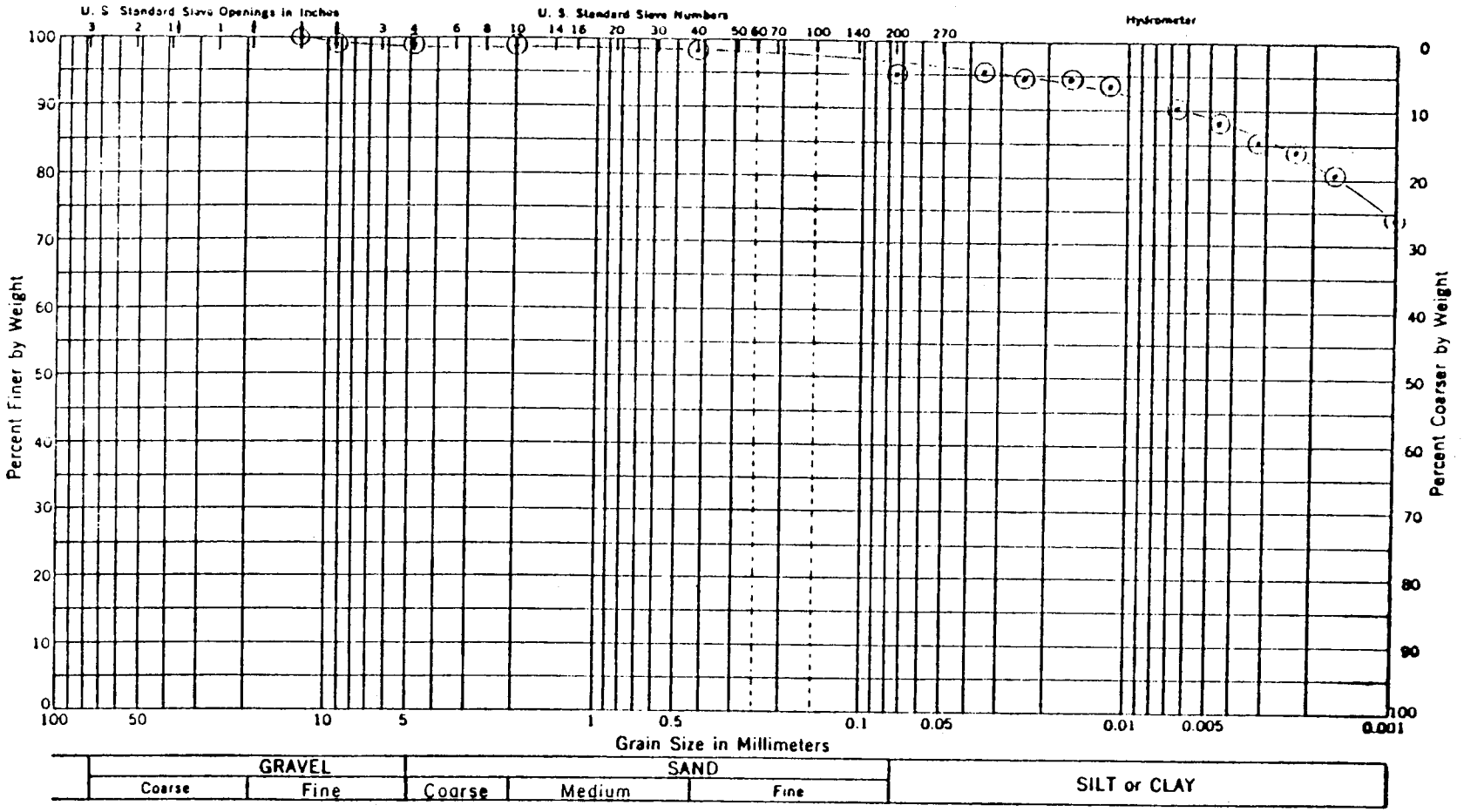
△ - LABORATORY TEST SAMPLE - COVER SOIL

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT | 9-19-88 | 94580 | no scale



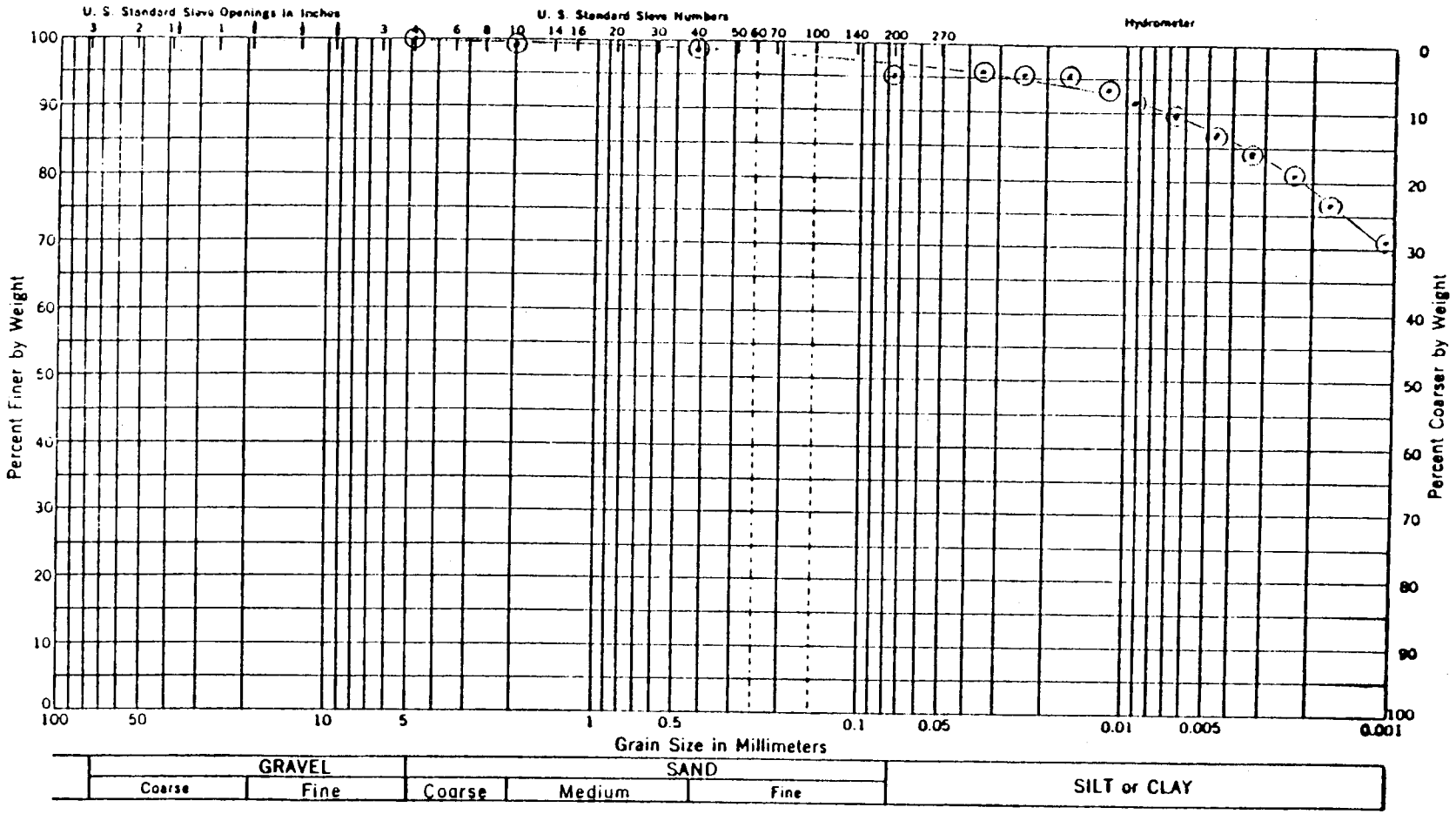
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A4-C1	--	92.3	28.1	64.2	Clay, Trace Sand - (CH)

Grain Size Distribution
Cover Soil - Lift #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580

REV 12/1/75
D:\Sts2\7611

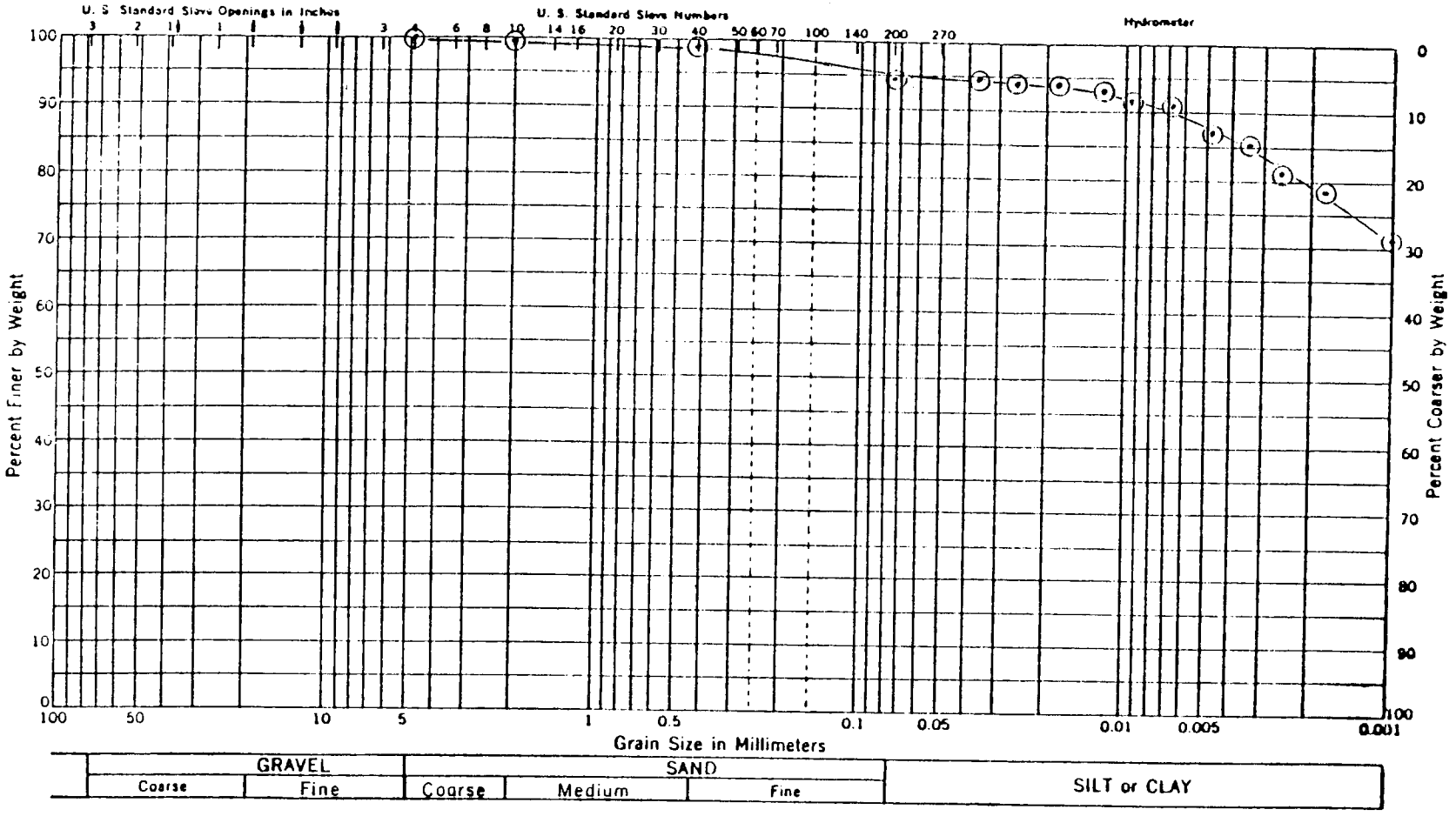


SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A4-C2	--	89.9	26.7	63.2	Clay, Trace Sand - (CH)

Grain Size Distribution
Soil Cover - Lift #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A4-C3	--	91.1	26.6	64.5	Clay, Trace Sand - (CH)

Grain Size Distribution
Cover Soil - Lift #3
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580

A5 - TOPSOIL

Borrow Source Evaluation

- Proctor Test Results
- Grain Size/Atterberg Limits Test Results
- Fertility Analysis Test Results

Field/Laboratory Testing of "As-Built" Construction

- Field Density Test Locations
- Field Density Test Results
- Laboratory Test Sample Locations
- Grain Size/Atterberg Limits Test Results

STS Consultants, Ltd.
3650 Annapolis Lane
Minneapolis, MN 55447-5434
(612) 559-1900

2820 Belknap Street
Superior, WI 54880
(715) 392-9006

108 Chestnut Street
Virginia, MN 55792
(218) 741-8804

COMPACTION CONTROL REPORT
Laboratory Compaction Test Data

Project: Koppers Closure Date: 10/12/88 STS Job#: 94580

Description of soil: Elastic Silt, Trace Sand, few roots - Brown

Material mark: A5-B1/B2 Composite (Topsoil) Classification: MH

Source of Material: J.R. Jensen Farm, Douglas County, Wisconsin

Natural water content: -- % Natural dry density: -- pcf Specific gravity: 2.53 (est.)

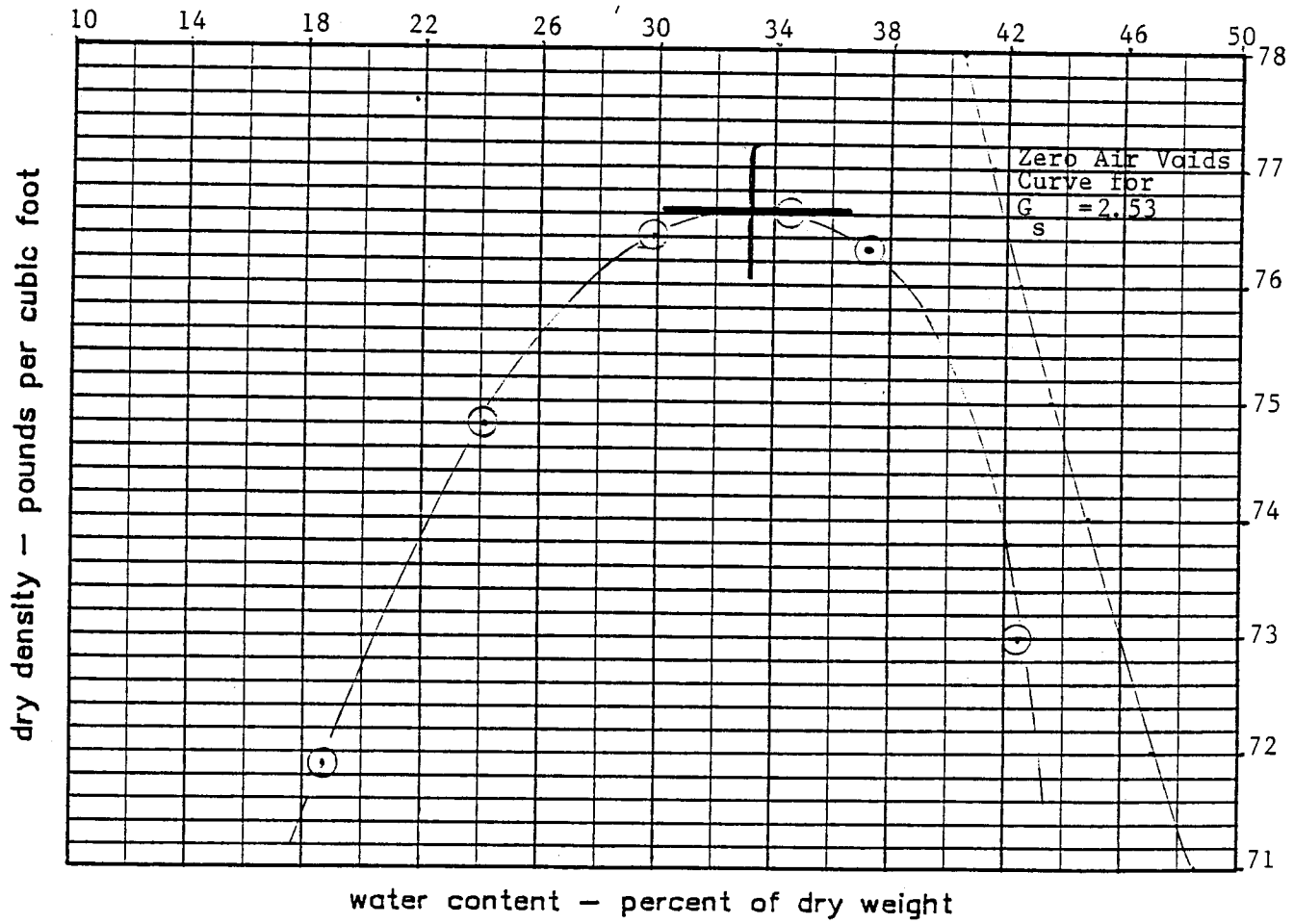
Liquid limit: 73.2/75.6 % Plastic limit: 40.4/42.1 % Plasticity index: 32.8/33.5

