CLOSURE REMEDIAL INVESTIGATION

VOLUME II
APPENDICES

CHEMICAL CONTROL CORPORATION SITE
ELIZABETH, NEW JERSEY

JUNE 1987
W.A. NO. 57-2L55.1

NOTICE

The information in this document has been funded by the United States Environmental Protection Agency (U.S. EPA) under REM III Contract No. 68-01-7250 to Ebasco Services Incorporated (Ebasco).

227579

JUNE 1987

CLOSURE REMEDIAL INVESTIGATION

VOLUME II
APPENDICES

CHEMICAL CONTROL CORPORATION SITE
ELIZABETH, NEW JERSEY

EPA WORK ASSIGNMENT NUMBER 107-2L55
UNDER
CONTRACT NUMBER 68-01-7250

PREPARED BY:
NUS CORPORATION
PITTSBURGH, PENNSYLVANIA

APPROVED BY:
EBASCO SERVICES INCORPORATED
LYNDHURST, NEW JERSEY

PREPARED BY:

D.R. Brenneman

DONALD R. BRENNEMAN
SITE MANAGER

APPROVED BY:

Dev R Sachdev

DEV R. SACHDEV, Ph.D., P.E.
REGIONAL MANAGER - REGION II

APPENDIX A

ANALYTICAL DATA

TABLE A-1

HSL LIST

THE CHEMICAL ANALYTICAL DATA SUMMARIZED IN THESE TABLES REPRESENT THE CONSTITUENTS ANALYZED DURING THE REMEDIAL INVESTIGATION FOR THE HAZARDOUS SUBSTANCE LIST (HSL) CHEMICALS. THE CHEMICALS INCLUDED ON THE HSL ARE PRESENTED BELOW. THE NUMBERS IN PARENTHESIS REPRESENT THE CONTRACT REQUIRED DETECTION LIMIT (CRDL)(FOR WATER AND SOIL MATRICES) REQUIRED BY THE CONTRACT LABORATORY PROGRAM (CLP). WHEN ONLY ONE NUMBER IS PRESENTED IT APPLIES TO BOTH AQUEOUS AND SOLID (SOIL / SEDIMENT) PHASES. UNITS ARE ug / L AND ug / kg. WHEN TWO NUMBERS ARE PRESENTED THE FIRST APPLIES TO AQUEOUS PHASE, THE SECOND APPLIES TO SOLIDS

CAS NUMBER	CHEMICAL (CRDL)
	VOLATILES
67-64-1	acetone (10)
78-93-3	2-butanone (10)
591-78-6	2-hexanone (10)
108-10-1	4-methyl-2-pentanone (10)
71-43-2	benzene (5)
108-88-3	toluene (5)
100-41-4	ethylbenzene (5)
1330-20-7	total xylenes (5)
100-42-5	stryrene (5)
108-90-7	chlorobenzene (5)
79-34-5	1,1,2,2-tetrachloroethane (5)
71-55-6	1,1,1-trichloroethane (5)
79-00-5	1,1,2-trichloroethane (5)
75-34-3	1,1-dichloroethane (5)
107-06-2	1,2-dichloroethane (5)
75-00-3	chloroethane (10)
127-18-4	tetrachloroethene (5)
79-01-6	trichloroethene (5)
156-60-5	1,2-dichloroethene (5)
75-35-4	1,1-dichloroethene (5)
75-01-4	vinyl chloride (10)
56-23-5	carbon tetrachloride (5)
67-66-3	chloroform (5)
75-09-2	methylene chloride (5)
74-87-3	chloromethane (10)
78-87-5	1,2-dichloropropane (5)
10061-02-6	trans-1,3-dichloropropene (5)
10061-01-5	cis-1,3-dichloropropene (5)
75-25-2	bromoform (5)
74-83-9	bromoethane (10)
75-27-4	bromodichloromethane (5)
124-48-1	dibromochloromethane (5)
75-15-0	carbon disulfide (5)
10-75-8	2-chloroethylvinylether (10)
108-05-4	vinyl acetate (10)

CAS NUMBER	CHEMICAL (CRDL)
	ACID EXTRACTABLES
108-95-2	phenol (10/330)
95-48-7	2-methylphenol (10/330)
106-44-5	4-methylphenol (10/330)
105-67-9	2,4-dimethylphenol (10/330)
95-57-8	2-chlorophenol (10/330)
120-83-2	2,4-dichlorophenol (10/330)
95-95-4	2,4,5-trichlorophenol (50/1600)
88-06-2	2,4,6-trichlorophenol (10/330)
87-86-5	pentachlorophenol (50/1600)
59-50-7	4-chloro-3-methylphenol (10/330)
88-75-5	2-nitrophenol (10/330)
100-02-7	4-nitrophenol (50/1600)
51-28-5	2,4-dinitrophenol (50/1600)
534-52-1	4,6-dinitro-2-methylphenol (50/1600)
	BASE / NEUTRAL EXTRACTABLES
117-81-7	bis (2-ethylhexyl) phthalte (10/330)
117-84-0	di-n-octyl phthalate (10/330)
84-74-2	di-n-butyl phthalate (10/330)
84-66-2	diethyl phthalate (10/330)
85-68-7	butylbenzyl phthalate (10/330)
131-11-3	dimethyl phthalate (10/330)
83-32-9	acenaphthene (10/330)
208-96-8	acenaphthylene (10/330)
120-12-7	anthracene (10/330)
56-55-3	benzo (a) anthracene (10/330)
205-99-2	benzo (b) fluoranthene (10/330)
207-08-9	benzo (k) fluoranthene (10/300)
191-24-2	benzo (g,h,i) perylene (10/330)
50-32-8	benzo (a) pyrene (10/330)
218-01-9	chrysene (10/330)
53-70-3	dibenz (a,h) anthracene (10/330)
206-44-0	fluoranthene (10/330)
86-73-7	fluorene (10/330)
193-39-5	indeno (1,2,3-cd) pyrene (10/330)
91-20-3	naphthalene (10/330)
91-57-6	2-methylnaphthalene (10/330)
91-58-7	2-chloronaphthalene (10/330)
85-01-8	phenanthrene (10/330)
129-00-0	pyrene (10/330)

CAS NUMBER	CHEMICAL (CRDL)
	BASE / NEUTRAL EXTRACTABLES (cont.)
95-50-1	1,2-dichlorobenzene (10/330)
541-73-1	1,3-dichlorobenzene (10/330)
106-46-7	1,4-dichlorobenzene (10/330)
120-82-1	1,2,4-trichlorobenzene (10/330)
118-74-1	hexachlorobenzene (10/330)
98-95-3	nitrobenzene (10/330)
606-20-2	2,6-dinitrotoluene (10/330)
121-14-2	2,4-dinitrotoluene (10/330)
62-75-9	n-nitrosodimethylamine (10/330)
621-64-7	n-nitrosodi-n-propylamine (10/330)
86-30-6	n-nitrosodiphenylamine (10/330)
62-53-3	aniline (10/330)
88-74-4	2-nitroaniline (50/1600)
99-09-2	3-nitroaniline (50/1600)
100-01-6	4-nitroaniline (50/1600)
106-47-8	4-chloroaniline (10/330)
111-44-4	bis (2-chloroethyl) ether (10/330)
39638-32-9	bis (2-chloroisopropyl) ether (10/330)
101-55-3	4-bromophenyl-phenylether (10/330)
7005-72-3	4-chlorophenyl-phenylether (10/330)
87-68-3	hexachlorobutadiene (10/330)
77-47-4	hexachlorocyclopentadiene (10/330)
92-87-5	benzidine (80/2600)
91-94-1	3,3'-dichlorobenzidine (10/330)
65-85-0	benzoic acid (50/1600)
100-51-6	benzyl alcohol (10/330)
111-91-1	bis (2-chloroethoxy) methane (10/330)
132-64-9	dibenzofuran (10/330)
67-72-1	hexachloroethane (10/330)
78-59-1	isophorone (10/330)
	PESTICIDES / PCB's
319-84-6	alpha-BHC (0.05/8.0)
319-85-7	beta-BHC (0.05/8.0)
319-86-8	delta-BHC (0.05/8.0)
58-89-9	gamma-BHC (0.05/8.0)
76-44-8	heptachlor (0.05/8.0)
1024-57-3	heptachlor epoxide (0.05/8.0)
50-29-3	4,4'-DDT (0.10/16.0)
74-54-8	4,4'-DDD (0.10/16.0)
72-55-9	4,4'-DDE (0.10-16.0)

CAS NUMBER	CHEMICAL (CRDL)
	PESTICIDES / PCB's
72-20-8	endrin (0.10/16.0)
53494-70-5	endrin ketone (0.10/16.0)
7421-93-4	endrin aldehyde (0.10/16.0)
959-98-8	endosulfan I (0.05/8.0)
33213-65-9	endosulfan II (0.10/16.0)
1031-07-8	endosulfan sulfate (0.10/16.0)
309-99-2	aldrin (0.05/8.0)
60-57-1	dieldrin (0.10/16.0)
57-74-9	chlordane (0.5/80.0)
72-43-5	methoxychlor (0.5/80.0)
8001-35-2	toxaphene (1.0/80.0)
12674-11-2	Arochlor 1016 (0.5/80.0)
11104-28-2	Arochlor 1221 (0.5/80.0)
11141-16-5	Arochlor 1232 (0.5/80.0)
53469-21-9	Arochlor 1242 (0.5/80.0)
12672-29-6	Arochlor 1248 (0.5/80.0)
11097-69-1	Arochlor 1254 (1.0/160.0)
11096-82-5	Arochlor 1260 (1.0/160.0)
	INORGANICS
7429-90-5	aluminum (200)
7440-36-0	antimony (60)
7440-38-2	arsenic (10)
513-77-9	barium (200)
100-44-7	beryllium (5)
7440-43-9	cadmium (5)
7440-70-2	calcium (5000)
7440-47-3	chromium (10)
7440-48-4	cobalt (50)
7440-50-4	copper (25)
1309-37-1	iron (100)
7439-92-1	lead (5)
7439-95-4	magnesium (5000)
7439-96-5	manganese (15)
7439-97-6	mercury (0.2)
7440-02-0	nickel (40)
7440-09-7	potassium (5000)
7782-49-2	selenium (5)
7440-22-4	silver (10)
7440-23-5	sodium (5000)
7440-28-0	thallium (10)
7440-31-5	tin (40)
7440-62-2	vanadium (50)
7440-66-6	zinc (20)

THE DATA BASE IS PRESENTED USING THE FOLLOWING QUALIFIERS FOR CLARIFICATION:

BLANK	-	Compound not detected at method detection limit, or data was rejected during the validation process and not used.
J	-	Estimated value.
B	-	Compound also detected in blank.
[]	-	Detected at a value greater than the instrument detection limit, but less than the contract required detection limit.
R	-	Left Side - Rejected by validation personnel.
R	-	Right Side - Lab Qualifier - Surrogate recovery outside of specifications.
E	-	Estimated value (Lab Qualifier).
C	-	Presence of Pesticide/PCB Confirmed by GC/MS.
HL	-	Sample holding time exceeded. Result to be considered a minimum value.
SH	-	Surrogate recovery high. Result to be considered an overestimate.
SL	-	Surrogate recovery low. Result to be considered a minimum value.
*	-	Indicates duplicate analysis not within control limits.

All results with the exception of soil/sediment inorganics (ppm) presented in ppb.

ppb	-	µg/L for Water Samples µg/kg for Soil and Sediments Samples
ppm	-	mg/kg for Soil and Sediment Samples

Gravel results reported with "B" Qualifier not included on Figure 4-4. Laboratory contaminants.

TABLE A-2

SURFACE SOIL RESULTS

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-000-13	CC-SO-001	CC-SO-002	CC-SO-003	CC-SO-004	CC-SO-005	CC-SO-006	CC-SO-007
TRAFFIC REPORT NUMBER :	BD862	BE352	BD827	BD828	BE353	BE356	BE354	BE357
DESCRIPTION:	BLANK VOA	GR18 0-3'C	SO-18 3-4'	SO-18 4-5'	GR17 0-3'C	GR19 0-3'C	GR16 0-3'C	GR20 0-3'C
DATE SAMPLED:	12/09/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86

*** VOLATILES ***

PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	R	HL 200B		R	HL 680B	HL 170B	HL 100B	HL 38B
	78-93-3	2-BUTANONE		HL 46B			HL 31B	HL 26B	HL 23B	HL 29B
4V	71-43-2	BENZENE				42				
86V	108-88-3	TOLUENE		HL 8	R	520				HL 4J
38V	100-41-4	ETHYLBENZENE			1100	600				
	95-47-6	TOTAL XYLENES			7000	2100				HL 8
7V	108-90-7	CHLOROBENZENE								
11V	71-55-6	1,1,1-TRICHLOROETHANE								
10V	75-34-3	1,1-DICHLOROETHANE								
16V	75-00-3	CHLOROETHANE								
85V	127-18-4	TETRACHLOROETHENE				59B				
87V	79-01-6	TRICHLOROETHENE			R	35				HL 4J
30V	156-60-5	TRANS-1,2-DICHLOROETHENE				110				HL 12
44V	75-09-2	METHYLENE CHLORIDE		HL 10B			HL 4JB	HL 5B	HL 5B	HL 5B
	75-15-0	CARBON DISULFIDE			3600					

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		HL 110JB			HL 130JB	HL 140JB	HL 45JB	HL 2200B
69B	117-84-0	DI-N-OCTYL PHTHALATE								HL 170J
68B	84-74-2	DI-N-BUTYL PHTHALATE		HL 46J			HL 150B	HL 100J	HL 52J	HL 280J
67B	85-68-7	BUTYL BENZYL PHTHALATE								HL 52O
1B	83-32-9	ACENAPHTHENE								HL 49J
72B	56-55-3	BENZO(A)ANTHRACENE								HL 57J
73B	50-32-8	BENZO(A)PYRENE								
76B	218-01-9	CHRYSENE								HL 84J

SAMPLE TYPE: SO

			SAMPLE NUMBER :	CC-SO-000-13	CC-SO-001	CC-SO-002	CC-SO-003	CC-SO-004	CC-SO-005	CC-SO-006	CC-SO-007
			TRAFFIC REPORT NUMBER :	BD952	BE352	BD927	BD928	BE353	BE356	BE354	BE357
			DESCRIPTION:	BLANK VOA	GR18 0-3'C	SO-18 3-4'	SO-18 4-5'	GR17 0-3'C	GR19 0-3'C	GR16 0-3'C	GR20 0-3'C
			DATE SAMPLED:	12/09/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85
39B	206-44-0	FLUORANTHENE									HL 140J
80B	86-73-7	FLUORENE									HL 40J
55B	91-20-3	NAPHTHALENE									HL 94J
	91-57-6	2-METHYLNAPHTHALENE									HL 100J
81B	85-01-8	PHENANTHRENE									HL 120J
84B	129-00-0	PYRENE									HL 190J
	95-50-1	1,2-DICHLOROBENZENE									HL 270J
8B	120-82-1	1,2,4-TRICHLOROBENZENE									HL 110J

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
	12672-29	AROCLOR-1248				HL 23000C				
107P	11097-69-1	AROCLOR-1254		R	640					
111P	11096-82-5	AROCLOR-1260		R	350					HL 280

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-000-13	CC-SO-001	CC-SO-002	CC-SO-003	CC-SO-004	CC-SO-005	CC-SO-006	CC-SO-007
TRAFFIC REPORT NUMBER :		MBF055	MBE737	MBE738	MBF056	MBF057	MBF058	MBF059
DESCRIPTION:	BLANK VOA	SO-18 0-3'	SO-18 3-4'	SO-18 4-5'	SO-17 0-3'	SO-19 0-3'	SO-16 0-3'	SO-20 0-3'
DATE SAMPLED:	12/09/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM		J 8440	J 7800	R			
2		ANTIMONY		J 31R					
3		ARSENIC		7.4	9.8				
4		BARIUM	[12]	J 178	J [96]	[1]	[11]	[1]	[46]
5		BERYLLIUM	[0.3]			[0.2]	[0.2]	[0.2]	[0.3]
6		CADMIUM		J 3.6					[2.9]
7		CALCIUM	10710E	J 13500	J 5020	[752]E	[1416]E	[2105]E	33930E
8		CHROMIUM	[4]	J 41	J 27	[4]	[3]	[4]	[4]
9		COBALT							
10		COPPER	[4]	J 156R	J 74R				[5]
11		IRON	R	J 22100	J 47800	[60]R	R	R	R
12		LEAD		J 422R	J 82R				
13		MAGNESIUM	[1966]	J 3950	J [2000]	[672]	[432]	[491]	5894
14		MANGANESE	72R	J 526R	J 304R	29R	35R	26R	188R
15		MERCURY		1.9	0.57				
16		NICKEL		J 33	J 30				
17		POTASSIUM	R	J [1240]	J [649]	R	R	R	R
18		SELENIUM							
19		SILVER	R	J [4]		R	R	R	R
20		SODIUM	[511]E			9271	[1864]E	[2426]E	9283E
21		THALLIUM							
22		TIN		J 117	28				
23		VANADIUM	R	J 35	J 35	R	R	R	R
24		ZINC	507	J 242	J 117	[13]	489	[11]	121

SAMPLE TYPE: SO

SAMPLE NUMBER :		CC-SO-008	CC-SO-009	CC-SO-010	CC-SO-011	CC-SO-012	CC-SO-013	CC-SO-014	CC-SO-015
TRAFFIC REPORT NUMBER :		BD833	BD834	BE358	BE359	BE364	BE365	BD839	BE366
DESCRIPTION:		SO-20 1-2'	SO-20 2-3'	GR15 0-3'C	GR14 0-3'C	GR12 0-3'C	GR13 0-1'C	SO-13 1-2'	GR11 0-1'C
DATE SAMPLED:		12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE		R	HL 180B	HL 97B	HL 26B	HL 24B		HL 38B
	78-93-3	2-BUTANONE			HL 10B	HL 33B	HL 16B	HL 15B		HL 21B
4V	71-43-2	BENZENE								
86V	108-88-3	TOLUENE	R	29						
38V	100-41-4	ETHYLBENZENE	38	6						
	95-47-6	TOTAL XYLENES	190	40					R	
7V	108-90-7	CHLOROBENZENE	18							
11V	71-55-6	1,1,1-TRICHLOROETHANE								
10V	75-34-3	1,1-DICHLOROETHANE								
16V	75-00-3	CHLOROETHANE								
85V	127-18-4	TETRACHLOROETHENE							R	
87V	79-01-6	TRICHLOROETHENE		3J						
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		6						
44V	75-09-2	METHYLENE CHLORIDE	18		HL 4JB	HL 4JB	HL 8JB	HL 4JB		HL 9B
	75-15-0	CARBON DISULFIDE								
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	50000	18000J	HL 140JB	HL 97JB	HL 60JB	HL 91JB	15000J	HL 100JB
69B	117-84-0	DI-N-OCTYL PHTHALATE								
68B	84-74-2	DI-N-BUTYL PHTHALATE	12000J		HL 13OJ	HL 93J	HL 100J	HL 110J		HL 52J
67B	85-68-7	BUTYL BENZYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE								
72B	56-55-3	BENZO(A)ANTHRACENE								
73B	50-32-8	BENZO(A)PYRENE							10000J	
76B	218-01-9	CHRYSENE								

SAMPLE TYPE: SO

SAMPLE NUMBER :			CC-SO-008	CC-SO-009	CC-SO-010	CC-SO-011	CC-SO-012	CC-SO-013	CC-SO-014	CC-SO-015
TRAFFIC REPORT NUMBER :			BD833	BD834	BE358	BE359	BE364	BE365	BD839	BE366
DESCRIPTION:			SO-20 1-2'	SO-20 2-3'	GR15 0-3'C	GR14 0-3'C	GR12 0-3'C	GR13 0-1'C	SO-13 1-2'	GR11 0-1'C
DATE SAMPLED:			12/08/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86	12/08/86
39B	206-44-0	FLUORANTHENE								
80B	86-73-7	FLUORENE								
55B	91-20-3	NAPHTHALENE								
	91-57-6	2-METHYLNAPHTHALENE								
81B	85-01-8	PHENANTHRENE								
84B	129-00-0	PYRENE								
	95-50-1	1,2-DICHLOROBENZENE								
8B	120-82-1	1,2,4-TRICHLOROBENZENE								

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
	12672-29	AROCLOR-1248								
107P	11097-69-1	AROCLOR-1254	7600	5200						
111P	11096-82-5	AROCLOR-1260	9400	8100					16000	HL 340

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-008	CC-SO-009	CC-SO-010	CC-SO-011	CC-SO-012	CC-SO-013	CC-SO-014	CC-SO-016
TRAFFIC REPORT NUMBER :	MBE743	MBE744	MBF060	MBF062	MBF063	MBF064	MBE749	MBA813
DESCRIPTION:	SO-20 1-2'	SO-20 2-3'	SO-15 0-3'	SO-14 0-3'	SO-12 0-3'	GR13 0-3'C	SO-13 1-2'	GR11 0-3'C
DATE SAMPLED:	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85	12/08/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	J 9180	J 6690		R			J 6500	
2		ANTIMONY							J 269R	
3		ARSENIC	42	47						
4		BARIUM	J 271	J 264	[3]	[2]	[1]	[1]	J 276	
5		BERYLLIUM			[0.2]	[0.4]	[0.3]	[0.3]		[0.3]
6		CADMIUM	J 4.6						J 10	
7		CALCIUM	J 12100	J 7740	[4846]E	[1648]E	[973]E	[4719]E	J 15600	R
8		CHROMIUM	J 78	J 61	[3]	[4]	[4]	[4]	J 48	[3]
9		COBALT								
10		COPPER	J 156R	J 135R	[9]	[7]	[7]		J 238R	
11		IRON	J 21900	J 21100	R	R	R	R	J 26500	R
12		LEAD	J 426R	J 204R					J 8070R	
13		MAGNESIUM	J 3710	J [2410]	[983]	[519]	[460]	[3833]	J 3700	[136]
14		MANGANESE	J 271R	J 232R	70R	62R	47R	53R	J 328R	[10]R
15		MERCURY	2.1	1.5					2.0	
16		NICKEL	J 42	J 45					J 70	
17		POTASSIUM	J [1060]	J [1010]	R	R	R	R	J [1090]	R
18		SELENIUM	2.9	3.7						
19		SILVER		J [41]	R	R	R	R	J [6.8]	R
20		SODIUM			[2594]E	[2774]E	[4069]E	10030E		6194E
21		THALLIUM								
22		TIN	82	66					258	
23		VANADIUM	J 42	J 45	R	R	R	R	J 40	R
24		ZINC	J 266	J 200	25	30	33	53	J 1500	[10]

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-016	CC-SO-017	CC-SO-018	CC-SO-019	CC-SO-019A	CC-SO-020	CC-SO-021	CC-SO-022
TRAFFIC REPORT NUMBER :	BD841	BD842	BD843	BD844	BD851	BD845	BD846	BD847
DESCRIPTION:	SO-10 0-2'	S008 1-3'C	S009 0-3'C	S007 0-3'C	DUPLICATE	S006 0-3'C	S005 0-4'C	SO-04 0-4'
DATE SAMPLED:	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85

*** VOLATILES ***

PP	CAS NO	COMPOUND								
	67-64-1	ACETONE			R			R		
	78-93-3	2-BUTANONE								
4V	71-43-2	BENZENE								
86V	108-88-3	TOLUENE	11	R	12	7	35	7J		16
38V	100-41-4	ETHYLBENZENE	6J	3J		13	60			
	95-47-6	TOTAL XYLENES	26	16	17	93	350			
7V	108-90-7	CHLOROBENZENE								
11V	71-55-6	1,1,1-TRICHLOROETHANE					15			
10V	75-34-3	1,1-DICHLOROETHANE				6	35			
16V	75-00-3	CHLOROETHANE			19		154			
85V	127-18-4	TETRACHLOROETHENE			R					
87V	79-01-6	TRICHLOROETHENE				5J	18			
30V	156-60-5	TRANS-1,2-DICHLOROETHENE					29			
44V	75-09-2	METHYLENE CHLORIDE			8		15			
	75-15-0	CARBON DISULFIDE	9	R						

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		9300J			2400J			
69B	117-84-0	DI-N-OCTYL PHTHALATE								
68B	84-74-2	DI-N-BUTYL PHTHALATE								
67B	85-68-7	BUTYL BENZYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE								
72B	56-55-3	BENZO(A)ANTHRACENE								
73B	50-32-8	BENZO(A)PYRENE								
76B	218-01-9	CHRYSENE								

SAMPLE TYPE: SO

			SAMPLE NUMBER :	CC-SO-016	CC-SO-017	CC-SO-018	CC-SO-019	CC-SO-019A	CC-SO-020	CC-SO-021	CC-SO-022
			TRAFFIC REPORT NUMBER :	BD841	BD842	BD843	BD844	BD851	BD845	BD846	BD847
			DESCRIPTION:	SO-10 0-2'	S008 1-3'C	S009 0-3'C	S007 0-3'C	DUPLICATE	S006 0-3'C	S005 0-4'C	SO-04 0-4'
			DATE SAMPLED:	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85	12/09/85
39B	206-44-0	FLUORANTHENE								5000J	
80B	86-73-7	FLUORENE									
55B	91-20-3	NAPHTHALENE									
	91-57-6	2-METHYLNAPHTHALENE									
81B	85-01-8	PHENANTHRENE								5000J	
84B	129-00-0	PYRENE								7500J	
	95-50-1	1,2-DICHLOROBENZENE									
8B	120-82-1	1,2,4-TRICHLOROBENZENE									

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND				
	12672-29	AROCLOR-1248				
107P	11097-69-1	AROCLOR-1254		1800		
111P	11096-82-5	AROCLOR-1260		2100	310	R

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-016	CC-SO-017	CC-SO-018	CC-SO-019	CC-SO-019A	CC-SO-020	CC-SO-021	CC-SO-022
TRAFFIC REPORT NUMBER :	MBE761	MBE762	MBE763	MBE764	MBE761	MBE765	MBE766	MBE767
DESCRIPTION:	SO-10 0-2'	SO-08 1-3'	SO-09 0-3'	SO-07 0-3'	DUPLICATE	SO-06 0-3'	SO-05 0-4'	SO-04 0-4'
DATE SAMPLED:	12/09/86	12/09/86	12/09/86	12/09/86	12/09/86	12/09/86	12/09/86	12/09/86

*** INORGANICS ***

PP	CAS NO	COMPOUND								
1		ALUMINUM	J 12100	J 10500	J 6590	J 10000	J 9770	J 7060	J 5900	J 8760
2		ANTIMONY								
3		ARSENIC	[5.7]	12	[4.2]	13	8.3	9.7	14	26
4		BARIUM		J [54]	J [111]	J [104]	J [82]	J [86]	J [57]	J [113]
5		BERYLLIUM								
6		CADMIUM								
7		CALCIUM	J 10100	J 12300	J 12700	J 6040	J 8420	J 3820	J [1620]	J 4360
8		CHROMIUM	J 7.6	J 28	J 16	J 63	J 42	J 13	J 26	J 18
9		COBALT	J [17]	J [14]						
10		COPPER	J 193R	J 186R	J 231R	J 112R	J 85R	J 152R	J 95R	J 118R
11		IRON	J 39800	J 30300	J 28200	J 43000	J 28300	J 24600	J 18800	J 25600
12		LEAD	J 11R	J 97	J 218R	J 192R	J 154R	J 494R	J 436R	J 192R
13		MAGNESIUM	J 5600	J 6020	J 5510	J 3690	J 4230	J [1340]	J [1040]	J 3290
14		MANGANESE	J 271R	J 278R	J 510R	J 395R	J 306R	J 309R	J 101R	J 267R
15		MERCURY	0.31	2.0	0.60	0.47	0.36	0.36	0.19	1.2
16		NICKEL	J [25]	J 31	J 30	J 36	J 28	J 27	J [19]	J 29
17		POTASSIUM	J [798]	J [927]	J [851]	J 1090	J [965]	J [594]	J [380]	J 1070
18		SELENIUM								
19		SILVER								
20		SODIUM								
21		THALLIUM								
22		TIN			[22]	[22]	[19]			[16]
23		VANADIUM	J 80	J 79	J 39	J 43	J 38	J 35	J [26]	J 37
24		ZINC	J 82	J 134	J 214	J 365	J 176	J 135	J 159	J 217

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-023	CC-SO-024	CC-SO-025
TRAFFIC REPORT NUMBER :	BD848	BD849	BD850
DESCRIPTION:	S003 0-4'C	S002 0-3'C	S001 0-4'C
DATE SAMPLED:	12/09/85	12/09/85	12/09/85

*** VOLATILES ***

PP	CAS NO	COMPOUND			
	67-64-1	ACETONE			
	78-93-3	2-BUTANONE			
4V	71-43-2	BENZENE			
86V	108-88-3	TOLUENE	8		
38V	100-41-4	ETHYLBENZENE			
	95-47-6	TOTAL XYLENES			
7V	108-90-7	CHLOROBENZENE			
11V	71-55-6	1,1,1-TRICHLOROETHANE			
10V	75-34-3	1,1-DICHLOROETHANE			
16V	75-00-3	CHLOROETHANE			
85V	127-18-4	TETRACHLOROETHENE		2J	
87V	79-01-6	TRICHLOROETHENE			
30V	156-60-5	TRANS-1,2-DICHLOROETHENE			
44V	75-09-2	METHYLENE CHLORIDE			
	75-15-0	CARBON DISULFIDE			

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE
69B	117-84-0	DI-N-OCTYL PHTHALATE
68B	84-74-2	DI-N-BUTYL PHTHALATE
67B	85-68-7	BUTYL BENZYL PHTHALATE
1B	83-32-9	ACENAPHTHENE
72B	56-55-3	BENZO(A)ANTHRACENE
73B	50-32-8	BENZO(A)PYRENE
76B	218-01-9	CHRYSENE

SAMPLE TYPE: SO

SAMPLE NUMBER :			CC-SO-023	CC-SO-024	CC-SO-025
TRAFFIC REPORT NUMBER :			BD848	BD849	BD850
DESCRIPTION:			S003 0-4'C	S002 0-3'C	S001 0-4'C
DATE SAMPLED:			12/09/85	12/09/85	12/09/85
39B	206-44-0	FLUORANTHENE	4200J	4800J	
80B	86-73-7	FLUORENE			
55B	91-20-3	NAPHTHALENE			
	91-57-6	2-METHYLNAPHTHALENE			
81B	85-01-8	PHENANTHRENE	2100J	2400J	
84B	129-00-0	PYRENE	4200J	4800J	
	95-50-1	1,2-DICHLOROBENZENE			
8B	120-82-1	1,2,4-TRICHLOROBENZENE			

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND
	12672-29	AROCLOR-1248
107P	11097-69-1	AROCLOR-1254
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-023	CC-SO-024	CC-SO-025
TRAFFIC REPORT NUMBER :	MBE758	MBE759	MBE760
DESCRIPTION:	SO-03 0-4'	SO-02 0-3'	SO-01 0-4'
DATE SAMPLED:	12/09/85	12/09/85	12/09/85

*** INORGANICS ***

PP	CAS NO	COMPOUND			
1		ALUMINUM	J 6400	J 6520	J 3860
2		ANTIMONY			
3		ARSENIC	76	14	11
4		BARIUM	J 142	J 250	J [70]
5		BERYLLIUM			
6		CADMIUM			
7		CALCIUM	J 3520	J 5110	J [2220]
8		CHROMIUM	J 19	J 16	J 10
9		COBALT			
10		COPPER	J 238R	J 501R	J 162R
11		IRON	J 28600	J 28100	J 20100
12		LEAD	J 334R	J 551R	J 221R
13		MAGNESIUM	J [1680]	J [1490]	J [744]
14		MANGANESE	J 160R	J 239R	J 118R
15		MERCURY	0.61	0.84	0.58
16		NICKEL	J 27	J 32	J [20]
17		POTASSIUM	J [660]	J [767]	J [427]
18		SELENIUM			
19		SILVER			
20		SODIUM			
21		THALLIUM	136		
22		TIN	41	74	[18]
23		VANADIUM	J 32	J 34	J [21]
24		ZINC	J 252	J 602	J 182

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SO

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
4V	71-43-2	BENZENE	1	42.00	42.00	42.00	
86V	108-88-3	TOLUENE	9	7.00	620.00	71.67	168.79
38V	100-41-4	ETHYLBENZENE	8	3.00	1100.00	227.00	381.11
	95-47-6	TOTAL XYLENES	9	16.00	7000.00	1092.44	2181.72
7V	108-90-7	CHLOROBENZENE	1	18.00	18.00	18.00	
11V	71-55-6	1,1,1-TRICHLOROETHANE	1	15.00	15.00	15.00	
10V	75-34-3	1,1-DICHLOROETHANE	2	6.00	35.00	20.50	14.50
16V	75-00-3	CHLOROETHANE	2	19.00	154.00	86.50	67.50
85V	127-18-4	TETRACHLOROETHENE	2	2.00	59.00	30.50	28.50
87V	79-01-6	TRICHLOROETHENE	4	3.00	35.00	15.25	12.77
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	3	6.00	110.00	48.33	44.60
44V	75-09-2	METHYLENE CHLORIDE	3	6.00	18.00	13.00	5.10
	75-15-0	CARBON DISULFIDE	2	9.00	3600.00	1804.50	1795.50
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5	2400.00	50000.00	18940.00	16417.26
68B	84-74-2	DI-N-BUTYL PHTHALATE	1	12000.00	12000.00	12000.00	
73B	50-32-8	BENZO(A)PYRENE	1	10000.00	10000.00	10000.00	
39B	206-44-0	FLUORANTHENE	3	4200.00	5000.00	4666.67	339.93
81B	85-01-8	PHENANTHRENE	3	2100.00	5000.00	3166.67	1302.13
84B	129-00-0	PYRENE	3	4200.00	7500.00	5500.00	1435.27
107P	11097-69-1	AROCLOR-1254	4	640.00	7600.00	3810.00	2756.14
111P	11096-82-5	AROCLOR-1260	6	310.00	16000.00	6043.33	5707.70
1		ALUMINUM	16	3860.00	12100.00	7816.88	1994.33
2		ANTIMONY	2	31.00	259.00	145.00	114.00
3		ARSENIC	15	4.20	76.00	19.94	19.38
4		BARIUM	24	1.00	276.00	92.96	91.01
5		BERYLLIUM	10	0.20	0.40	0.27	0.06
6		CADMIUM	4	2.80	10.00	5.25	2.82
7		CALCIUM	25	752.00	33930.00	7406.72	6955.02
8		CHROMIUM	26	3.00	78.00	21.18	21.23
9		COBALT	2	14.00	17.00	15.50	1.50
10		COPPER	21	4.00	501.00	136.33	112.02
11		IRON	17	60.00	47800.00	26750.59	10298.82
12		LEAD	16	11.00	8070.00	766.50	1894.54
13		MAGNESIUM	26	136.00	6020.00	2517.65	1864.91
14		MANGANESE	26	10.00	526.00	200.23	145.73
15		MERCURY	16	0.19	2.10	0.97	0.67
16		NICKEL	16	19.00	70.00	32.75	11.64
17		POTASSIUM	16	380.00	1240.00	848.00	244.66
18		SELENIUM	2	2.90	3.70	3.30	0.40
19		SILVER	3	4.00	41.00	17.27	16.82
20		SODIUM	10	511.00	10030.00	4801.50	3218.37
21		THALLIUM	1	136.00	136.00	136.00	
22		TIN	12	15.00	258.00	63.50	66.31
23		VANADIUM	16	21.00	80.00	41.31	15.57
24		ZINC	26	10.00	1500.00	235.58	296.38

SAMPLE TYPE: SO

SAMPLE NUMBER :		CC-SO-111	CC-SO-112	CC-SO-113	CC-SO-114	CC-SO-115
TRAFFIC REPORT NUMBER :		BF841	BF842	BF843	BF844	BF845
DESCRIPTION:		JUNKYARD	JUNKYARD	JUNKYARD	JUNKYARD	BACKGROUND
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** VOLATILES ***						
PP	CAS NO	COMPOUND				
	67-64-1	ACETONE	R	R	R	R	R
86V	108-88-3	TOLUENE	R				
11V	71-55-6	1,1,1-TRICHLOROETHANE		11	11	11	12
85V	127-18-4	TETRACHLOROETHENE	R	R	R	R	
44V	75-09-2	METHYLENE CHLORIDE	R	R	R	R	R
	75-15-0	CARBON DISULFIDE			1J		
*** BASE/NEUTRALS ***							
PP	CAS NO	COMPOUND					
77B	208-96-8	ACENAPHTHYLENE	1900				300J
72B	56-55-3	BENZO(A)ANTHRACENE	2700				980
	207-08-9	BENZO(K)FLUORANTHENE	2300				
39B	206-44-0	FLUORANTHENE	5300				1700
80B	86-73-7	FLUORENE	1200J*				
56B	91-20-3	NAPHTHALENE	R		580	360J	
	91-57-6	2-METHYLNAPHTHALENE	680		710	330J*	
81B	85-01-8	PHENANTHRENE	7200			6500	510
84B	129-00-0	PYRENE	4700				1300
8B	120-82-1	1,2,4-TRICHLOROBENZENE			1700		
	132-64-9	DIBENZOFURAN	230J				
*** ACIDS ***							
PP	CAS NO	COMPOUND					