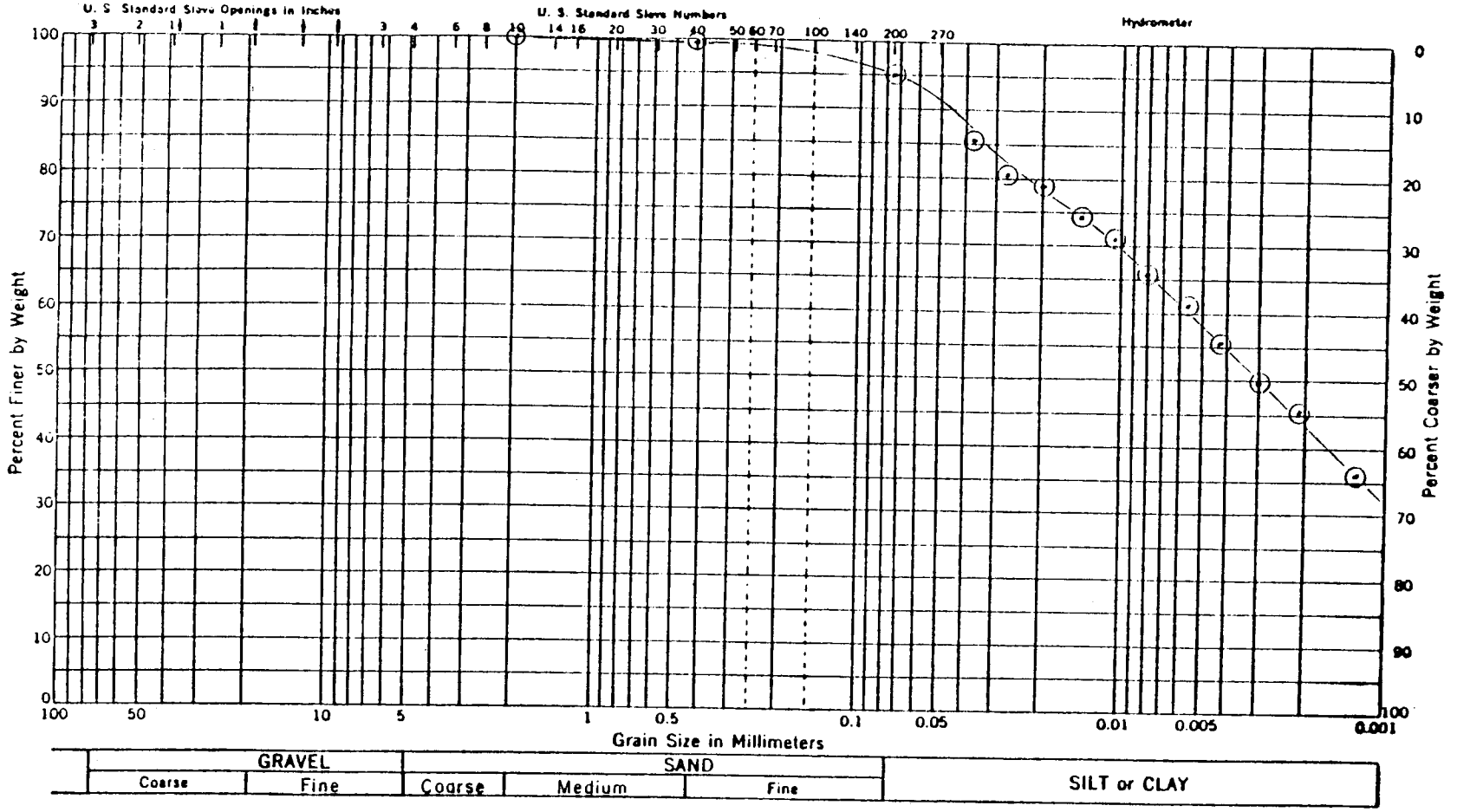
Test procedure used: Standard Proctor, ASTM D-698, Method A

TEST RESULTS

Maximum dry density: 76.6 pcf Optimum water content: 33.2 %

(at a wet density of: 102.0 pcf)





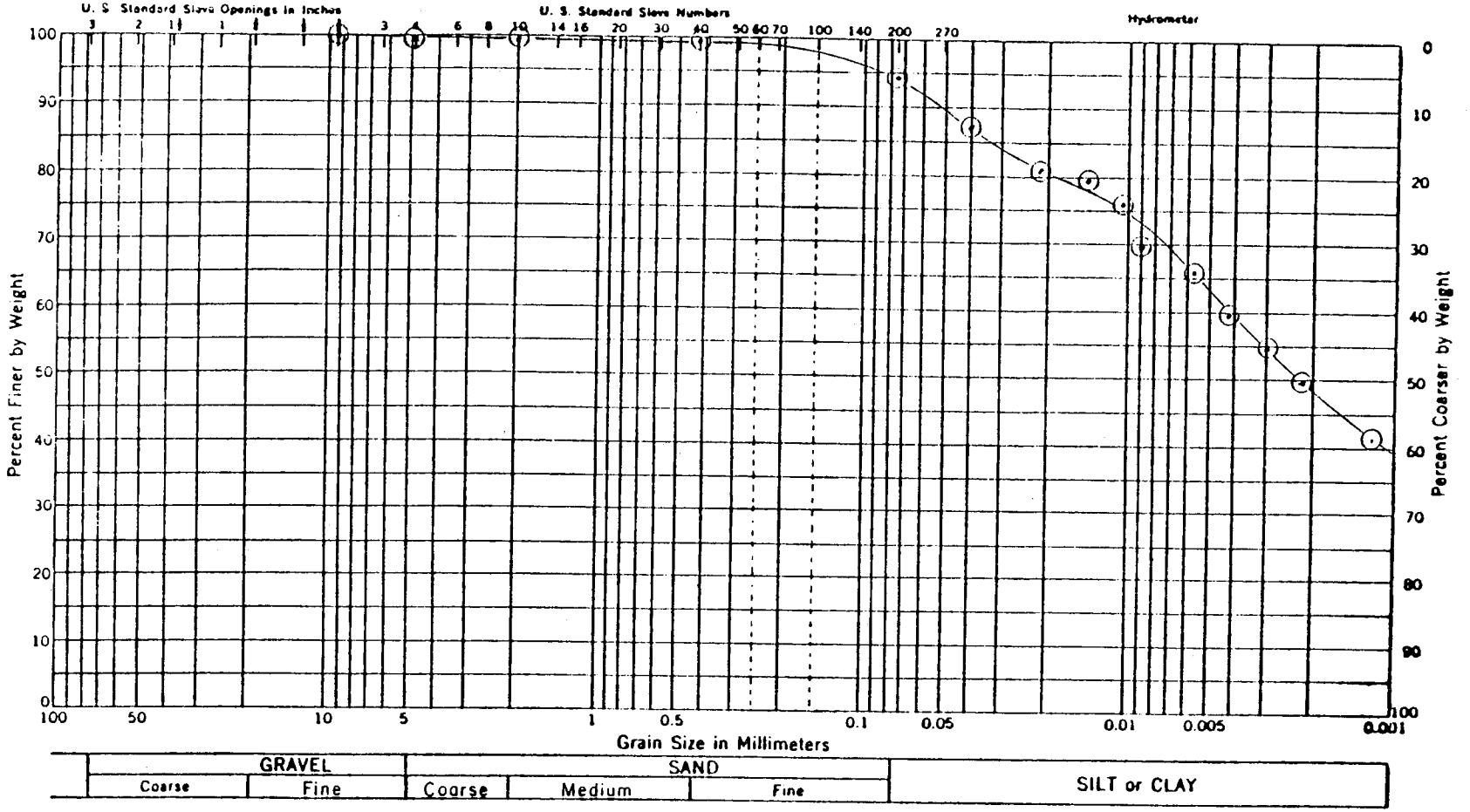
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A5-B1	--	73.2	40.4	32.8	Elastic Silt, Trace Sand - (MH)

Grain Size Distribution
Topsoil - Borrow #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/10/88	94580

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A5-B2	--	75.6*	42.1	33.5	Elastic Silt, Trace Sand - (MH)
					*Liquid Limit = 58.3 after oven-drying

Grain Size Distribution
Topsoil - Borrow #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/10/88	94580

SOIL ANALYSIS REPORT

MINNESOTA VALLEY TESTING LABORATORIES, Inc.

NEW ULM, MN. PH. 507-354-8517 NEVADA, IA. PH. 515-382-5486 BISMARCK, N.D. PH. 701-258-9720 GRAND FORKS, N.D. PH. 701-746-8335

SUBMITTED BY:

16120
STS CONSULTANTS, LTD.

c/o Bruce Smith
3650 Annapolis Ln.
Plymouth, MN 55447

DATE RECEIVED: 10-13-88
DATE REPORTED: 10-17-88
WORK ORDER NO: 11-2277
LAB NOS: 1023-512 / 1023-513

SUBMITTED FOR:

STS Project 94580

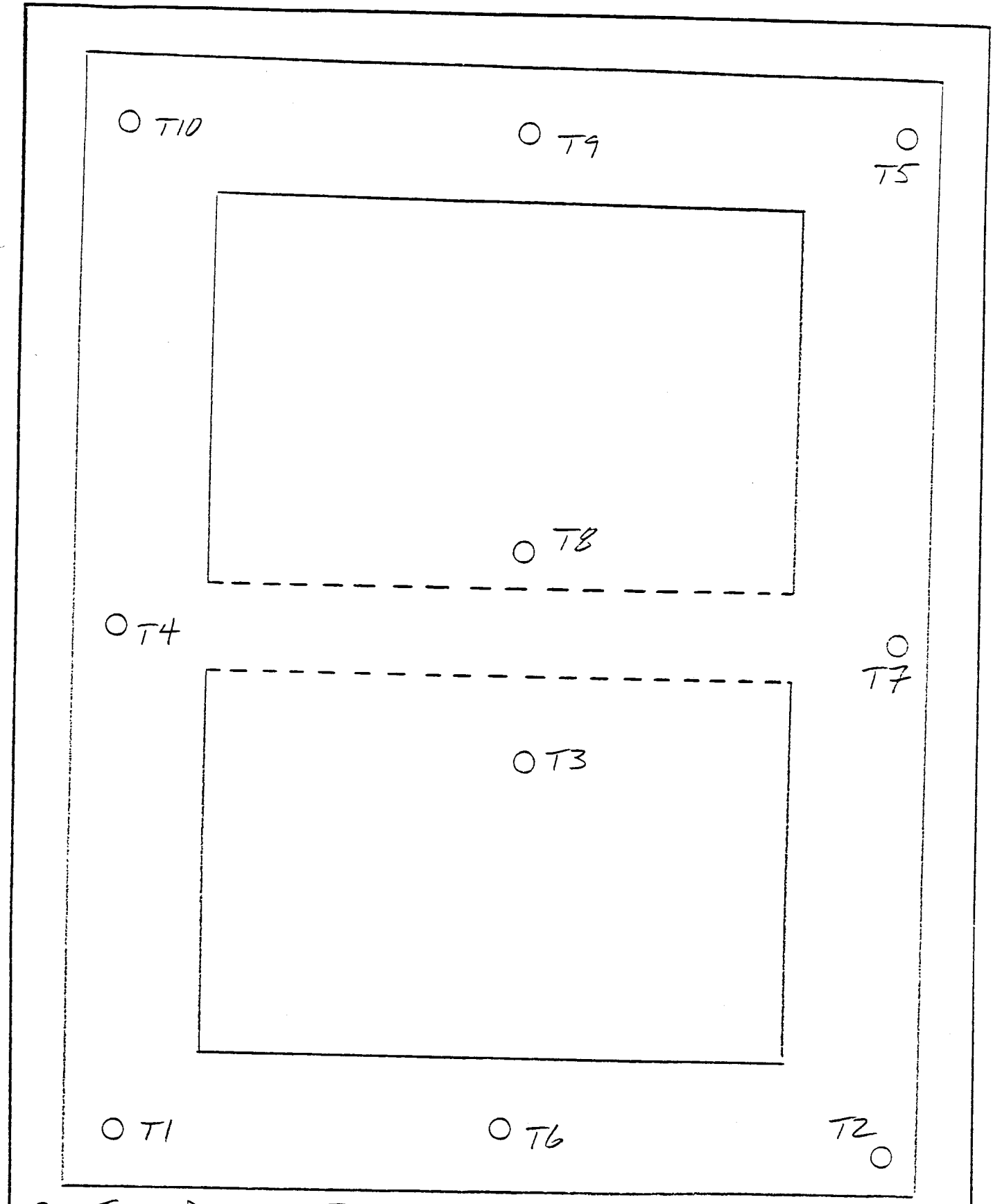
VB.00 880901

	FIELD AND/OR SAMPLE NO. A5-B1 /Unknown						FIELD AND/OR SAMPLE NO. A5-B2 /Unknown					
		V - LOW	LOW	MED	HIGH	V - HIGH		V - LOW	LOW	MED	HIGH	V - HIGH
ORGANIC MATTER	5.9%						4.9%					
NITROGEN NO_3-N LBS/A												
PHOSPHORUS BRAY 1 (P) LBS/A OLSEN	10						6					
POTASSIUM (K) LBS/A	340						340					
ZINC PPM												
SULFUR SO_4-S PPM												
ACIDITY pH	6.1	B LBS/A	Fe PPM	Mn PPM	Cu PPM	Na LBS/A	6.4	B LBS/A	Fe PPM	Mn PPM	Cu PPM	Na LBS/A
BUFFER INDEX												
SALTS mmhos/cm		TEXTURE FINE CEC						TEXTURE FINE CEC				
CALCIUM LBS/A		% BASE SATURATION Ca Mg K Na H						% BASE SATURATION Ca Mg K Na				
MAGNESIUM LBS/A												

ALL RECOMMENDATIONS ARE ON A BROADCAST BASIS.	MULTIPLE OPTION RECOMMENDATIONS			MULTIPLE OPTION RECOMMENDATIONS		
CROP AND YIELD GOAL	Grass (--)	Legume Grass (3)	ACTUAL (--)	Grass (--)	Legume Grass (3)	ACTUAL (--)
NITROGEN (LBS.)	50			50		
P_2O_5 LBS STANDARD	60	54		68	59	
P_2O_5 LBS BUILD (B) OR MAINTENANCE (M)						
K_2O LBS STANDARD	0	0		0	0	
K_2O LBS BUILD (B) OR MAINTENANCE (M)						
ZINC (LBS)						
SULFUR (LBS)						
LIME NEEDS AS 100% ECCE (lbs/acre) to pH 6.0	No lime required.			No lime required.		
to pH 6.5	4300 lbs of lime for 6 inch plow depth.			2700 lbs of lime for 6 inch plow depth.		

ADDITIONAL RECOMMENDATIONS AND COMMENTS:

(1) Reduce N REC 20 lbs/A with non-forage legumes or 35 lbs/A with forage legumes as previous crop (except for corn rece).
(2) For PASTURE under intensive management apply an additional 50-100 lbs/A of N, 20 lbs/A of P205, 40 lbs/A of K20 on mineral soils.
(3) Reduce LIME REC by one half for western Minnesota, the Dakotas, and in areas having limy subsoils.
) The standard recommendation is taken from University of Minnesota unless otherwise indicated.
) Refer to reverse side for explanation of soil tests and fertilizer recommendations.



O - FIELD DENSITY TEST - TOPSOIL

TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT | 9-19-88 | 94580 | no scale

STS Consultants Ltd.
Geotechnical Engineering
and Material Testing
2820 Belknap Street
Superior, Wisconsin 54880
(715) 392-9006

2405 Annapolis Ln., Suite 280
Minneapolis, Minnesota 55441
(612) 559-1900

108 Chestnut Street
Virginia, Minnesota 55792
(218) 741-8804

COMPACTION CONTROL REPORT

Job name and location SURFACE IMPOUNDMENT CLOSURE, KOPPERS CO. @ SUPERIOR, WISC.
Architect or Engineer KEYSTONE ENVIRONMENTAL RESOURCES, INC.
Contractor J. R. JENSEN
STS job number 94580 Month NOVEMBER Year 1988
Other project number 178275-04

Test No.	Date	Location	Lift No. or ~~Elevation~~	Material Mark	Maximum Lab Dry Density [pcf]	In-Place Moist Density [pcf]	Water Content [%] *	In-Place Dry Density [pcf]	Percent Compaction [%]	Comments
1	11-7	SEE PLAN	1ST	A5-B1	76.6	94.3	35.5	69.6	91	
2	"	"	"	"	"	94.0	36.4	68.9	90	
3	"	"	"	"	"	95.2	35.6	70.2	91	
4	"	"	"	"	"	96.6	36.1	71.0	92	
5	"	"	"	"	"	93.7	34.6	69.6	91	
6	"	"	2ND	"	"	93.9	33.6	70.3	91	
7	"	"	"	"	"	94.5	35.6	69.7	91	
8	"	"	"	"	"	96.3	34.9	71.4	93	
9	"	"	"	"	"	95.8	35.3	70.8	92	
10	"	"	"	"	"	96.0	36.0	70.6	92	

Topsoil

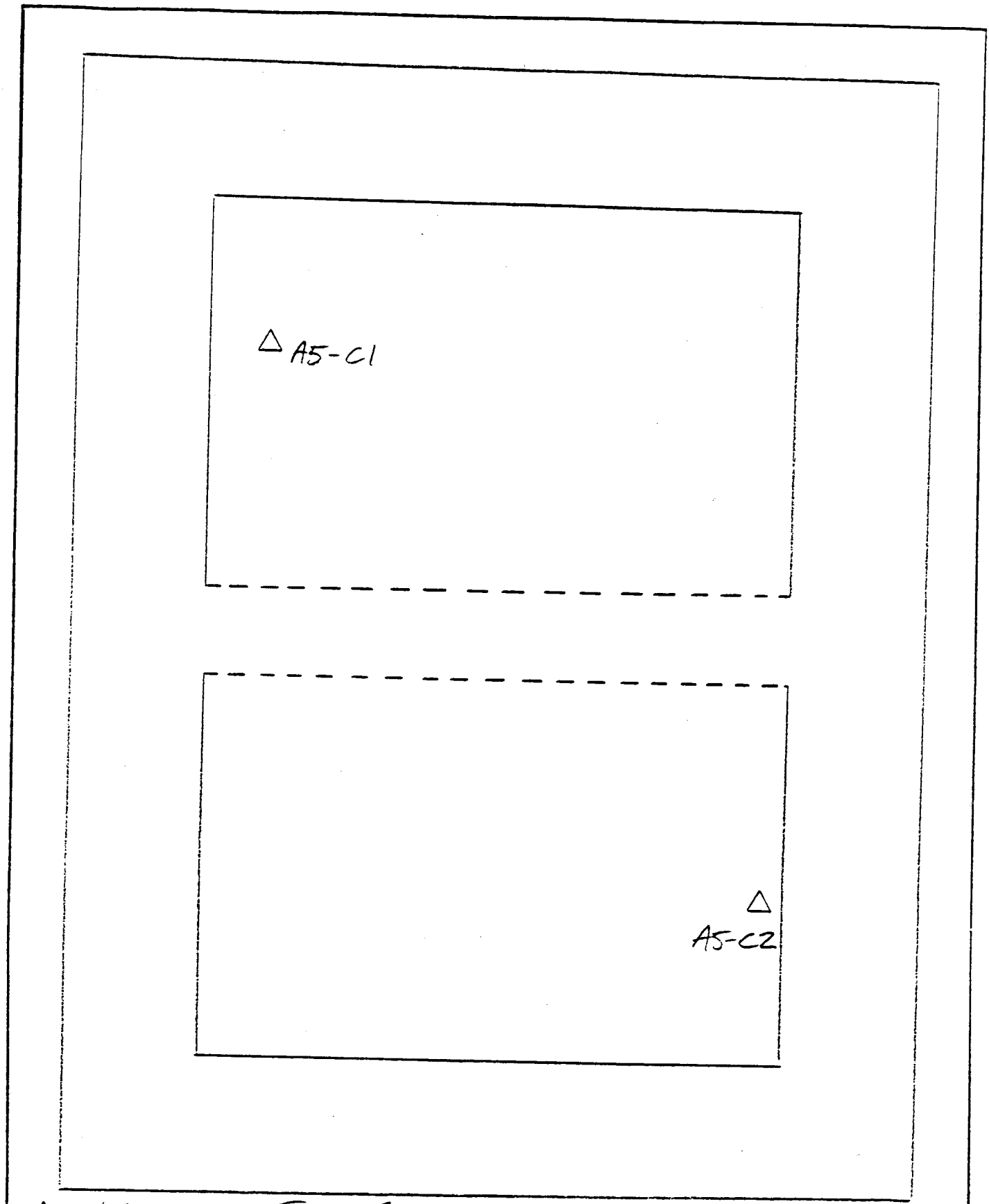
* Water content shown as percent of dry weight.

Percent Compaction Based On:

ASTM D 1557-70 (Modified Proctor) ☐
ASTM D 698-70 (Standard Proctor) ☒
Other _____ ☐
Compaction Required 90 %

Method of Field Density Measurements:

ASTM D 1566 (sand cone) ☐
ASTM D 2922 (nuclear) ☒



△ - LABORATORY TEST SAMPLE - TOPSOIL

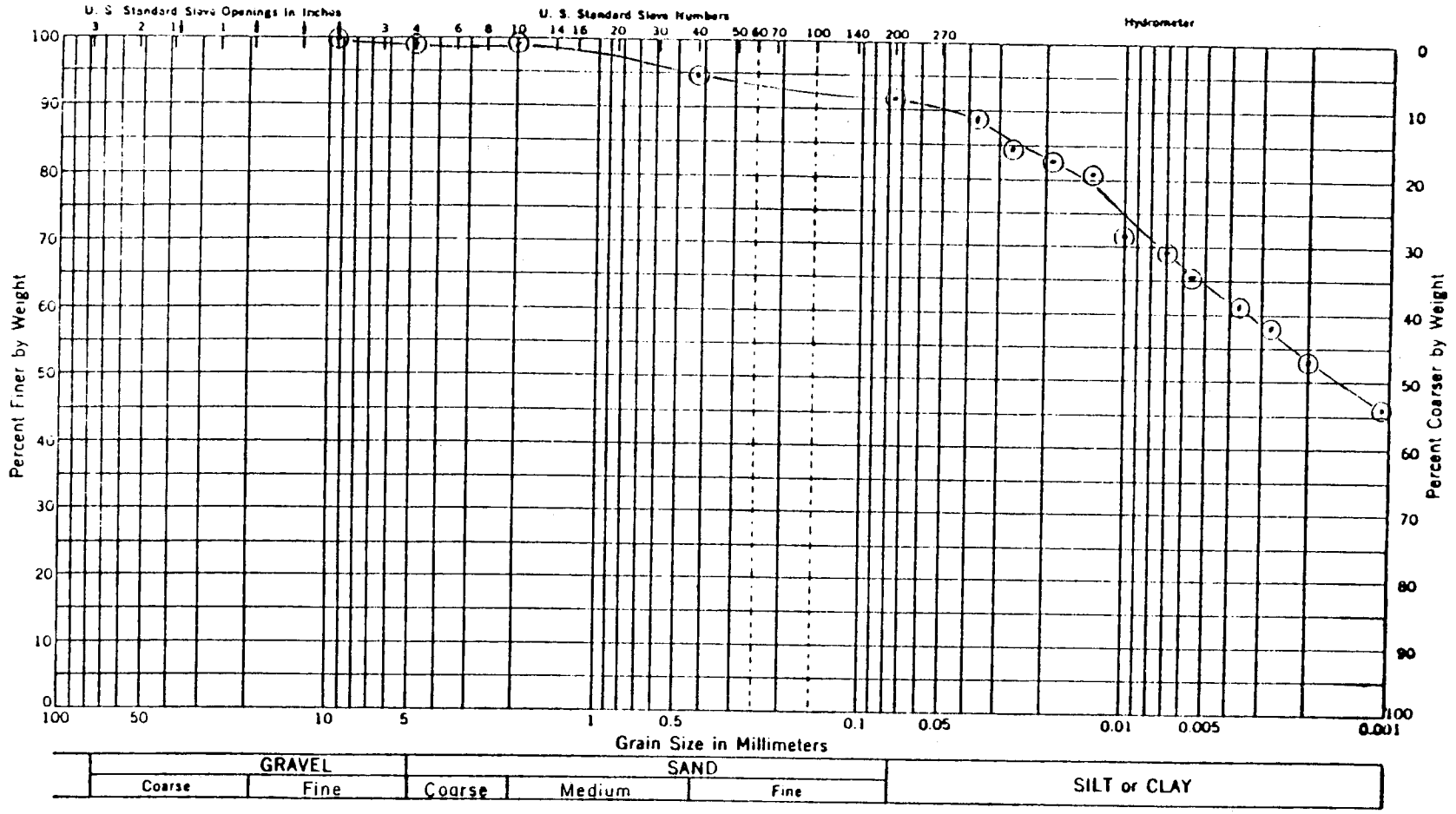
TEST LOCATION PLAN
KOPPERS COMPANY
SUPERIOR, WISCONSIN

NORTH

STS CONSULTANTS, LTD.
2820 Belknap Street
Superior, Wisconsin

FJT	9-19-88	94580	no scale

UNIFIED CLASSIFICATION SYSTEM



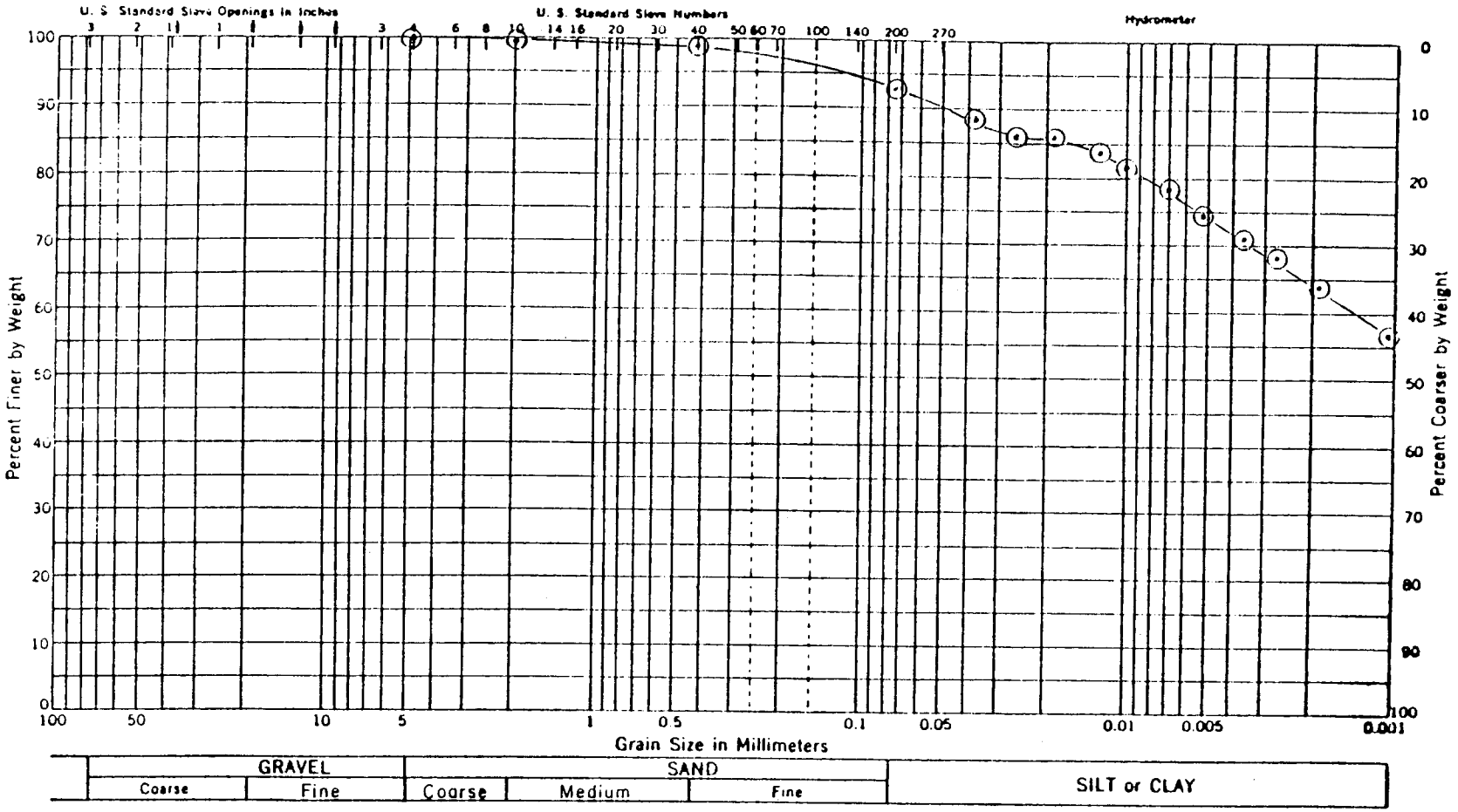
SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A5-C1	--	77.3	40.7	36.6	Elastic Silt, Trace Sand - (MH)

Grain Size Distribution
Topsoil - Lift #1
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
A5-C2	--	73.6	36.1	37.5	Elastic Silt, Trace Sand - (MH)

Grain Size Distribution
Topsoil - Lift #2
Koppers Closure
Superior, Wisconsin

STS CONSULTANTS, LTD.
2405 ANNAPOLIS LANE, SUITE 280
MINNEAPOLIS, MINNESOTA 55441

DRAWN	APPROVED	DATE	JOB No.
KE	MBS	11/29/88	94580

HDPE LINER

- Melt Index and Environmental Stress Crack Resistance Test Results
- Thickness, Density, Modulus of Elasticity and Tensile Strength Test Results
- Liner Seam Sample Locations
- Bonded Seam Strength and Peel Adhesion Test Results

AGP LABORATORIES, INC.
13911 DISTRIBUTION WAY
DALLAS, TEXAS 75234
(214) 243-2525

Fred LaFaske
STS Consultant LTD
2820 Belknap St.
Superior, Wisconsin 54880

Dear Fred,

Re: STS Inh # 91580 AGP Lab number 60-10-88.

The following are the results of the testing of the two different batches of material that were identified as Batch #3771 and Batch #3770. You requested that a melt index be performed as well as Environmental Stress Crack Resistance (ESCR).

MELT INDEX - ASTM D1238 190 2.16

BATCH # 3771	0.49 GMS. 10 MIN.
BATCH # 3770	0.49 GMS. 10 MIN.

ESCR - ASTM D1693 CONDITION C, 100° C, AND 100 % IGEPAL.

BATCH # 3771	500 HOURS NO FAILURES
BATCH # 3770	500 HOURS NO FAILURES

The procedures that were followed and the total hours of conditioning were in accordance to the specified test procedures of ASTM. The total test hours for ASTM D1693 were derived from the National Sanitation Foundation (NSF) Standard 54.

The test results and testing were done in accordance to specified procedures with no consideration to actual application. The results are presented in good faith, with the values presented only representing the samples that were submitted to AGP. These values should not be construed or the values implied to any other material except for the samples tested.

Respectfully yours,

Wayne Youngblood

Wayne Youngblood

STS Consultants Ltd.

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll #4L-3770 I 1704 Batch #3770
Date: 10/28/88

SUMMARY OF TEST RESULTS

TEST	AVERAGE
Thickness	42.5 mils
Density	0.974 g/cc
Modulus of Elasticity	
Longitudinal	25885 lbs/in^2
Transverse	27442 lbs/in^2
Tensile Strength and % Elongation	
Longitudinal	Yield: 2550 lbs/in^2 @ 12%
	Break: 3650 lbs/in^2 @ 632%
Transverse	Yield: 2600 lbs/in^2 @ 12%
	Break: 4650 lbs/in^2 @ 648%

STS Consultants Ltd.

Thickness Test
(Modified ASTM D-1777)
(2 kilopascal normal load)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3770 I 1704
10/25/88 Batch #3770

SUMMARY OF TEST RESULTS

Specimen	Mils	Millimeters
1	42.1	1.07
2	41.3	1.05
3	43.3	1.10
4	43.3	1.10
Ave.	42.5	1.08

STS Consultants Ltd.

Density
ASTM D-792

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3770 I 1704
Specimen: Batch #3770
10/28/88

SUMMARY OF TEST RESULTS

Specimen No.	Density (g/cc)
1	0.973
2	0.971
3	0.993
4	0.959
Ave.	0.974

STS Consultants Ltd.

Modulus Of Elasticity

ASTM D-882

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3770 I 1704
Specimen: Batch #3770
10/25/88

SUMMARY OF TEST RESULTS

Direction	Specimen No.	Modulus of Elasticity (lbs/in²)
Longitudinal	1	25581
	2	26190
	Ave.	25885
Transverse	1	26046
	2	28837
	Ave.	27442

STS Consultants Ltd.