NO PARAMETERS FOR THIS CATEGORY

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-111	CC-SO-112	CC-SO-113	CC-SO-114	CC-SO-115
TRAFFIC REPORT NUMBER :	BF841	BF842	BF843	BF844	BF845
DESCRIPTION:	JUNKYARD	JUNKYARD	JUNKYARD	JUNKYARD	BACKGROUND
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** PESTICIDES ***

PP	CAS NO	COMPOUND					
107P	11097-69-1	AROCLOR-1254	1200		4000		
111P	11096-82-5	AROCLOR-1260				5900	R

SAMPLE TYPE: SO

SAMPLE NUMBER :		CC-SO-111	CC-SO-112	CC-SO-113	CC-SO-114	CC-SO-115
TRAFFIC REPORT NUMBER :		MBG802	MBG803	MBG804	MBG805	MBG806
DESCRIPTION:		JUNKYARD	JUNKYARD	JUNKYARD	JUNKYARD	BACKGROUND
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** INORGANICS ***						
PP	CAS NO	COMPOUND				
1		ALUMINUM	1660	8580	7290	8030	7390
3		ARSENIC			6.8	9	10
4		BARIUM		200	467	491	496
6		CADMIUM		6	20	18	
7		CALCIUM	[3460]	82200	14500	9110	12000
8		CHROMIUM	17	29	56	98	62
9		COBALT			34	16	
10		COPPER	39	87	323	448	521
11		IRON	7960	26400	35200	60000	20900
12		LEAD	97	349	1030	1630	2000
13		MAGNESIUM	[1120]	4420	4180	4380	4070
14		MANGANESE	J 84	J 372	J 275	J 812	J 394
15		MERCURY	J 0.6	J 0.4	J 0.5	J 1.4	J 0.7
16		NICKEL		143	76	209	173
17		POTASSIUM		[544]	[435]	[674]	[762]
19		SILVER				8	8
22		TIN	[16]	[16]	31	78	215
23		VANADIUM		[25]	69	68	[34]
24		ZINC	334	812	2820	2670	1830

SAMPLE TYPE: SO

SAMPLE NUMBER :	CC-SO-111	CC-SO-112	CC-SO-113	CC-SO-114	CC-SO-115
TRAFFIC REPORT NUMBER :	MBG802	MBG803	MBG804	MBG805	MBG806
DESCRIPTION:	JUNKYARD	JUNKYARD	JUNKYARD	JUNKYARD	BACKGROUND
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

TABLE A-3

SUBSURFACE SOIL RESULTS

SAMPLE TYPE: SS

SAMPLE NUMBER :		CC-SS-000-10	CC-SS-000-2	CC-SS-000-3	CC-SS-000-4	CC-SS-000-5	CC-SS-000-6	CC-SS-000-7	CC-SS-000-8
TRAFFIC REPORT NUMBER :		BD962	BC684	BC685	BC686	BC693	BC694	BD963	BD966
DESCRIPTION:		BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA
DATE SAMPLED:		12/05/85	11/19/85	11/20/85	11/20/85	11/22/85	11/22/85	11/23/85	11/25/85
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	130	140	150			R	R
	78-93-3	2-BUTANONE				2J			
	591-78-6	2-HEXANONE							
	108-10-1	4-METHYL-2-PENTANONE							
4V	71-43-2	BENZENE							
86V	108-88-3	TOLUENE							
38V	100-41-4	ETHYLBENZENE							
	95-47-6	TOTAL XYLENES							
	100-42-5	STYRENE							
7V	108-90-7	CHLOROBENZENE							
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE							
11V	71-55-6	1,1,1-TRICHLOROETHANE							
10V	75-34-3	1,1-DICHLOROETHANE							
10V	107-06-2	1,2-DICHLOROETHANE							
16V	75-00-3	CHLOROETHANE							
85V	127-18-4	TETRACHLOROETHENE							
87V	79-01-6	TRICHLOROETHENE							
30V	156-60-5	TRANS-1,2-DICHLOROETHENE							
88V	75-01-4	VINYL CHLORIDE							
23V	67-66-3	CHLOROFORM							
44V	75-09-2	METHYLENE CHLORIDE	R	R	R				
45V	74-87-3	CHLOROMETHANE							
46V	74-83-9	BROMOMETHANE							
	75-15-0	CARBON DISULFIDE							

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND

SAMPLE TYPE: SS

SAMPLE NUMBER :			CC-SS-000-10	CC-SS-000-2	CC-SS-000-3	CC-SS-000-4	CC-SS-000-5	CC-SS-000-6	CC-SS-000-7	CC-SS-000-8
TRAFFIC REPORT NUMBER :			BD962	BC684	BC685	BC686	BC693	BC694	BD963	BD966
DESCRIPTION:			BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA
DATE SAMPLED:			12/06/85	11/19/85	11/20/85	11/20/85	11/22/85	11/22/85	11/23/85	11/25/85
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE								
69B	117-84-0	DI-N-OCTYL PHTHALATE								
68B	84-74-2	DI-N-BUTYL PHTHALATE								
70B	84-66-2	DIETHYL PHTHALATE								
67B	85-68-7	BUTYL BENZYL PHTHALATE								
71B	131-11-3	DIMETHYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE								
77B	208-96-8	ACENAPHTHYLENE								
78B	120-12-7	ANTHRACENE								
72B	56-55-3	BENZO(A)ANTHRACENE								
74B	205-99-2	BENZO(B)FLUORANTHENE								
	207-08-9	BENZO(K)FLUORANTHENE								
79B	191-24-2	BENZO(G,H,I)PERYLENE								
73B	50-32-8	BENZO(A)PYRENE								
76B	218-01-9	CHRYSENE								
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE								
80B	86-73-7	FLUORENE								
83B	193-39-5	INDENO(1,2,3-CD)PYRENE								
55B	91-20-3	NAPHTHALENE								
	91-57-6	2-METHYLNAPHTHALENE								
81B	85-01-8	PHENANTHRENE								
84B	129-00-0	PYRENE								
	95-50-1	1,2-DICHLOROBENZENE								
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE								
8B	120-82-1	1,2,4-TRICHLOROBENZENE								
62B	86-30-6	N-NITROSODIPHENYLAMINE								
	65-85-0	BENZOIC ACID								
	100-51-6	BENZYL ALCOHOL								
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE								
	132-64-9	DIBENZOFURAN								
54B	78-59-1	ISOPHORONE								

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-000-10	CC-SS-000-2	CC-SS-000-3	CC-SS-000-4	CC-SS-000-5	CC-SS-000-6	CC-SS-000-7	CC-SS-000-8
TRAFFIC REPORT NUMBER :	BD962	BC684	BC685	BC686	BC693	BC694	BD963	BD968
DESCRIPTION:	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA	BLANK VOA
DATE SAMPLED:	12/05/85	11/19/85	11/20/85	11/20/85	11/22/85	11/22/85	11/23/85	11/25/85

*** ACIDS ***

PP	CAS NO	COMPOUND
65A	108-95-2	PHENOL
	95-48-7	2-METHYLPHENOL
	106-44-5	4-METHYLPHENOL
34A	105-67-9	2,4-DIMETHYLPHENOL
22A	59-50-7	4-CHLORO-3-METHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND
92P	50-29-3	4,4'-DDT
93P	72-55-9	4,4'-DDE
107P	11097-69-1	AROCLOR-1254
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SS

SAMPLE NUMBER :		CC-SS-000-9	CC-SS-001	CC-SS-002	CC-SS-003	CC-SS-004	CC-SS-005	CC-SS-006	CC-SS-007
TRAFFIC REPORT NUMBER :		BD959	BC662	BC663	BC664	BC665	BC671	BC672	BC681
DESCRIPTION:		BLANK VOA	MW-1 3-5'	MW-1 6-8'	MW1 10-12'	MW1 15-17'	MW1 20-22'	MW1 25-27'	MW2 3-5'
DATE SAMPLED:		11/25/85	11/13/85	11/13/85	11/16/85	11/15/85	11/15/85	11/15/85	11/19/85
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	R	R	R	R	R	R	R	R
	78-93-3	2-BUTANONE		R	R				R	R
	591-78-6	2-HEXANONE								
	108-10-1	4-METHYL-2-PENTANONE		430						1500
4V	71-43-2	BENZENE		24		8J	52J			440J
86V	108-88-3	TOLUENE		710		210	1500	230	13J	2800
38V	100-41-4	ETHYLBENZENE		1000B	R	R	2400B	530B	R	3100
	95-47-6	TOTAL XYLENES		1600B	R	R	5500B	1200B	R	5000
	100-42-5	STYRENE								3600
7V	108-90-7	CHLOROBENZENE		16J			60			270J
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE							20	
11V	71-55-6	1,1,1-TRICHLOROETHANE					110			
10V	75-34-3	1,1-DICHLOROETHANE								
10V	107-06-2	1,2-DICHLOROETHANE								220J
16V	75-00-3	CHLOROETHANE								280J
85V	127-18-4	TETRACHLOROETHENE		42			110	21		880
87V	79-01-6	TRICHLOROETHENE		39		25J	160	25		1100
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		17				9J		1300
88V	75-01-4	VINYL CHLORIDE					21J			160J
23V	67-66-3	CHLOROFORM		7J		25J	190	20J		1100
44V	75-09-2	METHYLENE CHLORIDE	R	R	R	R	R	R	R	14000B
45V	74-87-3	CHLOROMETHANE								
46V	74-83-9	BROMOMETHANE								160J
	75-15-0	CARBON DISULFIDE		4J		17J		6J		

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND

SAMPLE TYPE: SS

		SAMPLE NUMBER :	CC-SS-000-9	CC-SS-001	CC-SS-002	CC-SS-003	CC-SS-004	CC-SS-006	CC-SS-006	CC-SS-007
		TRAFFIC REPORT NUMBER :	BD969	BC662	BC663	BC664	BC665	BC671	BC672	BC691
		DESCRIPTION:	BLANK VOA	MW-1 3-5'	MW-1 6-8'	MW1 10-12'	MW1 15-17'	MW1 20-22'	MW1 25-27'	MW2 3-5'
		DATE SAMPLED:	11/25/85	11/13/85	11/13/85	11/16/85	11/15/85	11/15/85	11/15/85	11/19/85
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		R	R	R	R	R	R	15000
69B	117-84-0	DI-N-OCTYL PHTHALATE		R	R	R	R	R	R	1300
68B	84-74-2	DI-N-BUTYL PHTHALATE		R	R	R	R	R	R	17000B
70B	84-66-2	DIETHYL PHTHALATE		R	R	R	R	R	R	
67B	85-68-7	BUTYL BENZYL PHTHALATE		R	R	R	R	R	R	6000
71B	131-11-3	DIMETHYL PHTHALATE		R	R					
1B	83-32-9	ACENAPHTHENE		R	R	R	R	R	R	290J
77B	208-96-8	ACENAPHTHYLENE			R					
78B	120-12-7	ANTHRACENE			R	R	R	R	R	380J
72B	56-55-3	BENZO(A)ANTHRACENE		R	R		R	R	R	620
74B	205-99-2	BENZO(B)FLUORANTHENE		R	R	R	R	R	R	
	207-08-9	BENZO(K)FLUORANTHENE		R	R	R	R	R	R	920
79B	191-24-2	BENZO(G,H,I)PERYLENE								200J
73B	50-32-8	BENZO(A)PYRENE		1800J	R			R		R
76B	218-01-9	CHRYSENE		R	R	R	R	R	R	670
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE		R	R	R	R	R	R	3000
80B	86-73-7	FLUORENE		R	R	R	R	R	R	420
83B	193-39-5	INDENO(1,2,3-CD)PYRENE			R					200J
56B	91-20-3	NAPHTHALENE		1600J	R	R	R	R	R	1200
	91-57-6	2-METHYLNAPHTHALENE		R	R	R	R	R	R	800
81B	85-01-8	PHENANTHRENE		R	R	R	R	R	R	4400
84B	129-00-0	PYRENE		R	R	R	R	R	R	890
	95-50-1	1,2-DICHLOROBENZENE		1000J	R	R	R			460
26B	541-73-1	1,3-DICHLOROBENZENE			R					
27B	106-46-7	1,4-DICHLOROBENZENE			R		R			
8B	120-82-1	1,2,4-TRICHLOROBENZENE		490J	R					590
62B	86-30-6	N-NITROSODIPHENYLAMINE								
	65-85-0	BENZOIC ACID		R	R	R	R	R	R	
	100-51-6	BENZYL ALCOHOL			R					630
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE		R						
	132-64-9	DIBENZOFURAN			R	R				290J
54B	78-59-1	ISOPHORONE								

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-000-9	CC-SS-001	CC-SS-002	CC-SS-003	CC-SS-004	CC-SS-005	CC-SS-006	CC-SS-007
TRAFFIC REPORT NUMBER :	BD959	BC662	BC663	BC664	BC665	BC671	BC672	BC681
DESCRIPTION:	BLANK VOA	MW-1 3-5'	MW-1 6-8'	MW1 10-12'	MW1 15-17'	MW1 20-22'	MW1 25-27'	MW2 3-5'
DATE SAMPLED:	11/25/85	11/13/85	11/13/85	11/16/85	11/15/85	11/15/85	11/15/85	11/19/85

*** ACIDS ***

PP	CAS NO	COMPOUND							
65A	108-95-2	PHENOL		3700J	R	R	R	R	R	4200
	95-48-7	2-METHYLPHENOL		680J	R			R		
	106-44-5	4-METHYLPHENOL		1100J	R	R				1200
34A	105-67-9	2,4-DIMETHYLPHENOL			R					420
22A	59-50-7	4-CHLORO-3-METHYLPHENOL			R					

*** PESTICIDES ***

PP	CAS NO	COMPOUND							
92P	50-29-3	4,4'-DDT							
93P	72-55-9	4,4'-DDE		R	R	R	R	R	
107P	11097-69-1	AROCLOR-1254							973J
111P	11096-82-5	AROCLOR-1260		6000					

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-000-9	CC-SS-001	CC-SS-002	CC-SS-003	CC-SS-004	CC-SS-005	CC-SS-006	CC-SS-007
TRAFFIC REPORT NUMBER :		MBD921	MBD922	MBD923	MBD924	MBD925	MBD926	MBD927
DESCRIPTION:	BLANK VOA	MW-1 3-5'	MW-1 6-8'	MW1 10-12'	MW1 15-17'	MW1 20-22'	MW1 25-27'	MW2 3-6'
DATE SAMPLED:	11/25/85	11/13/85	11/13/85	11/16/85	11/15/85	11/15/85	11/15/85	11/19/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM		6980	1780	10600	4300	5310	3370	8480
3		ARSENIC		[15]	[1.5]	34		[4.2]	8.3	19
4		BARIUM		R	R	R		R	R	[97]
5		BERYLLIUM		[0.35]		[0.59]		[0.52]	[0.4]	[0.47]
6		CADMIUM		3.6						
7		CALCIUM		R	R	R	R	R	R	7120
8		CHROMIUM		41*	3.6*	28*	8.6*	22*	8.1*	23
9		COBALT		[11]		[9.3]	[4]	[7.9]	[6.6]	[9.7]
10		COPPER		90	[7.8]	36	[7.8]	22	[9.7]	78*R
11		IRON		20000	2570	27100	12900	16800	6700	29600*
12		LEAD		234	[44]	J 19R	J 28R	J 17R	J 13R	97*R
13		MAGNESIUM		R	R	R	R	R	R	[2840]
14		MANGANESE		182	42	177	63	142	1200	308R
15		MERCURY		2.13*	2.46*			[0.12]*		0.6
16		NICKEL		[18]		[26]	[9.8]	[15]	[14]	[17]
17		POTASSIUM						[1350]	[1380]	[1710]
19		SILVER		2.6				[2.7]		[2.5]
20		SODIUM		R	R	R	R	R	R	[456]
22		TIN								
23		VANADIUM		[22]		[46]	[16]	[25]	[12]	34
24		ZINC		170*R	30*R	117*R	37*R	56*R	33*R	82*

SAMPLE TYPE: SS

SAMPLE NUMBER :			CC-SS-008	CC-SS-009	CC-SS-010	CC-SS-011	CC-SS-012	CC-SS-013	CC-SS-014	CC-SS-015
TRAFFIC REPORT NUMBER :			BC692	BC693	BC697	BC688	BC689	BC690	BC691	BC692
DESCRIPTION:			MW2 5-7'	MW2 7-9'	MW3 4-6'	MW3 8-9'	MW4 7-9'	MW5 11-13'	MW6 5-7'	MW6 7-9'
DATE SAMPLED:			11/19/85	11/19/85	11/20/85	11/20/85	11/20/85	11/21/85	11/21/85	11/21/85
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	R	2900	140000B	750000B	320000B	440	890	160
	78-93-3	2-BUTANONE	470	130J	2400B	1200000B	500000B	220	220	54
	591-78-6	2-HEXANONE								
	108-10-1	4-METHYL-2-PENTANONE			2200	2500	2700		43	
4V	71-43-2	BENZENE			1500	3800	240J	3J	200	8J
86V	108-88-3	TOLUENE	77J	24J	1800	2800	440J	28	57	27
38V	100-41-4	ETHYLBENZENE	75J	23J	590	510	240J	7	60	13
	95-47-6	TOTAL XYLENES	110J	40J	2500	2100	880	32	124	67
	100-42-5	STYRENE	130J	45J	650					
7V	108-90-7	CHLOROBENZENE						4J	250	
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE								
11V	71-55-6	1,1,1-TRICHLOROETHANE								
10V	75-34-3	1,1-DICHLOROETHANE				350				
10V	107-06-2	1,2-DICHLOROETHANE				170	2000			
16V	75-00-3	CHLOROETHANE								
85V	127-18-4	TETRACHLOROETHENE	59J	22J	1400	470	130J	9	22	16
87V	79-01-6	TRICHLOROETHENE			1500	32000J		4J	8	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE			5300	15000J		4J	12	4J
88V	75-01-4	VINYL CHLORIDE			250J	89J			3J	
23V	67-66-3	CHLOROFORM				33J	1700	47	62	20
44V	75-09-2	METHYLENE CHLORIDE	110JB	62JB	260JB	630000B	8400B	100B	110	34B
45V	74-87-3	CHLOROMETHANE					250J			
46V	74-83-9	BROMOMETHANE								
	75-15-0	CARBON DISULFIDE				130		12	10	14

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND

SAMPLE TYPE: SS

		SAMPLE NUMBER :	CC-SS-008	CC-SS-009	CC-SS-010	CC-SS-011	CC-SS-012	CC-SS-013	CC-SS-014	CC-SS-015
		TRAFFIC REPORT NUMBER :	BC682	BC683	BC687	BC688	BC689	BC690	BC691	BC692
		DESCRIPTION:	MW2 5-7'	MW2 7-9'	MW3 4-6'	MW3 8-9'	MW4 7-9'	MW5 11-13'	MW6 5-7'	MW6 7-9'
		DATE SAMPLED:	11/19/85	11/19/85	11/20/85	11/20/85	11/20/85	11/21/85	11/21/85	11/21/85
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	11000	2000	1900	840	500J	200J	260J	200J
69B	117-84-0	DI-N-OCTYL PHTHALATE	400J							
68B	84-74-2	DI-N-BUTYL PHTHALATE	26000B	R	R	R	R	R	1700B	1900B
70B	84-66-2	DIETHYL PHTHALATE		990						
67B	85-68-7	BUTYL BENZYL PHTHALATE	4700							
71B	131-11-3	DIMETHYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE		40J			100J			
77B	208-96-8	ACENAPHTHYLENE								
78B	120-12-7	ANTHRACENE		80J						
72B	56-55-3	BENZO(A)ANTHRACENE		100J	100J			90J	200J	
74B	205-99-2	BENZO(B)FLUORANTHENE								
	207-08-9	BENZO(K)FLUORANTHENE	800J	200J				90J	100J	
79B	191-24-2	BENZO(G,H,I)PERYLENE			40J					
73B	50-32-8	BENZO(A)PYRENE	2000J	R	200JB	R	R	200J	200J	300J
76B	218-01-9	CHRYSENE			80J					
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE	1000J	300J	230J	60J	400J	200J		80J
80B	86-73-7	FLUORENE		70J						
83B	193-39-5	INDENO(1,2,3-CD)PYRENE		80J	40J					
55B	91-20-3	NAPHTHALENE	400J	100J	80J		200J			
	91-57-6	2-METHYLNAPHTHALENE			80J		200J			
81B	85-01-8	PHENANTHRENE	3500J	650	620	300J	500J	200J	310J	
84B	129-00-0	PYRENE			200J		400J	100J	260J	
	95-50-1	1,2-DICHLOROBENZENE		40J	410	100J				
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE								
8B	120-82-1	1,2,4-TRICHLOROBENZENE		80J						
62B	86-30-6	N-NITROSODIPHENYLAMINE		80J	80J					
	65-85-0	BENZOIC ACID		380						
	100-51-6	BENZYL ALCOHOL		80J						
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE								
	132-64-9	DIBENZOFURAN								
54B	78-59-1	ISOPHORONE			230J	1700				

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-008	CC-SS-009	CC-SS-010	CC-SS-011	CC-SS-012	CC-SS-013	CC-SS-014	CC-SS-015
TRAFFIC REPORT NUMBER :	BC682	BC683	BC687	BC688	BC689	BC690	BC691	BC692
DESCRIPTION:	MW2 5-7'	MW2 7-9'	MW3 4-6'	MW3 8-9'	MW4 7-9'	MW5 11-13'	MW6 5-7'	MW6 7-9'
DATE SAMPLED:	11/19/85	11/19/85	11/20/85	11/20/85	11/20/85	11/21/85	11/21/85	11/21/85

*** ACIDS ***

PP	CAS NO	COMPOUND								
65A	108-95-2	PHENOL	800J		4100	2700	4800			
	95-48-7	2-METHYLPHENOL					500J			
	106-44-5	4-METHYLPHENOL		200J	530	1000	6000			
34A	105-67-9	2,4-DIMETHYLPHENOL					720J			
22A	59-50-7	4-CHLORO-3-METHYLPHENOL								

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
92P	50-29-3	4,4'-DDT								
93P	72-55-9	4,4'-DDE	12J				24			
107P	11097-69-1	AROCLOR-1254	335J	97J	108J	76J	198			40J
111P	11096-82-5	AROCLOR-1260								

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-008	CC-SS-009	CC-SS-010	CC-SS-011	CC-SS-012	CC-SS-013	CC-SS-014	CC-SS-015
TRAFFIC REPORT NUMBER :	MBD928	MBD929	MBD930	MBD931	MBD932	MBD933	MBD934	MBD935
DESCRIPTION:	MW2 5-7'	MW2 7-9'	MW3 4-6'	MW3 8-9'	MW4 7-9'	MW5 11-13'	MW6 5-7'	MW6 7-9'
DATE SAMPLED:	11/19/85	11/19/85	11/20/85	11/20/85	11/20/85	11/21/85	11/21/85	11/21/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	8220	6900	7220	19400	16600	10900	7880	19600
3		ARSENIC	11	10	9.3	27	23	16	19	20
4		BARIUM	[97]	[41]	[53]	[42]	[116]	[83]	[67]	[44]
5		BERYLLIUM	[0.6]	[0.39]	[0.54]	[1.3]	[1]	[0.73]	[0.54]	[1.2]
6		CADMIUM			3.3					[5.5]
7		CALCIUM	13500	13700	9880	[3150]	[6710]	5970	[2060]	[3380]
8		CHROMIUM	35	18	23	43	36	29	20	43
9		COBALT	[16]	[15]	[20]	[16]	[12]	[9]	[3.5]	[12]
10		COPPER	116*R	102*R	185*R	35*R	63*R	44*R	252*R	38*R
11		IRON	29000*	36700*	41300*	39800*	29800*	19700*	19200*	42000*
12		LEAD	129*R	49*R	93*R	31	299*R	89*R	149*R	J15
13		MAGNESIUM	5500	5430	[2660]	9090	[7270]	5200	[1410]	9920
14		MANGANESE	344R	375R	535R	441R	310R	385R	137R	374R
15		MERCURY	0.59	[0.12]			0.52	0.52	0.19	
16		NICKEL	65	56	28	50	[34]	[22]	[14]	[35]
17		POTASSIUM	3420		[1620]	[4710]	[4970]	[2630]		[4960]
19		SILVER	[2.6]	[2.4]	[2.9]	[4.6]			[2.2]	
20		SODIUM	[757]	[537]	[714]	5320	12600	6520	[1350]	7930
22		TIN					[31]		[22]	
23		VANADIUM	42	62	69	52	[53]	[31]	[24]	[68]
24		ZINC	105*	89*	76*	120*	101*	138*	335*	107*

SAMPLE TYPE: SS

SAMPLE NUMBER :			CC-SS-016	CC-SS-017	CC-SS-018	CC-SS-019	CC-SS-020	CC-SS-021	CC-SS-022	CC-SS-023
TRAFFIC REPORT NUMBER :			BC696	BC697	BC695	BD949	BD950	BD951	BD952	BD954
DESCRIPTION:			MW7 3-5'	MW7 10-12'	MW7 15-17'	MW7 20-22'	MW7 25-27'	MW7 27-29'	MW7 30-32'	MW8 2-4'
DATE SAMPLED:			11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/25/85
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	R	R	R	R	R	R	R	R
	78-93-3	2-BUTANONE								
	591-78-6	2-HEXANONE								
	108-10-1	4-METHYL-2-PENTANONE	9.5J							
4V	71-43-2	BENZENE	7.4				5.7J			
86V	108-88-3	TOLUENE	9.5			3.0J	16		1.2J	1.4J
38V	100-41-4	ETHYLBENZENE	8.1							
	95-47-6	TOTAL XYLENES	27				2.7J			
	100-42-5	STYRENE								
7V	108-90-7	CHLOROBENZENE	20							
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE								
11V	71-55-6	1,1,1-TRICHLOROETHANE								
10V	75-34-3	1,1-DICHLOROETHANE								
10V	107-06-2	1,2-DICHLOROETHANE								
16V	75-00-3	CHLOROETHANE								
85V	127-18-4	TETRACHLOROETHENE	3.7J							
87V	79-01-6	TRICHLOROETHENE	5.2J							
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	4.0J							
88V	75-01-4	VINYL CHLORIDE								
23V	67-66-3	CHLOROFORM			3.1J					
44V	75-09-2	METHYLENE CHLORIDE	R	R	R	R	R	R	R	R
45V	74-87-3	CHLOROMETHANE								
46V	74-83-9	BROMOMETHANE								
	75-15-0	CARBON DISULFIDE		5.3J	4.6J	7.6J	15	1.6J		

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND

SAMPLE TYPE: SS

		SAMPLE NUMBER :	CC-SS-016	CC-SS-017	CC-SS-018	CC-SS-019	CC-SS-020	CC-SS-021	CC-SS-022	CC-SS-023
		TRAFFIC REPORT NUMBER :	BC696	BC697	BC695	BD949	BD950	BD951	BD952	BD954
		DESCRIPTION:	MW7 3-5'	MW7 10-12'	MW7 16-17'	MW7 20-22'	MW7 25-27'	MW7 27-29'	MW7 30-32'	MW8 2-4'
		DATE SAMPLED:	11/23/86	11/23/86	11/23/86	11/23/86	11/23/86	11/23/86	11/23/86	11/25/86
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		90J			79J		54J	130J
69B	117-84-0	DI-N-OCTYL PHTHALATE						51J		
68B	84-74-2	DI-N-BUTYL PHTHALATE			R					
70B	84-66-2	DIETHYL PHTHALATE								
67B	85-68-7	BUTYL BENZYL PHTHALATE								
71B	131-11-3	DIMETHYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE	760				72J			
77B	208-96-8	ACENAPHTHYLENE	320J							
78B	120-12-7	ANTHRACENE	1300				79J			
72B	56-55-3	BENZO(A)ANTHRACENE	2500	97J			180J	51J		74J
74B	205-99-2	BENZO(B)FLUORANTHENE	3100	66J			240J	67J		130J
	207-08-9	BENZO(K)FLUORANTHENE	3100				240J	67J		67J
79B	191-24-2	BENZO(G,H,I)PERYLENE	770							
73B	50-32-8	BENZO(A)PYRENE	1200				360J	47J		70J
76B	218-01-9	CHRYSENE	2200				180J	51J		96J
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE	5300	84J			340J	82J		96J
80B	86-73-7	FLUORENE	860							
83B	193-39-5	INDENO(1,2,3-CD)PYRENE	750							
56B	91-20-3	NAPHTHALENE	920				85J			
	91-57-6	2-METHYLNAPHTHALENE	460J							
81B	85-01-8	PHENANTHRENE	6000	66J			420J	120J		74J
84B	129-00-0	PYRENE	4100	110J			370J	110J		110J
	95-50-1	1,2-DICHLOROBENZENE								
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE								
9B	120-82-1	1,2,4-TRICHLOROBENZENE								
62B	86-30-6	N-NITROSODIPHENYLAMINE								
	65-85-0	BENZOIC ACID								
	100-51-6	BENZYL ALCOHOL								
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE	94J							
	132-64-9	DIBENZOFURAN	740							
54B	78-59-1	ISOPHORONE								

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-016	CC-SS-017	CC-SS-018	CC-SS-019	CC-SS-020	CC-SS-021	CC-SS-022	CC-SS-023
TRAFFIC REPORT NUMBER :	BC696	BC697	BC695	BD949	BD950	BD951	BD952	BD954
DESCRIPTION:	MW7 3-5'	MW7 10-12'	MW7 15-17'	MW7 20-22'	MW7 25-27'	MW7 27-29'	MW7 30-32'	MW8 2-4'
DATE SAMPLED:	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/25/85

*** ACIDS ***

PP	CAS NO	COMPOUND							
65A	108-95-2	PHENOL							
	95-48-7	2-METHYLPHENOL							
	106-44-5	4-METHYLPHENOL	94J						
34A	105-67-9	2,4-DIMETHYLPHENOL	60J						
22A	59-50-7	4-CHLORO-3-METHYLPHENOL							

*** PESTICIDES ***

PP	CAS NO	COMPOUND
92P	50-29-3	4,4'-DDT
93P	72-55-9	4,4'-DDE
107P	11097-69-1	AROCLOR-1254
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-016	CC-SS-017	CC-SS-018	CC-SS-019	CC-SS-020	CC-SS-021	CC-SS-022	CC-SS-023
TRAFFIC REPORT NUMBER :	MBD936	MBD937	MBD938	MBD939	MBD940	MBD941	MBD942	MBD944
DESCRIPTION:	MW7 3-5'	MW7 10-12'	MW7 15-17'	MW7 20-22'	MW7 25-27'	MW7 27-29'	MW7 30-32'	MW8 2-4'
DATE SAMPLED:	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/23/85	11/25/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	9930*	15500*	16300*	12800*	12600*	9300*	6580*	3160*
3		ARSENIC	22	32	26	19	16	14	9.4	6.9
4		BARIUM	[147]	[37]	[45]	[42]	[59]	[87]	347	[53]
5		BERYLLIUM	[0.85]	[0.97]	[1.3]	[1]	[1.1]	[1.1]	[0.61]	[0.49]
6		CADMIUM								4.2
7		CALCIUM	9760	[2190]	[3000]	[2680]	[2760]	[14000]	39700	3440
8		CHROMIUM	29*	39*	41*	31*	33*	31*	16*	11*
9		COBALT	[5.9]	[15]	[16]	[11]	[14]	[16]	[9.4]	[6.7]
10		COPPER	65*	[22]*	29*	23*	34*	18*	[9.9]*	212*
11		IRON	14200	34900	37200	33600	33900	27200	13200	19000
12		LEAD	148*	44*	48*	J 19	J 7.5	J 13	J 6.7	154*
13		MAGNESIUM	[1220]	7890	8420	7170	7290	9870	7220	825
14		MANGANESE	129R	360R	505R	458R	237R	514R	723R	177R
15		MERCURY	0.4	[0.12]	[0.16]					0.14
16		NICKEL	[21]R	[31]R	[31]R	[25]R	[28]R	32R	[22]R	[13]R
17		POTASSIUM		[3990]	[4490]	[3210]	[2840]	3030	[2200]	
19		SILVER			[3.8]			[2.4]		8.7
20		SODIUM	R		R	R	R	R	R	R
22		TIN	[24]R							
23		VANADIUM	[20]	46	47	[45]	[41]	40	[17]	[16]
24		ZINC	142R	84R	108R	75R	82R	70R	45R	77R

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-024	CC-SS-025	CC-SS-026	CC-SS-027
TRAFFIC REPORT NUMBER :	BD955	BD957	BD958	BD960
DESCRIPTION:	MW8 9-11'	MW9 3-5'	MW9 9-11'	MW10 3-5'
DATE SAMPLED:	11/25/85	11/25/85	11/25/85	11/27/85

*** VOLATILES ***

PP	CAS NO	COMPOUND				
	67-64-1	ACETONE	R	HL 9200B	R	R
	78-93-3	2-BUTANONE		HL 7200B		
	591-78-6	2-HEXANONE			25	
	108-10-1	4-METHYL-2-PENTANONE		HL 2400J	8.5J	
4V	71-43-2	BENZENE		HL 1100J	7.2J	
86V	108-88-3	TOLUENE	3.8J	HL 42000B	55	
38V	100-41-4	ETHYLBENZENE		HL 13000	35	
	95-47-6	TOTAL XYLENES		HL 58000	100	R
	100-42-5	STYRENE				
7V	108-90-7	CHLOROBENZENE		HL 2000	3.4J	
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE				
11V	71-55-6	1,1,1-TRICHLOROETHANE			7.4	
10V	75-34-3	1,1-DICHLOROETHANE				
10V	107-06-2	1,2-DICHLOROETHANE		HL 1400	R	
16V	75-00-3	CHLOROETHANE				
85V	127-18-4	TETRACHLOROETHENE		HL 11000B	12	
87V	79-01-6	TRICHLOROETHENE		HL 12000	26	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		HL 2300	240	
88V	75-01-4	VINYL CHLORIDE			38	
23V	67-66-3	CHLOROFORM		HL 510J	R	
44V	75-09-2	METHYLENE CHLORIDE	R	HL 1600B	R	R
45V	74-87-3	CHLOROMETHANE				
46V	74-83-9	BROMOMETHANE				
	75-15-0	CARBON DISULFIDE	14		3.1J	

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND

SAMPLE TYPE: SS

SAMPLE NUMBER :			CC-SS-024	CC-SS-025	CC-SS-026	CC-SS-027
TRAFFIC REPORT NUMBER :			BD956	BD957	BD958	BD960
DESCRIPTION:			MW8 9-11'	MW9 3-5'	MW9 9-11'	MW10 3-5'
DATE SAMPLED:			11/25/86	11/25/86	11/25/86	11/27/86
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	120J	HL 94000	1300	84J
69B	117-84-0	DI-N-OCTYL PHTHALATE				
68B	84-74-2	DI-N-BUTYL PHTHALATE		HL 7000J	82J	49J
70B	84-66-2	DIETHYL PHTHALATE				
67B	85-68-7	BUTYL BENZYL PHTHALATE		HL 10000J	1900	
71B	131-11-3	DIMETHYL PHTHALATE				
1B	83-32-9	ACENAPHTHENE				
77B	208-96-8	ACENAPHTHYLENE				
78B	120-12-7	ANTHRACENE		HL 8800		490
72B	56-55-3	BENZO(A)ANTHRACENE			82J	510
74B	205-99-2	BENZO(B)FLUORANTHENE			110J	860
	207-08-9	BENZO(K)FLUORANTHENE			110J	860
79B	191-24-2	BENZO(G,H,I)PERYLENE				580
73B	50-32-8	BENZO(A)PYRENE				620
76B	218-01-9	CHRYSENE			110J	510
82B	53-70-3	DIBENZO(A,H)ANTHRACENE				350J
39B	206-44-0	FLUORANTHENE		HL 6000J	130J	980
80B	86-73-7	FLUORENE				44J
83B	193-39-5	INDENO(1,2,3-CD)PYRENE				370J
55B	91-20-3	NAPHTHALENE				82J
	91-57-6	2-METHYLNAPHTHALENE		HL 6000J		49J
81B	85-01-8	PHENANTHRENE		HL 19000J	82J	490
84B	129-00-0	PYRENE		HL 5800J	160J	510
	95-50-1	1,2-DICHLOROBENZENE		HL 7800J		
26B	541-73-1	1,3-DICHLOROBENZENE				
27B	106-46-7	1,4-DICHLOROBENZENE				
8B	120-82-1	1,2,4-TRICHLOROBENZENE		HL 5600J		
62B	86-30-6	N-NITROSODIPHENYLAMINE				
	65-85-0	BENZOIC ACID				
	100-51-6	BENZYL ALCOHOL				
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE				
	132-64-9	DIBENZOFURAN				
54B	78-59-1	ISOPHORONE				

SAMPLE TYPE: SS

SAMPLE NUMBER :		CC-SS-024	CC-SS-025	CC-SS-026	CC-SS-027
TRAFFIC REPORT NUMBER :		BD955	BD957	BD958	BD960
DESCRIPTION:		MW8 9-11'	MW9 3-5'	MW9 9-11'	MW10 3-5'
DATE SAMPLED:		11/25/85	11/25/85	11/25/85	11/27/85
*** ACIDS ***					
PP	CAS NO	COMPOUND			
65A	108-95-2	PHENOL	HL 12000J		
	95-48-7	2-METHYLPHENOL			
	106-44-5	4-METHYLPHENOL			
34A	105-67-9	2,4-DIMETHYLPHENOL			
22A	59-50-7	4-CHLORO-3-METHYLPHENOL			
*** PESTICIDES ***					
PP	CAS NO	COMPOUND			
92P	50-29-3	4,4'-DDT			38
93P	72-55-9	4,4'-DDE			
107P	11097-69-1	AROCLOR-1254	HL 9800J		
111P	11096-82-5	AROCLOR-1260			

SAMPLE TYPE: SS

SAMPLE NUMBER :	CC-SS-024	CC-SS-025	CC-SS-026	CC-SS-027
TRAFFIC REPORT NUMBER :	MBD945	MBD946	MBD947	MBD948
DESCRIPTION:	MW8 9-11'	MW9 3-5'	MW9 9-11'	MW10 3-5'
DATE SAMPLED:	11/25/85	11/25/85	11/25/85	11/27/85

*** INORGANICS ***

PP	CAS NO	COMPOUND				
1		ALUMINUM	10200*	6470*	10000*	6170
3		ARSENIC	21	20	11	71
4		BARIUM	[42]	191	[54]	[105]
5		BERYLLIUM	[0.77]	[0.89]	[0.73]	[0.4]
6		CADMIUM		11		[2.6]
7		CALCIUM	2880	14000	[1140]	12900
8		CHROMIUM	27*	85*	20*	27
9		COBALT	[8.6]	[11]	[6.4]	[8.7]
10		COPPER	[24]*	194*	216*	721
11		IRON	22300	20100	29100	24700
12		LEAD	J 80	423*	37*	206
13		MAGNESIUM	[5180]	3290	[1920]	3830
14		MANGANESE	168R	429R	114R	280
15		MERCURY	[0.15]	1.88	1.29	0.49
16		NICKEL	[22]R	27R	[9.8]R	[20]
17		POTASSIUM	[3370]	[1640]	[1780]	
19		SILVER	[8.8]	7.6	[3.5]	[3.4]
20		SODIUM	R	R	R	[674]
22		TIN	[42]R	65R		[23]
23		VANADIUM	[40]	[28]	[31]	[26]
24		ZINC	95R	423R	95R	277E

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SS

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	67-64-1	ACETONE	10	130.00	760000.00	121481.00	231718.18
	78-93-3	2-BUTANONE	9	2.00	1200000.00	189277.33	389810.91
	591-78-6	2-HEXANONE	1	25.00	25.00	25.00	
	108-10-1	4-METHYL-2-PENTANONE	8	8.50	2700.00	1173.88	1106.40
4V	71-43-2	BENZENE	13	3.00	3800.00	484.25	1035.38
86V	108-88-3	TOLUENE	21	1.20	2800.00	514.57	884.23
38V	100-41-4	ETHYLBENZENE	14	7.00	3100.00	613.65	927.98
	95-47-6	TOTAL XYLENES	15	2.70	5500.00	1285.51	1750.08
	100-42-5	STYRENE	4	45.00	3800.00	1106.25	1458.28
7V	108-90-7	CHLOROBENZENE	7	3.40	270.00	89.06	109.65
15V	79-34-5	1,1,2,2-TETRACHLOROETHANE	1	20.00	20.00	20.00	
11V	71-55-6	1,1,1-TRICHLOROETHANE	2	7.40	110.00	58.70	51.30
10V	75-34-3	1,1-DICHLOROETHANE	1	350.00	350.00	350.00	
10V	107-06-2	1,2-DICHLOROETHANE	3	170.00	2000.00	796.67	851.13
16V	75-00-3	CHLOROETHANE	1	280.00	280.00	280.00	
85V	127-18-4	TETRACHLOROETHENE	14	3.70	1400.00	228.34	401.92
87V	79-01-6	TRICHLOROETHENE	11	4.00	32000.00	3172.02	9129.43
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	10	4.00	15000.00	2189.00	4648.86
88V	75-01-4	VINYL CHLORIDE	6	3.00	250.00	93.50	87.05
23V	67-66-3	CHLOROFORM	11	3.10	1700.00	291.55	540.18
44V	75-09-2	METHYLENE CHLORIDE	9	34.00	630000.00	72564.00	197139.79
45V	74-87-3	CHLOROMETHANE	1	250.00	250.00	250.00	
46V	74-83-9	BROMOMETHANE	1	160.00	160.00	160.00	
	75-15-0	CARBON DISULFIDE	14	1.60	130.00	17.44	31.58
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	16	54.00	15000.00	2109.81	4222.25
69B	117-84-0	DI-N-OCTYL PHTHALATE	3	51.00	1300.00	583.67	526.18
68B	84-74-2	DI-N-BUTYL PHTHALATE	6	49.00	25000.00	7621.83	9763.50
70B	84-66-2	DIETHYL PHTHALATE	1	990.00	990.00	990.00	
67B	85-68-7	BUTYL BENZYL PHTHALATE	3	1900.00	6000.00	4200.00	1710.75
1B	83-32-9	ACENAPHTHENE	5	40.00	760.00	252.40	268.31
77B	208-96-8	ACENAPHTHYLENE	1	320.00	320.00	320.00	
78B	120-12-7	ANTHRACENE	5	79.00	1300.00	465.80	447.73
72B	56-55-3	BENZO(A)ANTHRACENE	12	51.00	2500.00	383.67	661.61
74B	205-99-2	BENZO(B)FLUORANTHENE	7	66.00	3100.00	661.86	1031.89
	207-08-9	BENZO(K)FLUORANTHENE	11	57.00	3100.00	594.00	856.70
79B	191-24-2	BENZO(G,H,I)PERYLENE	4	40.00	770.00	397.50	291.06
73B	50-32-8	BENZO(A)PYRENE	11	47.00	2000.00	636.09	671.52
76B	218-01-9	CHRYSENE	8	51.00	2200.00	487.12	681.30
82B	53-70-3	DIBENZO(A,H)ANTHRACENE	1	350.00	350.00	350.00	
39B	206-44-0	FLUORANTHENE	15	60.00	5300.00	818.80	1402.43
80B	86-73-7	FLUORENE	4	44.00	850.00	346.00	326.68
83B	193-39-5	INDENO(1,2,3-CD)PYRENE	5	40.00	750.00	288.00	257.95
55B	91-20-3	NAPHTHALENE	9	62.00	1600.00	516.33	545.13
	91-57-6	2-METHYLNAPHTHALENE	5	49.00	800.00	317.80	281.22
81B	85-01-8	PHENANTHRENE	15	66.00	6000.00	1182.13	1795.90
84B	129-00-0	PYRENE	12	100.00	4100.00	610.00	1075.23
	95-50-1	1,2-DICHLOROBENZENE	5	40.00	1000.00	402.00	341.55
8B	120-82-1	1,2,4-TRICHLOROBENZENE	3	80.00	590.00	386.67	220.66
62B	86-30-6	N-NITROSODIPHENYLAMINE	2	80.00	80.00	80.00	0.00
	65-85-0	BENZOIC ACID	1	380.00	380.00	380.00	

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SS

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	100-51-6	BENZYL ALCOHOL	2	80.00	630.00	355.00	275.00
43B	111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	94.00	94.00	94.00	
	132-64-9	DIBENZOFURAN	2	290.00	740.00	515.00	225.00
54B	78-59-1	ISOPHORONE	2	230.00	1700.00	965.00	735.00
65A	108-95-2	PHENOL	6	800.00	4800.00	3383.33	1318.35
	95-48-7	2-METHYLPHENOL	2	500.00	680.00	590.00	90.00
	106-44-5	4-METHYLPHENOL	7	94.00	6000.00	1446.29	1902.54
34A	105-67-9	2,4-DIMETHYLPHENOL	3	60.00	720.00	400.00	269.81
92P	50-29-3	4,4'-DDT	1	38.00	38.00	38.00	
93P	72-55-9	4,4'-DDE	2	12.00	24.00	18.00	6.00
107P	11097-69-1	AROCLOR-1254	7	40.00	973.00	260.86	304.76
111P	11096-82-5	AROCLOR-1260	1	6000.00	6000.00	6000.00	
1		ALUMINUM	27	1780.00	19600.00	9464.81	4686.65
3		ARSENIC	26	1.50	71.00	18.68	13.13
4		BARIUM	21	37.00	347.00	97.10	69.93
5		BERYLLIUM	25	0.35	1.30	0.75	0.30
6		CADMIUM	6	2.60	11.00	5.03	2.81
7		CALCIUM	21	1140.00	38700.00	9176.67	8163.20
8		CHROMIUM	27	3.60	85.00	28.46	15.41
9		COBALT	26	3.50	20.00	10.80	4.14
10		COPPER	27	7.80	721.00	97.45	141.92
11		IRON	27	2570.00	42000.00	25239.63	10267.58
12		LEAD	26	6.70	423.00	95.24	99.92
13		MAGNESIUM	21	825.00	9920.00	5392.14	2834.14
14		MANGANESE	27	42.00	1200.00	337.37	234.43
15		MERCURY	17	0.12	2.46	0.70	0.74
16		NICKEL	26	9.80	65.00	26.33	13.29
17		POTASSIUM	18	1350.00	4970.00	2955.56	1221.19
19		SILVER	15	2.20	8.80	4.03	2.27
20		SODIUM	10	456.00	12600.00	3695.80	4005.78
22		TIN	6	22.00	65.00	34.50	15.26
23		VANADIUM	26	12.00	69.00	36.19	15.14
24		ZINC	27	30.00	423.00	117.30	88.95

BACKGROUND VALUES FOR INORGANIC CHEMICALS DETECTED AT THE CHEMICAL CONTROL CORPORATION SITE
BASED ON RESULTS FOR 27 SUBSURFACE SOIL SAMPLES

ARSENIC	CADMIUM	CHROMIUM	MERCURY	LEAD	NICKEL
15	3.6	41	2.13	234	18
1.5	0	3.6	2.46	44	0
34	0	26	0	19	25
0	0	8.6	0	28	9.8
4.2	0	22	.12	17	15
8.3	0	8.1	0	13	14
19	0	23	.6	97	17
11	0	35	.59	129	65
10	0	18	.12	48	56
9.3	3.3	23	0	93	28
27	0	43	0	31	50
23	0	36	.52	299	34
16	0	29	.52	89	22
19	0	20	.19	149	14
20	5.5	43	0	15	35
22	0	29	.4	148	21
32	0	38	.12	44	31
26	0	41	.15	48	31
19	0	31	0	19	25
16	0	33	0	7.5	28
14	0	31	0	13	32
9.4	0	16	0	6.7	22
6.9	4.2	11	.14	154	13
21	0	27	.15	80	22
20	11	85	1.88	423	27
11	0	20	1.29	37	9.8
71	2.6	27	.49	206	20

CALCULATE AVERAGE VALUES AND STANDARD DEVIATIONS

17.98519	1.118519	28.45556	.4396296	92.26667	25.35556
8.911331	6.157750	157.3631	2.857352	20088.34	54.10420
271.7613	1.251084	617.7986	4.081896	2329.671	642.9042
256.4743	1.251084	6.029753	.1932742	5368.004	.1264198
323.4669	1.251084	394.2431	.1932742	4130.204	241.9753
190.0313	1.251084	41.67420	.1021631	5665.071	107.2375
93.80281	1.251084	414.3486	.1932742	6283.204	128.9486
1.029849	1.251084	29.76309	.0257187	22.40444	69.81531
48.79281	1.251084	42.82975	.0226112	1349.338	1571.682
63.76318	1.251084	109.3186	.1021631	1959.538	939.0820
75.43244	4.758861	29.76309	.1932742	.5377778	6.993086
81.26689	1.251084	211.5409	.1932742	3753.604	607.3486
25.14837	1.251084	56.91864	.0064594	42738.67	74.72642
3.940960	1.251084	.2964198	.0064594	10.67111	11.25975
1.029849	1.251084	71.49642	.0623150	3218.671	128.9486
4.059479	19.19738	211.5409	.1932742	5970.138	93.01531
16.11874	1.251084	.2964198	.0015705	3106.204	18.97086
196.4150	1.251084	91.09642	.1021631	2329.671	31.85975
64.23726	1.251084	157.3631	.0838853	1959.538	31.85975
1.029849	1.251084	6.474198	.1932742	5368.004	.1264198
3.940960	1.251084	20.65198	.1932742	7185.388	6.993086
15.88170	1.251084	6.474198	.1932742	6283.204	44.14864
73.70540	1.251084	155.1409	.1932742	7321.654	11.25975
122.8813	9.495528	304.6964	.0897779	3811.004	152.6598
9.089108	1.251084	2.118642	.0838853	150.4711	11.25975
4.059479	97.64368	3197.274	2.074667	109384.5	2.704198
48.79281	1.251084	71.49642	.7231298	3054.404	241.9753
2810.571	2.194787	2.118642	.0025372	12935.27	28.68198
4815.634	165.7207	6410.127	12.36150	265777.4	5260.667
13.60943	2.524653	15.70170	.6895231	101.1049	14.22439

TABLE A-4

GROUNDWATER RESULTS

SAMPLE TYPE: MW

SAMPLE NUMBER :		CC-MW-000-14	CC-MW-001	CC-MW-002	CC-MW-003	CC-MW-004	CC-MW-004A	CC-MW-005	CC-MW-006
TRAFFIC REPORT NUMBER :		BD867	BD866	BD867	BD868	BD869	BD860	BD861	BD862
DESCRIPTION:		BLANK	MW-001	MW-002	MW-003	MW-004	DUPLICATE	MW-005	MW-006
DATE SAMPLED:		12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE					160		
	78-93-3	2-BUTANONE							
	591-78-6	2-HEXANONE							
	108-10-1	4-METHYL-2-PENTANONE				170			
4V	71-43-2	BENZENE							
86V	108-88-3	TOLUENE				27			
38V	100-41-4	ETHYLBENZENE				5			
	95-47-6	TOTAL XYLENES		90	19	21	15		
	100-42-5	STYRENE							
7V	108-90-7	CHLOROBENZENE							
10V	75-34-3	1,1-DICHLOROETHANE							
10V	107-06-2	1,2-DICHLOROETHANE							
95V	127-18-4	TETRACHLOROETHENE		4J	64	3J	3J		
87V	79-01-6	TRICHLOROETHENE		4J	98	5	4J		
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		6	R		6		
88V	75-01-4	VINYL CHLORIDE			150	35			
23V	67-66-3	CHLOROFORM		5		42	34		
44V	75-09-2	METHYLENE CHLORIDE	24	R		R	R		
	75-15-0	CARBON DISULFIDE							
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		4J		4J			100
69B	117-84-0	DI-N-OCTYL PHTHALATE							
68B	84-74-2	DI-N-BUTYL PHTHALATE							
67B	85-68-7	BUTYL BENZYL PHTHALATE							

SAMPLE TYPE: MW

			SAMPLE NUMBER :	CC-MW-000-14	CC-MW-001	CC-MW-002	CC-MW-003	CC-MW-004	CC-MW-004A	CC-MW-005	CC-MW-006
			TRAFFIC REPORT NUMBER :	BD867	BD866	BD857	BD858	BD859	BD860	BD861	BD862
			DESCRIPTION:	BLANK	MW-001	MW-002	MW-003	MW-004	DUPLICATE	MW-005	MW-006
			DATE SAMPLED:	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85
1B	83-32-9	ACENAPHTHENE						R			
79B	191-24-2	BENZO(G,H,I)PERYLENE									
73B	50-32-8	BENZO(A)PYRENE						8J			
82B	53-70-3	DIBENZO(A,H)ANTHRACENE									
83B	193-39-5	INDENO(1,2,3-CD)PYRENE									
55B	91-20-3	NAPHTHALENE									
	95-50-1	1,2-DICHLOROBENZENE					18J				

*** ACIDS ***

PP	CAS NO	COMPOUND									
	95-48-7	2-METHYLPHENOL									
34A	105-67-9	2,4-DIMETHYLPHENOL						R			

*** PESTICIDES ***

PP	CAS NO	COMPOUND									
	319-84-6	ALPHA-BHC							0.15		
93P	72-55-9	4,4'-DDE						0.054	0.041		
97P	1031-07-8	ENDOSUFAN SULFATE									

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-000-14	CC-MW-001	CC-MW-002	CC-MW-003	CC-MW-004	CC-MW-004A	CC-MW-005	CC-MW-006
TRAFFIC REPORT NUMBER :	MBE678	MBE766	MBE767	MBE768	MBE769	MBE770	MBE771	MBE772
DESCRIPTION:	BLANK	MW-001	MW-002	MW-003	MW-004	DUPLICATE	MW-005	MW-006
DATE SAMPLED:	12/11/86	12/11/86	12/11/86	12/11/86	12/11/86	12/11/86	12/11/86	12/11/86

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	R	[870]R	[1550]R	2140R	[970]R	[810]R	R	R
2		ANTIMONY								
3		ARSENIC	R		R		R	R	R	R
4		BARIUM	[87]R	[1080]R					[132]R	
7		CALCIUM	[1380]R	199000R	187000R	200400R	61400R	65800	67400R	86400
8		CHROMIUM								
9		COBALT								
10		COPPER								
11		IRON	129	4120	1750		R	R	R	4130
12		LEAD								5.4R
13		MAGNESIUM		820000	223000	473400	72400	78300	46800	66500
14		MANGANESE		1130	710		115	116	382	540
16		NICKEL	[21]						67	
17		POTASSIUM		R	R	R	R	R	R	R
19		SILVER								
20		SODIUM	5330	6090000	1940000	3720000	826000	949000	402000	855000
22		TIN								
24		ZINC	34				[50]	[90]	51	[69]

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-000-14	CC-MW-001	CC-MW-002	CC-MW-003	CC-MW-004	CC-MW-004A	CC-MW-005	CC-MW-006
TRAFFIC REPORT NUMBER :	MBE678	MBE766	MBE767	MBE768	MBE769	MBE770	MBE771	MBE772
DESCRIPTION:	BLANK	MW-001	MW-002	MW-003	MW-004	DUPLICATE	MW-005	MW-006
DATE SAMPLED:	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85	12/11/85

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND								
		BICARBONATE (as CaCO3)		J 1870000	781000	103000	193000	193000	497000	369000
		CARBONATE (as CaCO3)								
		CHLORIDE		12500000	3670000	7770000	1560000	1720000	746000	1940000
		CYANIDE								
		NITRITE/NITRATE (as N)				/670				
		SULFATE		217000	330000	1300000	260000	260000	140000	715000
		TDS	18000	23200000	9200000	15700000	R	R	1940000	3730000
		TSS		78000	78000	32000	R	R	398000	228000
		ACIDITY	9900	-1700000	-798000	-103000	-193000	-178000	-470000	-352000
		ALKALINITY		J 1870000	781000	103000	193000	193000	497000	369000

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-007	CC-MW-008	CC-MW-009	CC-MW-100	CC-MW-100-01	CC-MW-101	CC-MW-102	CC-MW-103
TRAFFIC REPORT NUMBER :	BD863	BD864	BD865	BD875	BE355	BD866	BD998	BD999
DESCRIPTION:	MW-008	MW-009	MW-010	BLANK	BLANK	MW-001	MW-002	MW-003
DATE SAMPLED:	12/11/85	12/11/85	12/11/85	01/15/86	01/09/86	01/15/86	01/15/86	01/15/86

*** VOLATILES ***

PP	CAS NO	COMPOUND							
	67-64-1	ACETONE				R	R	R	R	200B
	78-93-3	2-BUTANONE				R	R	13B	R	R
	591-78-6	2-HEXANONE					R			
	108-10-1	4-METHYL-2-PENTANONE					R		6J	
4V	71-43-2	BENZENE		21					17	
86V	108-88-3	TOLUENE		120				5	32	
38V	100-41-4	ETHYLBENZENE		28					54	
	95-47-6	TOTAL XYLENES		61				11	46	
	100-42-5	STYRENE							20	
7V	108-90-7	CHLOROBENZENE							4J	
10V	75-34-3	1,1-DICHLOROETHANE								
10V	107-06-2	1,2-DICHLOROETHANE		R					2J	
85V	127-18-4	TETRACHLOROETHENE		27						14J
87V	79-01-6	TRICHLOROETHENE		75						17J
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		160				4J	3J	620
88V	75-01-4	VINYL CHLORIDE		120						190
23V	67-66-3	CHLOROFORM		7						
44V	75-09-2	METHYLENE CHLORIDE		R				2J	7	8J
	75-15-0	CARBON DISULFIDE						3J		

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		12J		R		R	R	R
69B	117-84-0	DI-N-OCTYL PHTHALATE						2J		
68B	84-74-2	DI-N-BUTYL PHTHALATE						5J	23	
67B	85-68-7	BUTYL BENZYL PHTHALATE						4J	5J	

SAMPLE TYPE: MW

SAMPLE NUMBER :			CC-MW-007	CC-MW-008	CC-MW-009	CC-MW-100	CC-MW-100-01	CC-MW-101	CC-MW-102	CC-MW-103
TRAFFIC REPORT NUMBER :			BD863	BD864	BD865	BD875	BE355	BD866	BD998	BD999
DESCRIPTION:			MW-008	MW-009	MW-010	BLANK	BLANK	MW-001	MW-002	MW-003
DATE SAMPLED:			12/11/86	12/11/86	12/11/86	01/15/86	01/09/86	01/15/86	01/15/86	01/15/86
1B	83-32-9	ACENAPHTHENE								
79B	191-24-2	BENZO(G,H,I)PERYLENE						2J		
73B	50-32-8	BENZO(A)PYRENE						2J		
82B	53-70-3	DIBENZO(A,H)ANTHRACENE						2J		
83B	193-39-5	INDENO(1,2,3-CD)PYRENE						2J		
55B	91-20-3	NAPHTHALENE		4J					2J	
	95-50-1	1,2-DICHLOROBENZENE		4J						

*** ACIDS ***

PP	CAS NO	COMPOUND
	95-48-7	2-METHYLPHENOL
34A	105-67-9	2,4-DIMETHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND
	319-84-6	ALPHA-BHC
93P	72-55-9	4,4'-DDE
97P	1031-07-8	ENDOSUFAN SULFATE

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-007	CC-MW-008	CC-MW-009	CC-MW-100	CC-MW-100-01	CC-MW-101	CC-MW-102	CC-MW-103
TRAFFIC REPORT NUMBER :	MBE773	MBE774	MBE735	MBF051		MBE679	MBE682	MBE683
DESCRIPTION:	MW-008	MW-009	MW-010	BLANK	BLANK	MW-001	MW-002	MW-003
DATE SAMPLED:	12/11/85	12/11/85	12/11/85	01/15/86	01/09/86	01/15/86	01/15/86	01/15/86

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	R	R	318R				
2		ANTIMONY							
3		ARSENIC		R					
4		BARIUM	221	[161]R	[139]R		965	376	[174]
7		CALCIUM	100300	49100R	76500R		193000	194000	284000
8		CHROMIUM					23		
9		COBALT					[25]		[28]
10		COPPER					[24]		
11		IRON	2320	R	1630		4520	374	310
12		LEAD	11R		7.2R				J 105
13		MAGNESIUM	33300	[734]	18100		915000	254000	698000
14		MANGANESE	1700		340		705	696	101
16		NICKEL	[27]						177
17		POTASSIUM	R	R	R		185000	90800	174000
19		SILVER					41		35
20		SODIUM	184400	179000	146000		6940000	1630000	5230000
22		TIN			R				
24		ZINC	90	41	70				

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-007	CC-MW-008	CC-MW-009	CC-MW-100	CC-MW-100-01	CC-MW-101	CC-MW-102	CC-MW-103
TRAFFIC REPORT NUMBER :	MBE773	MBE774	MBE735	MBF051		MBE679	MBE682	MBE683
DESCRIPTION:	MW-008	MW-009	MW-010	BLANK	BLANK	MW-001	MW-002	MW-003
DATE SAMPLED:	12/11/85	12/11/85	12/11/85	01/15/86	01/09/86	01/15/86	01/15/86	01/15/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND							
		BICARBONATE (as CaCO3)	432000	26000	389000				
		CARBONATE (as CaCO3)		292000					
		CHLORIDE	341000	270000	215000				
		CYANIDE						J 13	J 137
		NITRITE/NITRATE (as N)							
		SULFATE	734000	711000					
		TDS	1050000	919000	725000				
		TSS	1040000	40000	356000				
		ACIDITY	-542000	-161000	-391100				
		ALKALINITY	432000	319000	389000				

SAMPLE TYPE: MW

SAMPLE NUMBER :			CC-MW-104	CC-MW-104A	CC-MW-105	CC-MW-106	CC-MW-107	CC-MW-108	CC-MW-109
TRAFFIC REPORT NUMBER :			BD868	BD869	BD870	BD871	BD872	BD873	BD874
DESCRIPTION:			MW-004	DUPLICATE	MW-005	MW-006	MW-008	MW-009	MW-010
DATE SAMPLED:			01/14/86	01/14/86	01/14/86	01/14/86	01/15/86	01/14/86	01/15/86
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	R	110B	R	R	R	280B	R
	78-93-3	2-BUTANONE	R	R	R	R	R	R	
	591-78-6	2-HEXANONE							
	108-10-1	4-METHYL-2-PENTANONE	21	19				68	
4V	71-43-2	BENZENE		8				36	
86V	108-88-3	TOLUENE		27				66	
38V	100-41-4	ETHYLBENZENE	5	7	2J			25	
	95-47-6	TOTAL XYLENES	9	26	3J			53	
	100-42-5	STYRENE							
7V	108-90-7	CHLOROBENZENE						5	
10V	75-34-3	1,1-DICHLOROETHANE						13	
10V	107-06-2	1,2-DICHLOROETHANE	27	16	3J			47	
95V	127-18-4	TETRACHLOROETHENE		2J				24	
87V	79-01-6	TRICHLOROETHENE	4J	4J				110	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	7	4J				120	
98V	75-01-4	VINYL CHLORIDE	10	6J				74	
23V	67-66-3	CHLOROFORM	12	6				12	
44V	75-09-2	METHYLENE CHLORIDE	30	R	2J		4J	85	
	75-15-0	CARBON DISULFIDE							
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	R	R	R	R	R	R	R
69B	117-84-0	DI-N-OCTYL PHTHALATE				4J			
68B	84-74-2	DI-N-BUTYL PHTHALATE							
67B	85-68-7	BUTYL BENZYL PHTHALATE							

SAMPLE TYPE: MW

SAMPLE NUMBER :			CC-MW-104	CC-MW-104A	CC-MW-105	CC-MW-106	CC-MW-107	CC-MW-108	CC-MW-109
TRAFFIC REPORT NUMBER :			BD868	BD869	BD870	BD871	BD872	BD873	BD874
DESCRIPTION:			MW-004	DUPLICATE	MW-005	MW-006	MW-008	MW-009	MW-010
DATE SAMPLED:			01/14/86	01/14/86	01/14/86	01/14/86	01/15/86	01/14/86	01/15/86
1B	83-32-9	ACENAPHTHENE							
79B	191-24-2	BENZO(G,H,I)PERYLENE							
73B	50-32-8	BENZO(A)PYRENE							
82B	53-70-3	DIBENZO(A,H)ANTHRACENE							
83B	193-39-5	INDENO(1,2,3-CD)PYRENE							
55B	91-20-3	NAPHTHALENE							
	95-50-1	1,2-DICHLOROBENZENE							

*** ACIDS ***

PP	CAS NO	COMPOUND							
	95-48-7	2-METHYLPHENOL						4J	
34A	105-67-9	2,4-DIMETHYLPHENOL							

*** PESTICIDES ***

PP	CAS NO	COMPOUND							
	319-84-6	ALPHA-BHC							
93P	72-55-9	4,4'-DDE	0.28						
97P	1031-07-8	ENDOSUFAN SULFATE	0.36						

SAMPLE TYPE: MW

SAMPLE NUMBER :		CC-MW-104	CC-MW-104A	CC-MW-105	CC-MW-106	CC-MW-107	CC-MW-108	CC-MW-109
TRAFFIC REPORT NUMBER :		MBE684	MBE685	MBE686	MBE687	MBE950	MBE951	MBE952
DESCRIPTION:		MW-004	DUPLICATE	MW-005	MW-006	MW-008	MW-009	MW-010
DATE SAMPLED:		01/14/86	01/14/86	01/14/86	01/14/86	01/15/86	01/14/86	01/15/86
*** INORGANICS ***								
PP	CAS NO	COMPOUND						
1		ALUMINUM						
2		ANTIMONY			J 62			
3		ARSENIC						
4		BARIUM	[111]	[124]	213	[188]	211	239	[131]
7		CALCIUM	237000	254000	262000	114000	151000	270000	97400
8		CHROMIUM						
9		COBALT						
10		COPPER						
11		IRON			381	6760	10300	4860	
12		LEAD						
13		MAGNESIUM	244000	307000	153000	91800	80000	146000	30600
14		MANGANESE	168	212	791	534	2054	376	872
16		NICKEL				111	647	90	
17		POTASSIUM	90100	91400	51800	77000	29000	59000	20600
19		SILVER	16			19			12
20		SODIUM	2670000	2910000	1190000	1290000	483000	1720000	215000
22		TIN							
24		ZINC					22		

SAMPLE TYPE: MW

SAMPLE NUMBER :	CC-MW-104	CC-MW-104A	CC-MW-105	CC-MW-106	CC-MW-107	CC-MW-108	CC-MW-109
TRAFFIC REPORT NUMBER :	MBE684	MBE685	MBE686	MBE687	MBE950	MBE951	MBE952
DESCRIPTION:	MW-004	DUPLICATE	MW-005	MW-006	MW-008	MW-009	MW-010
DATE SAMPLED:	01/14/86	01/14/86	01/14/86	01/14/86	01/15/86	01/14/86	01/15/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND						
		BICARBONATE (as CaCO3)						
		CARBONATE (as CaCO3)						
		CHLORIDE						
		CYANIDE	J 104	J 78	J 28		J 21	
		NITRITE/NITRATE (as N)						
		SULFATE						
		TDS						
		TSS						
		ACIDITY						
		ALKALINITY						

STATISTICAL ANALYSIS FOR SAMPLE TYPE: MW

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	67-64-1	ACETONE	4	110.0000	280.0000	187.5000	82.2000
	78-93-3	2-BUTANONE	1	13.0000	13.0000	13.0000	
	108-10-1	4-METHYL-2-PENTANONE	5	6.0000	170.0000	54.8000	60.1400
4V	71-43-2	BENZENE	4	8.0000	36.0000	20.5000	10.1100
86V	108-88-3	TOLUENE	6	5.0000	120.0000	46.1700	37.5800
38V	100-41-4	ETHYLBENZENE	7	2.0000	54.0000	18.0000	17.5700
	95-47-6	TOTAL XYLENES	11	3.0000	90.0000	32.1800	25.7000
	100-42-5	STYRENE	1	20.0000	20.0000	20.0000	
7V	108-90-7	CHLOROBENZENE	2	4.0000	5.0000	4.5000	0.5000
10V	75-34-3	1,1-DICHLOROETHANE	1	13.0000	13.0000	13.0000	
10V	107-06-2	1,2-DICHLOROETHANE	5	2.0000	47.0000	19.0000	16.7500
85V	127-18-4	TETRACHLOROETHENE	8	2.0000	64.0000	17.6200	19.8400
87V	79-01-6	TRICHLOROETHENE	9	4.0000	110.0000	36.4400	42.1800
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	9	3.0000	620.0000	103.3300	191.0400
89V	75-01-4	VINYL CHLORIDE	7	6.0000	190.0000	83.5700	66.4900
23V	67-66-3	CHLOROFORM	7	5.0000	42.0000	16.8600	13.7800
44V	75-09-2	METHYLENE CHLORIDE	8	2.0000	85.0000	20.2500	26.3600
	75-15-0	CARBON DISULFIDE	1	3.0000	3.0000	3.0000	
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4	4.0000	100.0000	30.0000	40.5500
69B	117-84-0	DI-N-OCTYL PHTHALATE	2	2.0000	4.0000	3.0000	1.0000
68B	84-74-2	DI-N-BUTYL PHTHALATE	2	5.0000	23.0000	14.0000	9.0000
67B	85-68-7	BUTYL BENZYL PHTHALATE	2	4.0000	5.0000	4.5000	0.5000
79B	191-24-2	BENZO(G,H,I)PERYLENE	1	2.0000	2.0000	2.0000	
73B	50-32-8	BENZO(A)PYRENE	2	2.0000	8.0000	5.0000	3.0000
82B	53-70-3	DIBENZO(A,H)ANTHRACENE	1	2.0000	2.0000	2.0000	
83B	193-39-5	INDENO(1,2,3-CD)PYRENE	1	2.0000	2.0000	2.0000	
55B	91-20-3	NAPHTHALENE	2	2.0000	4.0000	3.0000	1.0000
	95-50-1	1,2-DICHLOROBENZENE	2	4.0000	18.0000	11.0000	7.0000
	95-48-7	2-METHYLPHENOL	1	4.0000	4.0000	4.0000	
	319-84-6	ALPHA-BHC	1	0.1500	0.1500	0.1500	
93P	72-55-9	4,4'-DDE	3	0.0400	0.2800	0.1200	0.1100
97P	1031-07-8	ENDOSUFAN SULFATE	1	0.3600	0.3600	0.3600	
1		ALUMINUM	6	318.0000	2140.0000	1109.6700	684.3700
2		ANTIMONY	1	62.0000	62.0000	62.0000	
4		BARIUM	16	87.0000	1080.0000	284.5000	287.2800
7		CALCIUM	21	1380.0000	284000.0000	150003.8100	82691.3600
8		CHROMIUM	1	23.0000	23.0000	23.0000	
9		COBALT	2	25.0000	28.0000	26.5000	1.5000
10		COPPER	1	24.0000	24.0000	24.0000	
11		IRON	13	129.0000	10300.0000	3198.7700	2886.9800
12		LEAD	4	5.4000	105.0000	32.1500	42.1100
13		MAGNESIUM	20	734.0000	620000.0000	227596.7000	248019.3700
14		MANGANESE	18	101.0000	2054.0000	641.1700	524.2600
16		NICKEL	7	21.0000	647.0000	162.8600	203.6700
17		POTASSIUM	10	20600.0000	185000.0000	86850.0000	52082.9200
19		SILVER	5	12.0000	41.0000	24.6000	11.3200
20		SODIUM	21	5330.0000	6940000.0000	1879653.8100	1987636.2300
24		ZINC	9	22.0000	90.0000	57.4400	22.5700
		BICARBONATE (as CaCO3)	10	26000.0000	1870000.0000	485300.0000	505825.8700
		CARBONATE (as CaCO3)	1	292000.0000	292000.0000	292000.0000	

STATISTICAL ANALYSIS FOR SAMPLE TYPE: MW

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
		CHLORIDE	10	215000.0000	*******.****	3073200.0000	3815674.7700
		CYANIDE	6	13.0000	137.0000	63.5000	46.3100
		SULFATE	9	140000.0000	1300000.0000	518565.5600	356307.7300
		TDS	9	18000.0000	*******.****	6163444.4400	7682304.1000
		TSS	8	32000.0000	1040000.0000	280000.0000	315922.4600

TABLE A-5

FIELD GROUNDWATER RESULTS

DRAFT

TABLE A- 5

SPECIFIC CONDUCTANCE AND pH-GROUNDWATER SAMPLES

Monitoring Well	pH 12/85	pH 01/86	Specific Conductance (µmho) 12/85	Specific Conductance (µmho) 01/86
MW-001	6.9	6.96	10,000+	10,000+
MW-002	7.35	7.32	10,000+	10,000+
MW-003	8.55	8.08	10,000+	10,000+
MW-004	8.85	8.5	4,900	10,000+
MW-005	8.85	7.67	4,900	7,200
MW-006	7.95	7.2	3,500	6,800
MW-007	7.35	--	6,100	--
MW-008	7.10	6.98	2,300	3,200
MW-009	--	8.10	2,100	8.200
MW-010	7.4	7.50	1,600	1,800

- = Reading not available

+ = Exceeded maximum meter reading

TABLE A-6

SURFACE WATER RESULTS

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-001	CC-SW-002	CC-SW-003	CC-SW-004	CC-SW-005	CC-SW-005A	CC-SW-006	CC-SW-007
TRAFFIC REPORT NUMBER :		BE368	BE369	BE370	BE371	BE372	BE376	BE373	BE374
DESCRIPTION:		T-5 SHORE	T-5 MIDDLE	T-4 SHORE	T-4 MIDDLE	T-2 SHORE	DUPLICATE	T-2 MIDDLE	T-1 SHORE
DATE SAMPLED:		12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	R	R				R	
	78-93-3	2-BUTANONE							
4V	71-43-2	BENZENE							
86V	108-88-3	TOLUENE							
38V	100-41-4	ETHYLBENZENE							
	95-47-6	TOTAL XYLENES							
85V	127-18-4	TETRACHLOROETHENE	1.8J						
87V	79-01-6	TRICHLOROETHENE							
30V	156-60-5	TRANS-1,2-DICHLOROETHENE							
88V	75-01-4	VINYL CHLORIDE							
44V	75-09-2	METHYLENE CHLORIDE	R	R	R	R	R	R	R	R