Modulus of Elasticity

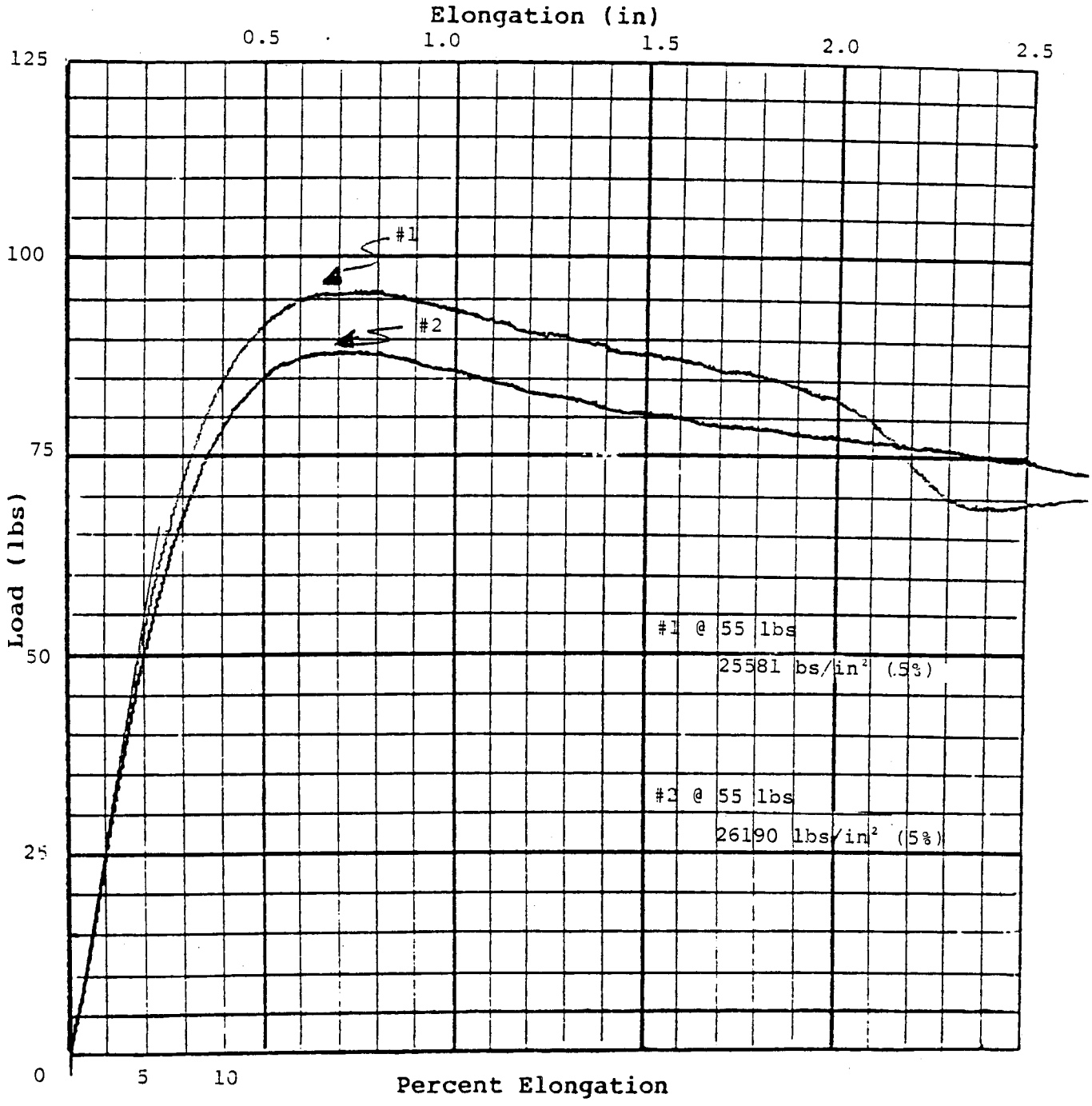
(ASTM D-882)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll #4L-3770 I 1704 Batch 3770
Specimen Longitudinal

1" wide, 4" gauge length
0.4"/min.

Modulus of Elasticity (lbs/in^2): 25885
Ave of 2 tests.

Cross Sectional Area: #1: 0.043 in^2
#2: 0.042 in^2



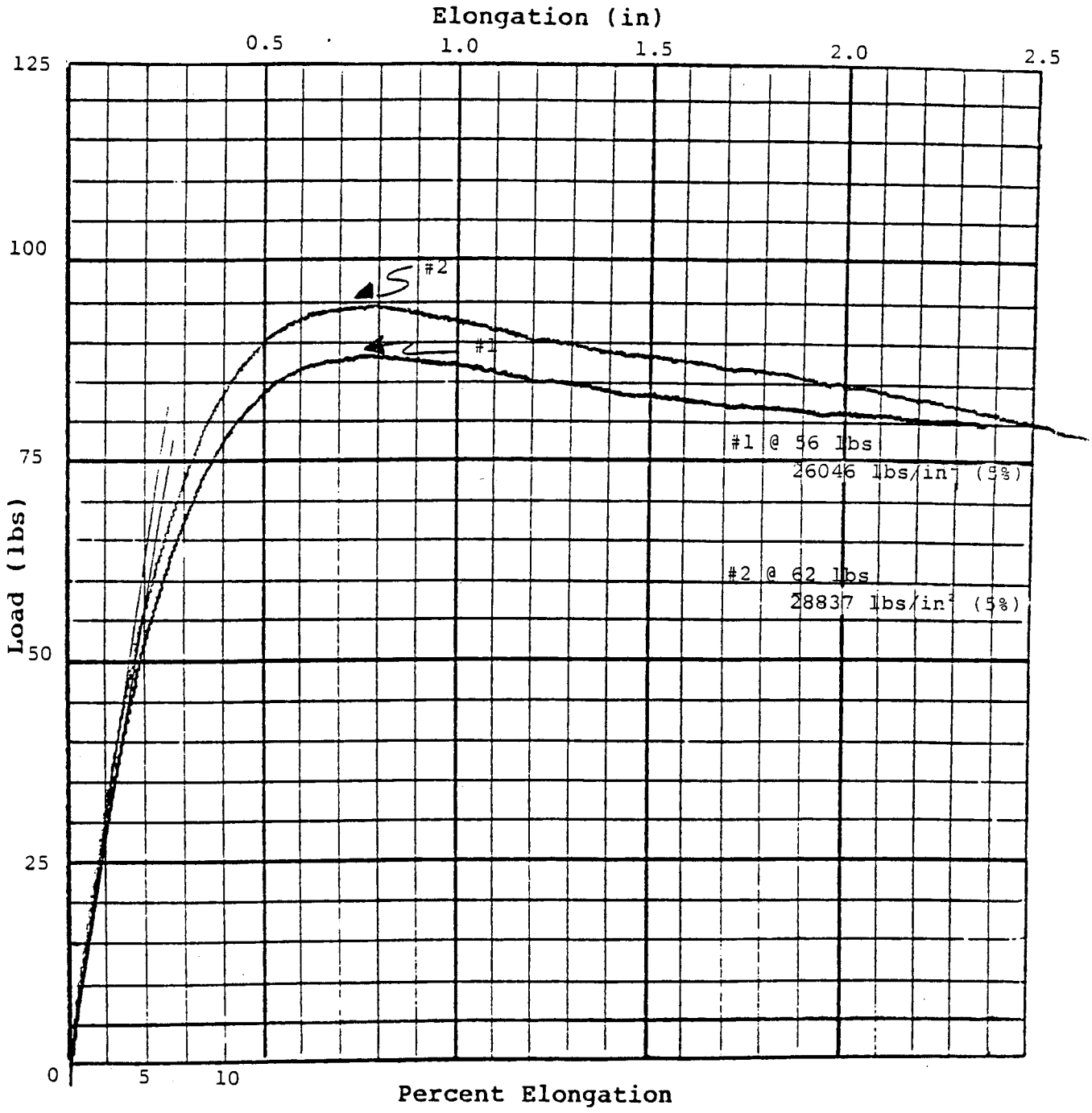
STS Consultants Ltd.

Modulus of Elasticity
(ASTM D-882)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll # 4L-3770 I 1704 Batch 3770
Specimen Transverse
1" wide, 4" gauge length
0.4"/min.

Modulus of Elasticity
(lbs/in²): 27442
Ave. of 2 tests.

Cross Sectional Area: #1: 0.043 in²
#2: 0.043 in²



STS Consultants Ltd.

Tensile Strength Test

(ASTM D-638)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co,
Geotextile: Roll #4L-3770 I 1704
Specimen: Batch #3770
10/25/88

SUMMARY OF TEST RESULTS

Direction	Specimen No.	Strength @ Yield (lbs/in²)	% Elongation	Strength @ Break (lbs/in²)	% Elongation
Longitudinal	1	2500	12	3200	566
	2	2600	12	4100	698
	Ave.	2550	12	3650	632
Transverse	1	2700	12	4600	652
	2	2500	12	4700	643
	Ave.	2600	12	4650	648

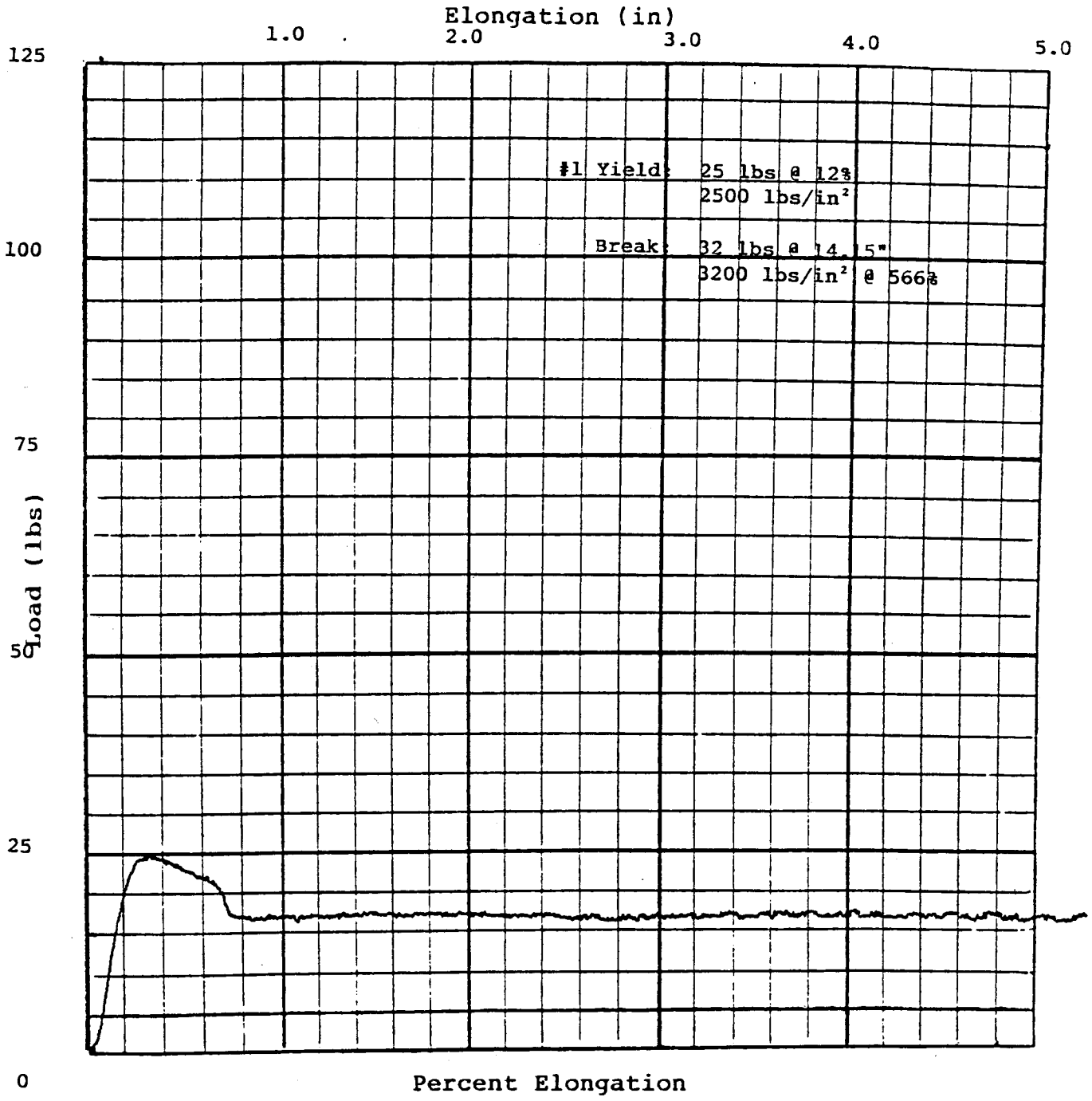
STS Consultants Ltd.

Tensile Strength Test
ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment closure for Kopper's Co.
Geosynthetic: Roll # 4L-3770 I 1704 Batch 3770
Specimen Longitudinal

Cross Sectional Area: #1: 0.010 in²

0.25" wide
2.5" gage length
2.0"/min.



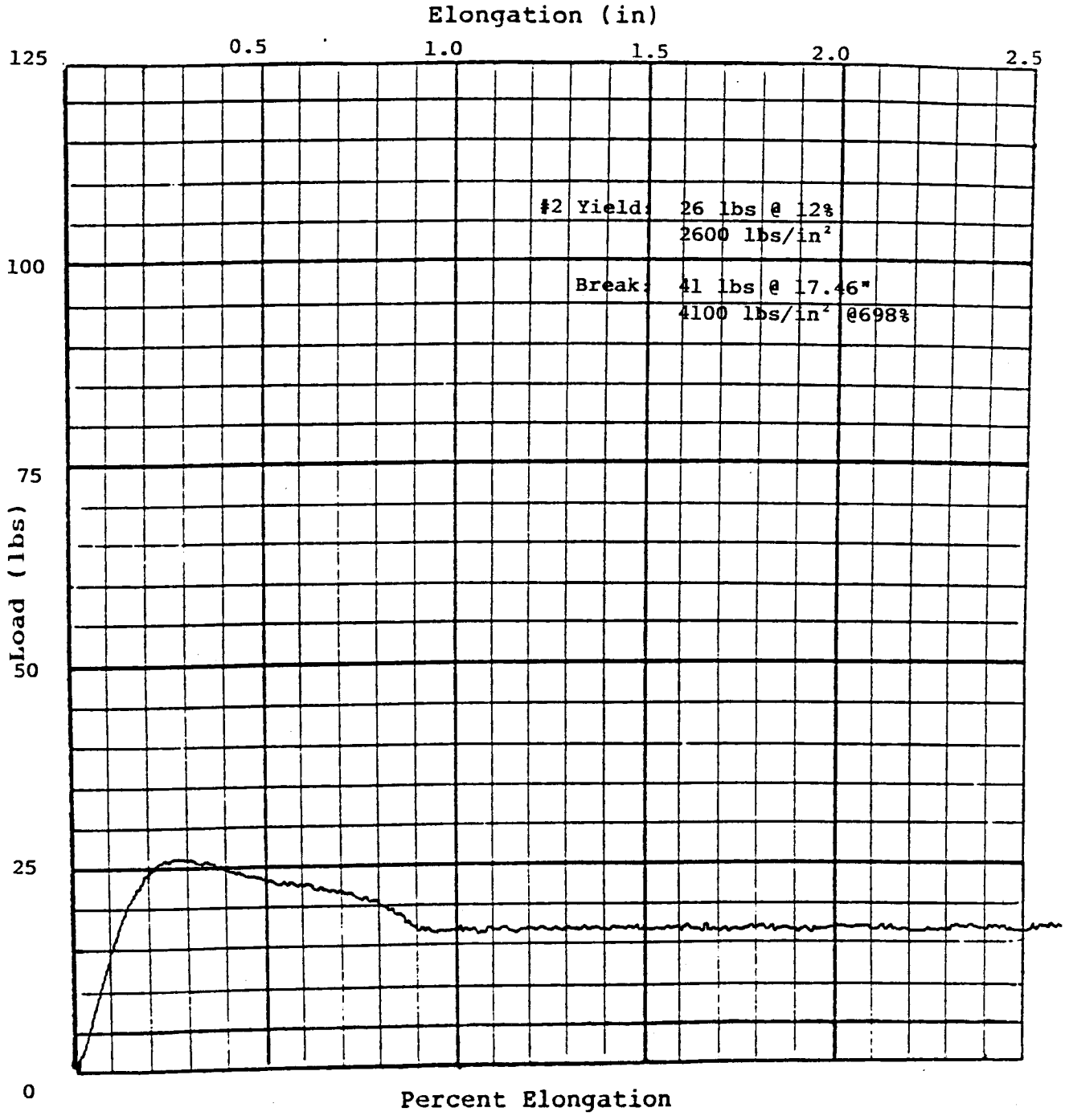
STS Consultants Ltd.

Tensile Strength Test
ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll# 4L-3770 I 1704 Batch 3770
Specimen Longitudinal

Cross Sectional Area: 0.010 in²

0.25" wide
2.5" gage length
2.0"/min.