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE
77B	208-96-8	ACENAPHTHYLENE
78B	120-12-7	ANTHRACENE
39B	206-44-0	FLUORANTHENE
80B	86-73-7	FLUORENE
56B	91-20-3	NAPHTHALENE
	91-57-6	2-METHYLNAPHTHALENE
81B	85-01-8	PHENANTHRENE
84B	129-00-0	PYRENE
	95-50-1	1,2-DICHLOROBENZENE

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-001	CC-SW-002	CC-SW-003	CC-SW-004	CC-SW-005	CC-SW-005A	CC-SW-006	CC-SW-007
TRAFFIC REPORT NUMBER :	BE368	BE369	BE370	BE371	BE372	BE376	BE373	BE374
DESCRIPTION:	T-5 SHORE	T-5 MIDDLE	T-4 SHORE	T-4 MIDDLE	T-2 SHORE	DUPLICATE	T-2 MIDDLE	T-1 SHORE
DATE SAMPLED:	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85

*** ACIDS ***

PP	CAS NO	COMPOUND								
	106-44-5	4-METHYLPHENOL								
34A	105-67-9	2,4-DIMETHYLPHENOL								

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
	309-00-2	ALDRIN						SH 0.81	SH 0.32	
106P	53469-21-9	AROCLOR-1242						SH 32	SH 10	
107P	11097-69-1	AROCLOR-1254						SH 50	SH 13	SH 0.92
111P	11096-82-5	AROCLOR-1260			SH 5.2					

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-001	CC-SW-002	CC-SW-003	CC-SW-004	CC-SW-005	CC-SW-005A	CC-SW-006	CC-SW-007
TRAFFIC REPORT NUMBER :		MBE668	MBE669	MBE670	MBE671	MBE672	MBE676	MBE673	MBE674
DESCRIPTION:		T-5 SHORE	T-5 MIDDLE	T-4 SHORE	T-4 MIDDLE	T-2 SHORE	DUPLICATE	T-2 MIDDLE	T-1 SHORE
DATE SAMPLED:		12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	[331]	[196]	[176]	[216]	[234]	[252]	[232]	[142]
2		ANTIMONY							
3		ARSENIC		15		20		20	22	25
4		BARIUM							
5		BERYLLIUM							
6		CADMIUM							
7		CALCIUM	129000	139000	132000	159000	155000	157000	133000	156000
8		CHROMIUM							155	
9		COBALT								
10		COPPER						[19]	[21]	
11		IRON	909	[413]	[494]	[370]	[424]	[378]	1240	[317]
12		LEAD	R							
13		MAGNESIUM	381000	425000	395000	494000	471000	490000	403000	478000
14		MANGANESE	82	[64]	77	[60]	[72]	[71]	121	[58]
15		MERCURY	[0.10]	[0.16]	[0.14]					
16		NICKEL								
17		POTASSIUM	106000	118000	109000	136000	132000	134000	112000	132000
18		SELENIUM								
19		SILVER								
20		SODIUM	2970000	3310000	3070000	3760000	3650000	3710000	3100000	3690000
21		THALLIUM								
22		TIN							[116]	
23		VANADIUM								
24		ZINC	R		R		R	R	R	

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-001	CC-SW-002	CC-SW-003	CC-SW-004	CC-SW-005	CC-SW-005A	CC-SW-006	CC-SW-007
TRAFFIC REPORT NUMBER :	MBE668	MBE669	MBE670	MBE671	MBE672	MBE676	MBE673	MBE674
DESCRIPTION:	T-5 SHORE	T-5 MIDDLE	T-4 SHORE	T-4 MIDDLE	T-2 SHORE	DUPLICATE	T-2 MIDDLE	T-1 SHORE
DATE SAMPLED:	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85	12/06/85

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND							
		AMMONIA (as N)							
		BICARBONATE (as CaCO3)	79700	78200	82900	78300	79700	78000	80900	79800
		CARBONATE (as CaCO3)							
		CHLORIDE	4320000	6710000	5820000	7320000	7230000	7220000	7020000	7260000
		COD							
		CYANIDE							
		NITRITE/NITRATE (as N)							
		pH							
		SPECIFIC CONDUCTANCE							
		SULFATE	666000	90300	946000	903000	946000	1000000	1060000	1080000
		TDS	9620000	11700000	11400000	9280000	12000000	11900000	11800000	12800000
		TEMPERATURE							
		TKN (as N)							
		TOC							
		TOTAL PETROLEUM HYDROCARBONS							
		TOX (as Cl)							
		TSS	24000	6000	16000	4000	6000		6000	22000
		ACIDITY	-71900	-70100	-74600	-71500	-70700	-71300	-69700	-62100
		ALKALINITY	79700	78200	82900	78300	79700	78000	80900	79800

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-008	CC-SW-009	CC-SW-010	CC-SW-011	CC-SW-012
TRAFFIC REPORT NUMBER :		BE375	BE377	BE378	BE380	BE381
DESCRIPTION:		T-1 MIDDLE	BLANK	DECON FLU	SEEP #1	SEEP #2
DATE SAMPLED:		12/06/85	12/06/85	12/06/85	12/11/85	12/11/85

*** VOLATILES ***

PP	CAS NO	COMPOUND					
	67-64-1	ACETONE	R		790000		
	78-93-3	2-BUTANONE			100		
4V	71-43-2	BENZENE			380B		
86V	108-88-3	TOLUENE			1200B		
38V	100-41-4	ETHYLBENZENE			420		
	95-47-6	TOTAL XYLENES			2300		
85V	127-18-4	TETRACHLOROETHENE					
87V	79-01-6	TRICHLOROETHENE				300J	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE				2100	
88V	75-01-4	VINYL CHLORIDE				600	
44V	75-09-2	METHYLENE CHLORIDE	R	R	R		R

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND					
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE			SH 2500	4J	
77B	208-96-8	ACENAPHTHYLENE			SH 2600		
78B	120-12-7	ANTHRACENE			SH 720		
39B	206-44-0	FLUORANTHENE			SH 230		
80B	86-73-7	FLUORENE			SH 2900		
55B	91-20-3	NAPHTHALENE			SH 19000		
	91-57-6	2-METHYLNAPHTHALENE			SH 24000		
81B	85-01-8	PHENANTHRENE			SH 7900		
84B	129-00-0	PYRENE			SH 1400		
	95-50-1	1,2-DICHLOROBENZENE				54	

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-008	CC-SW-009	CC-SW-010	CC-SW-011	CC-SW-012
TRAFFIC REPORT NUMBER :	BE376	BE377	BE378	BE380	BE381
DESCRIPTION:	T-1 MIDDLE	BLANK	DECON FLU	SEEP #1	SEEP #2
DATE SAMPLED:	12/06/86	12/06/86	12/06/86	12/11/86	12/11/86

*** ACIDS ***

PP	CAS NO	COMPOUND					
	106-44-5	4-METHYLPHENOL			SL 160		
34A	105-67-9	2,4-DIMETHYLPHENOL			SL 460		

*** PESTICIDES ***

PP	CAS NO	COMPOUND					
	309-00-2	ALDRIN					
106P	53469-21-9	AROCLOR-1242					
107P	11097-69-1	AROCLOR-1254					
111P	11096-82-5	AROCLOR-1260					

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-008	CC-SW-009	CC-SW-010	CC-SW-011	CC-SW-012
TRAFFIC REPORT NUMBER :		MBE676	MBE677	NA	MBE680	MBE681
DESCRIPTION:		T-1 MIDDLE	BLANK	DECON FLU	SEEP #1	SEEP #2
DATE SAMPLED:		12/06/86	12/06/86	12/06/86	12/11/86	12/11/86
*** INORGANICS ***						
PP	CAS NO	COMPOUND				
1		ALUMINUM	[208]	NA	9026R	2610R
2		ANTIMONY		NA		
3		ARSENIC	23	NA	R	
4		BARIUM		NA		
5		BERYLLIUM		NA		
6		CADMIUM		NA		
7		CALCIUM	155000	[410] NA	145600R	208000R
8		CHROMIUM		NA	71	
9		COBALT		NA		
10		COPPER	[26]	NA	[122]	
11		IRON	[317]	NA	15800	2910
12		LEAD		NA		14R
13		MAGNESIUM	473000	NA	220000	512000
14		MANGANESE	[68]	NA	666	[66]
15		MERCURY		NA		
16		NICKEL		NA	[172]	[193]
17		POTASSIUM	130000	NA	R	R
18		SELENIUM		NA		
19		SILVER		NA		
20		SODIUM	3640000	NA	1680000	3270000
21		THALLIUM		NA		
22		TIN		NA		
23		VANADIUM		NA		[131]
24		ZINC	R	NA	266	146

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-008	CC-SW-009	CC-SW-010	CC-SW-011	CC-SW-012
TRAFFIC REPORT NUMBER :	MBE676	MBE677	NA	MBE680	MBE681
DESCRIPTION:	T-1 MIDDLE	BLANK	DECON FLU	SEEP #1	SEEP #2
DATE SAMPLED:	12/06/95	12/06/95	12/06/95	12/11/95	12/11/95

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND					
		AMMONIA (as N)			NA		
		BICARBONATE (as CaCO3)	78200		NA	390000	96400
		CARBONATE (as CaCO3)			NA		
		CHLORIDE	7390000		NA	4720000	10100000
		COD			NA		
		CYANIDE			NA		
		NITRITE/NITRATE (as N)			NA		/1250
		pH			NA		
		SPECIFIC CONDUCTANCE			NA		
		SULFATE	1020000		NA	399000	1270000
		TDS	11800000	79000	NA	7640000	16600000
		TEMPERATURE			NA		
		TKN (as N)			NA		
		TOC			NA		
		TOTAL PETROLEUM HYDROCARBONS			NA		
		TOX (as Cl)			NA		
		TSS			NA	7560000	82000
		ACIDITY	-68500	3300		-345	-82000
		ALKALINITY	78200			390000	96400

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SW

PP	NUMBER OF

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	67-64-1	ACETONE	1	790000.0000	790000.0000	790000.0000	
	78-93-3	2-BUTANONE	1	100.0000	100.0000	100.0000	
4V	71-43-2	BENZENE	1	380.0000	380.0000	380.0000	
86V	108-88-3	TOLUENE	1	1200.0000	1200.0000	1200.0000	
88V	100-41-4	ETHYLBENZENE	1	420.0000	420.0000	420.0000	
	95-47-6	TOTAL XYLENES	1	2300.0000	2300.0000	2300.0000	
85V	127-18-4	TETRACHLOROETHENE	1	1.8000	1.8000	1.8000	
87V	79-01-6	TRICHLOROETHENE	1	300.0000	300.0000	300.0000	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	1	2100.0000	2100.0000	2100.0000	
89V	75-01-4	VINYL CHLORIDE	1	600.0000	600.0000	600.0000	
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	4.0000	4.0000	4.0000	
	95-50-1	1,2-DICHLOROBENZENE	1	54.0000	54.0000	54.0000	
1		ALUMINUM	11	142.0000	9025.0000	1238.2700	2555.8600
3		ARSENIC	6	15.0000	25.0000	20.8300	3.1300
7		CALCIUM	12	410.0000	208000.0000	139167.5000	46285.7200
8		CHROMIUM	2	71.0000	155.0000	113.0000	42.0000
10		COPPER	4	19.0000	122.0000	47.0000	48.3800
11		IRON	11	317.0000	15800.0000	2133.7300	4382.7500
12		LEAD	1	14.0000	14.0000	14.0000	
13		MAGNESIUM	11	220000.0000	512000.0000	429272.7300	77722.2200
14		MANGANESE	11	59.0000	565.0000	118.4500	142.1600
15		MERCURY	3	0.1000	0.1600	0.1300	0.0200
16		NICKEL	2	172.0000	193.0000	182.5000	10.5000
17		POTASSIUM	9	106000.0000	138000.0000	123222.2200	11212.8700
20		SODIUM	11	1000000.0000	3760000.0000	3250000.0000	595711.9500
22		TIN	1	115.0000	115.0000	115.0000	
23		VANADIUM	1	131.0000	131.0000	131.0000	
24		ZINC	2	146.0000	266.0000	206.0000	60.0000
		BICARBONATE (as CaCO3)	11	78000.0000	390000.0000	109290.9100	88909.5000
		CHLORIDE	11	1000000.0000	********.****	6828181.8200	1463692.6300
		SULFATE	11	90300.0000	1270000.0000	849845.4500	324946.6800
		TDS	12	78000.0000	********.****	********.****	3802458.1600
		TSS	9	4000.0000	7660000.0000	868444.4400	2369468.3500

SAMPLE TYPE: SW

SAMPLE NUMBER :			CC-SW-100	CC-SW-101	CC-SW-102	CC-SW-103	CC-SW-104	CC-SW-105	CC-SW-106	CC-SW-107
TRAFFIC REPORT NUMBER :			BC376	BC377	BC378	BC379	BC380	BC381	BC382	BE393
DESCRIPTION:			FLD BLANK	STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7
DATE SAMPLED:			06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	6.4J	R		R		R		R
	108-10-1	4-METHYL-2-PENTANONE								
4V	71-43-2	BENZENE								
86V	108-88-3	TOLUENE								14
38V	100-41-4	ETHYLBENZENE								
	95-47-6	TOTAL XYLENES								
11V	71-55-6	1,1,1-TRICHLOROETHANE								
85V	127-18-4	TETRACHLOROETHENE		2.7J	3.2J	2.9J	2.8J	2.3J	2.1J	7.5
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								6.2
6V	56-23-5	CARBON TETRACHLORIDE								
23V	67-66-3	CHLOROFORM	7.4	R	R	R	R	R	R	
44V	75-09-2	METHYLENE CHLORIDE	1.0JB		R		17			R
45V	74-87-3	CHLOROMETHANE								
32V	78-87-5	1,2-DICHLOROPROPANE								
48V	75-27-4	BROMODICHLOROMETHANE	2.4J							
*** BASE/NEUTRALS ***										
PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		3.6J	2.8J	9.2J	3.6J		3.0J	6.8J
69B	84-74-2	DI-N-BUTYL PHTHALATE	2.2J	R	R	R	R			R
67B	85-68-7	BUTYL BENZYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE								
39B	206-44-0	FLUORANTHENE								
	91-57-6	2-METHYLNAPHTHALENE								
94B	129-00-0	PYRENE								
	100-51-6	BENZYL ALCOHOL								2.8J
*** ACIDS ***										
PP	CAS NO	COMPOUND								

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-100	CC-SW-101	CC-SW-102	CC-SW-103	CC-SW-104	CC-SW-105	CC-SW-106	CC-SW-107
TRAFFIC REPORT NUMBER :	BC376	BC377	BC378	BC379	BC380	BC381	BC382	BE393
DESCRIPTION:	FLD BLANK	STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7
DATE SAMPLED:	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND							
91P	57-74-9	CHLORDANE							0.70
111P	11096-82-5	AROCLOR-1260							

SAMPLE TYPE: SW

SAMPLE NUMBER :
TRAFFIC REPORT NUMBER :
DESCRIPTION:
DATE SAMPLED:

*** INORGANICS ***

PP	CAS NO	COMPOUND	CC-SW-100 MBF061 FLD BLANK 05/20/86	CC-SW-101 MBF062 STA. #1 05/20/86	CC-SW-102 MBF063 STA. #2 05/20/86	CC-SW-103 MBF064 STA. #3 05/20/86	CC-SW-104 MBF065 STA. #4 05/20/86	CC-SW-105 MBF066 STA. #5 05/20/86	CC-SW-106 MBF067 STA. #6 05/20/86	CC-SW-107 MBF068 STA. #7 05/20/86
1		ALUMINUM	[116]	R	R	R			1739	5270
3		ARSENIC								[144]
4		BARIUM		[73]	[73]	[73]				187000
7		CALCIUM	[747]	66200	65300	67900	76800	89700	104000	34
8		CHROMIUM							R	R
10		COPPER	32	R	R	R			3350	8400
11		IRON	166	R	R	R	R	R	LS	LS 334
12		LEAD	LS [4]	LS [9]	LS 12	LS 12	LS 12	LS	217000	7590
13		MAGNESIUM		53000	43400	50600	92800	152000	221	340
14		MANGANESE		137	130	134	143	149		[33]
16		NICKEL								7060
17		POTASSIUM	[500]	17900	16000	17400	20200	20100	19700	
18		SELENIUM								51300
20		SODIUM	[3070]	398000	326000	384000	75700	1235000	1770000	[26]
23		VANADIUM								R
24		ZINC	128	R	R	R	R	R	R	

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-100	CC-SW-101	CC-SW-102	CC-SW-103	CC-SW-104	CC-SW-105	CC-SW-106	CC-SW-107
TRAFFIC REPORT NUMBER :		2290B-0	2290B-1	2290B-2	2290B-3	2290B-4	2290B-5	2290B-6	2290B-7
DESCRIPTION:		FLD BLANK	STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86
*** GEOCHEMICAL PARAMETERS ***									
PP	CAS NO	COMPOUND							
		BICARBONATE (as CaCO3)	139	133	133	144	138	128	61
		CHLORIDE	3.7 896	698	1390	767	2370	3640	95
		NITRITE/NITRATE (as N)	0.16/0.61	0.10/0.69	0.30/0.36	0.12/0.71	0.18/0.29		
		SULFATE	166	131	237	149	339	494	26
		TDS	1820	1730	2850	1800	4440	6640	195
		TSS	12	9.0	130	14	26	168	608

SAMPLE TYPE: SW

			CC-SW-108	CC-SW-109	CC-SW-110	CC-SW-111	CC-SW-112	CC-SW-113	CC-SW-114	CC-SW-114D
SAMPLE NUMBER :			BE394	BE395	BE396	BE397	BE398	BE399	BE400	BE392
TRAFFIC REPORT NUMBER :			STA. #8	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DESCRIPTION:										
DATE SAMPLED:			05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	R	92	R	R	R	R		R
	108-10-1	4-METHYL-2-PENTANONE								
4V	71-43-2	BENZENE		1.7J				2.2J		
86V	108-88-3	TOLUENE	3.6J	6.4	5.5			6.1		
38V	100-41-4	ETHYLBENZENE								
	95-47-6	TOTAL XYLENES								
11V	71-55-6	1,1,1-TRICHLOROETHANE			6.3	6.2	5.6		2.2J	2.2J
85V	127-18-4	TETRACHLOROETHENE	3.7J	29	14	18	21	30	4.4J	4.5J
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
6V	56-23-5	CARBON TETRACHLORIDE								
23V	67-66-3	CHLOROFORM	R	R						
44V	75-09-2	METHYLENE CHLORIDE								
45V	74-87-3	CHLOROMETHANE								
32V	78-87-5	1,2-DICHLOROPROPANE								
48V	75-27-4	BROMODICHLOROMETHANE								
*** BASE/NEUTRALS ***										
PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2.8J	9.2J				2.6J		
68B	84-74-2	DI-N-BUTYL PHTHALATE	R	R						
67B	85-68-7	BUTYL BENZYL PHTHALATE		3.2J						
1B	83-32-9	ACENAPHTHENE								
39B	206-44-0	FLUORANTHENE		2.2J						
	91-57-6	2-METHYLNAPHTHALENE								
84B	129-00-0	PYRENE		2.2J						
	100-51-6	BENZYL ALCOHOL						3.2J		
*** ACIDS ***										
PP	CAS NO	COMPOUND								

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-108	CC-SW-109	CC-SW-110	CC-SW-111	CC-SW-112	CC-SW-113	CC-SW-114	CC-SW-114D
TRAFFIC REPORT NUMBER :	BE394	BE395	BE396	BE397	BE398	BE399	BE400	BE392
DESCRIPTION:	STA. #8	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND							
91P	57-74-9	CHLORDANE		0.77	0.59				
111P	11096-82-5	AROCLOR-1260							

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-108	CC-SW-109	CC-SW-110	CC-SW-111	CC-SW-112	CC-SW-113	CC-SW-114	CC-SW-114D
TRAFFIC REPORT NUMBER :		MBF069	MBF070	MBF071	MBF072	MBF073	MBF074	MBF075	MBF086
DESCRIPTION:		STA. #8	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	1630	5630	J 2080	R	R	J 1760	R	R
3		ARSENIC								
4		BARIUM	[67]	[127]	[93]	[60]	[62]	[63]		
7		CALCIUM	24200	21400	38100	34200	34300	21600	57000	58900
8		CHROMIUM	11	48	23	12	12	12		
10		COPPER	R	R	R	R	R	R	R	R
11		IRON	2710	9000	3430	2000	2110	2760	658	635
12		LEAD	LS 103	LS 347	LS 144	LS 73	LS 60	LS 92	LS	LS
13		MAGNESIUM	7560	7450	8690	8260	8370	7120	131000	135000
14		MANGANESE	308	630	377	274	277	277	224	217
16		NICKEL		[31]	[25]					
17		POTASSIUM	5570	5780	5030	[4630]	[4850]	5670	20200	19800
18		SELENIUM								4
20		SODIUM	51400	43700	J 44600	J 44400	J 47000	J 45400	J 1020000	J 1060000
23		VANADIUM		[30]						
24		ZINC	R	R	R	R	R	R	R	R

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-108	CC-SW-109	CC-SW-110	CC-SW-111	CC-SW-112	CC-SW-113	CC-SW-114	CC-SW-114D
TRAFFIC REPORT NUMBER :		2290B-8	2290B-9	2290B-10	2290B-11	2290B-12	2290B-13	2290B-14	2290B-14D
DESCRIPTION:		STA. #8	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86
*** GEOCHEMICAL PARAMETERS ***									
PP	CAS NO	COMPOUND							
		BICARBONATE (as CaCO3)	62	56	87	79	82	59	56	52
		CHLORIDE	117	86	122	91	110	54	2330	2370
		NITRITE/NITRATE (as N)				0.24/0.76	0.64		0.24/0.46	0.24/0.44
		SULFATE	19	21	30	32	20	24	339	344
		TDS	276	200	276	306	280	270	4680	4430
		TSS	334	116	402	66	50	124	26	26

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-115	CC-SW-116	CC-SW-117	CC-SW-118	CC-SW-119	CC-SW-120	CC-SW-121	CC-SW-122
TRAFFIC REPORT NUMBER :		SD995	SD996	SD997	SS506	SS507	SC365	SC366	SC367
DESCRIPTION:		STA. 015	STA. 016	STA. 017	STA. 018	STA. 019	STA. 020	STA. 021	STA. 022
DATE SAMPLED:		05/21/96	05/21/96	05/21/96	05/21/96	05/21/96	05/21/96	05/21/96	05/21/96
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE				R	R		
	108-10-1	4-METHYL-2-PENTANONE					R	R	1J
4V	71-43-2	BENZENE							R
86V	108-88-3	TOLUENE							
38V	100-41-4	ETHYLBENZENE				R	R		2J
	95-47-6	TOTAL XYLENES				2J	1J	2J	
11V	71-55-6	1,1,1-TRICHLOROETHANE				R	R	R	6
85V	127-18-4	TETRACHLOROETHENE	4.2J	3.6J	3.8J	3.5J	2J	2J	
87V	79-01-6	TRICHLOROETHENE							
30V	156-60-5	TRANS-1,2-DICHLOROETHENE							
6V	56-23-5	CARBON TETRACHLORIDE				R	R		1J
23V	67-66-3	CHLOROFORM					R	R	R
44V	75-09-2	METHYLENE CHLORIDE				R			
46V	74-87-3	CHLOROMETHANE							
32V	78-87-5	1,2-DICHLOROPROPANE							
48V	75-27-4	BROMODICHLOROMETHANE							
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE				460			
68B	84-74-2	DI-N-BUTYL PHTHALATE							
67B	85-68-7	BUTYL BENZYL PHTHALATE							
1B	83-32-9	ACENAPHTHENE							
39B	206-44-0	FLUORANTHENE							
	91-57-6	2-METHYLNAPHTHALENE							
84B	129-00-0	PYRENE							
	100-51-6	BENZYL ALCOHOL							
*** ACIDS ***									
PP	CAS NO	COMPOUND							

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-115	CC-SW-116	CC-SW-117	CC-SW-118	CC-SW-119	CC-SW-120	CC-SW-121	CC-SW-122
TRAFFIC REPORT NUMBER :	BD985	BD986	BD987	BB606	BB607	BC365	BC366	BC367
DESCRIPTION:	STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND
91P	57-74-9	CHLORDANE
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-115	CC-SW-116	CC-SW-117	CC-SW-118	CC-SW-119	CC-SW-120	CC-SW-121	CC-SW-122
TRAFFIC REPORT NUMBER :		MBF076	MBF077	MBF078	MBF079	MBF081	MBF080	MBF082	MBF083
DESCRIPTION:		STA. 015	STA. 016	STA. 017	STA. 018	STA. 019	STA. 020	STA. 021	STA. 022
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	R	R	R	R	R	R	R	R
3		ARSENIC								
4		BARIUM	63700	71600	73900	78900	J 81900	J 102000	J 99900	J 92100
7		CALCIUM								
8		CHROMIUM			R	R				
10		COPPER	R	R	R	R	R	R	R	R
11		IRON	LS	LS	LS	LS				
12		LEAD	161000	174000	182000	195000	J 204000	J 263000	J 256000	J 221000
13		MAGNESIUM	216	210	200	201	J 211	J 206	J 206	J 224
14		MANGANESE								
16		NICKEL	20100	19900	19700	19700	J 19600	J 19300	J 19200	J 19300
17		POTASSIUM				[B]			12	[B]
18		SELENIUM	J 1190000	J 1360000	J 1420000	J 1540000	J 1440000	J 1830000	J 1730000	J 1490000
20		SODIUM								
23		VANADIUM	R	R	R	R	R	R	R	R
24		ZINC								

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-115	CC-SW-116	CC-SW-117	CC-SW-118	CC-SW-119	CC-SW-120	CC-SW-121	CC-SW-122
TRAFFIC REPORT NUMBER :	22908-15	22908-16	22908-17	22908-18	22908-19	22908-20	22908-21	22908-22
DESCRIPTION:	STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND							
		BICARBONATE (as CaCO3)	60	56	64	62	69	74	79
		CHLORIDE	2640	2990	3090	3420	3430	4670	3770
		NITRITE/NITRATE (as N)	0.22/0.45	0.20/0.47	0.18/0.44	0.17/0.52	0.18/0.56	0.16/0.45	0.25/0.15
		SULFATE	378	453	56	492	543	682	588
		TDS	5170	5740	5940	5480	6000	9780	6200
		TSS	11	34	33	21	27	22	37

SAMPLE TYPE: SW

SAMPLE NUMBER :
TRAFFIC REPORT NUMBER :
DESCRIPTION:
DATE SAMPLED:

			CC-SW-123	CC-SW-124	CC-SW-126	CC-SW-127	CC-SW-128	CC-SW-129	CC-SW-130
			BC368	BE367	BF801	BF802	BF803	BF804	BF805
			STA. 023	STA. 024	MANHOLE #1	MANHOLE #4	MANHOLE #5	MANHOLE #6	MANHOLE #7
			05/21/86	05/21/86	05/22/86	05/22/86	05/22/86	05/22/86	05/22/86
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE				R	R		
	108-10-1	4-METHYL-2-PENTANONE				R			
4V	71-43-2	BENZENE		R		R	R	R	
86V	108-88-3	TOLUENE			R				
39V	100-41-4	ETHYLBENZENE					4J	12	
	95-47-6	TOTAL XYLENES	R			R	16X	50X	R
11V	71-55-6	1,1,1-TRICHLOROETHANE	2J		2J	2J			2J
95V	127-18-4	TETRACHLOROETHENE	R						
97V	79-01-6	TRICHLOROETHENE	2J			3J			
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	5		1J*				2J
6V	56-23-5	CARBON TETRACHLORIDE				2J			
23V	67-66-3	CHLOROFORM	R	7		R			
44V	75-09-2	METHYLENE CHLORIDE	R	R		R	R	R	R
46V	74-87-3	CHLOROMETHANE	12			4J			
32V	78-87-5	1,2-DICHLOROPROPANE				1J			
49V	75-27-4	BROMODICHLOROMETHANE		2J					
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE						4J	
68B	84-74-2	DI-N-BUTYL PHTHALATE							
67B	85-68-7	BUTYL BENZYL PHTHALATE						2J*	
1B	83-32-9	ACENAPHTHENE							
39B	206-44-0	FLUORANTHENE						4J	
	91-57-6	2-METHYLNAPHTHALENE						2J*	
84B	129-00-0	PYRENE							
	100-51-6	BENZYL ALCOHOL							
*** ACIDS ***									
PP	CAS NO	COMPOUND							

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-123	CC-SW-124	CC-SW-126	CC-SW-127	CC-SW-128	CC-SW-129	CC-SW-130
TRAFFIC REPORT NUMBER :	BC368	BE367	BF801	BF802	BF803	BF804	BF805
DESCRIPTION:	STA. #23	STA. #24	MANHOLE #1	MANHOLE #4	MANHOLE #5	MANHOLE #6	MANHOLE #7
DATE SAMPLED:	05/21/86	05/21/86	05/22/86	05/22/86	05/22/86	05/22/86	05/22/86

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND	
91P	57-74-9	CHLORDANE	3.5
111P	11096-82-5	AROCLOR-1260	

SAMPLE TYPE: SW

SAMPLE NUMBER :		CC-SW-123	CC-SW-124	CC-SW-126	CC-SW-127	CC-SW-128	CC-SW-129	CC-SW-130
TRAFFIC REPORT NUMBER :		MBF084	MBF085	MBF087	MBF088	MBF089	MBF090	MBF091
DESCRIPTION:		STA. #23	STA. #24	MANHOLE #1	MANHOLE #4	MANHOLE #5	MANHOLE #6	MANHOLE #7
DATE SAMPLED:		05/21/86	05/21/86	05/22/86	05/22/86	05/22/86	05/22/86	05/22/86
*** INORGANICS ***								
PP	CAS NO	COMPOUND						
1		ALUMINUM	R	J [148]	J 3540	J 2610	J 2860	J 2345	R
3		ARSENIC				J [6]	J [8]	J [4]	
4		BARIUM					J [87]		
7		CALCIUM	J 94600	J [707]	J 46000	J 18100	J 63800	J 84300	J 109000
8		CHROMIUM			J 13	J 15	J 12		J 703
10		COPPER		J 53	R	R	R	R	
11		IRON	R		J 12500	J 5030	J 7560	J 6900	J 3845
12		LEAD		J [3]	J 74	J 567	J 81	J 5	
13		MAGNESIUM	J 227000		J 7460	J 2910	J 55400	J 94500	J 170000
14		MANGANESE	J 232		J 114	J 92	J 288	J 304	J 272
16		NICKEL			J [22]	J [21]	J [22]		J 344
17		POTASSIUM	J 19400		J [4870]	J [2590]	J 19200	J 20200	J 19800
18		SELENIUM	J 4						
20		SODIUM	J 1530000	J [3030]	J 38300	J 10500	J 381000	J 695000	J 1260000
23		VANADIUM			[26]	[31]	[32]		
24		ZINC	R	R	R	R	R	R	R

SAMPLE TYPE: SW

SAMPLE NUMBER :	CC-SW-123	CC-SW-124	CC-SW-126	CC-SW-127	CC-SW-128	CC-SW-129	CC-SW-130
TRAFFIC REPORT NUMBER :	2290B-23	2290B-24	MBF087	MBF088	MBF089	MBF090	MBF091
DESCRIPTION:	STA. #23	STA. #24	MANHOLE #1	MANHOLE #4	MANHOLE #5	MANHOLE #6	MANHOLE #7
DATE SAMPLED:	05/21/86	05/21/86	05/22/86	05/22/86	05/22/86	05/22/86	05/22/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND		
		BICARBONATE (as CaCO3)	77	
		CHLORIDE	3860	
		NITRITE/NITRATE (as N)	0.27/0.06	
		SULFATE	466	
		TDS	6980	46
		TSS	46	

TABLE A-7

SEDIMENT RESULTS

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-000-11	CC-SD-001	CC-SD-002	CC-SD-003	CC-SD-004	CC-SD-005	CC-SD-006	CC-SD-007
TRAFFIC REPORT NUMBER :			BD984	BD989	BD990	BD991	BD992	BD993	BD994	BD963
DESCRIPTION:			BLANK VOA	T1 1/4 SFC	T1 1/4CORE	T1 1/2 SFC	T1 1/2CORE	T1 3/4 SFC	T1 3/4CORE	T2 1/4 SFC
DATE SAMPLED:			12/06/86	12/03/86	12/03/86	12/03/86	12/03/86	12/03/86	12/03/86	12/04/86
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE		290	82	94	240	51	450	140
	78-93-3	2-BUTANONE								
4V	71-43-2	BENZENE			4.0J		33		70	
86V	108-88-3	TOLUENE			4.0J		52		38	
38V	100-41-4	ETHYLBENZENE			56		1300		1800	
	95-47-6	TOTAL XYLENES			180		2400		3800	
7V	108-90-7	CHLOROBENZENE			17	3.1J	170	3.6J	680	
85V	127-18-4	TETRACHLOROETHENE								
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
23V	67-66-3	CHLOROFORM		5.4JB			7.6J	3.1J		
44V	75-09-2	METHYLENE CHLORIDE	6.2J	60	R	R	R	R	R	R
	75-15-0	CARBON DISULFIDE			3.8J					
*** BASE/NEUTRALS ***										
PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE		7300	21000	8600	HL 16000J	8900	30000	24000
69B	117-84-0	DI-N-OCTYL PHTHALATE		260J		310J		300J	1100J	
68B	84-74-2	DI-N-BUTYL PHTHALATE		230J	250J	120J				
67B	85-68-7	BUTYL BENZYL PHTHALATE			340J					
1B	83-32-9	ACENAPHTHENE		300J	3500	1400	HL 130000	410J	2800	980J
77B	208-96-8	ACENAPHTHYLENE		210J	910J	220J		200J	630J	390J
78B	120-12-7	ANTHRACENE				2200	HL 22000J	680J	2500	940J
72B	56-55-3	BENZO(A)ANTHRACENE		1000	380J	1700	HL 20000J	3000	3200	
74B	205-99-2	BENZO(B)FLUORANTHENE		3800		2100	HL 16000J	3500	3500	3300
	207-08-9	BENZO(K)FLUORANTHENE		3800		3000	HL 16000J	4900		3300

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-000-11	CC-SD-001	CC-SD-002	CC-SD-003	CC-SD-004	CC-SD-005	CC-SD-006	CC-SD-007
TRAFFIC REPORT NUMBER :			BD984	BD989	BD990	BD991	BD992	BD993	BD994	BD983
DESCRIPTION:			BLANK VOA	T1 1/4 SFC	T1 1/4CORE	T1 1/2 SFC	T1 1/2CORE	T1 3/4 SFC	T1 3/4CORE	T2 1/4 SFC
DATE SAMPLED:			12/06/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/04/85
79B	191-24-2	BENZO(G,H,I)PERYLENE				430J				
73B	50-32-8	BENZO(A)PYRENE		960		1100	HL 8000J	950	2500	2000
76B	218-01-9	CHRYSENE		1100	3400	1500	HL 16000J	3400	3200	2300
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE		2400	1300J	3400	HL 92000	3000	8700	3500
80B	86-73-7	FLUORENE		260J	3600	650	HL 94000	280J	2600	620J
83B	193-39-5	INDENO(1,2,3-CD)PYRENE							1300	830J
55B	91-20-3	NAPHTHALENE		110J	4400	460J	HL 130000	150J	3700	370J
	91-57-6	2-METHYLNAPHTHALENE			3800	220J	HL 98000		2900	300J
81B	85-01-8	PHENANTHRENE		990	18000	3000	HL 240000	1200	8400	1800
84B	129-00-0	PYRENE		1500	7400	3100	HL 80000	2600	6000	5100
	95-50-1	1,2-DICHLOROBENZENE								
26B	541-73-1	1,3-DICHLOROBENZENE						110J	510J	
27B	106-46-7	1,4-DICHLOROBENZENE			570J	95J		670J	480J	
62B	86-30-6	N-NITROSODIPHENYLAMINE					HL 6200J			
	106-47-8	4-CHLOROANILINE			4200			630J		300J
	132-64-9	DIBENZOFURAN			2000	590J	HL 64000	120J		

*** ACIDS ***

PP	CAS NO	COMPOUND
34A	105-67-9	2,4-DIMETHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND						
92P	50-29-3	4,4'-DDT	61	270	100		970	97
	72-54-8	4,4'-DDD	56	420	71		50	67
93P	72-55-9	4,4'-DDE	43	88J	35J		32	69

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-000-11	CC-SD-001	CC-SD-002	CC-SD-003	CC-SD-004	CC-SD-005	CC-SD-006	CC-SD-007
TRAFFIC REPORT NUMBER :	BD984	BD989	BD990	BD991	BD992	BD993	BD994	BD963
DESCRIPTION:	BLANK VOA	T1 1/4 SFC	T1 1/4CORE	T1 1/2 SFC	T1 1/2CORE	T1 3/4 SFC	T1 3/4CORE	T2 1/4 SFC
DATE SAMPLED:	12/05/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/04/85

90P	60-57-1	DIELDRIN
106P	53469-21-9	AROCLOR-1242
107P	11097-69-1	AROCLOR-1254
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-000-11	CC-SD-001	CC-SD-002	CC-SD-003	CC-SD-004	CC-SD-005	CC-SD-006	CC-SD-007
TRAFFIC REPORT NUMBER :			MBE688	MBE689	MBE690	MBE691	MBE692	MBE693	MBE648
DESCRIPTION:		BLANK VOA	T1 1/4 SFC	T1 1/4CORE	T1 1/2 SFC	T1 1/2CORE	T1 3/4 SFC	T1 3/4CORE	T2 1/4 SFC
DATE SAMPLED:		12/05/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/03/85	12/04/85
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	11300	12800	6590	10000	11600	11600	14600
2		ANTIMONY				[36]R			
3		ARSENIC	14	19		24	24	21	
4		BARIUM	[201]	226	[119]	368	[225]	227	[233]
5		BERYLLIUM	[1]	[0.99]	[0.63]	[1.2]	[1.3]	[1.2]	[1.4]
6		CADMIUM	8.2	12	5.5	24	12	18	10
7		CALCIUM	6320	6080	5770	5450	[5280]	6230	[5430]
8		CHROMIUM	114	190	98	177	188	200	184
9		COBALT	[11]	[16]	[6.8]	[12]	[18]	[16]	[17]
10		COPPER	235	362	168	439	394	381	296
11		IRON	22600	28700	16300	26600	30700	36500	30300
12		LEAD	458	658	260	705	611	681	498
13		MAGNESIUM	6590	7250	4920	5950	7340	6610	8040
14		MANGANESE	284	289	169	234	281	347	304
15		MERCURY	2.12	6.02	1.76	5.7	3.89	5.85	3.05
16		NICKEL	50	98	41	72	82	96	60
17		POTASSIUM	[2290]	[2690]					[3220]
19		SILVER	[7.4]	14	[4.8]	11	[14]	18	[9.3]
20		SODIUM	7720	8920	5510	8160	11800	9500	9170
22		TIN	[35]	[31]	[29]	65	[49]	50	
23		VANADIUM	[43]	[51]	[27]	[43]	[51]	[53]	[56]
24		ZINC	480E	805E	333E	874E	773E	753E	542E

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-008	CC-SD-009	CC-SD-010	CC-SD-011	CC-SD-012	CC-SD-013	CC-SD-014	CC-SD-015
TRAFFIC REPORT NUMBER :			BD964	BD965	BD966	BD967	BD968	BD969	BD970	BD971
DESCRIPTION:			T2 1/4CORE	T2 1/2 SFC	T2 1/2CORE	T2 3/4 SFC	T2 3/4CORE	T3 1/4 SFC	T3 1/4CORE	T3 1/2 SFC
DATE SAMPLED:			12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	240	400	290	98	R	160	290	R
	78-93-3	2-BUTANONE								
4V	71-43-2	BENZENE	8.5J		12J				39J	
86V	108-88-3	TOLUENE	5.2J		31				76	
38V	100-41-4	ETHYLBENZENE	58	15	1000		4.7J		1000	6.2J
	95-47-6	TOTAL XYLENES	140	26	3000		8.1J		2800	6.0J
7V	108-90-7	CHLOROBENZENE	54	37	830	3.3J	2.0J	3.5J	680	
85V	127-18-4	TETRACHLOROETHENE								
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
23V	67-66-3	CHLOROFORM						7.3J		
44V	75-09-2	METHYLENE CHLORIDE	72	R	35JB	R	R	R	R	R
	75-15-0	CARBON DISULFIDE					4.1J			
*** BASE/NEUTRALS ***										
PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	14000	16000	24000	11000	9500	24000	33000	21000
69B	117-84-0	DI-N-OCTYL PHTHALATE	470J		920J	320J		1100J	1200J	1200J
68B	84-74-2	DI-N-BUTYL PHTHALATE				200J		560J	820J	460J
67B	85-68-7	BUTYL BENZYL PHTHALATE				450J				
1B	83-32-9	ACENAPHTHENE	27000	1300J	3400	220J			2800J	1700J
77B	208-96-8	ACENAPHTHYLENE	2200J	430J	800J	150J			740J	560J
78B	120-12-7	ANTHRACENE	16000	1600	3600	920			4100	1800J
72B	56-55-3	BENZO(A)ANTHRACENE	11000	2600	4100	1200	4600	1600J		3300
74B	205-99-2	BENZO(B)FLUORANTHENE	13000	4500	6600	2000	6100	2800J	6900	5900
	207-08-9	BENZO(K)FLUORANTHENE	13000	4500	6600	2000	6100	2800J	6900	5900

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-008	CC-SD-009	CC-SD-010	CC-SD-011	CC-SD-012	CC-SD-013	CC-SD-014	CC-SD-015
TRAFFIC REPORT NUMBER :			BD964	BD965	BD966	BD967	BD968	BD969	BD970	BD971
DESCRIPTION:			T2 1/4CORE	T2 1/2 SFC	T2 1/2CORE	T2 3/4 SFC	T2 3/4CORE	T3 1/4 SFC	T3 1/4CORE	T3 1/2 SFC
DATE SAMPLED:			12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85
79B	191-24-2	BENZO(G,H,I)PERYLENE				620J	1700	1400J	1100J	1000J
73B	50-32-8	BENZO(A)PYRENE	7300	2300	3800	1100	3000	1800J	3400J	3000J
76B	218-01-9	CHRYSENE	12000	3000	4400	1400			5000	3800
82B	53-70-3	DIBENZO(A,H)ANTHRACENE				220J				
39B	206-44-0	FLUORANTHENE	35000	6200	9800	2900	7400	3600J	11000	6800
80B	86-73-7	FLUORENE	21000	880J	3200	200J			2900J	1600J
83B	193-39-5	INDENO(1,2,3-CD)PYRENE				580J	1400	920J	1000J	990J
55B	91-20-3	NAPHTHALENE	51000	590J	4900	140J			2200J	1100J
	91-57-6	2-METHYLNAPHTHALENE	27000	180J	3000				1600J	460J
81B	85-01-8	PHENANTHRENE	61000	3300	12000	1300	2900	1100J	10000	5600
84B	129-00-0	PYRENE	22000	5200	7800	2200	10000	2600J	8800	6200
	95-50-1	1,2-DICHLOROBENZENE							820J	
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE		460J	1000J	170J			450J	
62B	86-30-6	N-NITROSODIPHENYLAMINE								
	106-47-8	4-CHLOROANILINE		600J						
	132-64-9	DIBENZOFURAN	9200	450J	1500J	100J			1400J	690J

*** ACIDS ***

PP	CAS NO	COMPOUND								
34A	105-67-9	2,4-DIMETHYLPHENOL							1700J	

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
92P	50-29-3	4,4'-DDT		73	140	100		110J		66
	72-54-8	4,4'-DDD		44	46J	64		130		54
93P	72-55-9	4,4'-DDE		44	70J	72		160		44

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-008	CC-SD-009	CC-SD-010	CC-SD-011	CC-SD-012	CC-SD-013	CC-SD-014	CC-SD-015
TRAFFIC REPORT NUMBER :	BD964	BD965	BD966	BD967	BD968	BD969	BD970	BD971
DESCRIPTION:	T2 1/4CORE	T2 1/2 SFC	T2 1/2CORE	T2 3/4 SFC	T2 3/4CORE	T3 1/4 SFC	T3 1/4CORE	T3 1/2 SFC
DATE SAMPLED:	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85

90P	60-57-1	DIELDRIN
106P	53469-21-9	AROCLOR-1242
107P	11097-69-1	AROCLOR-1254
111P	11096-82-5	AROCLOR-1260

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-008	CC-SD-009	CC-SD-010	CC-SD-011	CC-SD-012	CC-SD-013	CC-SD-014	CC-SD-015
TRAFFIC REPORT NUMBER :	MBE649	MBE650	MBE651	MBE652	MBE653	MBE654	MBE655	MBE656
DESCRIPTION:	T2 1/4CORE	T2 1/2 SFC	T2 1/2CORE	T2 3/4 SFC	T2 3/4CORE	T3 1/4 SFC	T3 1/4CORE	T3 1/2 SFC
DATE SAMPLED:	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	11800	11100	11300	12900	11800	11000	13000	10500
2		ANTIMONY		[34]R						[24]R
3		ARSENIC	19	17	19		16	19	16	
4		BARIUM	229	[189]	241	[216]	[117]	[193]	[220]	[173]
5		BERYLLIUM	[1.2]	[1.1]	[1.2]	[1.2]	[1.1]	[1.3]	[1.3]	[1.1]
6		CADMIUM	14	14	14	9.7		[6.4]	16	7
7		CALCIUM	6120	[5320]	5980	[4270]	[2630]	7920	6770	8580
8		CHROMIUM	179	161	221	265	193	205	228	93
9		COBALT	[15]	[13]	[15]	[15]	[13]	[16]	[18]	[11]
10		COPPER	347	336	371	334	178	346	427	223
11		IRON	27500	27300	28700	32900	27700	32100	30300	21400
12		LEAD	644	773	736	488	256	353	585	430
13		MAGNESIUM	6600	6510	6460	7230	5890	8590	7950	6730
14		MANGANESE	269	236	262	258	261	266	278	240
15		MERCURY	3.16	4.27	4.08	1.50	2.04	5.00	7.95	3.08
16		NICKEL	101	109	122	116	[2510]	[51]	102	49
17		POTASSIUM	[2260]		[2270]	[3160]			[3040]	[2120]
19		SILVER	14	11	13	[9.4]	[6]	[12]	13	[7.6]
20		SODIUM	7620	8590	8500	8880	6390	9030	1080	5510
22		TIN	[32]	[19]	[36]	[21]	[23]	[42]	50	[16]
23		VANADIUM	[48]	[44]	[50]	[52]	[38]	[45]	[52]	[41]
24		ZINC	743E	880E	884E	671E	271E	466E	807E	433E

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-016	CC-SD-017	CC-SD-018	CC-SD-019	CC-SD-019A	CC-SD-020	CC-SD-020A	CC-SD-021
TRAFFIC REPORT NUMBER :	BD972	BD973	BD974	BD976	BD976	BD977	BD978	BD979
DESCRIPTION:	T3 1/2CORE	T3 3/4 SFC	T3 3/4CORE	T4 1/4 SFC	DUPLICATE	T4 1/4CORE	DUPLICATE	T4 1/2 SFC
DATE SAMPLED:	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85

*** VOLATILES ***

PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	77	R	290	R	190	870B	380	110
	78-93-3	2-BUTANONE								
4V	71-43-2	BENZENE	5.7J					62	42	
86V	108-88-3	TOLUENE	11J					120	380	
38V	100-41-4	ETHYLBENZENE	400	4.2J	6.1J	5.4J		2000	1800	
	95-47-6	TOTAL XYLENES	720	6.0J	26	18		6300	3900	
7V	108-90-7	CHLOROBENZENE	47					830	740	
85V	127-18-4	TETRACHLOROETHENE								
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
23V	67-66-3	CHLOROFORM								
44V	75-09-2	METHYLENE CHLORIDE	62	R	R	R	R	100B	170	R
	75-15-0	CARBON DISULFIDE			7.4J		4.3J	23J		

*** BASE/NEUTRALS ***

PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	28000	35000	21000	11000	7400	22000	33000	13000
69B	117-84-0	DI-N-OCTYL PHTHALATE	1200J	1100J		260J	260J	920J	1000J	
68B	84-74-2	DI-N-BUTYL PHTHALATE				550J	400J	580J	1400J	
67B	85-68-7	BUTYL BENZYL PHTHALATE	1000J		3100J				3300J	1600
1B	83-32-9	ACENAPHTHENE	3300J			110J			1300J	2800
77B	208-96-8	ACENAPHTHYLENE				110J				500J
78B	120-12-7	ANTHRACENE	3600J		870J	340J	280J			9400
72B	56-55-3	BENZO(A)ANTHRACENE	7800	2100J	3500J	1400	920J	2800J	2100J	3100
74B	205-99-2	BENZO(B)FLUORANTHENE	6800	4000J	1800J	980	750J	2500J	3500J	3800
	207-08-9	BENZO(K)FLUORANTHENE	6800	4000J	1800J	980	750J	2500J	3500J	3800

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-016	CC-SD-017	CC-SD-018	CC-SD-019	CC-SD-019A	CC-SD-020	CC-SD-020A	CC-SD-021
TRAFFIC REPORT NUMBER :			BD972	BD973	BD974	BD975	BD976	BD977	BD978	BD979
DESCRIPTION:			T3 1/2CORE	T3 3/4 SFC	T3 3/4CORE	T4 1/4 SFC	DUPLICATE	T4 1/4CORE	DUPLICATE	T4 1/2 SFC
DATE SAMPLED:			12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85
79B	191-24-2	BENZO(G,H,I)PERYLENE	1100J	740J		300J	230J		400J	880
73B	50-32-8	BENZO(A)PYRENE	3400J	2100J	1000J	640J	440J	1200J	1800J	2300
76B	218-01-9	CHRYSENE	7800	2400J	3500J	770J	580J	2800J	2900J	2900
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE	9600	4700	4300J	1600	1200	3400J	6200	7200
80B	86-73-7	FLUORENE	3100J						1300J	1800
83B	193-39-5	INDENO(1,2,3-CD)PYRENE	1100J	740J		260J	170J		440J	860
55B	91-20-3	NAPHTHALENE	4300					820J	3200J	400J
	91-57-6	2-METHYLNAPHTHALENE	4700						2300J	420J
81B	85-01-8	PHENANTHRENE	9400	1300J	2500J	700J	500J	2900J	15000	9400
84B	129-00-0	PYRENE	7800	3800J	3300J	1400	1100	3700J	4800	6100
	95-50-1	1,2-DICHLOROBENZENE								
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE								
62B	86-30-6	N-NITROSODIPHENYLAMINE								
	106-47-8	4-CHLOROANILINE								
	132-64-9	DIBENZOFURAN	1200J							

*** ACIDS ***

PP	CAS NO	COMPOUND
34A	105-67-9	2,4-DIMETHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND							
92P	50-29-3	4,4'-DDT	170	560	65	30		270	210
	72-54-8	4,4'-DDD	61J	140	58	24		72J	58
93P	72-55-9	4,4'-DDE	98	120	34J	26		56J	72

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-016	CC-SD-017	CC-SD-018	CC-SD-019	CC-SD-019A	CC-SD-020	CC-SD-020A	CC-SD-021
TRAFFIC REPORT NUMBER :		BD972	BD973	BD974	BD976	BD976	BD977	BD978	BD979
DESCRIPTION:		T3 1/2CORE	T3 3/4 SFC	T3 3/4CORE	T4 1/4 SFC	DUPLICATE	T4 1/4CORE	DUPLICATE	T4 1/2 SFC
DATE SAMPLED:		12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85
90P 60-57-1	DIELDRIN			210J					
106P 53469-21-9	AROCLOR-1242								
107P 11097-69-1	AROCLOR-1254								
111P 11096-82-5	AROCLOR-1260								

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-016	CC-SD-017	CC-SD-018	CC-SD-019	CC-SD-019A	CC-SD-020	CC-SD-020A	CC-SD-021
TRAFFIC REPORT NUMBER :		MBE657	MBE658	MBE659	MBE660	MBE661	MBE662	MBE663	MBE664
DESCRIPTION:		T3 1/2CORE	T3 3/4 SFC	T3 3/4CORE	T4 1/4 SFC	DUPLICATE	T4 1/4CORE	DUPLICATE	T4 1/2 SFC
DATE SAMPLED:		12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85	12/04/85
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	12800	13600	12900	14500	12600	13000	14100	9840
2		ANTIMONY			147R			[67]R		
3		ARSENIC	14	17	26	17	17	26	31	17
4		BARIUM	249	[264]	465	[262]	[237]	405	318	229
5		BERYLLIUM	[1.4]	[1.5]	[1.5]	[1.6]	[1.6]	[0.93]	[1.2]	[0.88]
6		CADMIUM	15	9.1	15	10	10	14	16	6.1
7		CALCIUM	6250	[5190]	9500	[6070]	[5610]	6600	7530	[5380]
8		CHROMIUM	207	225	395	208	196	277	315	129
9		COBALT	[16]	[17]	[18]	[15]	[13]	[15]	[18]	[14]
10		COPPER	391	454	527	404	379	510	549	262
11		IRON	29500	35000	39600	32200	29000	32000	34100	27200
12		LEAD	695	519	942	445	411	626	618	432
13		MAGNESIUM	6990	8240	7690	8610	7810	8080	8890	6500
14		MANGANESE	306	314	330	312	294	320	370	240
15		MERCURY	7.45	7.5	10	5.97	4.86	7.1	10	3.1
16		NICKEL	101	95	96	[53]	[54]	93	86	50
17		POTASSIUM	[2500]	[3030]		[3730]	[3030]	[2790]	[3180]	[2630]
19		SILVER	16	[12]	16	[8.3]	[9]	14	13	[9.2]
20		SODIUM	7960	9400	11400	10800	10900	10500	11700	8460
22		TIN	69	56	62	[34]	[47]	[37]	66	51
23		VANADIUM	[51]	[55]	74	[58]	[51]	[54]	[58]	[41]
24		ZINC	781E	670E	872E	586E	548E	866E	837E	491E

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-022	CC-SD-023	CC-SD-024	CC-SD-025	CC-SD-026	CC-SD-027	CC-SD-029	CC-SD-031
TRAFFIC REPORT NUMBER :			BD980	BD981	BD982	BE382	BE383	BE384	BE385	BE386
DESCRIPTION:			T4 1/2CORE	T4 3/4 SFC	T4 3/4CORE	T6 1/4 SFC	T6 1/4CORE	T6 1/2 SFC	T6 3/4 SFC	T5 1/4 SFC
DATE SAMPLED:			12/04/85	12/04/85	12/04/85	12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
*** VOLATILES ***										
PP	CAS NO	COMPOUND								
	67-64-1	ACETONE	480	R	280	46B	99B	29B	25JB	107
	78-93-3	2-BUTANONE				40JB	25JB	20JB	25JB	35J
4V	71-43-2	BENZENE	48			20JB	17B	43	15JB	20J
86V	108-88-3	TOLUENE	12		4.5J		15J	35		20J
38V	100-41-4	ETHYLBENZENE	330				240	420		20J
	95-47-6	TOTAL XYLENES	930		6.5J		400	1400		
7V	108-90-7	CHLOROBENZENE	34				230	560		36
85V	127-18-4	TETRACHLOROETHENE								
87V	79-01-6	TRICHLOROETHENE								
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
23V	67-66-3	CHLOROFORM			3.7J					
44V	75-09-2	METHYLENE CHLORIDE	R	R	42	20JB	16B	10JB	15JB	20J
	75-15-0	CARBON DISULFIDE	5.8J		3.7J					
*** BASE/NEUTRALS ***										
PP	CAS NO	COMPOUND								
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	19000	7400	17000	26000	20000	42000	9800	9200
69B	117-84-0	DI-N-OCTYL PHTHALATE	660J		600J					
68B	84-74-2	DI-N-BUTYL PHTHALATE	280J	200J	380J	3500B	1800JB	13000J	1800J	4900
67B	85-68-7	BUTYL BENZYL PHTHALATE				2400J	1800J		1800J	
1B	83-32-9	ACENAPHTHENE	1600	130J	2500	2400J	1800J	13000J		
77B	208-96-8	ACENAPHTHYLENE	440J	160J	560J					
78B	120-12-7	ANTHRACENE	2300	230J	2600	2400J	1800J	13000J		
72B	56-55-3	BENZO(A)ANTHRACENE	3000	770J	2800	2400J	1800J	13000J	1800J	2200J
74B	205-99-2	BENZO(B)FLUORANTHENE	5200	1000	2900		1800J			
	207-08-9	BENZO(K)FLUORANTHENE	5200	1000	2900		1800J			

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-022	CC-SD-023	CC-SD-024	CC-SD-025	CC-SD-026	CC-SD-027	CC-SD-029	CC-SD-031
TRAFFIC REPORT NUMBER :			BD980	BD981	BD982	BE382	BE383	BE384	BE385	BE386
DESCRIPTION:			T4 1/2CORE	T4 3/4 SFC	T4 3/4CORE	T6 1/4 SFC	T6 1/4CORE	T6 1/2 SFC	T6 3/4 SFC	T5 1/4 SFC
DATE SAMPLED:			12/04/85	12/04/85	12/04/85	12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
79B	191-24-2	BENZO(G,H,I)PERYLENE								
73B	50-32-8	BENZO(A)PYRENE	2900	690J	2000		1800J			
76B	218-01-9	CHRYSENE	4400	720J	2300	2600	2000	13000J	1800J	2200J
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE	9600	1600	8300	3800	2300	13000J	1900	2200J
80B	86-73-7	FLUORENE	1300J	140J	990J	2400J	1800J	13000J		
83B	193-39-5	INDENO(1,2,3-CD)PYRENE			860J					
55B	91-20-3	NAPHTHALENE	1400J	120J	1000J	2400J	1800J	13000J		
	91-57-6	2-METHYLNAPHTHALENE	730J		340J	2400J	1800J	13000J		
81B	85-01-8	PHENANTHRENE	7100	750J	4800	4200	2300	13000J	1800J	2200J
84B	129-00-0	PYRENE	6800	1200	5100	5400	5300	13000J	1900	2200J
	95-50-1	1,2-DICHLOROBENZENE								
26B	541-73-1	1,3-DICHLOROBENZENE								
27B	106-46-7	1,4-DICHLOROBENZENE								
62B	86-30-6	N-NITROSODIPHENYLAMINE		400J						
	106-47-8	4-CHLOROANILINE								
	132-64-9	DIBENZOFURAN			960J	2400J	1800J	13000J		

*** ACIDS ***

PP	CAS NO	COMPOUND
34A	105-67-9	2,4-DIMETHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND								
92P	50-29-3	4,4'-DDT	82	19		R				R
	72-54-8	4,4'-DDD	66	20		170	80		44	95
93P	72-55-9	4,4'-DDE	61	17		98	38		28	49

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-022	CC-SD-023	CC-SD-024	CC-SD-025	CC-SD-026	CC-SD-027	CC-SD-029	CC-SD-031
TRAFFIC REPORT NUMBER :	BD980	BD981	BD982	BE382	BE383	BE384	BE385	BE386
DESCRIPTION:	T4 1/2CORE	T4 3/4 SFC	T4 3/4CORE	T6 1/4 SFC	T6 1/4CORE	T6 1/2 SFC	T6 3/4 SFC	T5 1/4 SFC
DATE SAMPLED:	12/04/85	12/04/85	12/04/85	12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
90P 60-57-1 DIELDRIN								
106P 53469-21-9 AROCLOR-1242								
107P 11097-69-1 AROCLOR-1254					440			
111P 11096-82-5 AROCLOR-1260								

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-022	CC-SD-023	CC-SD-024	CC-SD-025	CC-SD-026	CC-SD-027	CC-SD-029	CC-SD-031
TRAFFIC REPORT NUMBER :	MBE665	MBE666	MBE667	MBE725	MBE726	MBE727	MBE728	MBE729
DESCRIPTION:	T4 1/2CORE	T4 3/4 SFC	T4 3/4CORE	T6 1/4 SFC	T6 1/4CORE	T6 1/2 SFC	T6 3/4 SFC	T6 1/4 SFC
DATE SAMPLED:	12/04/85	12/04/85	12/04/85	12/05/85	12/05/85	12/05/85	12/05/85	12/05/85

*** INORGANICS ***

PP	CAS NO	COMPOUND								
1		ALUMINUM	11600	11500	12700	11000	13500	10100	10900	12600
2		ANTIMONY			90R			[55]		
3		ARSENIC	19	21	73		20R	[12]R	21R	22R
4		BARIUM	240	[235]	441	[261]	320	[218]	[249]	[271]
5		BERYLLIUM	[0.73]	[1.1]	[1.3]	[1.8]	[1.9]	[1.3]	[1.6]	[1.8]
6		CADMIUM	11	11	19	20	11	12	12	12
7		CALCIUM	6740	[4890]	11200	[5970]	7700	6010	[6070]	[5700]
8		CHROMIUM	189	194	235	205	322	192	227	267
9		COBALT	[15]	[13]	[16]	[16]	[19]	[13]	[15]	[15]
10		COPPER	409	399	483	483*	647*	370*	472*	552*
11		IRON	28900	28300	32400	30900	36900	24700	30100	34100
12		LEAD	723	477	648	597*	792*	511*	453*	574*
13		MAGNESIUM	7480	7750	8070	7790	8550	6360	7690	8330
14		MANGANESE	293	280	331	286	400	306	311	323
15		MERCURY	5.5	5.1	7.4	6.88	12.3	6.86	2.92	8.44
16		NICKEL	120	59	76	67*	140*	68*	65*	81*
17		POTASSIUM			[2800]		2810			
19		SILVER	[11]	[9.3]	13	[14]	14	14	[10]	[13]
20		SODIUM	11200	9990	9750	9310	9810	8270	10600	13400
22		TIN	[44]	[50]	55	[37]	99	84	[54]	[56]
23		VANADIUM	[50]	[46]	[53]	[58]	62	[46]	[50]	[57]
24		ZINC	877E	587E	776E	699*E	1180*E	631*E	664*E	837*E

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-032	CC-SD-033	CC-SD-034	CC-SD-035	CC-SD-036
TRAFFIC REPORT NUMBER :			BE387	BE388	BE389	BE390	BE391
DESCRIPTION:			T5 1/4CORE	T5 1/2 SFC	T5 1/2CORE	T5 3/4 SFC	T5 3/4CORE
DATE SAMPLED:			12/05/85	12/06/85	12/05/85	12/05/85	12/05/85
*** VOLATILES ***							
PP	CAS NO	COMPOUND					
	67-64-1	ACETONE	510	76B	360	49B	30B
	78-93-3	2-BUTANONE	340J	25B	230	30JB	20JB
4V	71-43-2	BENZENE	640	16B	120	15JB	10JB
86V	108-88-3	TOLUENE	6000	15JB	120	15JB	10JB
38V	100-41-4	ETHYLBENZENE	4300	105	1700		10J
	95-47-6	TOTAL XYLENES	13000	130	4500		32
7V	108-90-7	CHLOROBENZENE	5000	21	180		
85V	127-18-4	TETRACHLOROETHENE		15J			
87V	79-01-6	TRICHLOROETHENE		15J			
30V	156-60-5	TRANS-1,2-DICHLOROETHENE		15J			
23V	67-66-3	CHLOROFORM					
44V	75-09-2	METHYLENE CHLORIDE	180J		120J	18B	10JB
	75-15-0	CARBON DISULFIDE					
*** BASE/NEUTRALS ***							
PP	CAS NO	COMPOUND					
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	33000	19000	6000	18000	12000
69B	117-84-0	DI-N-OCTYL PHTHALATE					
68B	84-74-2	DI-N-BUTYL PHTHALATE	10000	19000	2300	6000	3000
67B	85-68-7	BUTYL BENZYL PHTHALATE	7100J				
1B	83-32-9	ACENAPHTHENE	7100J	1800J	5600	2000J	1300J
77B	208-96-8	ACENAPHTHYLENE		1800J	1600J		1300J
79B	120-12-7	ANTHRACENE	7100J	1800J	4500	2000J	1300J
72B	56-55-3	BENZO(A)ANTHRACENE	7100J	1800J	3300	2000J	1300J
74B	205-99-2	BENZO(B)FLUORANTHENE		1800J		2000J	1300J
	207-08-9	BENZO(K)FLUORANTHENE			2000	2000J	1300J

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-032	CC-SD-033	CC-SD-034	CC-SD-035	CC-SD-036
TRAFFIC REPORT NUMBER :			BE387	BE388	BE389	BE390	BE391
DESCRIPTION:			T5 1/4CORE	T5 1/2 SFC	T5 1/2CORE	T5 3/4 SFC	T5 3/4CORE
DATE SAMPLED:			12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
79B	191-24-2	BENZO(G,H,I)PERYLENE					
73B	50-32-8	BENZO(A)PYRENE		1800J	2600		1300J
76B	218-01-9	CHRYSENE	7100J	1800J	4000	2000J	1300J
82B	53-70-3	DIBENZO(A,H)ANTHRACENE					
39B	206-44-0	FLUORANTHENE	7100J	2900	8000	2000J	1600
80B	86-73-7	FLUORENE	7100J	1800J	3600		1300J
83B	193-39-5	INDENO(1,2,3-CD)PYRENE					
55B	91-20-3	NAPHTHALENE	7100J	1800J	5400	2000J	1300J
	91-57-6	2-METHYLNAPHTHALENE	7100J	1800J	5400		1300J
81B	85-01-8	PHENANTHRENE	7100J		2600	2000J	1300J
84B	129-00-0	PYRENE	7100J	3200	9500	2400	2100
	95-50-1	1,2-DICHLOROBENZENE	10000				
26B	541-73-1	1,3-DICHLOROBENZENE					
27B	106-46-7	1,4-DICHLOROBENZENE	7100J		1600J		
62B	86-30-6	N-NITROSODIPHENYLAMINE					
	106-47-8	4-CHLOROANILINE					
	132-64-9	DIBENZOFURAN	7100J	1800J	1600J		1300J

*** ACIDS ***

PP	CAS NO	COMPOUND
34A	105-67-9	2,4-DIMETHYLPHENOL

*** PESTICIDES ***

PP	CAS NO	COMPOUND					
92P	50-29-3	4,4'-DDT					
	72-54-8	4,4'-DDD	180	64	140	100	49
93P	72-55-9	4,4'-DDE	340	57	100	73	37

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-032	CC-SD-033	CC-SD-034	CC-SD-035	CC-SD-036
TRAFFIC REPORT NUMBER :		MBE730	MBE731	MBE732	MBE733	MBE734
DESCRIPTION:		T5 1/4CORE	T5 1/2 SFC	T5 1/2CORE	T5 3/4 SFC	T5 3/4CORE
DATE SAMPLED:		12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
*** INORGANICS ***						
PP	CAS NO	COMPOUND				
1		ALUMINUM	12700	12900	9240	13700	10900
2		ANTIMONY	[31]				
3		ARSENIC	21R	15R	20R	22R	16R
4		BARIUM	294	[243]	237	[301]	214
5		BERYLLIUM	[1.5]	[1.7]	[1.5]	[2.1]	[1.4]
6		CADMIUM	11	15	21	11	8.6
7		CALCIUM	6340	[5490]	[5660]	[6040]	[5240]
8		CHROMIUM	264	215	232	267	163
9		COBALT	[14]	[15]	[14]	[18]	[15]
10		COPPER	509*	410*	428*	519*	312*
11		IRON	32700	30900	28500	36900	28600
12		LEAD	593*	575*	875*	540*	373*
13		MAGNESIUM	7710	7170	6320	8790	6320
14		MANGANESE	333	300	323	378	322
15		MERCURY	9.13	5.75	6.36	7.81	6.06
16		NICKEL	79*	72*	64*	71*	49*
17		POTASSIUM	[2800]	[2820]			[2520]
19		SILVER	14	15	12	[15]	[9.5]
20		SODIUM	9060	9640	6840	11400	5670
22		TIN	50	[36]	[38]	[51]	[35]
23		VANADIUM	55	[57]	[46]	[62]	[45]
24		ZINC	759*E	659*E	565*E	690*E	429*E

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-032	CC-SD-033	CC-SD-034	CC-SD-035	CC-SD-036
TRAFFIC REPORT NUMBER :			BE387	BE388	BE389	BE390	BE391
DESCRIPTION:			T5 1/4CORE	T5 1/2 SFC	T5 1/2CORE	T5 3/4 SFC	T5 3/4CORE
DATE SAMPLED:			12/05/85	12/05/85	12/05/85	12/05/85	12/05/85
90P	60-57-1	DIELDRIN					
106P	53469-21-9	AROCLOR-1242	5100				
107P	11097-69-1	AROCLOR-1254					
111P	11096-82-5	AROCLOR-1260	5200				

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SD

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	67-64-1	ACETONE	31	25.00	870.00	220.42	186.69
	78-93-3	2-BUTANONE	10	20.00	340.00	79.00	106.06
4V	71-43-2	BENZENE	20	4.00	640.00	82.01	136.37
86V	108-88-3	TOLUENE	19	4.00	6000.00	366.51	1330.50
38V	100-41-4	ETHYLBENZENE	23	4.20	4300.00	712.20	1015.64
	95-47-6	TOTAL XYLENES	23	6.00	13000.00	1896.90	2962.30
7V	108-90-7	CHLOROBENZENE	22	2.00	5000.00	461.89	1035.60
85V	127-18-4	TETRACHLOROETHENE	1	15.00	15.00	15.00	
87V	79-01-6	TRICHLOROETHENE	1	15.00	15.00	15.00	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE	1	15.00	15.00	15.00	
23V	67-66-3	CHLOROFORM	5	3.10	7.60	5.42	1.82
44V	75-09-2	METHYLENE CHLORIDE	17	6.20	180.00	56.25	53.89
	75-15-0	CARBON DISULFIDE	7	3.70	23.00	7.44	6.47
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	35	6000.00	42000.00	18742.86	9324.66
69B	117-84-0	DI-N-OCTYL PHTHALATE	18	260.00	1200.00	726.67	370.57
68B	84-74-2	DI-N-BUTYL PHTHALATE	24	120.00	19000.00	2988.75	4623.47
67B	85-68-7	BUTYL BENZYL PHTHALATE	10	340.00	7100.00	2289.00	1860.99
1B	83-32-9	ACENAPHTHENE	27	110.00	27000.00	3427.78	5296.05
77B	208-96-8	ACENAPHTHYLENE	20	110.00	2200.00	695.00	577.56
78B	120-12-7	ANTHRACENE	26	230.00	16000.00	3371.54	3823.24
72B	56-55-3	BENZO(A)ANTHRACENE	33	380.00	13000.00	3168.79	2741.01
74B	205-99-2	BENZO(B)FLUORANTHENE	29	760.00	13000.00	3718.93	2534.27
	207-08-9	BENZO(K)FLUORANTHENE	27	760.00	13000.00	3819.63	2667.78
79B	191-24-2	BENZO(G,H,I)PERYLENE	12	230.00	1700.00	825.00	437.48
73B	50-32-8	BENZO(A)PYRENE	28	440.00	7300.00	2106.43	1335.72
76B	218-01-9	CHRYSENE	33	580.00	13000.00	3435.45	2802.49
82B	53-70-3	DIBENZO(A,H)ANTHRACENE	1	220.00	220.00	220.00	
39B	206-44-0	FLUORANTHENE	35	1200.00	35000.00	5900.00	5882.18
80B	86-73-7	FLUORENE	25	140.00	21000.00	3096.80	4505.43
83B	193-39-5	INDENO(1,2,3-CD)PYRENE	14	170.00	1400.00	817.86	344.78
55B	91-20-3	NAPHTHALENE	27	110.00	51000.00	4266.19	9569.86
	91-57-6	2-METHYLNAPHTHALENE	21	180.00	27000.00	3845.24	5952.17
81B	85-01-8	PHENANTHRENE	34	500.00	61000.00	6510.00	10490.96
84B	129-00-0	PYRENE	35	1100.00	22000.00	5362.86	4003.15
	95-50-1	1,2-DICHLOROBENZENE	2	620.00	10000.00	5310.00	4690.00
26B	541-73-1	1,3-DICHLOROBENZENE	2	110.00	510.00	310.00	200.00
27B	106-46-7	1,4-DICHLOROBENZENE	10	95.00	7100.00	1249.50	1992.23
62B	86-30-6	N-NITROSODIPHENYLAMINE	1	400.00	400.00	400.00	
	106-47-8	4-CHLOROANILINE	4	300.00	4200.00	1432.50	1603.02
	132-64-9	DIBENZOFURAN	18	100.00	13000.00	2622.78	3402.13
34A	105-67-9	2,4-DIMETHYLPHENOL	1	1700.00	1700.00	1700.00	
92P	50-29-3	4,4'-DDT	18	19.00	970.00	187.94	226.46
	72-54-8	4,4'-DDD	27	20.00	420.00	89.00	76.48
93P	72-55-9	4,4'-DDE	27	17.00	340.00	72.19	61.39
90P	60-57-1	DIELDRIN	1	210.00	210.00	210.00	
106P	53469-21-9	AROCLOR-1242	1	5100.00	5100.00	5100.00	
107P	11097-69-1	AROCLOR-1254	1	440.00	440.00	440.00	
111P	11096-82-5	AROCLOR-1260	1	5200.00	5200.00	5200.00	
1		ALUMINUM	36	6590.00	14600.00	11904.72	1586.70
2		ANTIMONY	8	24.00	147.00	60.38	38.70