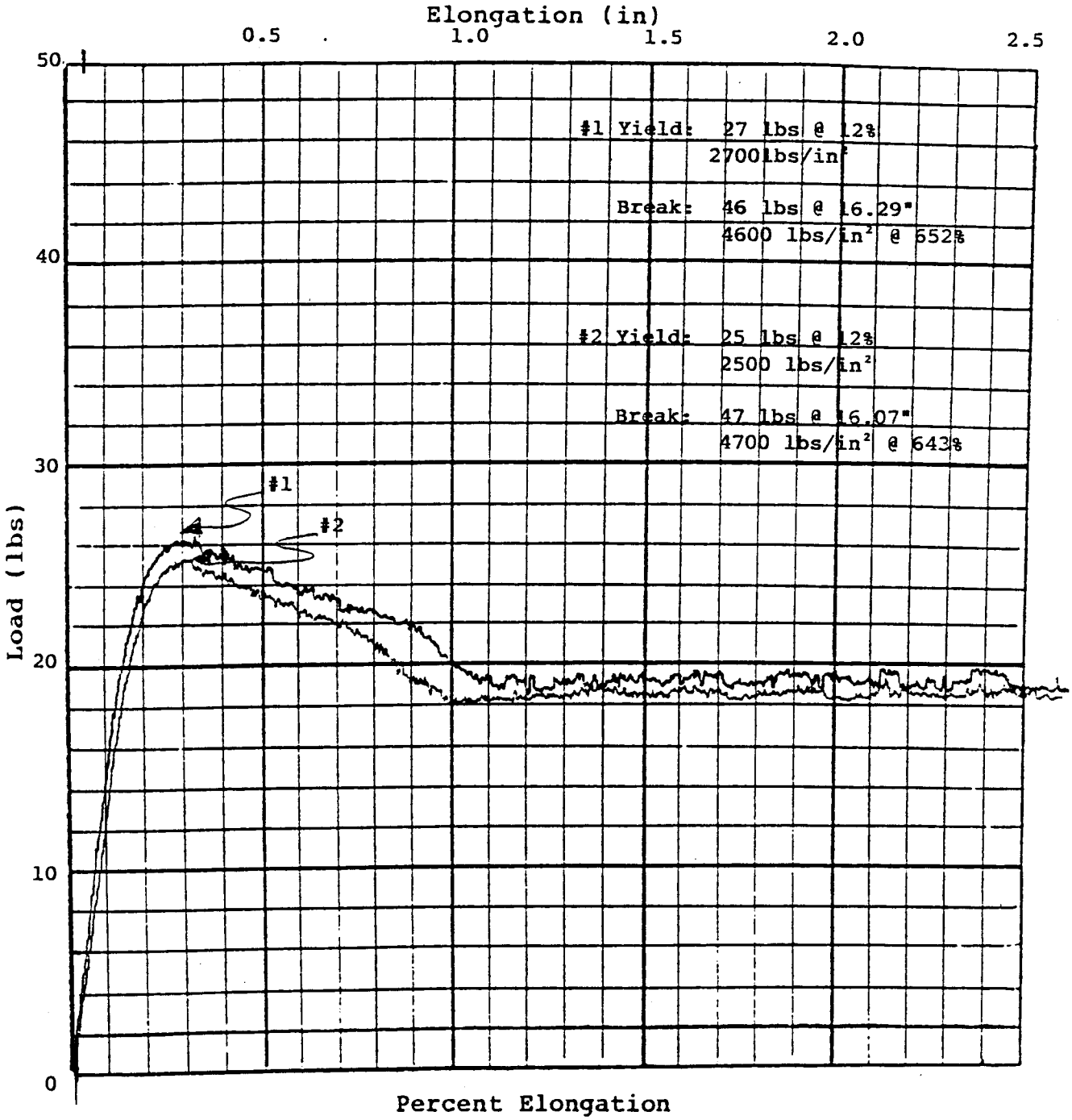
STS Consultants Ltd.

Tensile Strength Test
ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll # 4L-3770 I 1704 Barch 3770
Specimen Transverse

Cross Sectional Area: #1-0.010 in²
#2-0.010 in²

0.25" wide
2.5" gage length
2"/min.



STS Consultants Ltd.

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll #4L-3771 I 1706 Batch #3771
Date: 10/28/88

SUMMARY OF TEST RESULTS

TEST	AVERAGE
Thickness	42.8 mils
Density	0.978 g/cc
Modulus of Elasticity	
Longitudinal	26510 lbs/in^2
Transverse	28704 lbs/in^2
Tensile Strength and % Elongation	
Longitudinal	Yield: 2500 lbs/in^2 @ 12%
	Break: 4600 lbs/in^2 @ 716%
Transverse	Yield: 2500 lbs/in^2 @ 12%
	Break: 4600 lbs/in^2 @ 640%

STS Consultants Ltd.

Thickness Test
(Modified ASTM D-1777)
(2 kilopascal normal load)

STS Job No.: 94580
Project: Surface Impoundment closure for Kopper's Co.
Geotextile: Roll #4:-3771 I 1706
10/25/88 Batch #3771

SUMMARY OF TEST RESULTS

Specimen	Mils	Millimeters
1	43.7	1.11
2	42.5	1.08
3	41.7	1.06
4	43.3	1.10
Ave.	42.8	1.09

STS Consultants Ltd.

Density

ASTM D-792

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3771 I 1706
Specimen: Batch #3771
10/28/88

SUMMARY OF TEST RESULTS

Specimen No.	Density (g/cc)
1	0.994
2	0.973
3	0.962
4	0.985
ave.	0.978

STS Consultants Ltd.

Modulus Of Elasticity

ASTM D-882

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3771 I 1706
Specimen: Batch #3771
10/25/88

SUMMARY OF TEST RESULTS

Direction	Specimen No.	Modulus of Elasticity (lbs/in²)
Longitudinal	1	26829
	2	26190
	Ave.	26510
Transverse	1	28837
	2	28571
	Ave.	28704

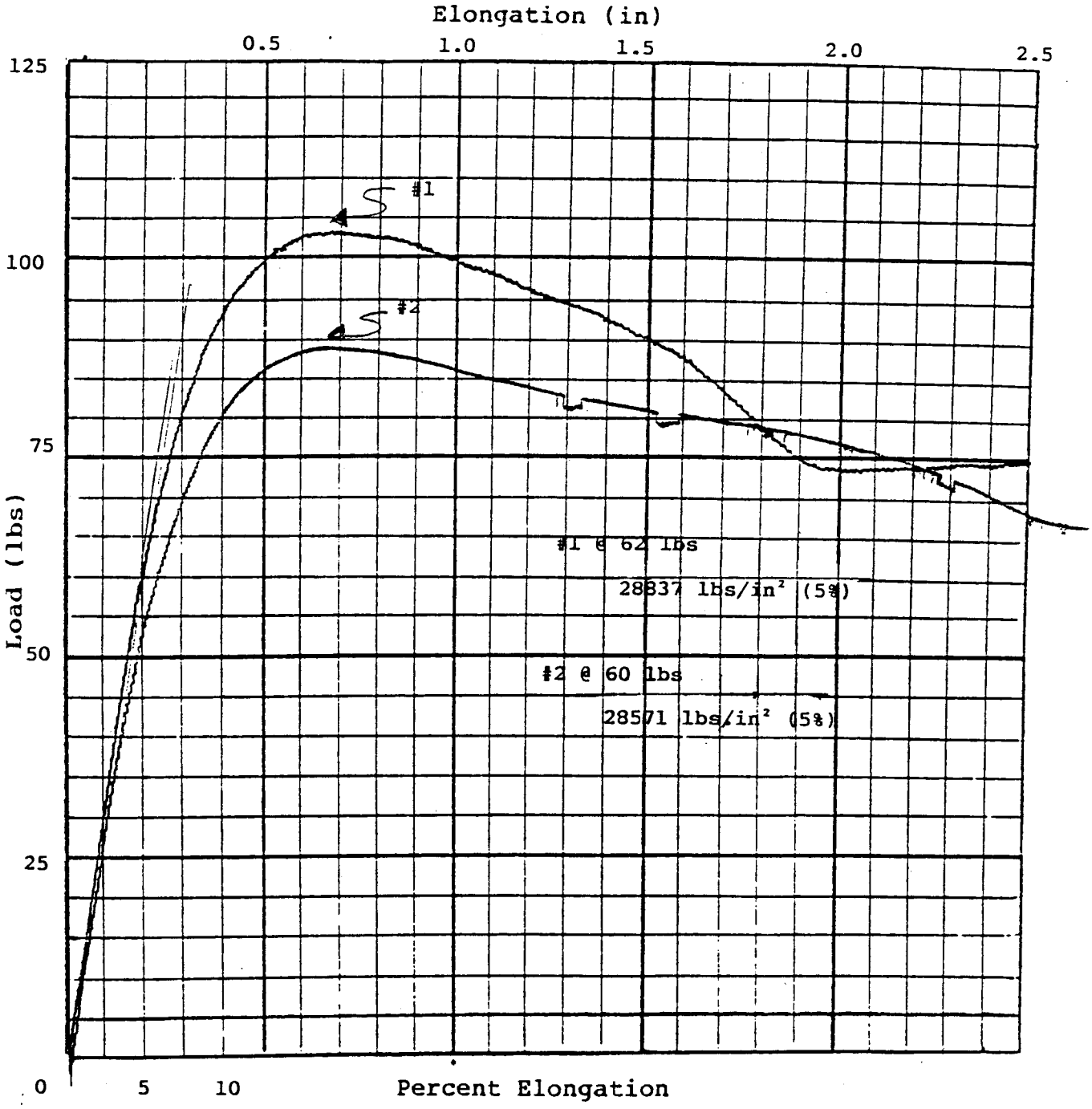
STS Consultants Ltd.

Modulus of Elasticity
(ASTM D-882)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll# 4L-3771 I 1706 Batch 3771
Specimen Transverse
1" wide-4" gauge length
0.4"/min.

Modulus of Elasticity (lbs/in): 28704
Ave. of 2 tests.

Cross Sectional Area: #1: 0.043 in²
#2: 0.042 in²



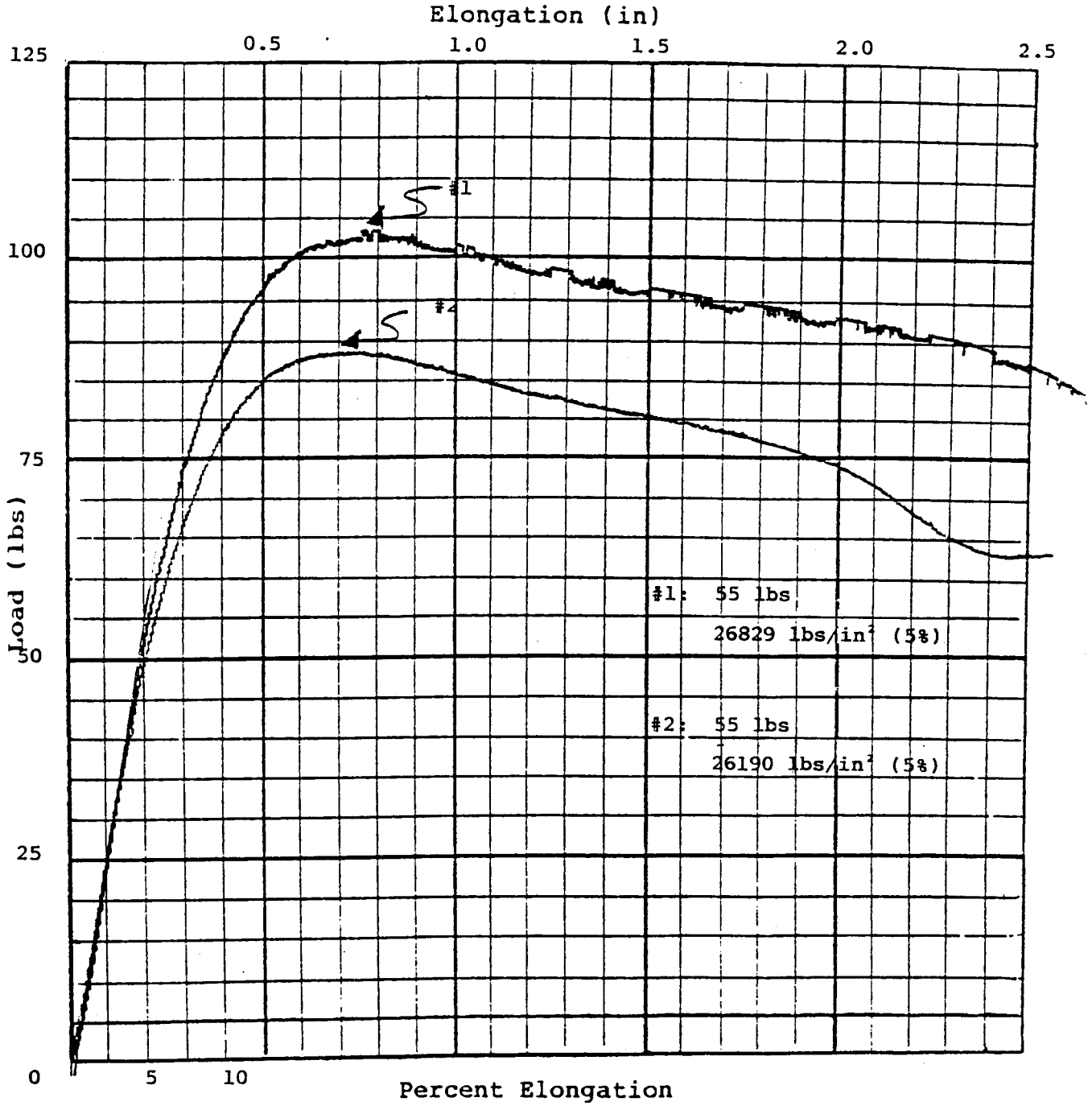
STS Consultants Ltd.

Modulus of Elasticity
(ASTM D-882)

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll # 4L-3771 I 1706 Batch 3771
Specimen Longitudinal
1" wide-4" gauge length
0.4"/min.

Modulus of Elasticity
(lbs/in): 26510
Ave. of 2 tests.

Cross Sectional Area: #1: 0.041 i
#2: 0.042 i



STS Consultants Ltd.

Tensile Strength Test

ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: Roll #4L-3771 I 1706
Specimen: Batch 3771
10/25/88

SUMMARY OF TEST RESULTS

Direction	Specimen No.	Strength @ Yield (lbs/in²)	% Elongation	Strength @ Break (lbs/in²)	% Elongation
Longitudinal	1	2500	12	4500	712
	2	2500	12	4700	719
	Ave.	2500	12	4600	716
Transverse	1	2500	12	4600	688
	2	2500	12	4600	592
	Ave.	2500	12	4600	640

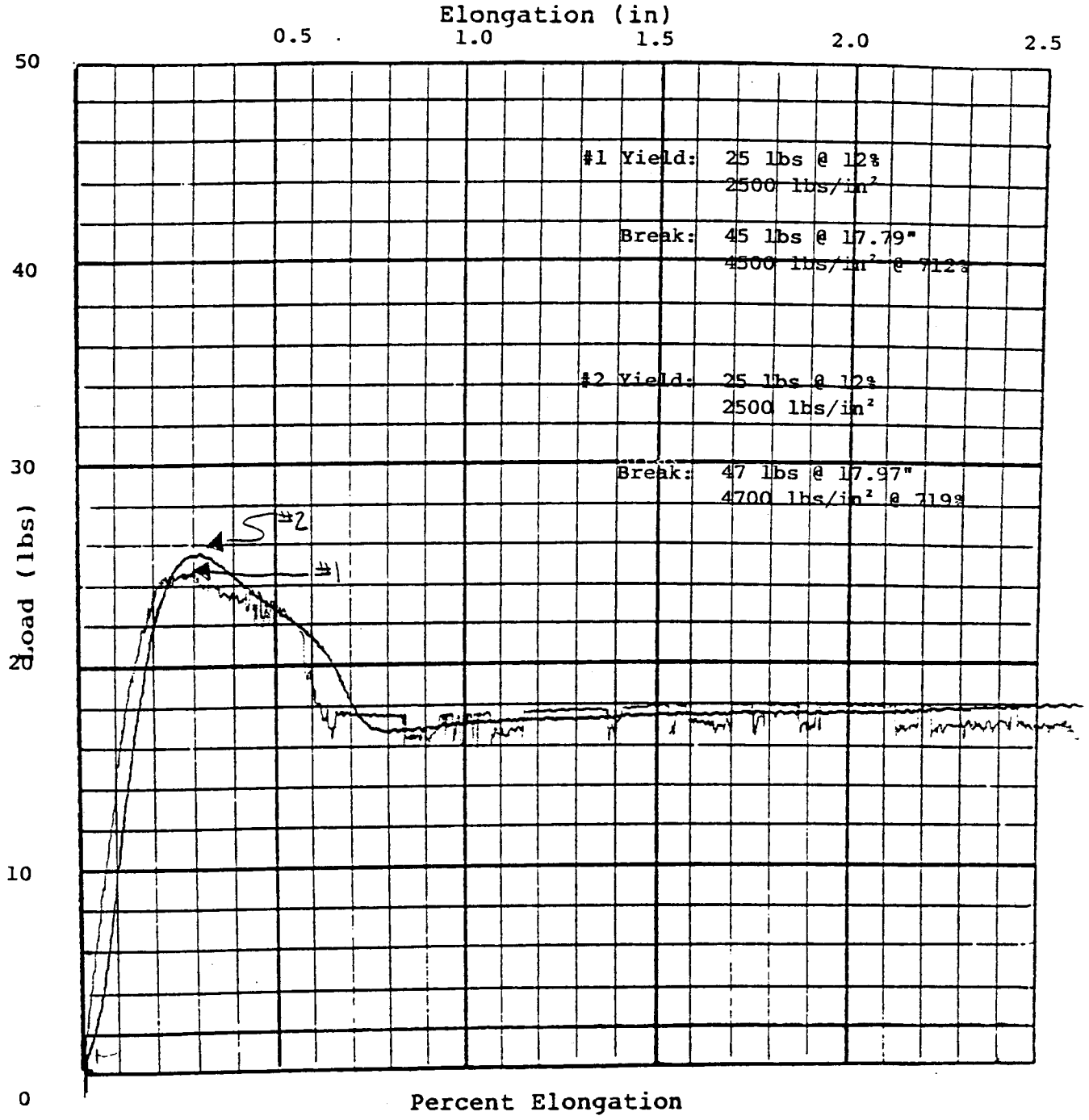
STS Consultants Ltd.