STATISTICAL ANALYSIS FOR SAMPLE TYPE: SD

PP NO	CAS NO	COMPOUND	NUMBER OF OCCURRENCES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
3		ARSENIC	31	12.00	73.00	21.00	10.31
4		BARIUM	36	117.00	466.00	252.69	72.86
5		BERYLLIUM	36	0.63	2.10	1.32	0.33
6		CADMIUM	35	5.60	24.00	12.56	4.21
7		CALCIUM	36	2630.00	11200.00	6175.56	1448.45
8		CHROMIUM	36	93.00	386.00	209.67	59.27
9		COBALT	36	6.80	19.00	14.83	2.33
10		COPPER	36	168.00	647.00	397.36	105.83
11		IRON	36	16300.00	39600.00	30058.33	4474.64
12		LEAD	36	256.00	942.00	570.69	154.42
13		MAGNESIUM	36	4920.00	8890.00	7321.94	924.92
14		MANGANESE	36	169.00	400.00	295.28	44.23
15		MERCURY	36	1.50	12.30	5.72	2.62
16		NICKEL	36	41.00	2510.00	147.14	400.13
17		POTASSIUM	20	2120.00	3730.00	2784.50	385.93
19		SILVER	36	4.80	18.00	11.83	2.96
20		SODIUM	36	1080.00	13400.00	8951.11	2245.58
22		TIN	35	16.00	99.00	45.97	17.40
23		VANADIUM	36	27.00	74.00	50.58	8.07
24		ZINC	36	271.00	1180.00	683.17	183.47

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-101	CC-SD-102	CC-SD-103	CC-SD-104	CC-SD-105	CC-SD-106	CC-SD-107	CC-SD-108
TRAFFIC REPORT NUMBER :		BF811	BF812	BF813	BF814	BF815	BF816	BF817	BF818
DESCRIPTION:		STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7	STA. #8
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE		15			17	22J	39
	78-93-3	2-BUTANONE	66	62	76	80	80	120	120
	591-78-6	2-HEXANONE							
	108-10-1	4-METHYL-2-PENTANONE							
4V	71-43-2	BENZENE							
86V	108-88-3	TOLUENE							
38V	100-41-4	ETHYLBENZENE							
	95-47-6	TOTAL XYLENES							
7V	108-90-7	CHLOROBENZENE		1J					
85V	127-18-4	TETRACHLOROETHENE							
30V	156-60-5	TRANS-1,2-DICHLOROETHENE							
44V	75-09-2	METHYLENE CHLORIDE							
	75-15-0	CARBON DISULFIDE							
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE				3000			990
68B	84-74-2	DI-N-BUTYL PHTHALATE			45J				
1B	83-32-9	ACENAPHTHENE	340J	3700	320J		130J	360J	10000	610
77B	208-96-8	ACENAPHTHYLENE	300J		140J	290J	190J	150J	3400	420J
78B	120-12-7	ANTHRACENE	1200		770		440	610	9200	990
72B	56-55-3	BENZO(A)ANTHRACENE	2600	7800	1800		1400	820	20000	
74B	205-99-2	BENZO(B)FLUORANTHENE								
	207-08-9	BENZO(K)FLUORANTHENE	2400		2200		1300	820	17000	
79B	191-24-2	BENZO(G,H,I)PERYLENE								
73B	50-32-8	BENZO(A)PYRENE	2100		1100		980	750J*	17000	
76B	218-01-9	CHRYSENE	2000		1700		1200	920	8200	
82B	53-70-3	DIBENZO(A,H)ANTHRACENE	470							
39B	206-44-0	FLUORANTHENE	4800	15000	4000		3400	1700		
80B	86-73-7	FLUORENE	430J*	4100J*	340J*	640J*		330J*		430J*
83B	193-39-5	INDENO(1,2,3-CD)PYRENE								

SAMPLE TYPE: SD

SAMPLE NUMBER :
TRAFFIC REPORT NUMBER :
DESCRIPTION:
DATE SAMPLED:

			CC-SD-101 BF811 STA. #1 05/20/86	CC-SD-102 BF812 STA. #2 05/20/86	CC-SD-103 BF813 STA. #3 05/20/86	CC-SD-104 BF814 STA. #4 05/20/86	CC-SD-105 BF815 STA. #5 05/20/86	CC-SD-106 BF816 STA. #6 05/20/86	CC-SD-107 BF817 STA. #7 05/20/86	CC-SD-108 BF818 STA. #8 05/20/86
668	91-20-3	NAPHTHALENE	130J	1100J	1100	670				280J
	91-57-6	2-METHYLNAPHTHALENE			180J	370J*			370J	150J*
818	85-01-8	PHENANTHRENE	3300	20000	3000	7100	1300	1600	33000	1900
848	129-00-0	PYRENE	1400	13000	1400	2744	1100	770		
	65-85-0	BENZOIC ACID								
	132-64-9	DIBENZOFURAN	260J	3000	230J	440J		100J		

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND
	72-54-8	4,4'-DDD

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-101	CC-SD-102	CC-SD-103	CC-SD-104	CC-SD-105	CC-SD-106	CC-SD-107	CC-SD-108
TRAFFIC REPORT NUMBER :		MBD622	MBD623	MBD624	MBD625	MBD626	MBD627	MBD628	MBD820
DESCRIPTION:		STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7	STA. #8
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86
*** INORGANICS ***									
PP	CAS NO	COMPOUND							
1		ALUMINUM	5460	4830	4250	10300	7590	10100	4340	7310
2		ANTIMONY								
3		ARSENIC	[3]	[4]	[4]	[5]	[5]	[3]	[6]	11
4		BARIUM	[84]	[41]	[80]	[95]	[106]	[129]	[84]	[69]
6		CADMIUM								
7		CALCIUM	[2420]	[1950]	[3090]	[2660]	6500	[1280]	[1260]	[1590]
8		CHROMIUM	26	32	28	42	30	33	23	[65]
9		COBALT								
10		COPPER	45	108	71	98	71	45	57	98
11		IRON	11800	15640	9360	12300	16500	20000	10800	18200
12		LEAD	130	133	244	245	255	215	148	241
13		MAGNESIUM	4010	3510	[2700]	[3498]	3840	4970	[2530]	4590
14		MANGANESE	142	124	127	185	325	242	99	220
15		MERCURY	0.29	0.39	0.19	0.24	0.6	0.25	0.35	0.85
16		NICKEL	[25]	45	[28]	40	[26]	[26]		37
17		POTASSIUM	[912]	[640]	[607]	[879]	[949]	[1360]	[891]	[1030]
18		SELENIUM								
19		SILVER				[5]				
20		SODIUM	[2535]	[2120]	[2640]	5510	[2890]	[3990]	[6830]	[3860]
21		THALLIUM								
22		TIN	[16]	[25]	77	[33]	35		[33]	64
23		VANADIUM	[18]	[16]	[15]	[23]	[25]	[28]		[26]
24		ZINC	62	321	238	259	168	132	166	235

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-101	CC-SD-102	CC-SD-103	CC-SD-104	CC-SD-105	CC-SD-106	CC-SD-107	CC-SD-108
TRAFFIC REPORT NUMBER :	MBD622	MBD623	MBD624	MBD625	MBD626	MBD627	MBD628	MBD820
DESCRIPTION:	STA. #1	STA. #2	STA. #3	STA. #4	STA. #5	STA. #6	STA. #7	STA. #8
DATE SAMPLED:	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-109	CC-SD-109-1	CC-SD-110	CC-SD-111	CC-SD-112	CC-SD-113	CC-SD-114	CC-SD-114D
TRAFFIC REPORT NUMBER :		BF819	BF810	BF820	BF821	BF822	BF823	BF824	BF838
DESCRIPTION:		STA. #9	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:		05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE			24		110	48	40	R
	78-93-3	2-BUTANONE	110	88	89	66	190	120	60	
	591-78-6	2-HEXANONE					27			
	108-10-1	4-METHYL-2-PENTANONE					20			
4V	71-43-2	BENZENE								
86V	108-88-3	TOLUENE					29			
38V	100-41-4	ETHYLBENZENE							6	1J
	95-47-6	TOTAL XYLENES								
7V	108-90-7	CHLOROBENZENE								
85V	127-18-4	TETRACHLOROETHENE								R
30V	156-60-5	TRANS-1,2-DICHLOROETHENE					47			
44V	75-09-2	METHYLENE CHLORIDE								R
	75-15-0	CARBON DISULFIDE			6J					
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE				3300				
69B	84-74-2	DI-N-BUTYL PHTHALATE								
1B	83-32-9	ACENAPHTHENE				1800	1100J*	2800		
77B	208-96-8	ACENAPHTHYLENE			480J	340J				
78B	120-12-7	ANTHRACENE				7300	3150J*		2100	
72B	56-55-3	BENZO(A)ANTHRACENE		850			3200J*	1000		110J*
74B	205-99-2	BENZO(B)FLUORANTHENE					8200J*			
	207-08-9	BENZO(K)FLUORANTHENE		330J	3700		8200J*			
79B	191-24-2	BENZO(G,H,I)PERYLENE								
73B	50-32-8	BENZO(A)PYRENE		431J*	1900		3600J*	650J		
76B	218-01-9	CHRYSENE			3600		4300J*		2500	
82B	53-70-3	DIBENZO(A,H)ANTHRACENE								
39B	206-44-0	FLUORANTHENE		1000	6200		9300		5400	
80B	86-73-7	FLUORENE				1800J*		340J*	1250J*	
83B	193-39-5	INDENO(1,2,3-CD)PYRENE								

SAMPLE TYPE: SD

			CC-SD-109	CC-SD-109-1	CC-SD-110	CC-SD-111	CC-SD-112	CC-SD-113	CC-SD-114	CC-SD-114D
SAMPLE NUMBER :			BF819	BF810	BF820	BF821	BF822	BF823	BF824	BF838
TRAFFIC REPORT NUMBER :			STA. #9	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DESCRIPTION:			05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86
DATE SAMPLED:										
55B	91-20-3	NAPHTHALENE			480J	1400		1800	710	
	91-57-6	2-METHYLNAPHTHALENE	190J*		210J*	620J*		800	540	
81B	85-01-8	PHENANTHRENE		390J	1100		5200	720	5700	
84B	129-00-0	PYRENE		440J*	3200		7400	190J*	5300	
	65-85-0	BENZOIC ACID								
	132-64-9	DIBENZOFURAN			270J	790			330J	

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND
	72-54-8	4,4'-DDD

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-109	CC-SD-109-1	CC-SD-110	CC-SD-111	CC-SD-112	CC-SD-113	CC-SD-114	CC-SD-114D
TRAFFIC REPORT NUMBER :	MBD822	MBB726	MBF092	MBF093	MBF094	MBF095	MBF096	MBF097
DESCRIPTION:	STA. #9	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/20/86	05/21/86	05/21/86

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	8100	9940	6790	6800	6110	16500	3360	3600
2		ANTIMONY								
3		ARSENIC	[9]	[4]	[7]	[3]		[6]	[3]	[5]
4		BARIUM	[144]	[68]	[112]	[116]	[128]	[56]	[40]	[46]
6		CADMIUM								
7		CALCIUM	5990	[2090]	[1080]	[1070]	[3920]	[1030]	[1690]	[1000]
8		CHROMIUM	59	28	42	49	80	37	33	29
9		COBALT		18						
10		COPPER	146	64	131	183	291	58	75	73
11		IRON	17100	24900	15800	16400	13400	32800	9080	11800
12		LEAD	382	80	226	270	682	110	197	106
13		MAGNESIUM	[4620]	5070	[3310]	[3360]	[3420]	7230	[2360]	[2200]
14		MANGANESE	237	J 288	J 174	J 161	J 312	J 348	J 90	J 107
15		MERCURY	0.51		J 0.47	J 0.83	J 0.5	J 0.4	R	R
16		NICKEL	38		[24]	[25]		[23]	[16]	[18]
17		POTASSIUM	[1040]	[1410]	[930]	[892]	[846]	[2260]	[566]	[581]
18		SELENIUM								
19		SILVER								
20		SODIUM	[4630]	4780	[3940]	[3600]	[4780]	7160	[2710]	[2960]
21		THALLIUM								
22		TIN	38	50	62	62	52	[32]	[22]	[25]
23		VANADIUM	[30]	[28]	[24]	[24]	[27]	[40]		
24		ZINC	353	109	210	289	501	169	190	185

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-109	CC-SD-109-1	CC-SD-110	CC-SD-111	CC-SD-112	CC-SD-113	CC-SD-114	CC-SD-114D
TRAFFIC REPORT NUMBER :	MBD822	MBB725	MBF092	MBF093	MBF094	MBF095	MBF096	MBF097
DESCRIPTION:	STA. #9	STA. #9	STA. #10	STA. #11	STA. #12	STA. #13	STA. #14	DUPLICATE
DATE SAMPLED:	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/20/86	06/21/86	06/21/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-115	CC-SD-116	CC-SD-117	CC-SD-118	CC-SD-119	CC-SD-120	CC-SD-121	CC-SD-122
TRAFFIC REPORT NUMBER :		BF825	BF826	BF827	BF828	BF829	BF830	BF831	BF832
DESCRIPTION:		STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** VOLATILES ***									
PP	CAS NO	COMPOUND							
	67-64-1	ACETONE	30	14J		67		120	
	78-93-3	2-BUTANONE			39				
	591-78-6	2-HEXANONE							
	108-10-1	4-METHYL-2-PENTANONE							
4V	71-43-2	BENZENE							
86V	108-88-3	TOLUENE				2J	2J	2J	3J	6J
38V	100-41-4	ETHYLBENZENE				3J	22	16	90	83
	95-47-6	TOTAL XYLENES				5J	26X	16X	120	98
7V	108-90-7	CHLOROBENZENE							25	
85V	127-18-4	TETRACHLOROETHENE				R	R	R	R	
30V	156-60-5	TRANS-1,2-DICHLOROETHENE								
44V	75-09-2	METHYLENE CHLORIDE				R	R	R	R	R
	75-15-0	CARBON DISULFIDE								
*** BASE/NEUTRALS ***									
PP	CAS NO	COMPOUND							
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE				3600	4600		
68B	84-74-2	DI-N-BUTYL PHTHALATE			3800	380J			
1B	83-32-9	ACENAPHTHENE	1300	690	130J	2100	12000		15000
77B	208-96-8	ACENAPHTHYLENE		210J					
78B	120-12-7	ANTHRACENE	4600	630			J 15000		
72B	56-55-3	BENZO(A)ANTHRACENE		1000	350J	4300			
74B	205-99-2	BENZO(B)FLUORANTHENE							
	207-08-9	BENZO(K)FLUORANTHENE		2300		J 5000			6300
79B	191-24-2	BENZO(G,H,I)PERYLENE							
73B	50-32-8	BENZO(A)PYRENE		690			1000		
76B	218-01-9	CHRYSENE		1100					
82B	53-70-3	DIBENZO(A,H)ANTHRACENE							
39B	206-44-0	FLUORANTHENE			1600	R		16000	13000	14000
80B	86-73-7	FLUORENE	800J*	300J*					
83B	193-39-5	INDENO(1,2,3-CD)PYRENE							

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-116	CC-SD-116	CC-SD-117	CC-SD-118	CC-SD-119	CC-SD-120	CC-SD-121	CC-SD-122
TRAFFIC REPORT NUMBER :			BF825	BF826	BF827	BF828	BF829	BF830	BF831	BF832
DESCRIPTION:			STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:			05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
65B	91-20-3	NAPHTHALENE	1300	950			8400		23000	
	91-57-6	2-METHYLNAPHTHALENE	800	160J	43J	660	J 13000			
81B	85-01-8	PHENANTHRENE		1300	170J	J 5700			6800	
84B	129-00-0	PYRENE		2500						16000
	65-85-0	BENZOIC ACID								
	132-64-9	DIBENZOFURAN		110J						

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND
	72-54-8	4,4'-DDD

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-115	CC-SD-116	CC-SD-117	CC-SD-118	CC-SD-119	CC-SD-120	CC-SD-121	CC-SD-122
TRAFFIC REPORT NUMBER :	MBF098	MBF099	MBD619	MBD620	MBD621	MBG745	MBG746	MBG747
DESCRIPTION:	STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** INORGANICS ***

PP	CAS NO	COMPOUND							
1		ALUMINUM	10200	5870	3260	4850	8790	9940	11400	13700
2		ANTIMONY							310	140
3		ARSENIC		[4]	[3]	[6]	22	23	16	24
4		BARIUM	[169]	[81]		[99]	[167]	594	516	399
6		CADMIUM	10					16	13	13
7		CALCIUM	[2340]	[2730]	[378]	[1829]	[3610]	9820	5240	5940
8		CHROMIUM	109	32	18	53	110	126	164	202
9		COBALT								
10		COPPER	249	62	41	144	319	538	452	467
11		IRON	22000	12400	7620	11300	21900	22000	27200	30600
12		LEAD	540	103	77	284	421	644	638	744
13		MAGNESIUM	[4820]	[3190]	[1940]	[2770]	[4850]	5630	5710	6680
14		MANGANESE	J 224	J 199	87	114	258	218	287	336
15		MERCURY	J 1.7	J 0.66	0.7	1.2	2.6	2.8	4.9	1.7
16		NICKEL	72		[18]	40	[41]	50	63	81
17		POTASSIUM	[1340]	[867]	[622]	[691]	[1680]	[1240]	[1400]	[1650]
18		SELENIUM		5.7						
19		SILVER	11					[6]	[7]	14
20		SODIUM	6980	4240	[3440]	4000	8400	6300	7350	7970
21		THALLIUM					6.3			
22		TIN	69	[23]	[18]	[26]	59	128	126	100
23		VANADIUM	[37]	[19]		[23]	[34]	[32]	[42]	53
24		ZINC	531	128	90	297	457	891	742	821

SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-115	CC-SD-116	CC-SD-117	CC-SD-118	CC-SD-119	CC-SD-120	CC-SD-121	CC-SD-122
TRAFFIC REPORT NUMBER :	MBF098	MBF099	MBD619	MBD620	MBD621	MBG746	MBG746	MBG747
DESCRIPTION:	STA. #15	STA. #16	STA. #17	STA. #18	STA. #19	STA. #20	STA. #21	STA. #22
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-123	CC-SD-124	CC-SD-125	CC-SD-126	CC-SD-127
TRAFFIC REPORT NUMBER :		BF833	BF834	BF835	BF836	BF837
DESCRIPTION:		STA. #23	STA. #24	STA. #25	STA. #26	STA. #27
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** VOLATILES ***						
PP	CAS NO	COMPOUND				
	67-64-1	ACETONE				260
	78-93-3	2-BUTANONE			64	
	591-78-6	2-HEXANONE				
	108-10-1	4-METHYL-2-PENTANONE		14		
4V	71-43-2	BENZENE	R			
86V	108-88-3	TOLUENE	5J	4J	1J	2J
38V	100-41-4	ETHYLBENZENE	91	44		5J
	95-47-6	TOTAL XYLENES	84	62		16X
7V	108-90-7	CHLOROBENZENE		40		
85V	127-18-4	TETRACHLOROETHENE				
30V	156-60-5	TRANS-1,2-DICHLOROETHENE				
44V	75-09-2	METHYLENE CHLORIDE	R	R	R	R
	75-15-0	CARBON DISULFIDE				
*** BASE/NEUTRALS ***						
PP	CAS NO	COMPOUND				
66B	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE			670	
68B	84-74-2	DI-N-BUTYL PHTHALATE				
1B	83-32-9	ACENAPHTHENE		5100		710	800J*
77B	208-96-8	ACENAPHTHYLENE		1000		
78B	120-12-7	ANTHRACENE				
72B	56-55-3	BENZO(A)ANTHRACENE		2700		530	
74B	205-99-2	BENZO(B)FLUORANTHENE			265J*	
	207-08-9	BENZO(K)FLUORANTHENE		5500			2300
79B	191-24-2	BENZO(G,H,I)PERYLENE				190J*	
73B	50-32-8	BENZO(A)PYRENE		1400	130J*		
76B	218-01-9	CHRYSENE					
82B	53-70-3	DIBENZO(A,H)ANTHRACENE					
39B	206-44-0	FLUORANTHENE		6500	R	2000	2900
80B	86-73-7	FLUORENE		3300J*			
83B	193-39-5	INDENO(1,2,3-CD)PYRENE				200J*	

SAMPLE TYPE: SD

SAMPLE NUMBER :			CC-SD-123	CC-SD-124	CC-SD-125	CC-SD-126	CC-SD-127
TRAFFIC REPORT NUMBER :			BF833	BF834	BF835	BF836	BF837
DESCRIPTION:			STA. #23	STA. #24	STA. #25	STA. #26	STA. #27
DATE SAMPLED:			05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
65B	91-20-3	NAPHTHALENE		6300			860J*
	91-57-6	2-METHYLNAPHTHALENE	3900	5500J*			880
81B	85-01-8	PHENANTHRENE	6200	11000		620	2800
84B	129-00-0	PYRENE	6500	5900			2300
	65-85-0	BENZOIC ACID	R				
	132-64-9	DIBENZOFURAN	9600	1200			

*** ACIDS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY

*** PESTICIDES ***

PP	CAS NO	COMPOUND	
	72-54-8	4,4'-DDD	R

SAMPLE TYPE: SD

SAMPLE NUMBER :		CC-SD-123	CC-SD-124	CC-SD-125	CC-SD-126	CC-SD-127
TRAFFIC REPORT NUMBER :		MBG748	MBG749	MBG750	MBG751	MBG752
DESCRIPTION:		STA. #23	STA. #24	STA. #25	STA. #26	STA. #27
DATE SAMPLED:		05/21/86	05/21/86	05/21/86	05/21/86	05/21/86
*** INORGANICS ***						
PP	CAS NO	COMPOUND				
1		ALUMINUM	9120	9880	11000	2750	6390
2		ANTIMONY					
3		ARSENIC	31	22	14	9	23
4		BARIUM	272	232		[49]	347
6		CADMIUM	12	12			11
7		CALCIUM	6490	[4620]	[1320]	[2120]	4800
8		CHROMIUM	204	180	28	22	167
9		COBALT					
10		COPPER	1020	422	27	49	386
11		IRON	28300	26900	26400	7640	18100
12		LEAD	812	572		32	261
13		MAGNESIUM	4920	[5220]	5650	[1431]	[4022]
14		MANGANESE	312	309	316	84	169
15		MERCURY	6.6	5.4	0.8	1.0	7.4
16		NICKEL	99	73	[22]		
17		POTASSIUM	[1210]	[1280]	[1950]	[464]	[911]
18		SELENIUM					
19		SILVER	[5]	12			[4]
20		SODIUM	6790	5880	8110	2190	5600
21		THALLIUM					
22		TIN	85	64		[21]	60
23		VANADIUM	57	[46]	[31]		[32]
24		ZINC	1090	607	75	58	397

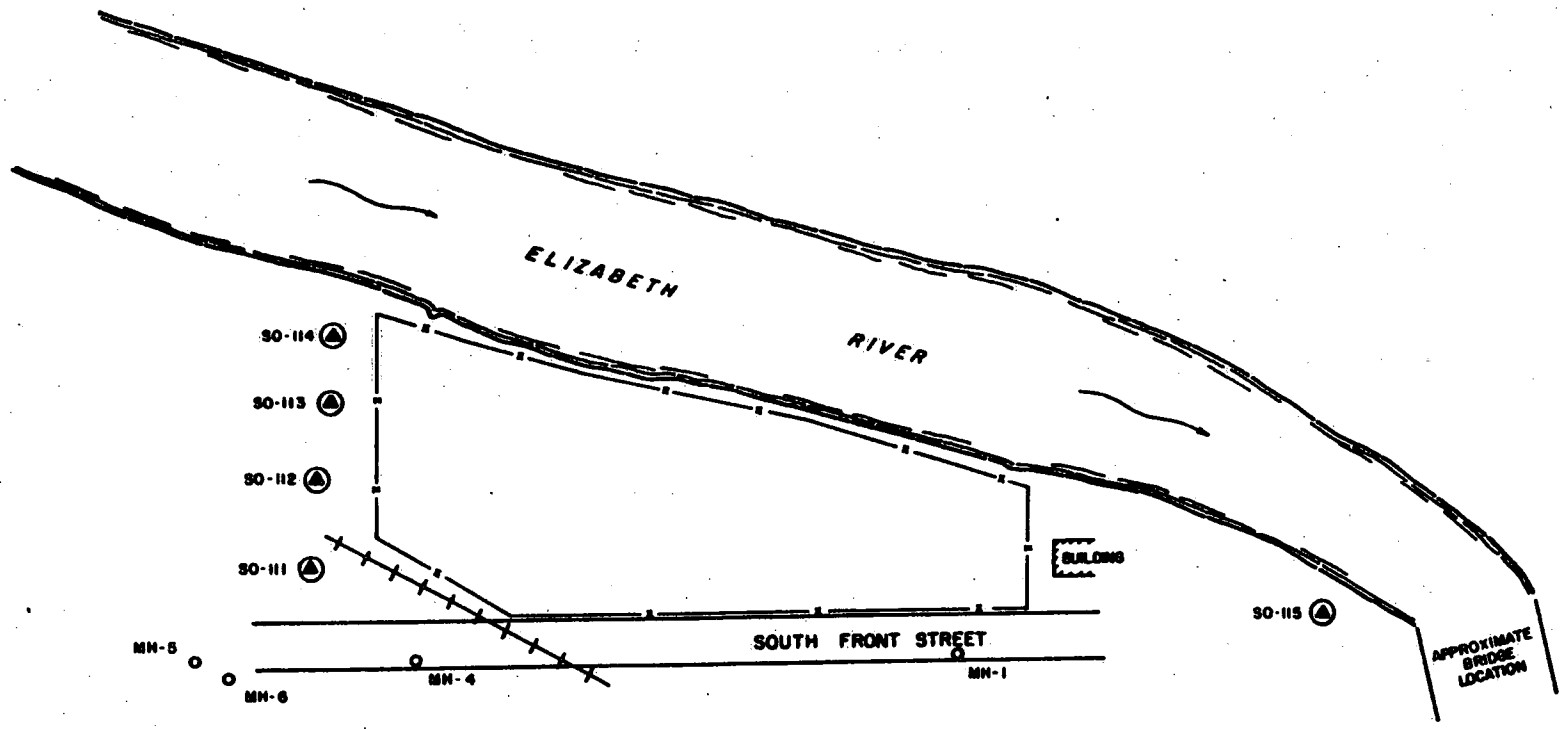
SAMPLE TYPE: SD

SAMPLE NUMBER :	CC-SD-123	CC-SD-124	CC-SD-125	CC-SD-126	CC-SD-127
TRAFFIC REPORT NUMBER :	MBG748	MBG749	MBG750	MBG751	MBG752
DESCRIPTION:	STA. #23	STA. #24	STA. #25	STA. #26	STA. #27
DATE SAMPLED:	05/21/86	05/21/86	05/21/86	05/21/86	05/21/86

*** GEOCHEMICAL PARAMETERS ***

PP	CAS NO	COMPOUND

NO PARAMETERS FOR THIS CATEGORY



LEGEND

SO-113 SOIL SAMPLE

MH-4 MANHOLE

MH-7

FIGURE A-1

SURFACE SOIL AND SEWER SYSTEM SAMPLING LOCATIONS - MAY 1986 -
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

0 100 200
SCALE IN FEET

NUS CORPORATION
A Halliburton Company

APPENDIX B

CALCULATIONS

NUS CORPORATION AND SUBSIDIARIES	STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: 876947	BY: R. NOWAK	PAGE 1 OF 3
SUBJECT: GW Discharge from shallow zone		CHECKED BY: SJC - 4-24-86	DATE: 4/10/86

PROBLEM - ESTIMATE THE GROUNDWATER DISCHARGE FROM THE shallow zone.

METHOD A: ESTIMATE THE discharge by $Q = KiA$, dividing the SITE INTO TWO SEGMENTS. USE DATA FROM DAYS when have rounds OF WATER LEVEL MEASUREMENTS

SUMMARY OF RESULTS

DATE		ESTIMATED DISCHARGE
12/6/85	-	636 gpd
12/19	-	701
12/26	-	578
1/2/86	-	684
1/9	-	838
1/15	-	390

ave = 638 ≈ 640 gpd

METHOD B: ESTIMATE AFTER SITE FLOODING using MW-002 & MW-003 average daily decline in water level from 12/14 → 12/21/86 (data from STEVEN'S RECORDERS)

DATE	-	ESTIMATED DISCHARGE
12/14/85	-	49,532 gpd
12/15	-	17,369
12/16	-	14,152
12/17	-	8,363
12/18	-	9,006
12/19	-	12,222
12/20	-	3,216

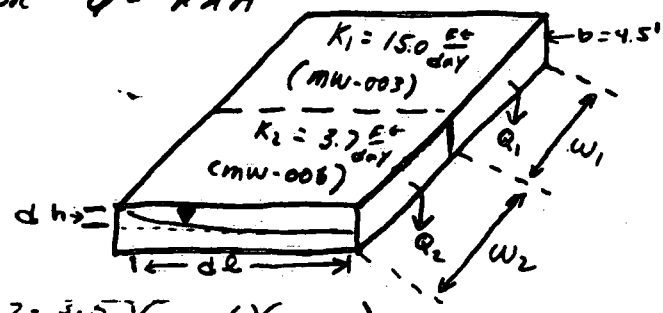
avg - 16,266 gpd

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: 8769.47	BY: R. NOWAK	PAGE 2 OF 3
SUBJECT: GW Discharge From Shallow Zone		CHECKED BY: SGC 4-24-86	DATE: 4/10/86

METHOD A – Divide site into appropriate discharge zones & determine appropriate factors for $Q = KiA$

$Q = KiA$

$Q = K\left(\frac{dh}{dl}\right)(w)(b)$



12/6/86 -

$Q_1 = (15.0\ ft/day)\left(\frac{4.2-3.5}{130'}\right)(190')(4.5') = 69.1$ cfd

$Q_2 = (3.7\ ft/day)\left(\frac{3.6-2.88}{120}\right)(160)(4.5') = 16.0$ cfd

85.1 cfd = 636 gpd

12/19/86 - $Q_1 = (15.0\ ft/day)\left(\frac{4.0-3.2}{130'}\right)(200')(4.5') = 83.1$ cfd

$Q_2 = (3.7\ ft/day)\left(\frac{3.2-2.75}{120}\right)(120)(4.5') = 10.6$ cfd

93.7 cfd = 701 gpd

12/26/86 $Q_1 = (15.0\ ft/day)\left(\frac{3.4-2.9}{100}\right)(200')(4.5') = 67.5$ cfd

$Q_2 = (3.7\ ft/day)\left(\frac{2.8-2.43}{120}\right)(190)(4.5) = 9.8$ cfd

77.3 cfd = 578 gpd

1/2/86 $Q_1 = (15.0)\left(\frac{3.2-2.8}{80}\right)(260)(4.5) = 87.8$ cfd

$Q_2 = (3.7)\left(\frac{2.6-2.38}{120}\right)(120)(4.5) = 3.7$ cfd

91.5 cfd = 684 gpd

1/9/86 $Q_1 = (15.0)\left(\frac{3.6-2.8}{110}\right)(220)(4.5) = 108$ cfd

$Q_2 = (3.7)\left(\frac{2.63-2.31}{120}\right)(90)(4.5) = 4.0$ cfd

112 cfd = 838 gpd

1/15/86 $Q_1 = (15)\left(\frac{3.2-2.8}{120}\right)(210)(4.5) = 47.3$

$Q_2 = (3.7)\left(\frac{2.6-2.28}{120}\right)(110)(4.5) = 4.9$

522 = 390 gpd

AVE = (636 + 701 + 578 + 684 + 838 + 390)/6

= 638 ≈ 640 gpd

NUS CORPORATION AND SUBSIDIARIES — **STANDARD CALCULATION SHEET**

CLIENT: USEPA	FILE NO.: 1769.47	BY: R. NOWAK	PAGE 3 OF 3
SUBJECT: GW Discharge from shallow zone		CHECKED BY: SJC 4-24-86	DATE: 4/10/86

METHOD B: Using decline in water levels of MW-002 & MW-003, averaging, applying over site, and computing volumetric water loss

DATE	MW-002 water level[1]	MW-002 difference	MW-003 water level[1]	MW-003 difference	avg. diff.	Q (gpd)[2]
12/14	5.05		4.85			
		0.44		0.33	0.385	49,532
12/15	4.61		4.52			
		0.15		0.12	0.135	17,369
12/16	4.46		4.40			
		0.11		0.11	0.110	14,152
12/17	4.35		4.29			
		0.08		0.05	0.065	8,363
12/18	4.27		4.24			
		0.06		0.08	0.070	9,006
12/19	4.21		4.16			
		0.12		0.07	0.095	12,222
12/20	4.09		4.09			
		0.01		0.04	0.025	3,216
12/21	4.08		4.05			
				TOTAL –	0.885	113,860
					AVERAGE –	16,266

1 – water levels read off of Recorder charts @ 0000 each day

2 – Q = site area × avg. water level decline × effective porosity × 7.48 gal/ft³

= 86,000 ft² × ? × 0.20 × 7.48 gal/ft³

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: S769 (Chem Control)	BY: RJH	PAGE 1 OF 2
SUBJECT: Total Hardness - Elizabeth River		CHECKED BY: AEL	DATE: 4-9-86

Relevant Equation

Total Hardness (TH) (ppm) = $([Ca]_{ppm} \times 0.0499 + [Mg]_{ppm} \times 0.0822) \times 50.04$

For the chemical control site average values of Ca and Mg were determined for 9 surface water samples from the Eliz. River.

$$\bar{Ca} = \frac{129 + 139 + 133 + 159 + 155 + 157 + 133 + 156 + 155}{9}$$

$$= 146.2 \text{ ppm}$$

$$\bar{Mg} = \frac{381 + 425 + 395 + 484 + 471 + 480 + 403 + 478 + 473}{9}$$

$$= 443.3 \text{ ppm}$$

Thus:

$$TH = [(146.2)(0.0499) + (443.3)(0.0822)](50.04)$$

$$TH = 2188.5 \approx 2{,}200 \text{ ppm} = 2{,}200 \text{ mg/l}$$

The AWQC (ambient water quality criteria) may be calculated for nickle (Ni) as:

$$AWQC_{Ni,\,acute} = \exp[0.76 \ln[2{,}200] + 4.02]$$

$$AWQC_{Ni} = 19{,}300 \ \mu g/l \quad \text{(Freshwater Fish)}$$

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: 5769 (Chem Control)	BY: RJH	PAGE 2 OF 2
SUBJECT: Total Hardness - Elizabeth River		CHECKED BY: AEL	DATE: 4-9-86

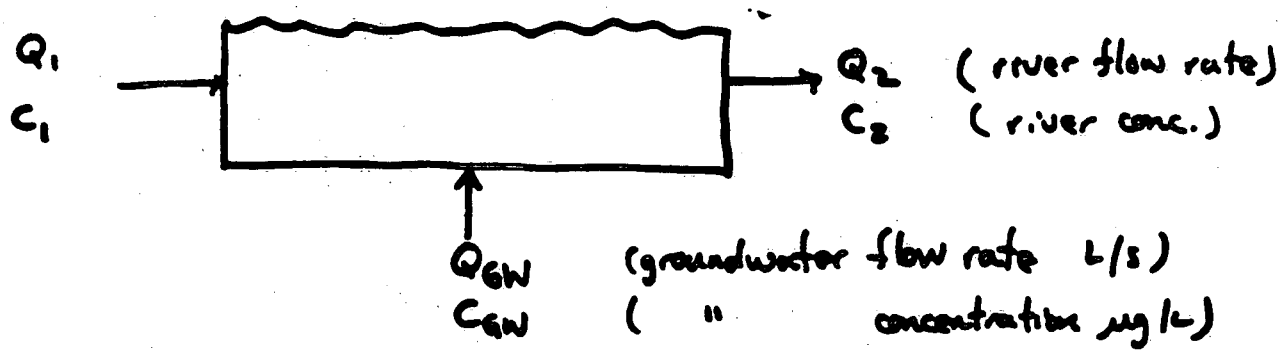
The AWQC for lead (Pb) is similarly calculated:

$$AWQC_{Pb,\,acute} = \exp[\,1.22 \ln(2{,}200) + (-0.47)\,]$$

$$= 7475 \ \cancel{mg}\ \mu g/l \approx 7{,}500\ \mu g/l$$

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA 2	FILE NO.: 5769	BY: RJH	PAGE 1 OF 5
SUBJECT: GROUNDWATER IMPACT - ELIZ. RIVER.		CHECKED BY: AEL	DATE: 4-23-86

Mass Balance



in-out = accumulation = 0 (Steady-state)

Assumptions: (stream is well-mixed.)