Tensile Strnegth Test
ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll # 4L-3771 I 1706 Batch 3771
Specimen Longitudinal

Cross Sectional Area: #1-0.010 in²
#2-0.010 in²

0.25" wide
2.5" gage length
2.0"/min.



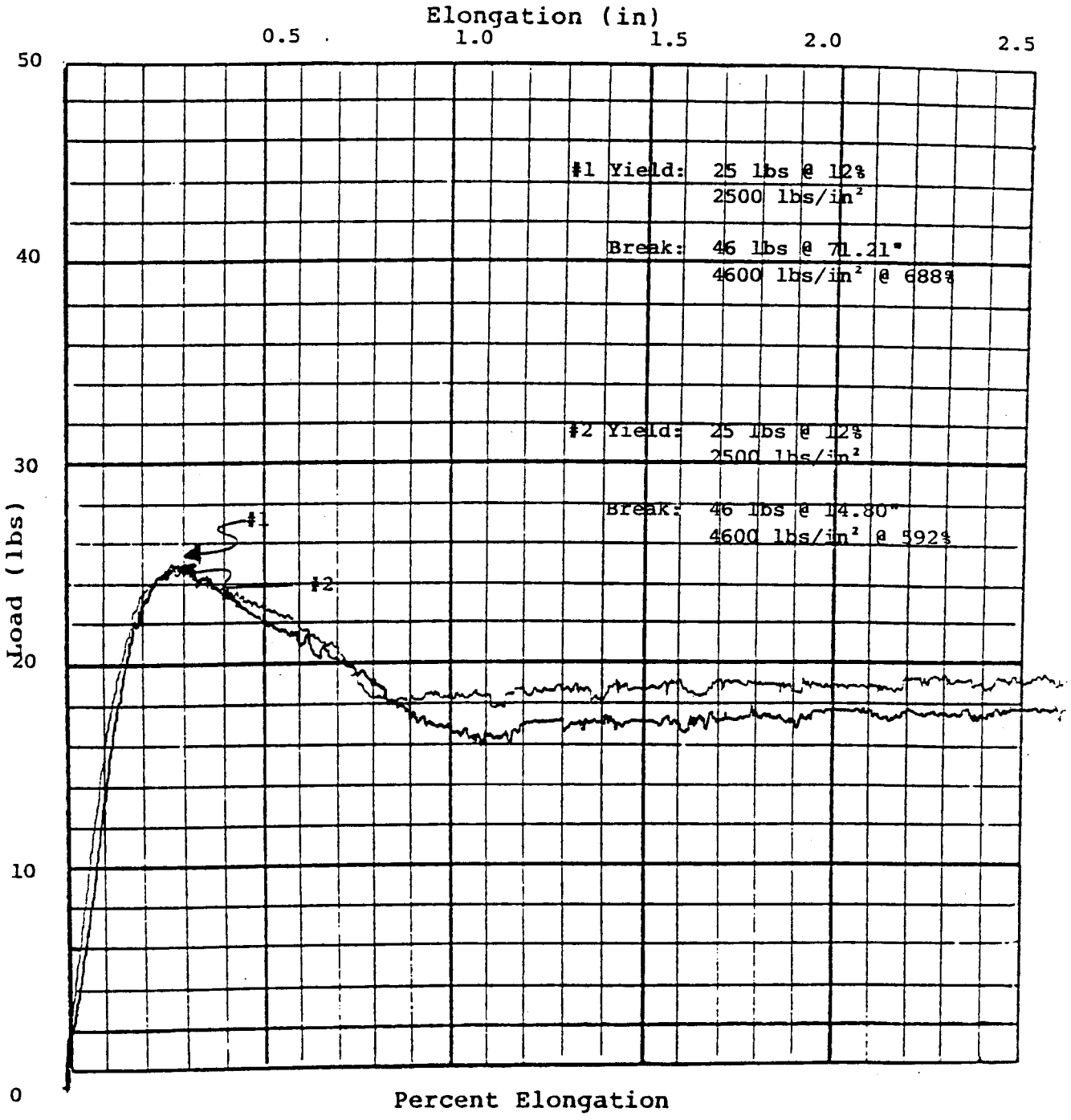
STS Consultants Ltd.

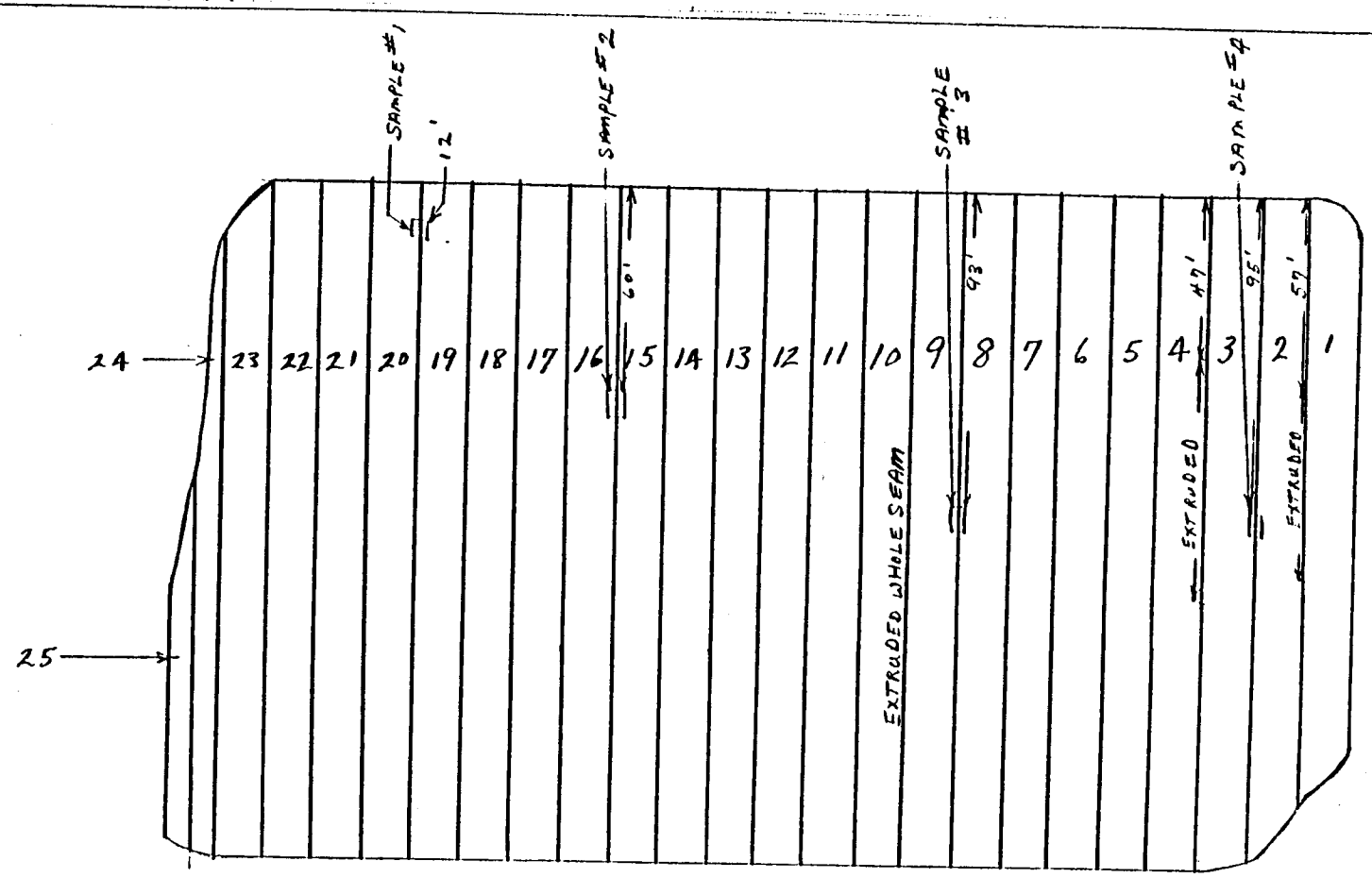
Tensile Strength Test
ASTM D-638

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geosynthetic: Roll # 4L-3771 I 1706 Batch # 3771
Specimen Transverse

Cross Sectional Area: #1-0.010 in²
#2-0.010 in²

0.25" wide
2.5" gage length
2.0".min,





N.T.S.

Geo-Synthetics, Inc.
KOPPERS CO. INC. SURFACE IMPOUNDMENT CLOSURE LINER
DRAWN BY: E.J.S. NOV. 1, 1988

STS Consultants Ltd.

Bonded Seam Strength

ASTM D-3083

STS Job No.:94580
Project: Surface Impoundment Closure For Koppe's Co.
Geotextile: HDPE Seam #2
Specimen: 1" wide-20"/min,
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Strength at Yield (lbs)
1	114
2	124
Ave.	119

#1 Stretched, then failed between clamp and seam

#2 Broke at edge of seam

STS Consultants Ltd.

20"/min

Bonded Seam Strength

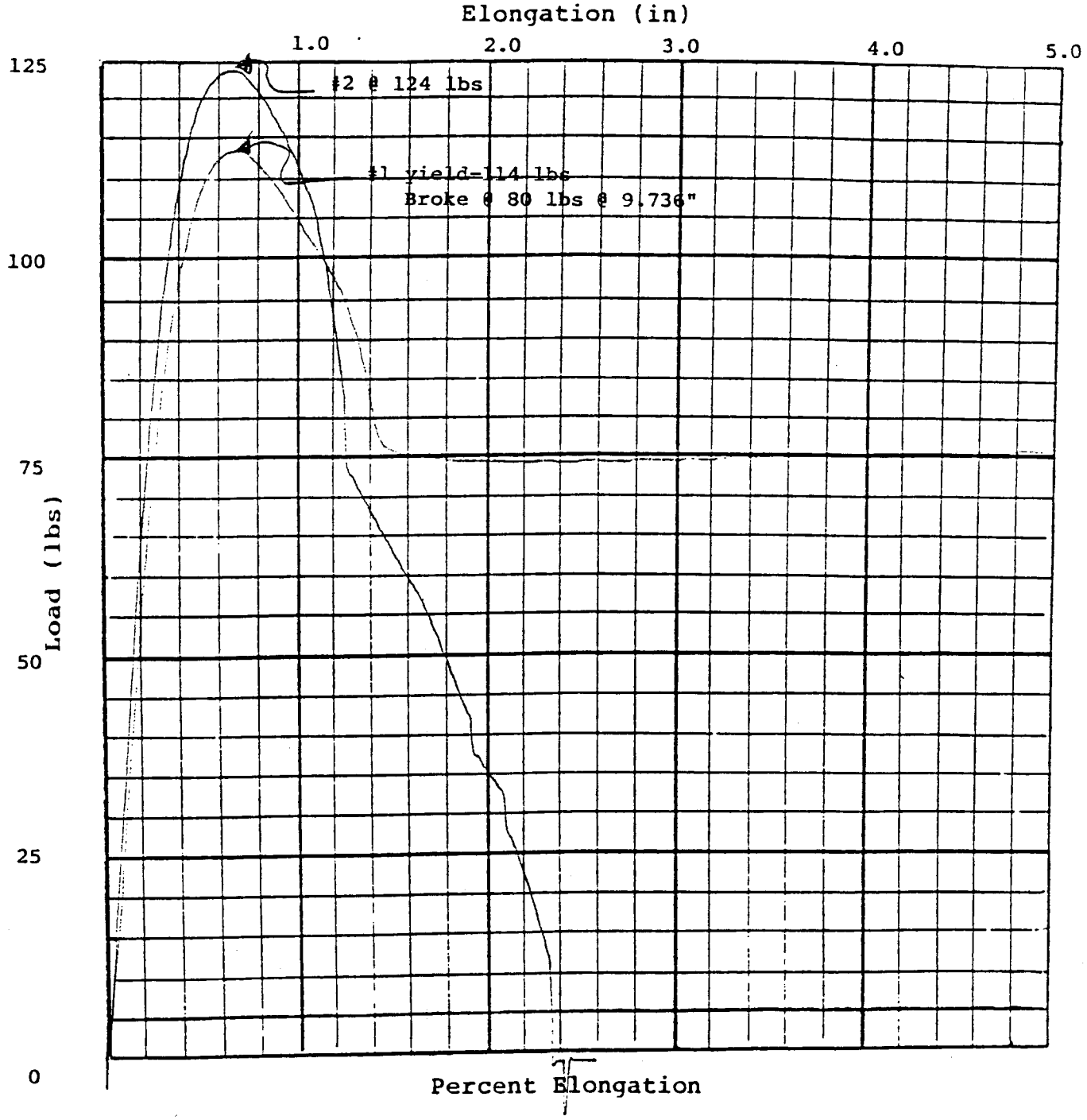
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #2
Specimen 1" wide

Tensile Strength (lbs 119 lb
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.042" thick
Seam: 1.916" long
0.084" thick

#2: 0.041" thick
Seam: 1.858" long
0.081" thick



#1 Stretched, then broke between clamp and seam
#2 broke at edge of seam

STS Consultants Ltd.

Peel Adhesion

ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE Seam #2
Specimen: 1" wide-2"/min 180° peel
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Peel Adhesion (lbs)
1	82
2	84
Ave.	83

Both samples broke at edge of bonded area, did not peel

STS Consultants Ltd.

2"/min
180° peel

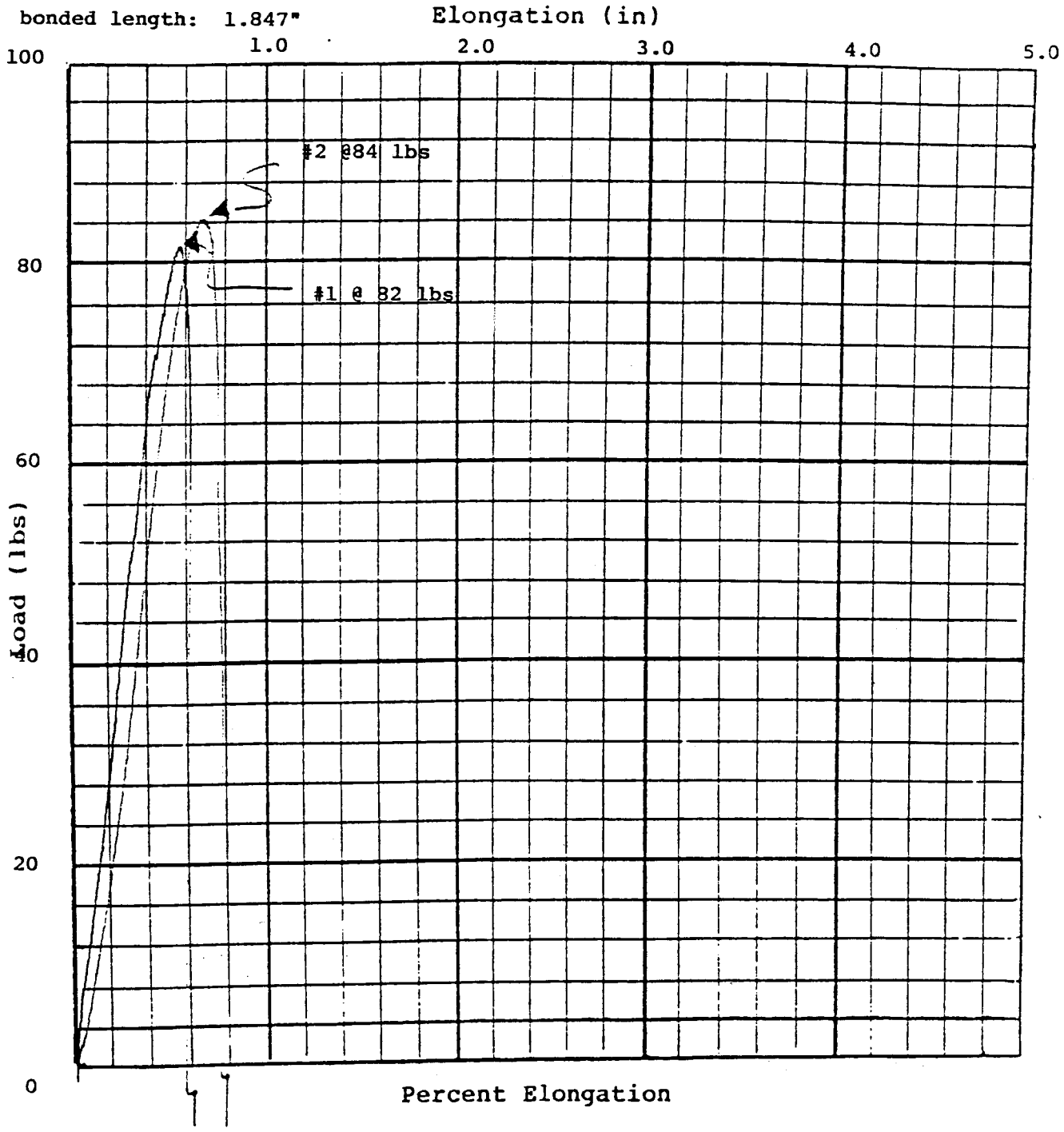
Peel Adhesion
ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #2
Specimen 1" wide

Tensile Strength (lbs 83 lbs
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.041" thick
bonded length: 1.886"

#2: 0.041" thick
bonded length: 1.847"



Both samples broke at edge of bonded area, did not peel

STS Consultants Ltd.