- $Q_1 = Q_2$ (Q_{GW} negligible) Q in Liters/sec
- $C_1 = 0$ (no contaminants upstream of site)
- C_{GW} = maximum groundwater contaminant concentration for each chemical detected during the RI. (µg/L)

mass of contaminant in = $Q_{GW} \cdot C_{GW}$

mass of contaminant out = $Q_2 \cdot C_2$

$$Q_{GW} \cdot C_{GW} = Q_2 \cdot C_2 \qquad C_2 = \frac{Q_{GW} \cdot C_{GW}}{Q_2}$$

The USGS in Trenton reports a Q_{7-10} of 1.9 cfs for the Elizabeth River at Elizabeth.

$$Q_{7-10} = \frac{1.9\ ft^3}{s} \left| \frac{28.32\ liters}{ft^3} \right. = 53.81\ liters/s$$

Daily discharges:

Estimated base flow from hydrogeologic investigation:

$Q_{GW} = 640$ gal/day

$$= \frac{640\ gal}{day} \left| \frac{1\ day}{24\ hrs} \right| \frac{1\ hr}{3600\ s} \left| \frac{3.785\ liters}{gal} \right. = 0.03\ \frac{liters}{s}$$

Maximum daily discharge after inundation:

$Q_{GW} = 48{,}246$ gal/day

$$= \frac{48{,}246\ gal}{day} \left| \frac{1\ day}{24\ hrs} \right| \frac{1\ hr}{3600\ s} \left| \frac{3.785\ liters}{gal} \right. = \frac{2.1\ liters}{s}$$

The relevant forms of the mass balance are thus:

normal base flow discharge:

$$1)\quad C_2 = \frac{Q_{GW}}{Q_2} C_{GW} = \frac{0.03}{53.81} C_{GW} = 5.58 \times 10^{-4} C_{GW}$$

maximum observed discharge:

$$2)\quad C_2 = \frac{Q_{GW}}{Q_2} C_{GW} = \frac{2.1}{53.81} C_{GW} = 3.9 \times 10^{-2} C_{GW}$$

An example is as follows:

benzene: maximum observed groundwater concentration:

36 µg/L

base flow: $C_2 = 5.58 \times 10^{-4} \cdot 36 \mu g/L = 2.0 \times 10^{-2} \mu g/L$

maximum: $C_2 = 3.9 \times 10^{-2}\ 36 \mu g/L = 1.4\ \mu g/L$

Similarly, the table presented on page 4 may be generated. All groundwater contaminants detected above 5 µg/L are included.

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA 2	FILE NO.: 3769	BY: RJH	PAGE 4 OF 5
SUBJECT: GROUNDWATER IMPACT - ELIZAB. RIV.		CHECKED BY: AEL	DATE: 4-23-86

GW CONTAMINANT	MAXIMUM CONC (µg/L)	DOWNSTREAM CONCENTRATION (µg/L) Base Flow	Maximum Discharge
acetone	280	1.6×10^{-1}	1.1×10^{1}
2-butanone	13	7.3×10^{-3}	5.1×10^{-1}
4-methyl-2-pentanone	170	9.4×10^{-2}	6.63
benzene	36	2.0×10^{-2}	1.4
toluene	120	6.7×10^{-2}	4.7
ethylbenzene	54	3.0×10^{-2}	2.1
total xylenes	90	5.0×10^{-2}	3.5
styrene	20	1.1×10^{-2}	0.8
chlorobenzene	5	2.8×10^{-3}	0.2
1,1-dichloroethane	13	7.3×10^{-3}	0.5
1,2-dichloroethane	47	2.6×10^{-2}	1.8
tetrachloroethene	64	3.6×10^{-2}	2.5
trichloroethene	110	6.1×10^{-2}	4.3
1,2-dichloroethene	620	3.5×10^{-1}	24
vinyl chloride	190	1.1×10^{-1}	7.4
chloroform	42	2.3×10^{-2}	1.6
methylene chloride	85	4.7×10^{-2}	3.3
bis(2-ethylhexyl) phthalate	100	5.6×10^{-2}	3.9
di-n-butyl phthalate	23	1.3×10^{-2}	0.9
1,2-dichlorobenzene	18	1.0×10^{-2}	0.7

Even this extremely conservative treatment indicates that only low levels of chemicals will be present. Note that this treatment is conservative in the following ways:

- the average daily flow rate for the eliz riv. is 24 cfs, which is much greater than 1.9 cfs.
- if groundwater discharges as rapidly after inundation as is evident, equilibration between the soil and groundwater will not occur.

- If conditions are such that the site is flooded, the flow rate of the river will be much greater than 1.9 cfs.
- The treatment assumes that groundwater contaminant concentrations are continuous across the site. The data indicate that only point sources are present.
- The treatment does not account for attenuation by either the soil or sediment matrix.
- The treatment does not account for volatilization from the river.

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA II	FILE NO.: 8769	BY: AEL	PAGE 1 OF 2
SUBJECT: Dermal Contact with River Sediments		CHECKED BY: RJH	DATE: 4/21/86

Problem: What is risk associated with dermal contact with river sediments?

Assumptions:
- People will swim an average of 7 days/yr (McLaughlin, 1984) for 10 years (ages 10 to 20)
- Body surface area of 15-year-old child is 14000 cm^2; sediment contact area ≈ 10%, or 1400 cm^2
- 2.77 mg of sediment can adhere to 1 cm^2 of skin (McLaughlin, 1984)
- 10% of pesticides/PAHs is absorbed; 100% of volatiles
- 15-year-old child weighs 40 kg
- Life expectancy is 70 yr

The following contaminants were detected in sediments:

contaminant	max conc (µg/kg)	avg conc (µg/kg)	potency factor
benzene	43	7	2.9×10^{-2} kg-day/m
chloroform	7.3	1	7×10^{-2}
methylene chloride	60	8	6.3×10^{-4}
tetrachloroethene (PCE)	15	1	6.0×10^{-2}
trichloroethene (TCE)	15	1	1.2×10^{-2}
DDT/metabolites	1052	250	0.34
total PAHs	130,000	28,500	11.5 (benzo(a)pyre

Solution: Risk is calculated as follows:

$$\text{Risk} = \frac{(\text{PF})(\text{sed. conc.})(\text{skin sfc. area})(\text{adhesion})(\text{exposure})(\text{absorption})}{(\text{body weight})(\text{lifetime})}$$

$$\text{Risk(max benz.)} = \frac{\frac{2.9\times10^{-2}\ \text{kg-day}}{\text{mg}} \cdot \frac{43\ \mu\text{g}}{\text{kg}} \cdot \frac{1400\ \text{cm}^2}{\text{event}} \cdot \frac{7\ \text{event}}{\text{yr}} \cdot 10\ \text{yr} \cdot \frac{2.77\ \text{mg}}{\text{cm}^2} \cdot 1.0 \cdot \frac{\text{kg}}{10^9\ \mu\text{g}}}{40\ \text{kg} \cdot 70\ \text{yr} \cdot \frac{365\ \text{day}}{\text{yr}}} = 3.2\times10^{-10}$$

NUS CORPORATION AND SUBSIDIARIES — **STANDARD CALCULATION SHEET**

CLIENT: USEPA II	FILE NO.: $769	BY: AEL	PAGE 2 OF 2
SUBJECT:		CHECKED BY: RJH	DATE: 4/21/86

Contaminant	Max. Risk	Avg. Risk
benzene	3.2×10^{-10}	5.5×10^{-11}
chloroform	1.4×10^{-10}	1.8×10^{-11}
methylene chloride	1.0×10^{-11}	1.4×10^{-12}
PCE	2.4×10^{-10}	1.6×10^{-11}
TCE	4.8×10^{-11}	3.2×10^{-12}
DDT	9.5×10^{-9}	2.2×10^{-9}
PAHs	4.0×10^{-5}	8.7×10^{-6}
Total:	4.0×10^{-5}	8.7×10^{-6}

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA II	FILE NO.: 5769	BY: AEL	PAGE 1 OF 1
SUBJECT: Dermal Contact with Surface Water		CHECKED BY: RJH	DATE: 4/21/86

Problem: What is risk associated with dermal contact with river water?

Assumptions:
- People will boat/fish/ski on an average of 7 days/yr (McLaughlin, 1984) for 40 yrs, for 2.6 hr/day.
- Body surface area for an adult is 17,400 cm^2
- Water flux through skin is 0.5 mg/cm^2-hr (McLaughlin, 1984)
- An adult weighs 70 kg
- Life expectancy is 70 yr
- 100% of dissolved contaminant is absorbed thru the skin.

PCE was detected in 1 surf. water sample @ 1.8 µg/l, ∴ avg = 0.2 µg/l

Solution: Risk is calculated as follows:

$$\text{Risk} = \frac{(\text{PF})(\text{water conc.})(\text{body sfc. area})(\text{water flux})(\text{exposure})(\text{absorption})}{(\text{body weight})(\text{lifetime})}$$

where potency factor (PF) = 6.0×10^{-2} kg-day/mg for PCE

$$\text{Risk (max PCE)} = \frac{\frac{6.0\times10^{-2}\,kg\text{-}day}{mg} \cdot \frac{1.8\,\mu g}{l} \cdot \frac{17400\,cm^2}{} \cdot \frac{0.5\,mg}{cm^2\text{-}hr} \cdot \frac{18.2\,hr}{yr} \cdot \frac{40\,yr}{} \cdot \frac{1.0}{} \cdot \frac{l}{10^3\,cm^3} \cdot \frac{cm^3}{mg} \cdot \frac{mg}{10^3\,\mu g}}{70\,kg \cdot 70\,yr \cdot \frac{365\,day}{yr}}$$

Risk (max PCE) = 3.8×10^{-7}

Similarly, Risk (avg PCE) = 4.2×10^{-8}

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA II	FILE NO.: $769	BY: AEL	PAGE 1 OF 1
SUBJECT: Accidental Ingestion of River Water		CHECKED BY: RJH	DATE: 4/22/86

Problem: What is risk associated with accidental ingestion of river water?

Assumptions:
- People will boat/fish/ski an average of 7 day/yr (McLaughlin, 1984) for 40 yr
- 0.2 l of water will be swallowed each time
- An adult weighs 70 kg
- Life expectancy is 70 kg
- 100% of a swallowed contaminant is absorbed

The following contaminants were detected in surface water samples:

tetrachloroethene (PCE)	1.8 μg/l - max	0.2 μg/l - avg.
arsenic (As)	25	14
chromium (Cr)	155	17

Solution: Risk is determined as follows:

Risk = (PF)(water conc.)(ingestion rate)(exposure)(absorption) / (body wt.)(lifetime)

where (PF) potency factor =

PCE	6.0×10^{-2} kg-day/mg
As	15
Cr	41

$$\text{Risk (max PCE)} = \frac{\frac{6.0\times10^{-2}\,\text{kg-day}}{\text{mg}} \cdot \frac{1.8\,\mu\text{g}}{\text{l}} \cdot \frac{0.2\,\text{l}}{\text{day}} \cdot \frac{7\,\text{day}}{\text{yr}} \cdot \frac{40\,\text{yr}}{} \cdot \frac{1.0}{} \cdot \frac{\text{mg}}{10^3\,\mu\text{g}}}{70\,\text{kg} \cdot 70\,\text{yr} \cdot \frac{365\,\text{day}}{\text{yr}}} = 3.4\times10^{-9}$$

Similarly,

contaminant	Max Risk	Avg Risk
PCE	3.4×10^{-9}	3.8×10^{-10}
As	1.2×10^{-5}	6.6×10^{-6}
Cr	2.0×10^{-4}	2.2×10^{-5}

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA II	FILE NO.: $769	BY: AEL	PAGE 1 OF 1
SUBJECT: Dermal Contact with Seep		CHECKED BY: RJH	DATE: 4/21/86

Problem: What is risk associated with dermal contact with the seep?

Assumptions:
- People will come into contact w/ the seep for ~ 3 hr/lifetime
- 10% of body surface area will be exposed (feet & lower legs), ∴ $0.10 \times 14000\ cm^2 = 1400\ cm^2$
- Contact will only occur between the ages of 10 and 20
- A 15-year-old child weighs 40 kg
- Life expectancy is 70 yr
- 100% of a dissolved contaminant is absorbed thru the skin.
- Water flux thru skin is 0.5 mg/cm²-hr (McLaughlin, 1984)

The following contaminants were detected in the seep:
- trichloroethene (TCE) 300 µg/l
- vinyl chloride 600 µg/l

Solution: Risk is calculated as follows:

$$\text{Risk} = \frac{(PF)(\text{water conc.})(\text{body sfc. area})(\text{water flux})(\text{exposure})(\text{absorption})}{(\text{body weight})(\text{lifetime})}$$

where potency factor (PF) = 1.2×10^{-2} kg-day/mg - TCE
1.75×10^{-2} kg-day/mg - vinyl chloride

$$\text{Risk (TCE)} = \frac{\frac{1.2\times10^{-2}\ kg\text{-}day}{mg} \cdot \frac{300\ \mu g}{l} \cdot \frac{1400\ cm^2}{} \cdot \frac{0.5\ mg}{cm^2\text{-}hr} \cdot \frac{3\ hr}{} \cdot \frac{1.0}{} \cdot \frac{l}{10^3\ cm^3} \cdot \frac{1\ cm^3}{1\ mg} \cdot \frac{mg}{10^3\ \mu g}}{\frac{70\ yr}{} \cdot \frac{365\ day}{yr} \cdot \frac{40\ kg}{}}$$

Risk (TCE) = 7.4×10^{-10}

Similarly, Risk (V.C.) = 2.2×10^{-8}

APPENDIX C

BOREHOLE GEOLOGY AND MONITORING WELL CONSTRUCTION SHEETS

NUS CORPORATION
A Halliburton Company

PROJECT CHEMICAL CONTROL
PROJECT NO. 1769.47 BORING CC-MW-001
ELEVATION DATE 11/13/85 → 11/15/85
FIELD GEOLOGIST R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
1.0						COARSE GRAVEL FILL		
								WATER @ 2'
3.0			3.0'					
S-1	15 21	1.3/		DENSE	BLACK	SILTY SAND FILL; wood + brick chips	SM	1 ppm Head Sp
5.0	18 13	2.0				TRACES OF SLAG		
S-2	90	0.4/0.5			BLACK	SILTY SAND, some GRAVEL. REFUSED PENETRATION		
6.0								Difficult DRILLING
S-3	3 7	1.0/		MEDIUM	BLACK	SILTY SAND FILL w/ GRAVEL	SM	50 ppm Head Sp
	4 5	2.0	7.5		BROWN	CLAYEY SILT, FREQUENT CHIPS, TR SAND	ML/CL	METHANE ODOR
10.0		1.4/		very soft	DARK BROWN	SILTY CLAY, FREQUENT LIGHT-BROWN	CL	
S-4	2 1	2.0				ROOTS, MORE CLAY THAN ABOVE		2 ppm Head Sp
12.0	1 1		SILTY CLAY					
15.0			15.0					
S-5	5 2	1.4/		SOFT	BROWN-RED-BRN	CLAYEY SILT, TRACE SAND, some	ML	1 ppm
17.0	1 2	2.0				ORGANICS, MOIST, some SAND AT		
						BOTTOM (INITIAL 8.0 on HNU)		
			19.0			MAXIMUM SIZE 1/2"		
20.0			SANDY SILT		GREY	GREY SANDY SILT, SOME [redacted]	ML	
S-6	5 5	1.0/				ROCK FRAGMENTS (GLACIAL), Rounded		0 ppm
22.0	10 5	2.0	21.5			ROCK FRAGMENTS, MOIST		
					RED BROWN	SILTY SAND, SOME Rounded ROCK	SM	
			SILTY SAND			FRAGMENTS, MAX SIZE 3/4", MOIST		
25.0			25.0			(GLACIAL)		

REMARKS 0-10' on 11/13/85 ; 10'-31.5' on 11/15/85

BORING MW-001

*SEE LEGEND ON BACK

NUS CORPORATION
A Halliburton Company

PROJECT Chemical Control
PROJECT NO. 8769.47 BORING MW-001
ELEVATION DATE 11/13/85 - 11/15/85
FIELD GEOLOGIST R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
25.0								
-7 (2 ATTEMPTS)	13 14 15 20	0.8/2.0	SANDY SILT	DENSE	Brown-Red	SANDY SILT, SOME ROCK	ML	0 ppm
27.0						FRAGMENTS AND GRAVEL.		
						MOIST (GLACIAL TILL)		
			30.0					
30.0								
-8	50 100/(illegible) 100/2"			V. DENSE	RED Brown	SANDY SILTSTONE AND SANDY SILT	V.BR.	
32						(WEATHERED BEDROCK?) BY FRAGS		
						AUGER REFUSAL @ 31.5' - DIFFICULT		
						drilling 30-31.5'		
			BEDROCK (PENNSWICK Fm.)					

REMARKS ROLLER-BIT INSIDE AUGERS 30-31.0 - HARD DRILLING
TRY 1 SPOON FROM 31.0 - 100 blows/5" - BOTTOM OF HOLE @ 31.5' BORING MW-001

*SEE LEGEND ON BACK

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 1769.47 BORING: MW-002
ELEVATION: DATE: 11/19/85
FIELD GEOLOGIST: R NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						FEW GRAVEL FILL - COARSE GRAVEL	GP	WATER @ 1'
			MOV'D FILL			AUGER REFUSAL @ 1.5' - MOVE AUG 2'		
			3.0					
S-1	5 5	1.0/2.0	4.2	M DENSE	BLACK	SILTY SAND FILL LITTLE GRAVEL	SM	WET (30ppm)
5.0	12 16		4.5 5.0			BRICK FRAGMENTS		
S-2	30 10	1.3/2.0		M. STIFF	RED	CLAYEY SILT SOME GRAVEL ROUNDED	ML	MOIST (200ppm)
7.0	12 1		7.0	SOFT	GREEN	GRAVEL FRAGMENTS (SOME GYPSUM)	VERY BROKEN	MOIST
S-3	1 29	1.9/2.0		M DENSE	BLACK-RED	SILTY SAND FILL SOME GRAVEL AT	SM	WET (700)
9.0	8 1		8.8			BOTTOM RED CLAYEY FILL 0.4'		
	16 9	0.3/2.0	9.0	LOOSE	BLACK RED	SILTY SAND FILL SOME BRICK FRAGMENTS	SM	WET
11.0	2 1					MEDIUM SAND		
S-4				SOFT	GRAY-BROWN	CLAYEY SILT SOME ROOT FRAGMENTS	ML	MOIST
				V. SOFT	BLACK-GRAY	SILTY CLAY FEW ROOT STEMS	CL	MOIST
						BOTTOM OF AUGERS @ 9.5'		

REMARKS: ROLLER BIT INSIDE OF AUGERS FROM 3.5'
ppm ENV READINGS ARE HEAD SPACE AFTER ~ 1hr
4 attempts @ S-4 2 pounding, then 2 drive w/rig - very SOFT

BORING: MW-002

*SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: Chemical Control
PROJECT NO.: 1769.47 BORING: MW-003
ELEVATION: DATE: 11/20/85
FIELD GEOLOGIST: R. Nowak

SAMPLE NO. TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						COARSE GRAVEL FILL	GP	
4.0			4.0					
S-1	3 3	1.0/2.0		M. DENSE	BLACK	SILTY SAND FILL, SOME GRAVEL	SM	WET
6.0	12 3		6.0			& wood chips		170 PPM
*	4 5	0/						
8.0	2 2	12.0						
S-2 9.0	2 2 6 SPOON	1.0/1.0	SILTY CLAY	V. SOFT	GRAY-BLACK	SILTY CLAY, SOME LIGHT BROWN	CL	MOIST
						ROOTS		100 PPM
						Bottom of Auger @ 7.5'		
						-3 ATTEMPTS @ 6'-8' (2 Pushes,		
						SPT [illegible])		
						- Auger to 7.5' + push		
						drive open to 9'		

REMARKS: * 3 ATTEMPTS, NO RECOVERY

BORING: MW-003

*SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.47 BORING: MW-004
ELEVATION: DATE: 11/20/85
FIELD GEOLOGIST: R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
			"NEW" GRAVEL			COARSE GRAVEL FILL	GP	
								water @ 2.5' - 4.0'
3.0			3.0					
S-1	↑ Pushed SPOON ↓	0.2/ 2.0	SILTY SAND FILL	LOOSE	BLACK	SILTY FINE SAND, TRACE GRAVEL	SM	WET
5.0						+ trace rubble		
S-2	2 2	0.3/ 2.0						
7.0			6.5					
S-3	↑ Pushed SPOON ↓	1.2/ 2.0	CLAYEY SILT	V. SOFT	Brown/ Gray-Brown	CLAYEY SILT WITH FREQUENT SMALL ROOTS	ML	MOIST 5 ppm
9.0								
						BOTTOM OF AUGERS @ 7'		
						Pushed SPOON 7-9'		

REMARKS

BORING MW-004

*SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 3769.47 BORING: MW-005
ELEVATION: DATE: 11/21/85
FIELD GEOLOGIST: R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
			"NEW" FILL			COARSE GRAVEL FILL	GP	
3.0			3.0					
S-1	6	0.2/	BUILDING RUBBLE & GRAVEL					
5.0	4 3	/2.0		LOOSE	BLACK	SANDY GRAVEL & BUILDING	GW	WET
S-2	2 5 3	0.5/	6.0			RUBBLE WITH WOOD		
7.0	4 2	/2.0	STIFF SANDY SILT	STIFF	RED	SANDY SILT, TRACE medium	ML	MOIST
S-3	↑ PUSHED SPOON ↓	0.2/		↓	↓	GRAVEL	↓	
7.0		/2.0						MOIST
S-4	2 3	0.5/		STIFF	RED	SANDY SILT, TRACE GRAVEL,	ML	MOIST
11.0	4 9	/2.0				FEW BRICK FRAGMENTS		
S-5	24 3	1.6/	12.0	↓	↓	↓	↓	
13.0	1 2	/2.0	CLAYEY SILT	SOFT	GRAY-BROWN	CLAYEY SILT, FREQUENT FINE	ML	MOIST
						ROOT FRAGMENTS		0 PPM
						BOTTOM OF AUGERS @ 11'		
						SPT FROM 11-13'		

REMARKS: MOVED HOLE TWICE. FIRST TWO ATTEMPTS HIT Building RUBBLE. BORING: MW-005

*SEE LEGEND ON BACK

2 ATTEMPTS @ S-1

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.47 BORING: MW-006
ELEVATION: DATE: 11/21/85
FIELD GEOLOGIST: R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
			"NEW" FILL			COARSE GRAVEL FILL	GP	
								2.5' DT. W. HAND
3.0			3.0					
S-1	3 30	0.5/2.0	SILTY SAND & GRAVEL FILL	LOOSE	BLACK	SILTY SAND & GRAVEL FILL, WOOD	SM	WET
5.0	7 5					CHIPS		
S-2	3 5	1.6/2.0		M. DENSE	BLACK & LT. GRY	SILTY SAND & GRAVEL FILL WOOD	SM	WET (LOOSE)
7.0	3 15					CHIPS WHERE BLACK, WEATHERED FELDSPARS		
8.0	7 4	0/2.0	8.0			AND LIGHT GREY FROM 5.8–6.2'		
S-3 9.0	1 2 / 1/2 2		9.1	SOFT	GRY-BROWN	CLAYEY SILT WITH FREQUENT LIGHT	ML	MOIST (0 SPM)
10.0	1/2 2	2.0/2.0				BROWN ROOTS (BEACH GRASS?)		
				SOFT	GREY-BEACH	SILTY CLAY WITH SOME LIGHT	CL	MOIST
						BROWN ROOTS, GRADES FROM ABOVE		
						BOTTOM OF AUGERS @ 8'		
						SPT S-3 FROM 8-10'		

REMARKS: * 30 counts on S-1 was wood chip
* No Recovery on SPT 7-9' FIRST ATTEMPT (S-3) → AUGER TO 8'
and run SPT 8-10'

BORING: MW-006

*SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO. 5769.47 BORING MW-207
ELEVATION DATE 1/23/85
FIELD GEOLOGIST R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
			"NEW" GRAVEL FILL 3.0		GREY	COARSE GRAVEL FILL	GP	
0								
S-1	5 4	1.1/2.0	SILTY SAND & GRAVEL FILL 3.0	V. LOOSE	DK. BRN & BLACK	SILTY SAND & GRAVEL FILL, BRICK	SM	WET (3ppm)
5.0	2 1					FRAGMENTS & FELDSPAR CHIPS		
S-2	3	1.1/2.0		M. DENSE	BLACK	SILTY SAND & GRAVEL FILL	SM	WET
7.0	5 6							
10.0			CLAYEY SILT					
S-3	1/2 1/2	1.5/2.0		SOFT	GREY-BLACK	CLAYEY SILT WITH FEW LIGHT	ML	MOIST (0ppm)
12.0	2 1					BROWN ROOTS		
15.0			15.0					
S-4	1/2 1/2	1.5/2.0	15.5	SOFT	GRAY-BROWN	CLAYEY SILT WITH FREQUENT LIGHT	ML	MOIST (0ppm)
17.0	1 1					BROWN ROOTS (PEAT?)		
				SOFT	GREY-BLACK	CLAYEY SILT TO SILTY CLAY, NO	ML/CL	MOIST
						ROOTS		
20.0								
S-5	1 1	1.6/2.0	CLAYEY SILT	M. STIFF	DARK GREEN GREY	CLAYEY SILT, TRACE FINE SAND	ML	MOIST (0ppm)
22.0	1 2					FEW ROOTS		
25.0								

REMARKS

BORING MW-207

*SEE LEGEND ON BACK

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 3769.47 BORING: MW-007
ELEVATION: DATE: 11/23/85
FIELD GEOLOGIST: P. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
S-6	WOR WOR	1.6/2.0	CLAYEY SILT	M. STIFF	DK. GREEN-GREY	CLAY-Y SILT, TRACE FINE SAND, TRACE	ML	MOIST (0ppm
27.0	1 2					MICA. SOME INTERBEDDED RED-BROWN ROOTS		
	4		27.5 / 28.0					
S-7 29.0	23 25	1.2/2.0	GLACIAL TILL	M. DENSE	LIGHT GREY	SILTY FINE SAND, BROWN COARSE	SM	MOIST (0ppm
30.0	24					BOTTOM 0.2' FEW COBBLES (1/2")		
S-8	7 14	1.1/2.0		STIFF	RED	CLAYEY SILT, TRACE SAND, SOME SUB-ANGULAR	ML	SLIGHTLY MOIST
32.0	15 17					ROCK FRAGMENTS FEW COBBLES (~1")		(0ppm)
						(GLACIAL TILL)		
35.0						TRACE SAND		
S-9 37.0	27 15 25 30	1.0/2.0		STIFF	RED	CLAYEY SILT, SOME SUBANGULAR	ML	SLIGHTLY MOIST
						ROCK FRAGMENTS & COBBLES (~1")		TO DRY
						(GLACIAL TILL)		
40.0			40.0					
S-10	100/5"		BEDROCK (BRUNSWICK FM.)	SOFT	RED	WEATHERED RED SILTSTONE TO	V. BR	SLIGHTLY MOIST
						VERY FINE GRAINED SANDSTONE		TO DRY
						(WEATHERED BEDROCK)		
						BOTTOM OF AUGERS @ 40'		
						TRY ONE SPOON 40-40.4' - 100 BLOWS		

REMARKS: WOR = WEIGHT OF RODS ONLY PUSHED SPOON
DIFFICULT DRILLING FROM 32-37. VERY DIFFICULT FROM 37-40 BORING: 11

*SEE LEGEND ON BACK

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.42 BORING: MW-008
ELEVATION: DATE: 11/25/85
FIELD GEOLOGIST: R NOWAK

SAMPLE NO., TYPE & DEPTH(ft)	BLOWS/SIX INCHES OR RQD(%)	SAMPLE RECOVERY/ SAMPLE LENGTH(ft)	MATERIAL MOISTURE & WATER DEPTH(ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
1.0			1.0		GRY	COARSE GRAVEL FILL	GP	
3.0	9		FILL	LOOSE	BLACK	SANDY GRAVEL FILL, SOME SILT	GW	MOIST
S-1	7 5	0.8/2.0				WOOD CHIPS & CINDERS.		(0PPM)
5.0	2		5.0	SOFT	GRAY	SILTY FILL SOME SAND & GRAVEL	ML	WET
S-2	1 1	0.9/2.0	SOFT SILT TO SILTY SAND			COAL FRAGMENTS		
7.0	1 1		7.0	SOFT	RED-BROWN	SANDY SILT TO SILTY SAND	ML/SM	WET
	1/2 1/2	NO RECOVERY	CLAYEY SILT					
9.0	1 1							
S-3	1/2 1/2	2.0/2.0		V. SOFT	GREY-BROWN	CLAYEY SILT WITH FREQUENT	ML	MOIST
11.0	1 1		10.5			light brown roots some		(2 PPM)
						interbedded red-brown roots (PEAT?)		
				SOFT		SILTY CLAY WITH SOME LIGHT	CL	MOIST
						BROWN ROOTS		
						-BOTTOM OF AUGERS @ 9'		
						-FINAL SPOON FROM 9'-11'		

REMARKS: -MOVED CNC HOLE & THEN MOVED ~2' AWAY.
-ROLLER BIT & WASH INSIDE OF AUGERS BEFORE SETTING SCREEN

BORING: MW-008

*SEE LEGEND ON BACK

PAGE 1 OF

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO. 876947 . BORING MW-009
ELEVATION _____ DATE 11/25/85
FIELD GEOLOGIST R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						COARSE GRAVEL FILL	GP	
			"OLD" FILL					
3.0								
S-1	4 7	1.1/		M. DENSE	DK. BRN TO BLACK	SILTY FINE SAND, SOME GRAVEL	SM	WET-MOIST
5.0	5 6	2.0				BRICK FRAGMENTS, WOOD CHIPS		(60 PPM)
S-2	1 4	0.3/	"NEW" FILL	LOOSE	BLACK	SILTY GRAVEL, SOME SAND.	GM	WET
7.0	2 3	2.0				OIL IN WATER IN SAMPLE.		
S-3	4 5	0.4/		LOOSE	BLACK	SILTY SAND & GRAVEL, OIL IN SAMPLE	SM/GM	WET
9.0	4 6	2.0						
S-4	5 4	0.6/	10.0	LOOSE	BLACK	SILTY medium SAND, SOME GRAVEL, OILY	SM	WET (3 ppm
11.0	2 1	2.0	10.2	M. STIFF	DK GRAY BLACK	Clayey SILT with frequent light brown	ML	MOIST
						ROOTS		
				STIFF	RED-BROWN	SANDY SILT, SOME GRAVEL, DARK	ML	MOIST
						at top		
						BOTTOM OF AUGERS @ 9'		

REMARKS _____

BORING MW-009

*SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION
A Halliburton Company

PROJECT: CHEMICAL CONTROL
PROJECT NO. 5769.47 BORING: MW-010
ELEVATION: DATE: 11/27/1955
FIELD GEOLOGIST: R. NOWAK

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
			1.5'	STIFF	RED	GRAVELLY SILT with building rubble fragments (~1")	ML	[illegible]
2.0								
S-1	10 23 5 6	0.4/2.0	SILTY SAND FILL	M. DENSE	GREY-BLACK	SILTY SAND with some gravel (1")	SM	[illegible]
4.0						Wood chips brick fragments &		
S-2	5 5	0.5/2.0				BUILDING RUBBLE		
6.0								
		0/2.0						
8.0			9.0					
S-4		0.1/2.0		SOFT	GREY-BROWN	CLAYEY SILT w/ frequent root fragments	ML	LITTLE
11.0						(PEAT)		RECOVERY
						BOTTOM OF AUGERS @ 9'		
						TRY 1" SPOON 9-11'		
						- POOR SPOON RECOVERY entire hole		
						- GEOLOGY LOGGED FROM		
						CUTTINGS & SPT		

REMARKS: [illegible] = 527 from 3'-5' from auger cuttings (poor spoon recovery)

BORING: MW-010

*SEE LEGEND ON BACK

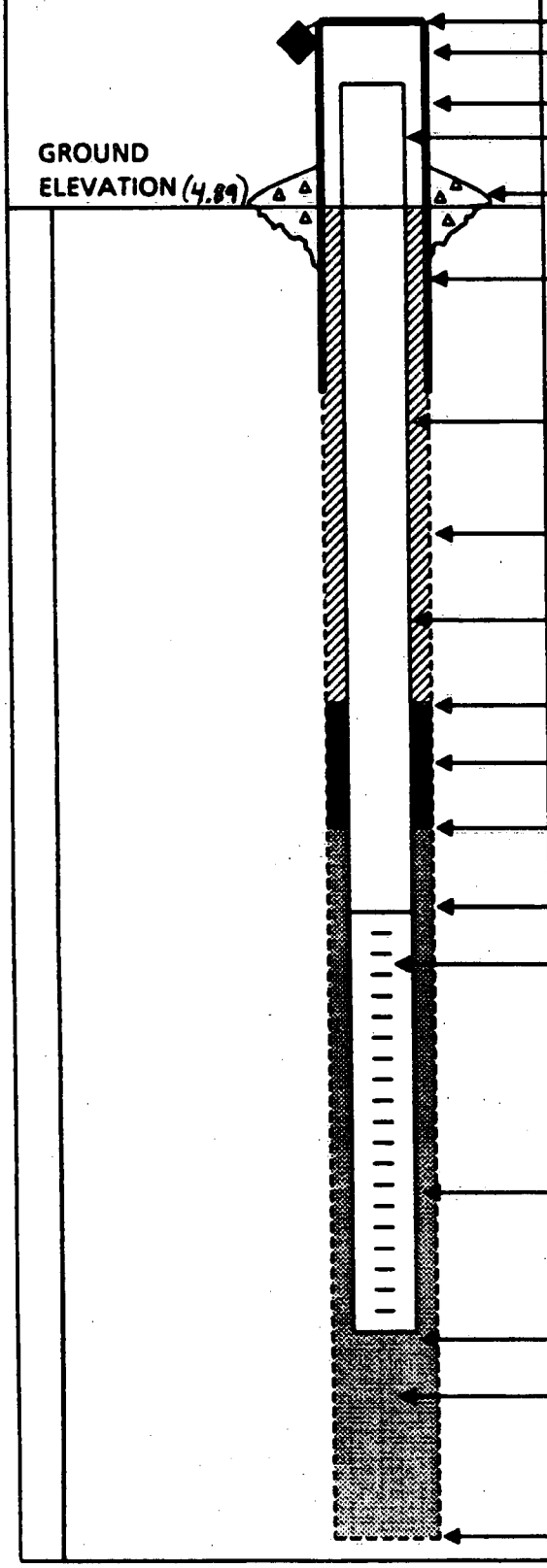
PAGE 1 OF 1

BORING NO.: MW-001

NUS CORPORATION
A Halliburton Company

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 1769.47
ELEVATION: (GROUND) 4.89'
FIELD GEOLOGIST: P. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-001
DATE: 11/13/85 - 11/16/85
DRILLER: CLIPPINGER
DRILLING METHOD: HOLLOW STEM AUGER
DEVELOPMENT METHOD: SURGE BLOCK & PUMP



ELEVATION OF TOP OF SURFACE CASING: 6.43
ELEVATION OF TOP OF RISER PIPE: 6.04
STICK - UP TOP OF SURFACE CASING: 1.54'
STICK - UP RISER PIPE: 1.15'
TYPE OF SURFACE SEAL: GROUT
I.D. OF SURFACE CASING: 6" (3.45' BG)
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: GROUT
ELEVATION / DEPTH TOP OF SEAL: (-8.11)/13'
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (-11.11)/16'
ELEVATION / DEPTH TOP OF SCREEN: (-14.71)/19.6'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT x 10'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-24.71)/29.6'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-26.61)/31.5'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-26.61)/31.5'

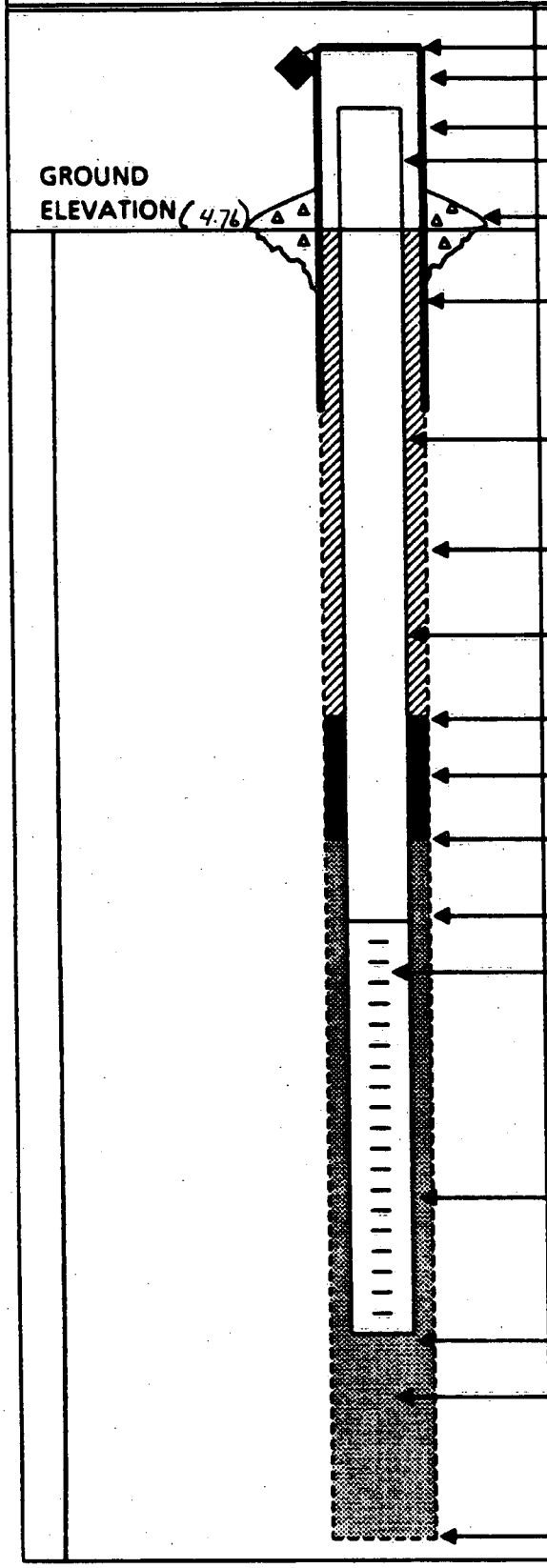
NUS CORPORATION
A Halliburton Company

BORING NO.: MW-002

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.47
ELEVATION (Ground): 4.76'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ.
BORING: MW-002
DATE: 11/19/1985