Bonded Seam Strength

ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE Seam #8
Specimen: 1" wide - 20"/min
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Strength at Yield (lbs)
1	122
2	100
Ave.	111

#1 Broke at edge of seam
#2 Stretched, then broke at edge of seam

STS Consultants Ltd.

20"/min

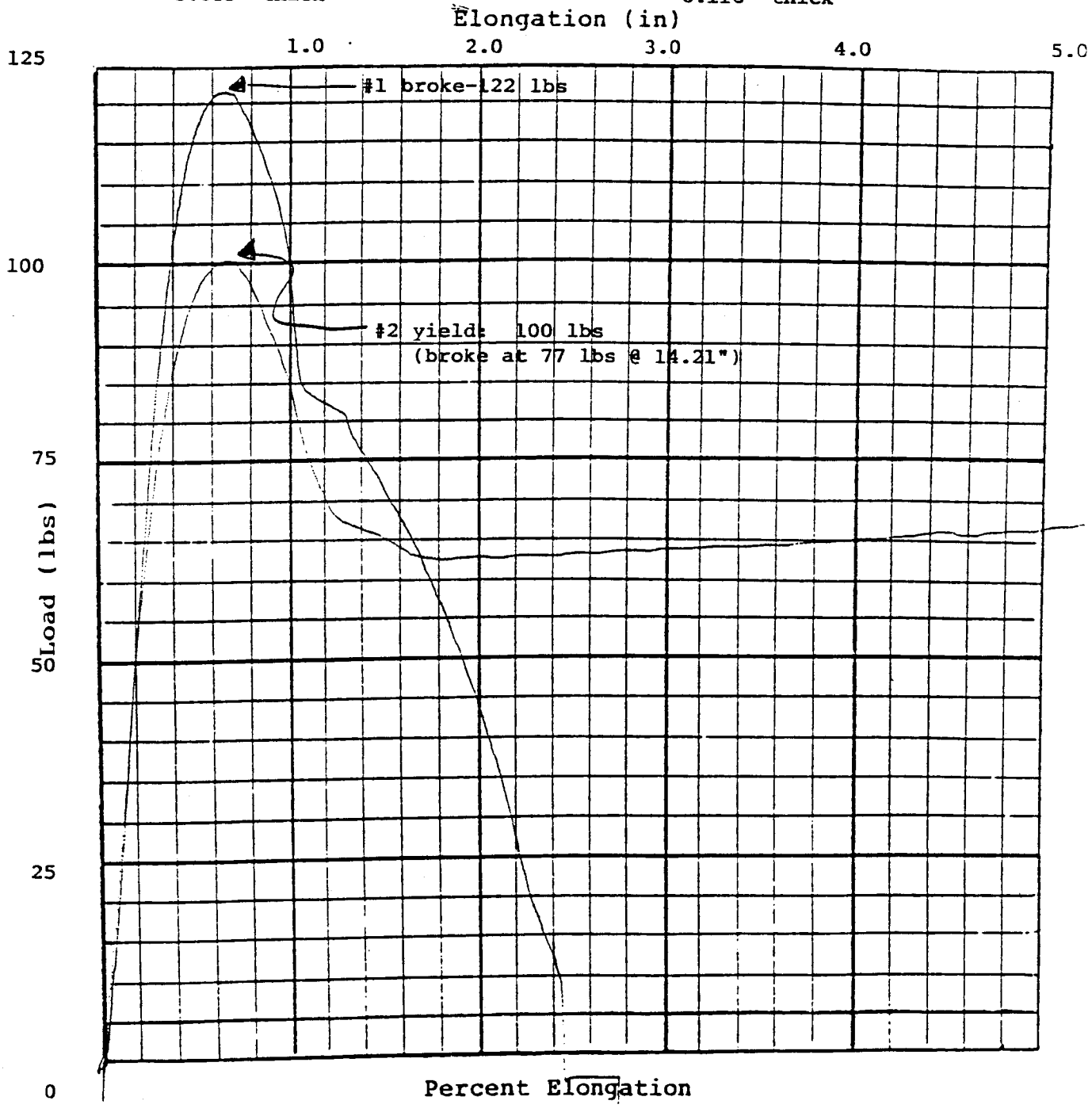
Bonded Seam Strength
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #8
Specimen 1" wide

Tensile Strength (lbs 111 lb
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1- 0.041" thick
Seam: 1.982" long
0.083" thick

#2- 0.041" thick
Seam: 1.999" long
0.116" thick



#1 broke at edge of seam

STS Consultants Ltd.

Peel Adhesion

ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE- Seam #8
Specimen: 1" wide-2"/min, 180° peel
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Peel Adhesion (lbs)
1	84
2	80
Ave.	82

Both samples broke at edge of bonded area, did not peel

STS Consultants Ltd.

2"/min
180° Peel

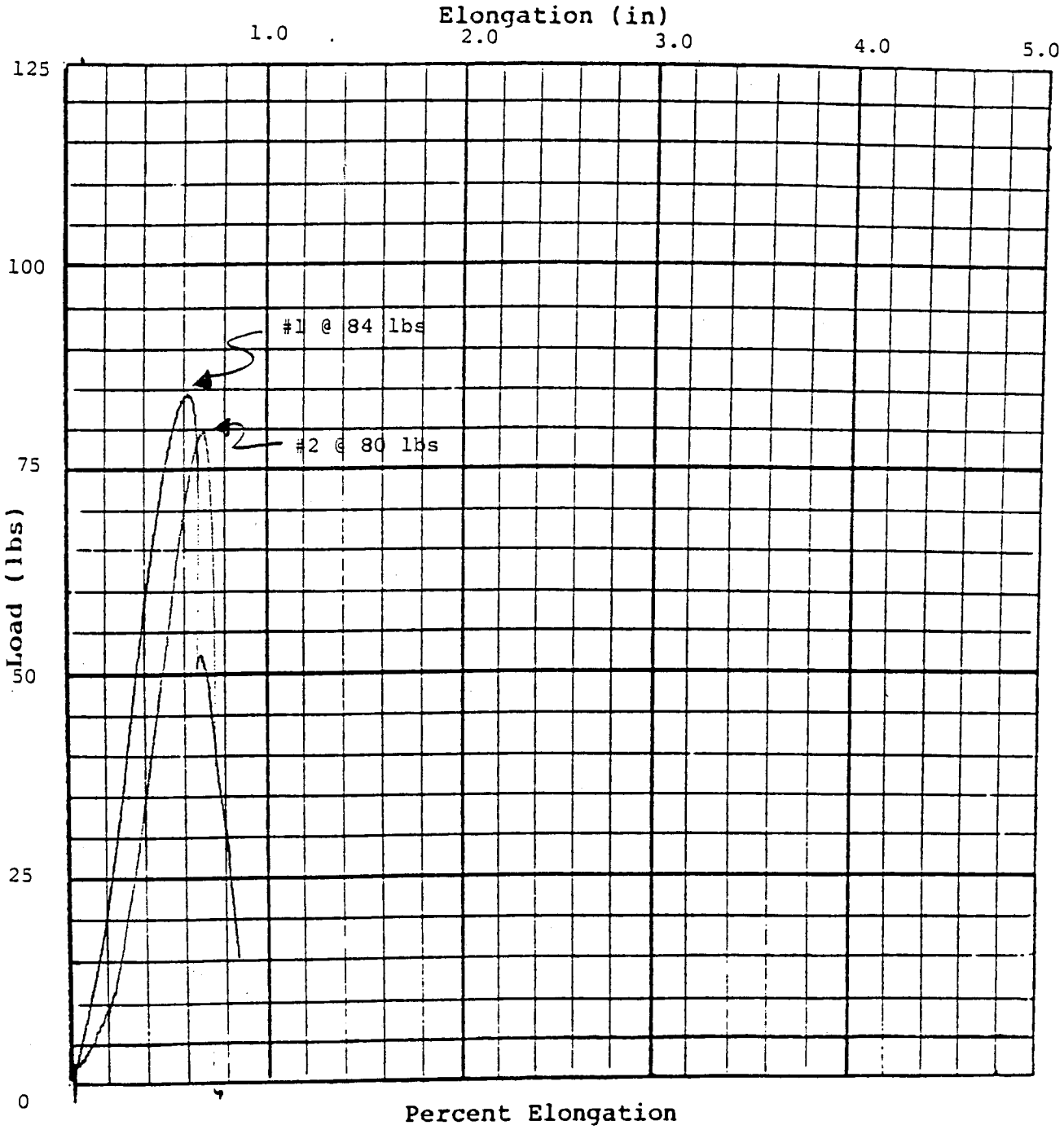
Peel Adhesion
ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #8
Specimen 1" wide

Tensile Strength (lbs 82 l
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.040" thick
bonded length: 1.983"

#2: 0.040" thick
bonded length: 1.995"



Both samples broke at edge of bonded area,did not peel

STS Consultants Ltd.

Bonded Seam Strength
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE Seam #15
Specimen: 1" wide, 20"/min
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Strength at Yield (lbs)
1	115
2	121
Ave.	118

Both samples stretched, then failed at edge of seam

STS Consultants Ltd.

20"/min

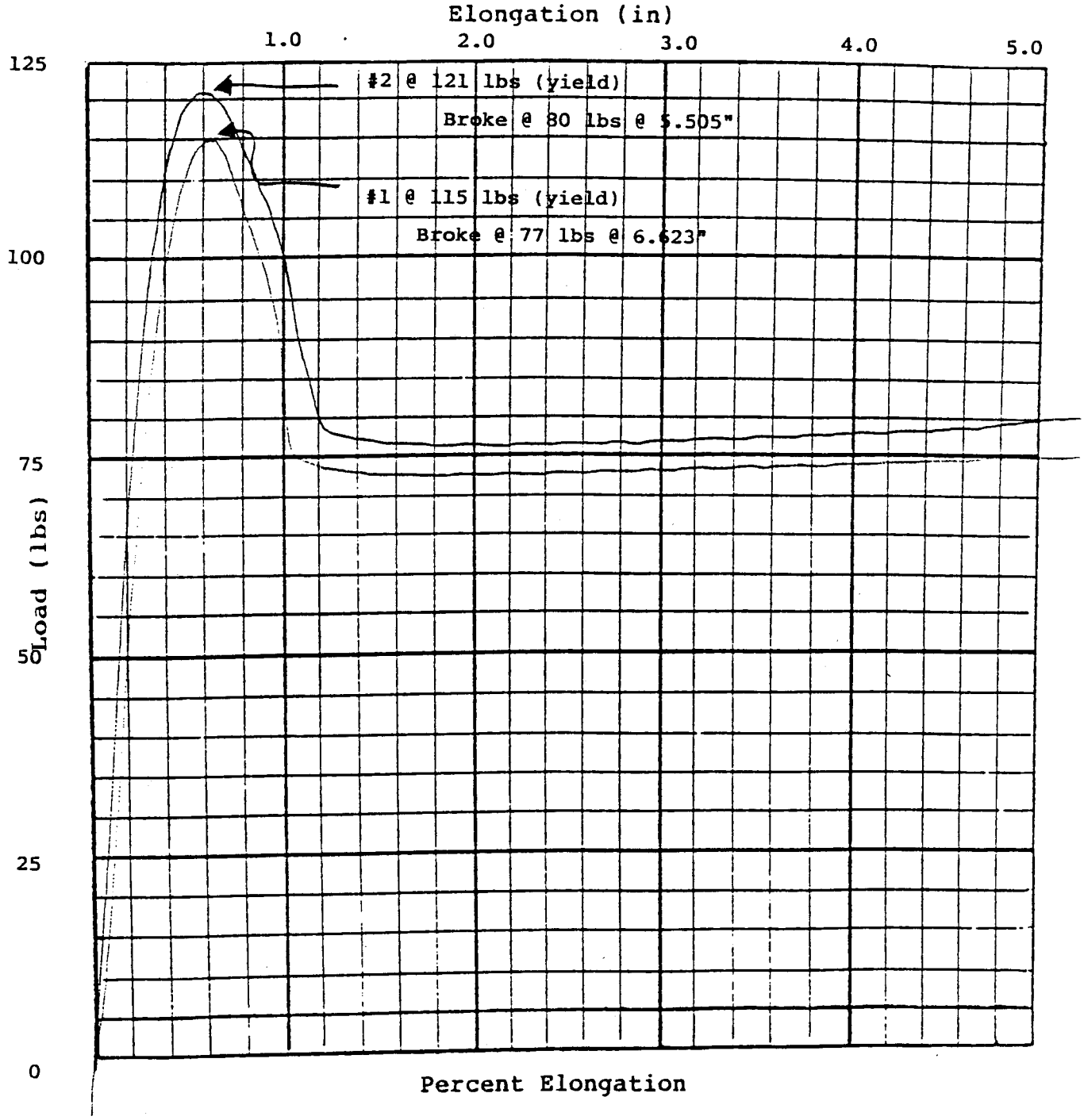
Bonded Seam Strength
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #15
Specimen 1" wide

Tensile Strength (lbs 118 lb
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.041" thick
Seam: 1.812" long
0.085" thick

#2: 0.042" thick
Seam: 1.852" long
0.083" thick



Both samples stretched, then failed at edge of seam

STS Consultants Ltd.

Peel Adhesion

ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure at Kopper's Co.
Geotextile: HDPE Seam #15
Specimen: 1" wide-2"/min, 18.0° peel
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Peel Adhesion (lbs)
1	63
2	57
Ave.	60

Both Samples peeled about 1/8", then broke at edge of bonded area.

STS Consultants Ltd.

2"/min
180° peel

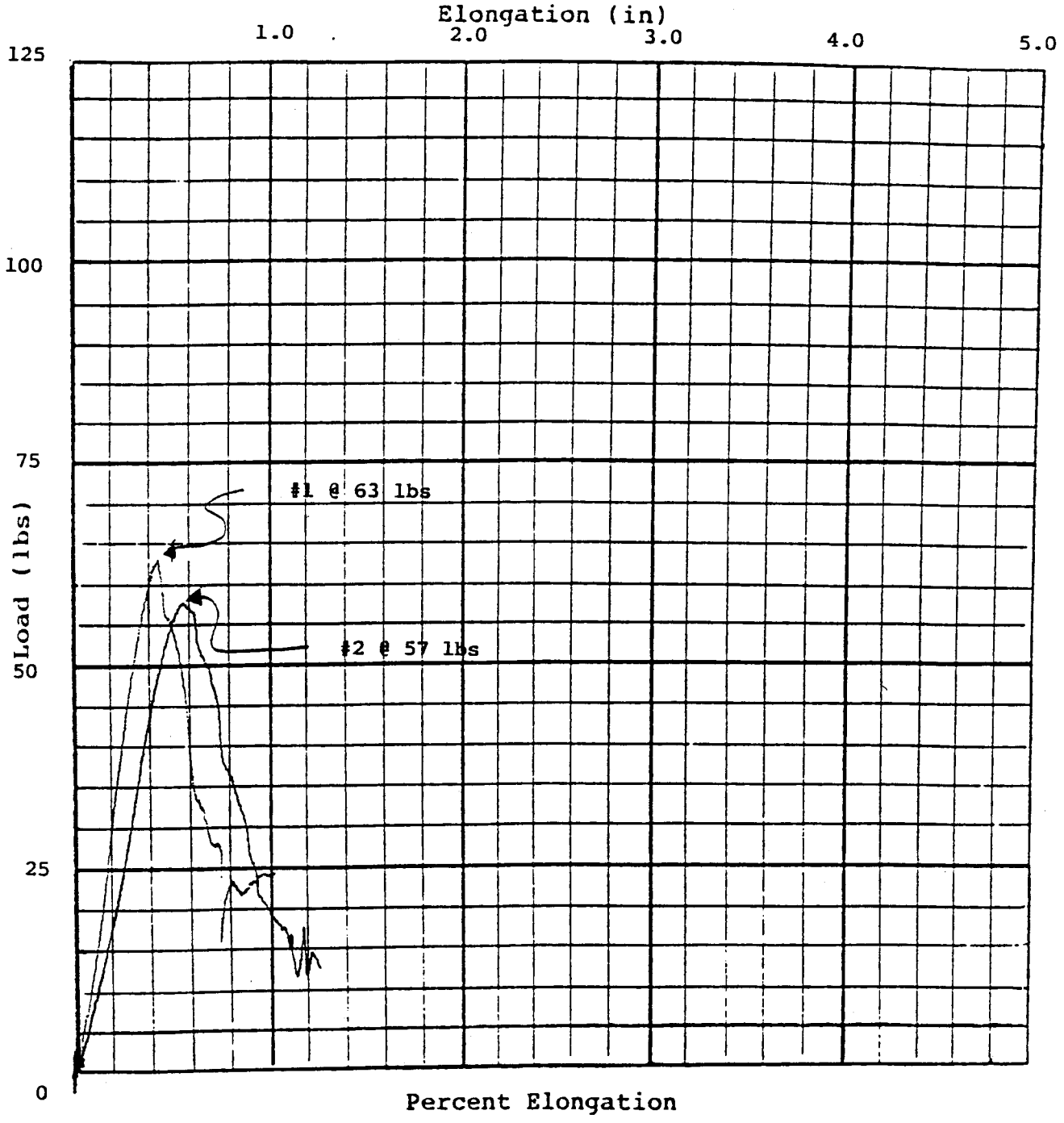
Peel Adhesion
ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #15
Specimen 1" wide

Tensile Strength (lbs) 60 lbs
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.040" thick
bond length: 1.799"

#2: 0.040" thick
bond length: 1.799"



Both samples peeled about 1/8", then failed at edge of bonded area.

STS Consultants Ltd.

Bonded Seam Strength

ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE Seam #19
Specimen: 1" wide-20"/min
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Strength at Yield (lbs)
1	124
2	117
Ave.	120

Both samples stretched, then broke at edge of seam

STS Consultants Ltd.

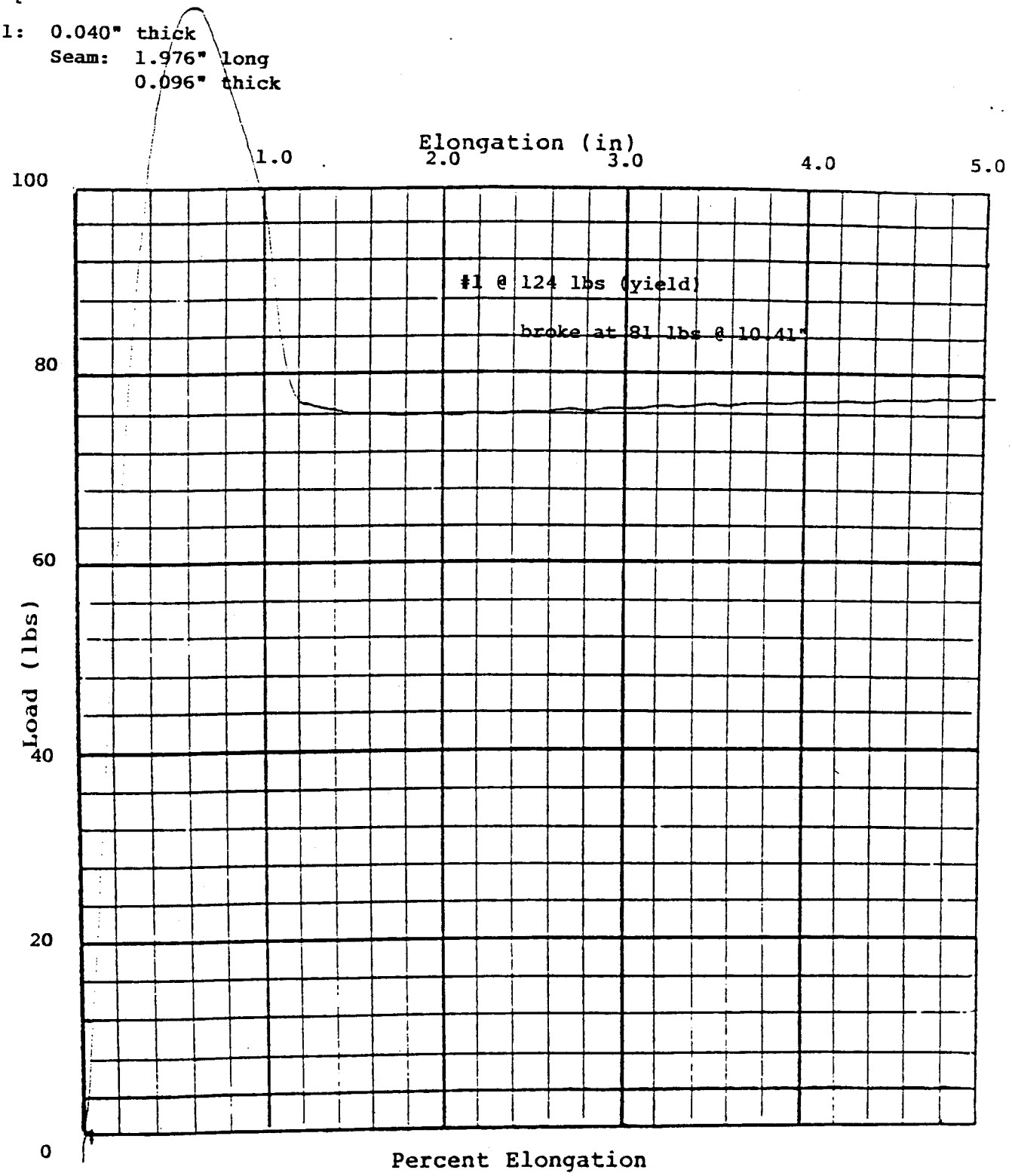
20"/min

Bonded Seam Strength
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #19
Specimen 1" wide

Tensile Strength (lbs 120 lbs
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.040" thick
Seam: 1.976" long
0.096" thick



Sample stretched, then broke at edge of seam

STS Consultants Ltd.

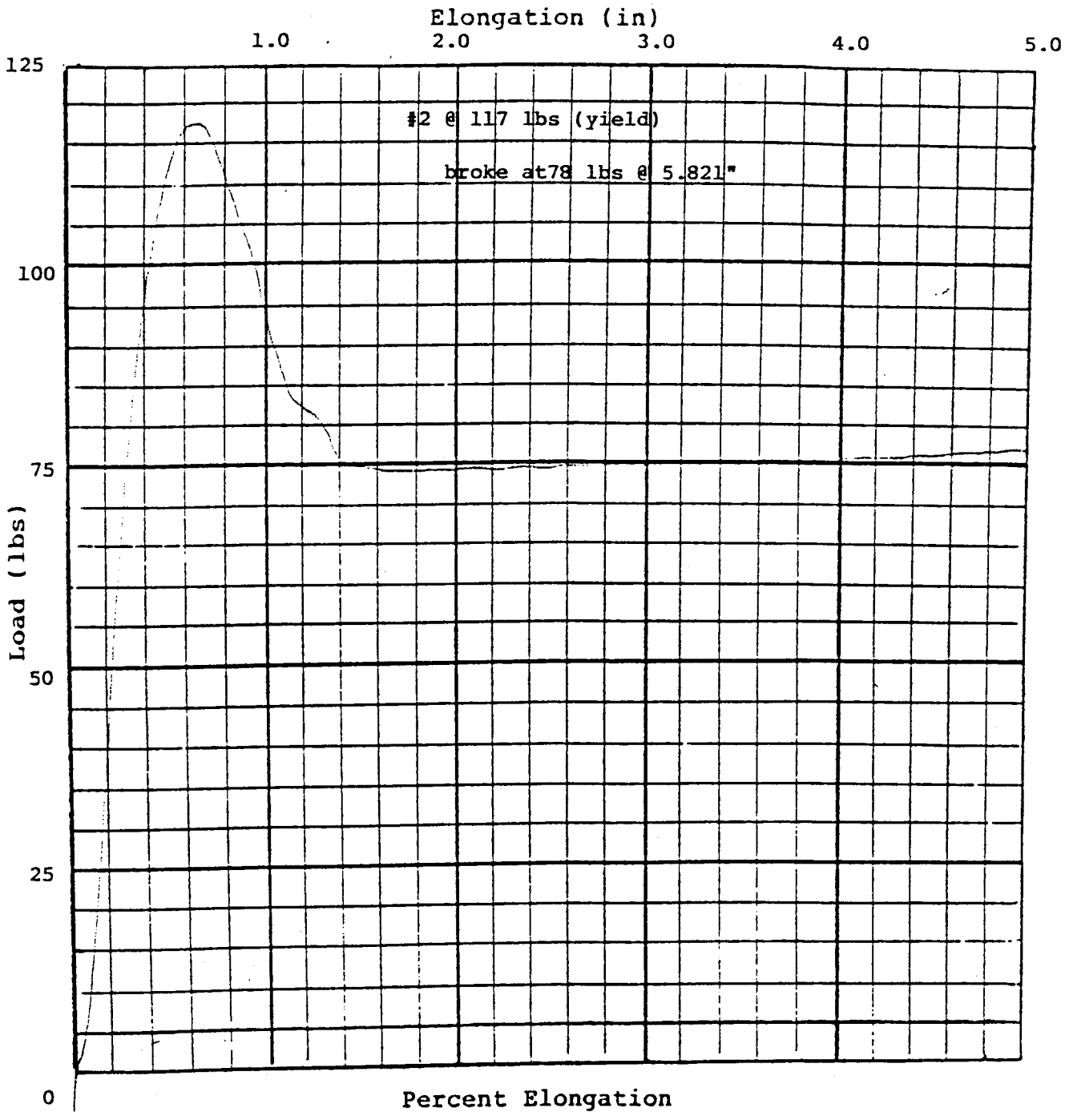
20"/min

Bonded Seam Strength
ASTM D-3083

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic:SEam #19
Specimen 1" wide

Tensile Strength (lbs 120 lbs
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#2: 0.040" thick
Seam: 1.976" long
0.086" thick



Sample stretched, then broke at edge of bonded area.

STS Consultants Ltd.

Peel Adhesion

ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure for Kopper's Co.
Geotextile: HDPE Seam #19
Specimen: 1" wide-2"/min, 180° peel
10/20/88

SUMMARY OF TEST RESULTS

Specimen No.	Peel Adhesion (lbs)
1	88
2	79
Ave,	84

Both samples broke at edge of bonded area, did not peel

STS Consultants Ltd.

2"/min
180° peel

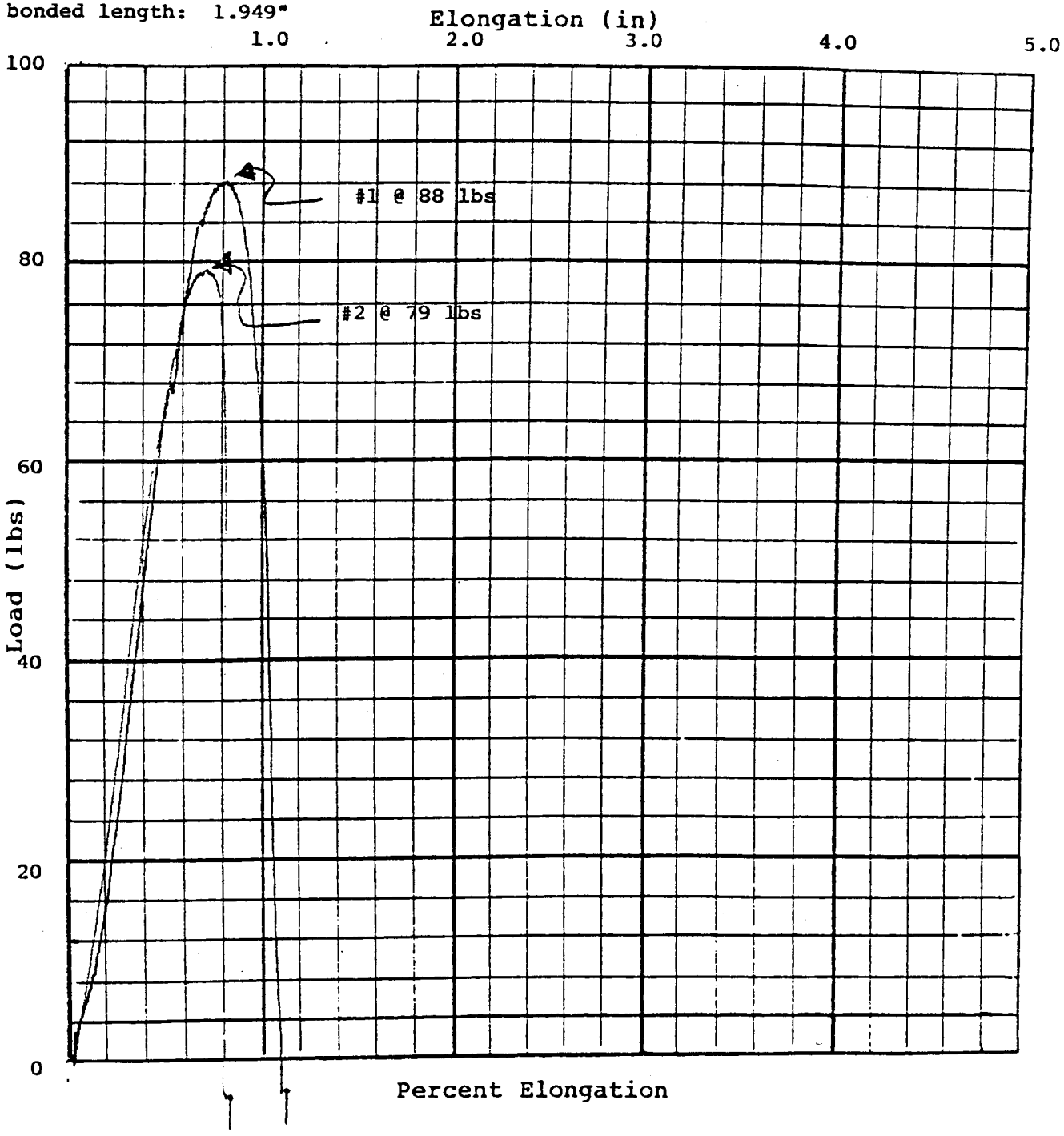
Peel Adhesion
ASTM D-413

STS Job No.: 94580
Project: Surface Impoundment Closure
Geosynthetic: Seam #19
Specimen 1" wide

Tensile Strength (lbs 84 lbs
% Elongation at Break:
Modulus at _____% Elongation:
Ave. of 2 tests

#1: 0.041" thick
bonded length: 1.976"

#2: 0.041"thick
bonded length: 1.949"



both samples broke at edge of bonded area, did not peel

APPENDIX F

MATERIALS AND SUPPLIERS LIST

SUPERIOR WISCONSIN PROJECT

MATERIAL LIST

CAP COMPONENT(1)	SOURCE / DESCRIPTION
Unclassified Soil Fill	Ray Konen on Highway "C", Douglas County, Wisconsin/Clay, trace sand.
Clay Barrier	Ray Konen on Highway "C", Douglas County, Wisconsin/Clay, trace sand.
HDPE Liner	Manufactured by National Seal Company, Installed by Geosynthetics Inc., a subcontractor/40 mil High Density Polyethylene.
Geotextile	Exxon Chemical Company/Filter Fabric stock number P1023, polypropylene, weight 10 oz./SY.
Drainage Layer	Allen Pit on Highway "B", Douglas County, Wisconsin/Fine to Coarse Brown Sand, trace gravel.
Cover Soil	Ray Konen on Highway "C", Douglas County, Wisconsin/Clay, trace sand.
Topsoil	J.R. Jensen Farm, Douglas County, Wisconsin/Elastic Silt, trace sand.
Seeding Cap Areas	Work completed by Kerrick Sod Co., Duluth, Minnesota, a subcontractor/ Prepared area, lime, fertilize, seed, and mulch.

Seed	C&K Seed Company, South St. Paul / 80 pounds/Acre Rye, Perennial 75 pounds/Acre Tall Fescue 30 pounds/Acre Birdsfoot Trefoil.
Fertilizer	Sturgeon Lake Fertilizer / 30 pounds of 5-10-5/1000 Square Feet.
Lime	Cutler (CLM) / 4 Tons Total
Mulch	Hay / 2 Tons/Acre

NOTES

(1) - Samples of the liner and geotextile are provided on the following pages along with the manufacturer specification sheets.

APPENDIX G

SYNTHETIC MEMBRANE CERTIFICATION REPORT

This report has not been received from G.S.I. It will be forwarded upon receipt by Keystone Environmental Resources, Inc.