DRILLER: LIPPINCOTT
DRILLING METHOD: HOLLOW STEM AUGER
DEVELOPMENT METHOD: (SURGE BLOCK & PUMP)



ELEVATION OF TOP OF SURFACE CASING: 6.44
ELEVATION OF TOP OF RISER PIPE: 6.32
STICK - UP TOP OF SURFACE CASING: 1.68'
STICK - UP RISER PIPE: 1.56'
TYPE OF SURFACE SEAL: GROUT
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAP
ELEVATION / DEPTH TOP OF SEAL: GROUND
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (1.76)/3'
ELEVATION / DEPTH TOP OF SCREEN: (1.26)/3.5'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT x 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-3.74)/8.5'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-4.74)/9.5'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-4.74)/9.5'

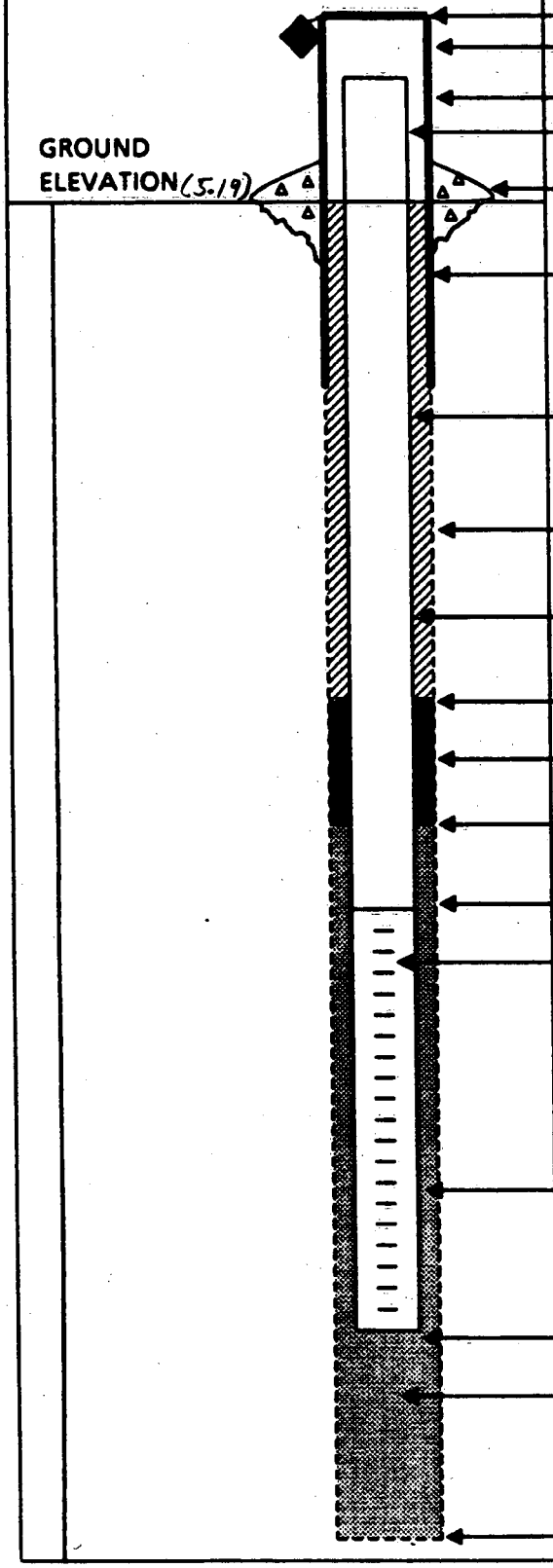
NUS CORPORATION
A Halliburton Company

BORING NO.: MW-003

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.47
ELEVATION (Ground) = 5.19
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-003
DATE: 11/20/1985

DRILLER: LIPPINCOTT
DRILLING METHOD: Hollow Stem Auger
DEVELOPMENT METHOD: (Surge Block & Pump)



ELEVATION OF TOP OF SURFACE CASING: 7.30
ELEVATION OF TOP OF RISER PIPE: 7.20
STICK - UP TOP OF SURFACE CASING: 2.11
STICK - UP RISER PIPE: 2.01
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: GROUND
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (3.89)/1.3'
ELEVATION / DEPTH TOP OF SCREEN: (3.69)/1.5'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT x 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-1.31)/6.5'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-2.31)/7.5'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-2.31)/7.5'

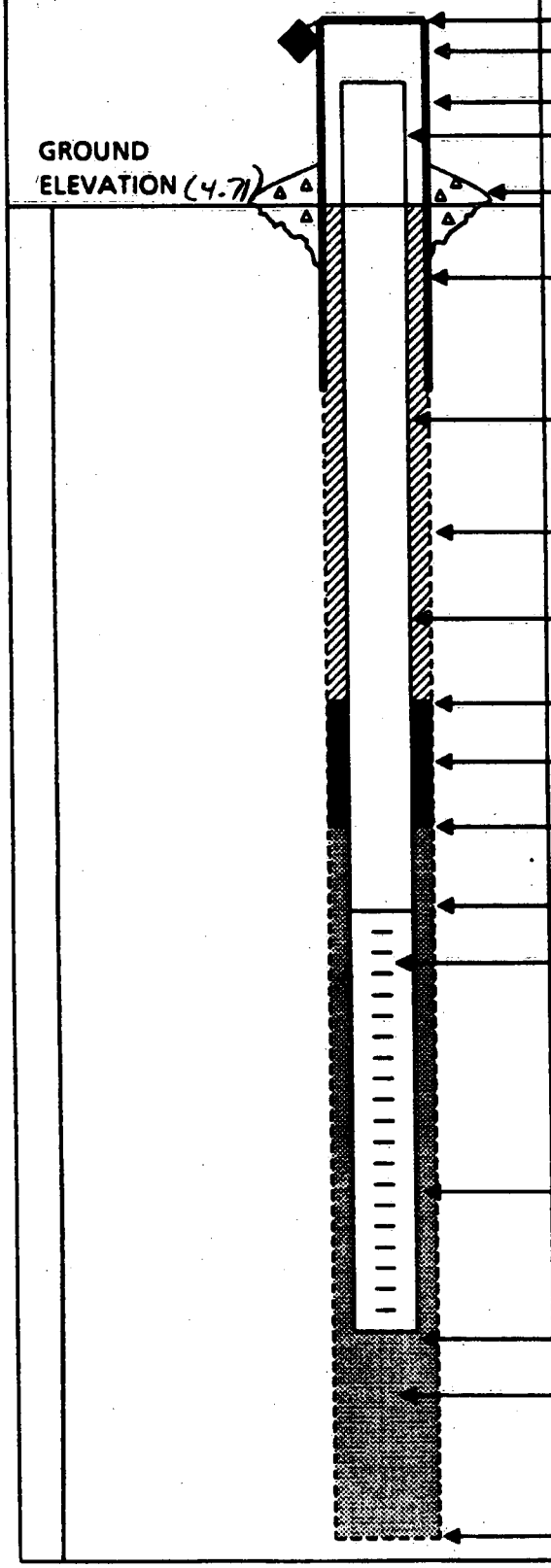
BORING NO.: MW-004

NUS CORPORATION
A Halliburton Company

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: S 269.42
ELEVATION: (Ground) = 4.71'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-004
DATE: 11/20/1985

DRILLER: LIPPINCOTT
DRILLING METHOD: Hollow Stem Auger
DEVELOPMENT METHOD: Surge Block & Pump



ELEVATION OF TOP OF SURFACE CASING: 5.95
ELEVATION OF TOP OF RISER PIPE: 5.46
STICK - UP TOP OF SURFACE CASING: 1.24
STICK - UP RISER PIPE: 0.75
TYPE OF SURFACE SEAL: Grout & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: GROUND
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (3.51)/1.2'
ELEVATION / DEPTH TOP OF SCREEN: (3.21)/1.5'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT X 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-1.79)/6.5'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-2.29)/7'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-2.29)/7'

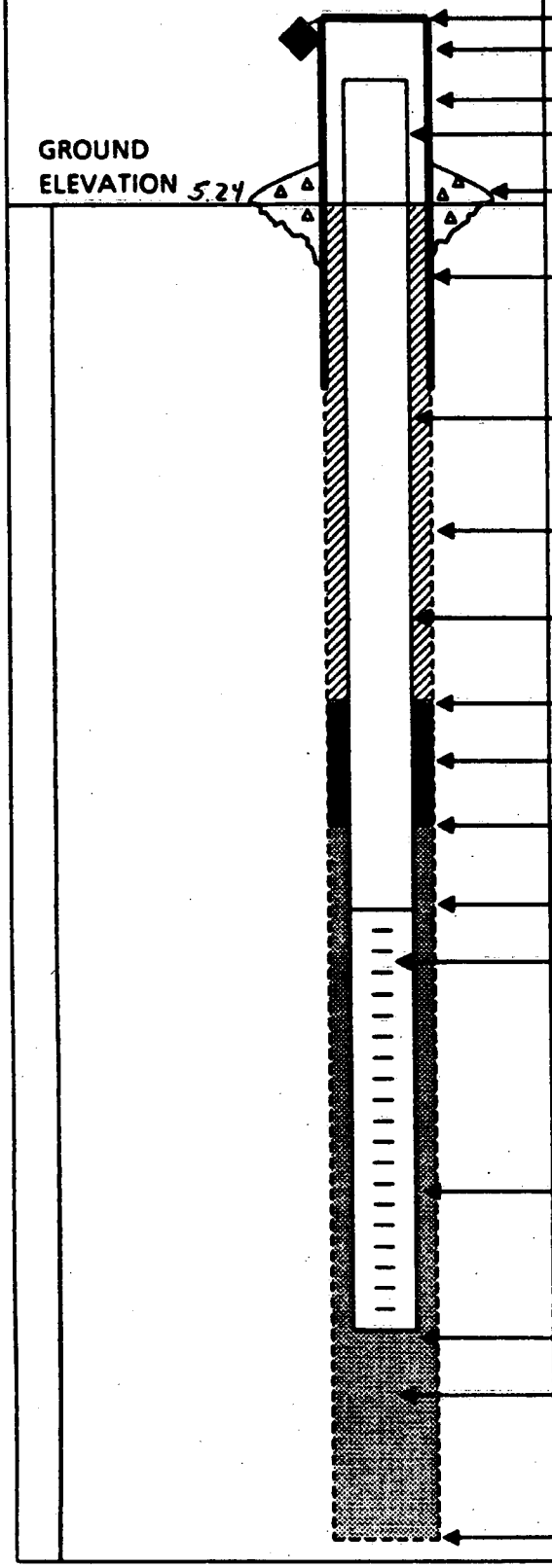
BORING NO.: MW-005

NUS CORPORATION
A Halliburton Company

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8769.47
ELEVATION: (Ground) = 5.24'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-005
DATE: 11/21/85

DRILLER: LIPPINCOTT
DRILLING METHOD: HOLLOW STEM AUGER
DEVELOPMENT METHOD: SURGE BLOCK & PUMP



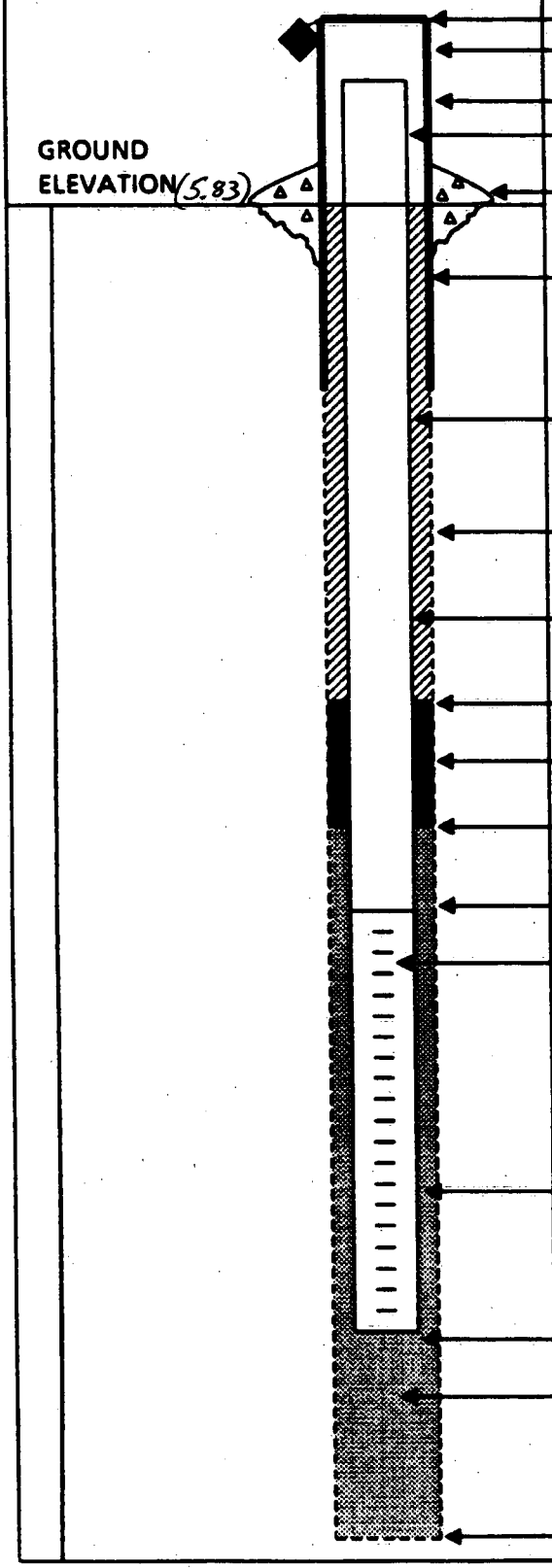
ELEVATION OF TOP OF SURFACE CASING: 6.58
ELEVATION OF TOP OF RISER PIPE: 6.36
STICK - UP TOP OF SURFACE CASING: 1.34'
STICK - UP RISER PIPE: 1.12'
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: GROUND
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (4.04)/1.2'
ELEVATION / DEPTH TOP OF SCREEN: (3.94)/1.3'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT x 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-1.06)/6.3'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-2.76)/8.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL: PELLONITE FROM 8.8'-8.0'
#0 SAND FROM 11.0 - 8.8'
ELEVATION / DEPTH OF HOLE: (AUGERS) (-5.76)/11.0

BORING NO.: MW-006

NUS CORPORATION
A Halliburton Company

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: S 769.47
ELEVATION (GROUND): 5.83'
FIELD GEOLOGIST: R NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-006
DATE: 11/21/85
DRILLER: LIPPINCOTT
DRILLING METHOD: Hollow Stem Auger
DEVELOPMENT METHOD: Surge Block & Pump



ELEVATION OF TOP OF SURFACE CASING: 6.48
ELEVATION OF TOP OF RISER PIPE: 5.87
STICK - UP TOP OF SURFACE CASING: 0.65
STICK - UP RISER PIPE: 0.04
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAP
ELEVATION / DEPTH TOP OF SEAL: GROUND
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (4.33)/1.5'
ELEVATION / DEPTH TOP OF SCREEN: (3.83)/2.0'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT X 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-1.17)/7.0'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-2.17)/8.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-2.17)/8.0'

BORING NO.: MW-007

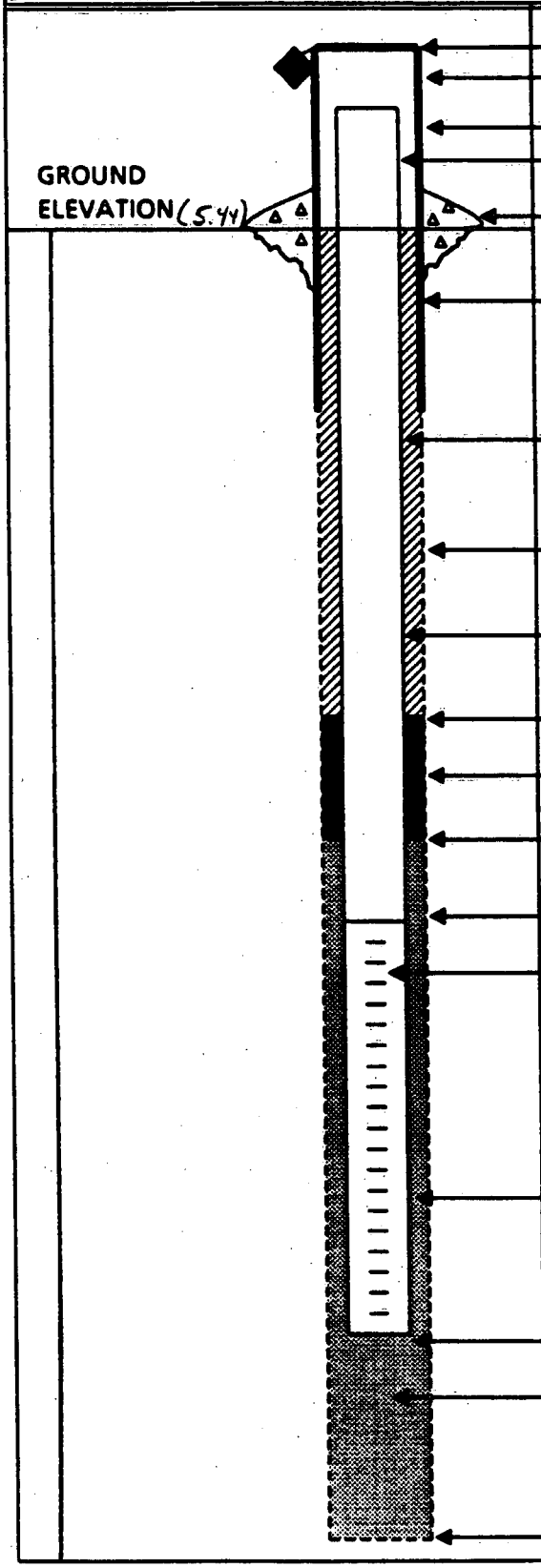
NUS CORPORATION
A Halliburton Company

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8269.47
ELEVATION (Ground) = 5.44
FIELD GEOLOGIST: R. NOWAK

LOCATION: ELIZABETH, NJ
BORING: MW-007
DATE: 11/23/85

DRILLER: LIPPINCOTT
DRILLING METHOD: Hollow Stem Auger
DEVELOPMENT METHOD: Surge Block & Pump



ELEVATION OF TOP OF SURFACE CASING: 6.81
ELEVATION OF TOP OF RISER PIPE: 6.63
STICK - UP TOP OF SURFACE CASING: 1.37
STICK - UP RISER PIPE: 1.19
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: SCH. 40 PVC
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: GROUT
ELEVATION / DEPTH TOP OF SEAL: (-16.56)/22'
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (-17.56)/23'
ELEVATION / DEPTH TOP OF SCREEN: (-20.76)/26.2'
TYPE OF SCREEN: SCH. 40 PVC
SLOT SIZE x LENGTH: 20-SLOT X 10'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-30.76)/36.2'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-33.26)/38.7'
TYPE OF BACKFILL BELOW OBSERVATION WELL: FORMATION ALLOWED TO CAVE
ELEVATION / DEPTH OF HOLE: (AUGERS (-34.56)/40'

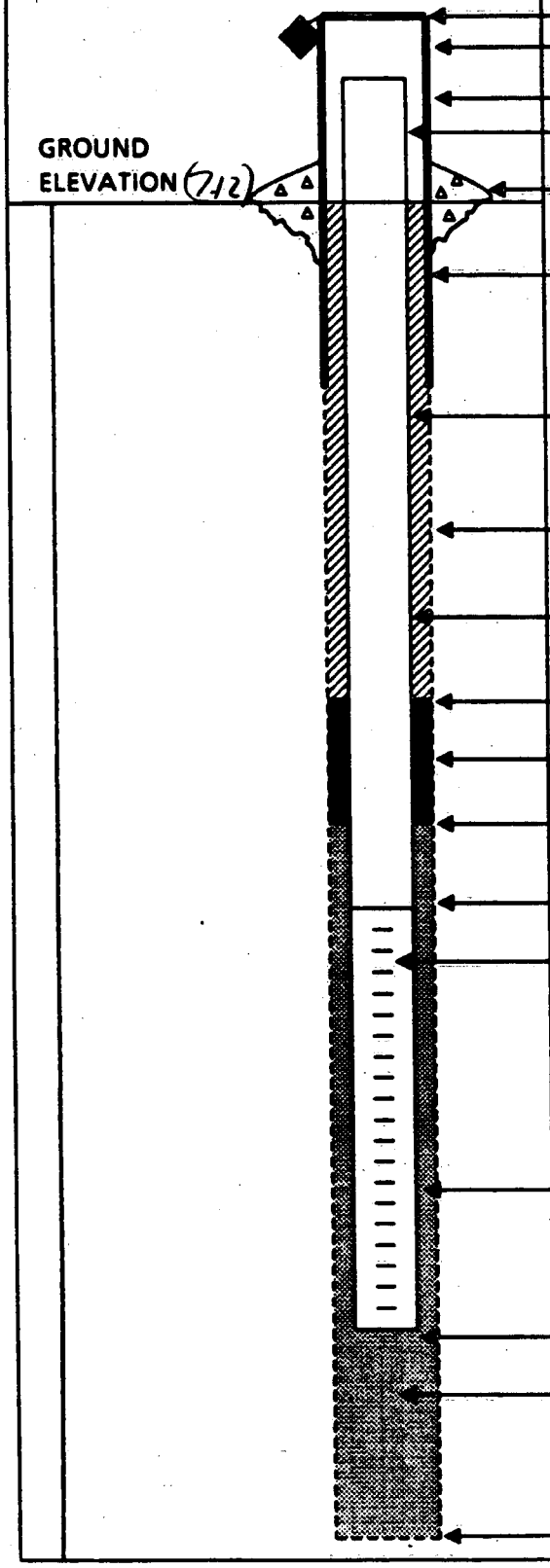
BORING NO.: MW-008

NUS CORPORATION
A Halliburton Company

OVERBURDEN
MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8269.47
ELEVATION: (Ground) = 7.12'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-008
DATE: 11/25/1985

DRILLER: LIPPINCOTT
DRILLING METHOD: Hollow Stem Auger
DEVELOPMENT METHOD: Surge Block & Pump



ELEVATION OF TOP OF SURFACE CASING: 7.12
ELEVATION OF TOP OF RISER PIPE: 7.07
STICK - UP TOP OF SURFACE CASING: -0-
STICK - UP RISER PIPE: -0.05'
TYPE OF SURFACE SEAL: GROUT & SAND AROUND FLUSH-MOUNT COVER
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: (6.62)/0.5'
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (6.12)/1.0'
ELEVATION / DEPTH TOP OF SCREEN: (5.72)/1.4'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT X 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (0.72)/6.4'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-1.88)/9.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-1.88)/9.0'

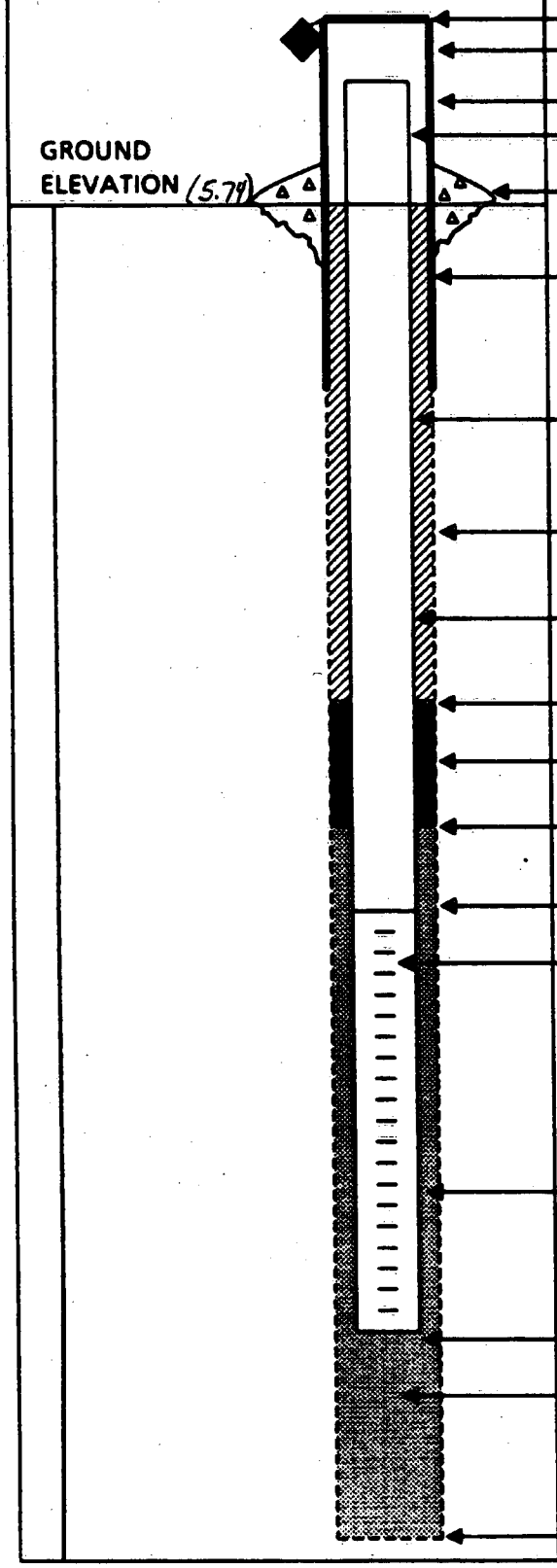
NUS CORPORATION
A Halliburton Company

BORING NO.: MW-009

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 8269.47
ELEVATION: (Ground) 5.24'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-009
DATE: 11/25 & 26/85

DRILLER: LIPPINCOTT
DRILLING METHOD: HOLLOW STEM
DEVELOPMENT METHOD:



ELEVATION OF TOP OF SURFACE CASING: 7.26
ELEVATION OF TOP OF RISER PIPE: 7.10
STICK - UP TOP OF SURFACE CASING: 1.52
STICK - UP RISER PIPE: 1.36
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: (5.24)/0.5'
TYPE OF SEAL: BELLONITE
DEPTH TOP OF SAND PACK: (4.74)/1.0'
ELEVATION / DEPTH TOP OF SCREEN: (4.34)/1.4'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-slot x 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-0.66)/6.4'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-0.86)/6.6'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND 6.6-6.4'
HOLE CAVED BELOW (RUNNING SAND)
ELEVATION / DEPTH OF HOLE: (AUGERS (-3.26)/9.0'

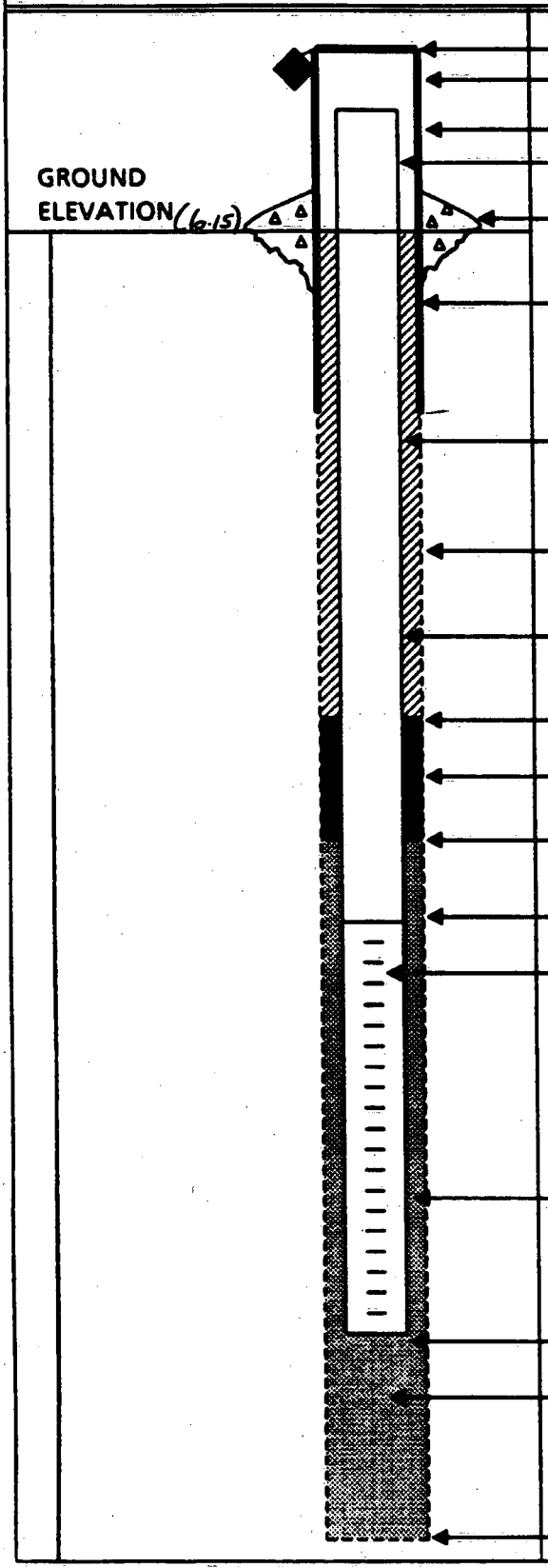
NUS CORPORATION
A Halliburton Company

BORING NO.: MW-010

OVERBURDEN MONITORING WELL SHEET

PROJECT: CHEMICAL CONTROL
PROJECT NO.: 1269.47
ELEVATION: (Ground) = 6.15'
FIELD GEOLOGIST: R. NOWAK
LOCATION: ELIZABETH, NJ
BORING: MW-010
DATE: 11/27/85

DRILLER: LIPPINCOTT
DRILLING METHOD: HOLLOW STEM AUGER
DEVELOPMENT METHOD: SURGE BLOCK & PUMP



ELEVATION OF TOP OF SURFACE CASING: 5.93
ELEVATION OF TOP OF RISER PIPE: 5.84
STICK - UP TOP OF SURFACE CASING: -0.22
STICK - UP RISER PIPE: -0.31
TYPE OF SURFACE SEAL: GROUT & SAND
I.D. OF SURFACE CASING: 6"
TYPE OF SURFACE CASING: STEEL (1')
RISER PIPE I.D. 4"
TYPE OF RISER PIPE: STAINLESS STEEL
BOREHOLE DIAMETER: 10"
TYPE OF BACKFILL: NAD
ELEVATION / DEPTH TOP OF SEAL: (5.65)/0.5'
TYPE OF SEAL: PELLONITE
DEPTH TOP OF SAND PACK: (5.15)/1.0'
ELEVATION / DEPTH TOP OF SCREEN: (4.65)/1.5'
TYPE OF SCREEN: STAINLESS STEEL
SLOT SIZE x LENGTH: 20-SLOT x 5'
I.D. OF SCREEN: 4"
TYPE OF SAND PACK: #1 SAND
ELEVATION / DEPTH BOTTOM OF SCREEN: (-0.35)/6.5'
ELEVATION / DEPTH BOTTOM OF SAND PACK: (-2.85)/9.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL: #1 SAND
ELEVATION / DEPTH OF HOLE: (AUGERS) (-2.85)/9.0'

APPENDIX D

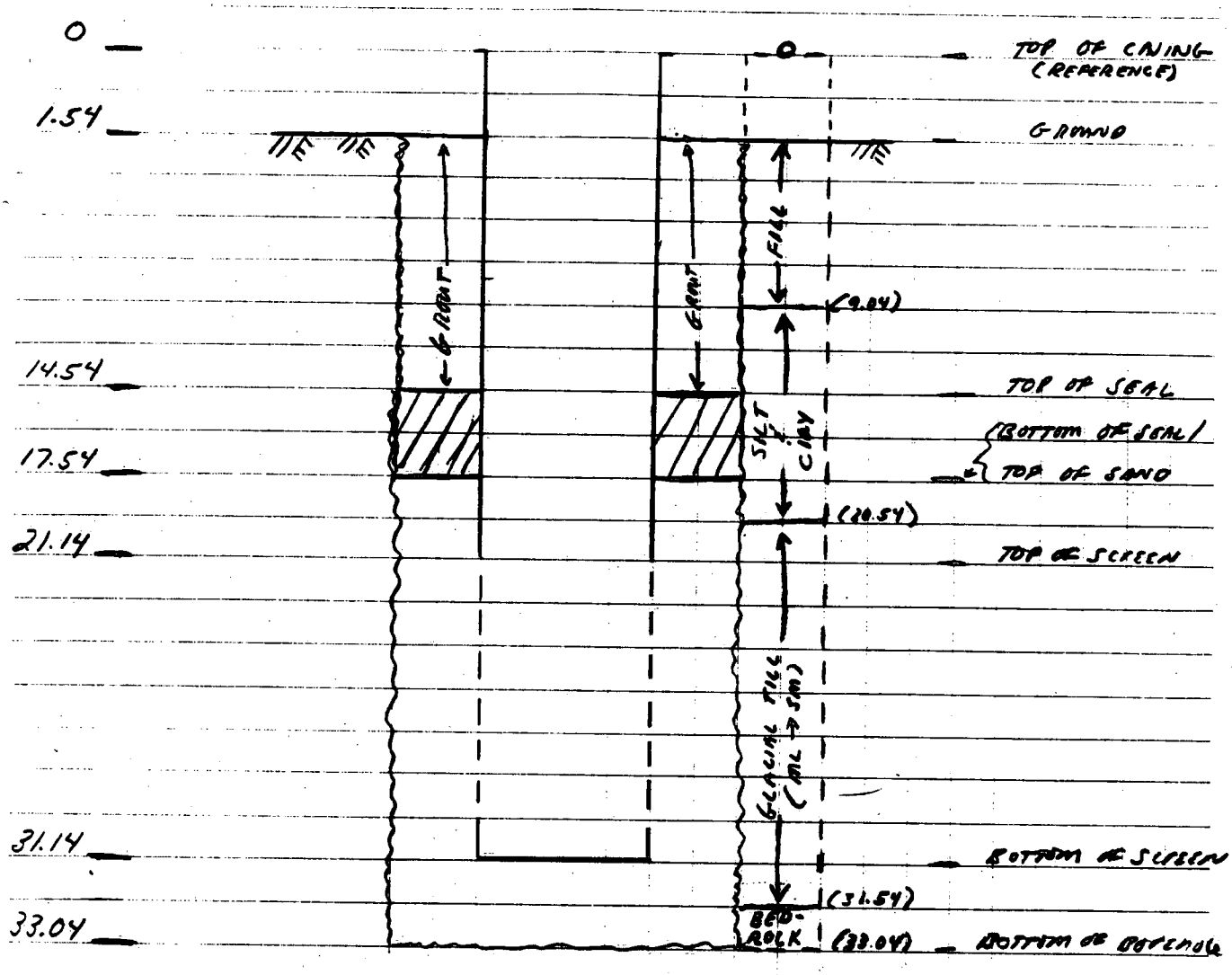
SLUG TEST AND PUMPING TEST RESULTS

NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT CHEM CONTROL - MW-001 SLUG TEST Checked By MF



NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT MW-001 SLUG TEST (1/17/86) Checked By transfer from field book and calculations O.K. CWF 2/5/8

II. DATA

RISING HEAD

TIME (min)	D.T.W. (ft)	H (ft)	H/Ho
0	8.0 - 0.42 = 7.58	0	—
0.33	9.0 - 1.08 = 7.92	0.34	0.840
0.5	9 - 1.08 =	0.34	0.840
0.75	9 - 1.10	0.32	0.790
1	9 - 1.10	0.32	0.790
1.25	9 - 1.11	0.31	0.765
1.5	9 - 1.12	0.30	0.741
2	9 - 1.12	0.30	0.741
3	9 - 1.14	0.28	0.691
4	9 - 1.15	0.27	0.667
5	9 - 1.16	0.26	0.642
6	9 - 1.17	0.25	0.617
7	9 - 1.18	0.24	0.593
8	9 - 1.19	0.23	0.568
9	9 - 1.20	0.22	0.543
10	9 - 1.21	0.21	0.519
12	9 - 1.22	0.20	0.494
14	9 - 1.24	0.18	0.444
16	9 - 1.25	0.17	0.420
18	9 - 1.26	0.16	0.395
20	9 - 1.27	0.15	0.370
25	9 - 1.28	0.14	0.346
30	9 - 1.31	0.11	0.272
35	9 - 1.33	0.09	0.222
40	9 - 1.34	0.08	0.198
45	9 - 1.35	0.07	0.173
50	9 - 1.36	0.06	0.148
55	9 - 1.36	0.06	0.148
60	9 - 1.38	0.04	0.099
65	9 - 1.38	0.04	0.099
75	9 - 1.40	0.02	0.049
85	9 - 1.40	0.02	0.049

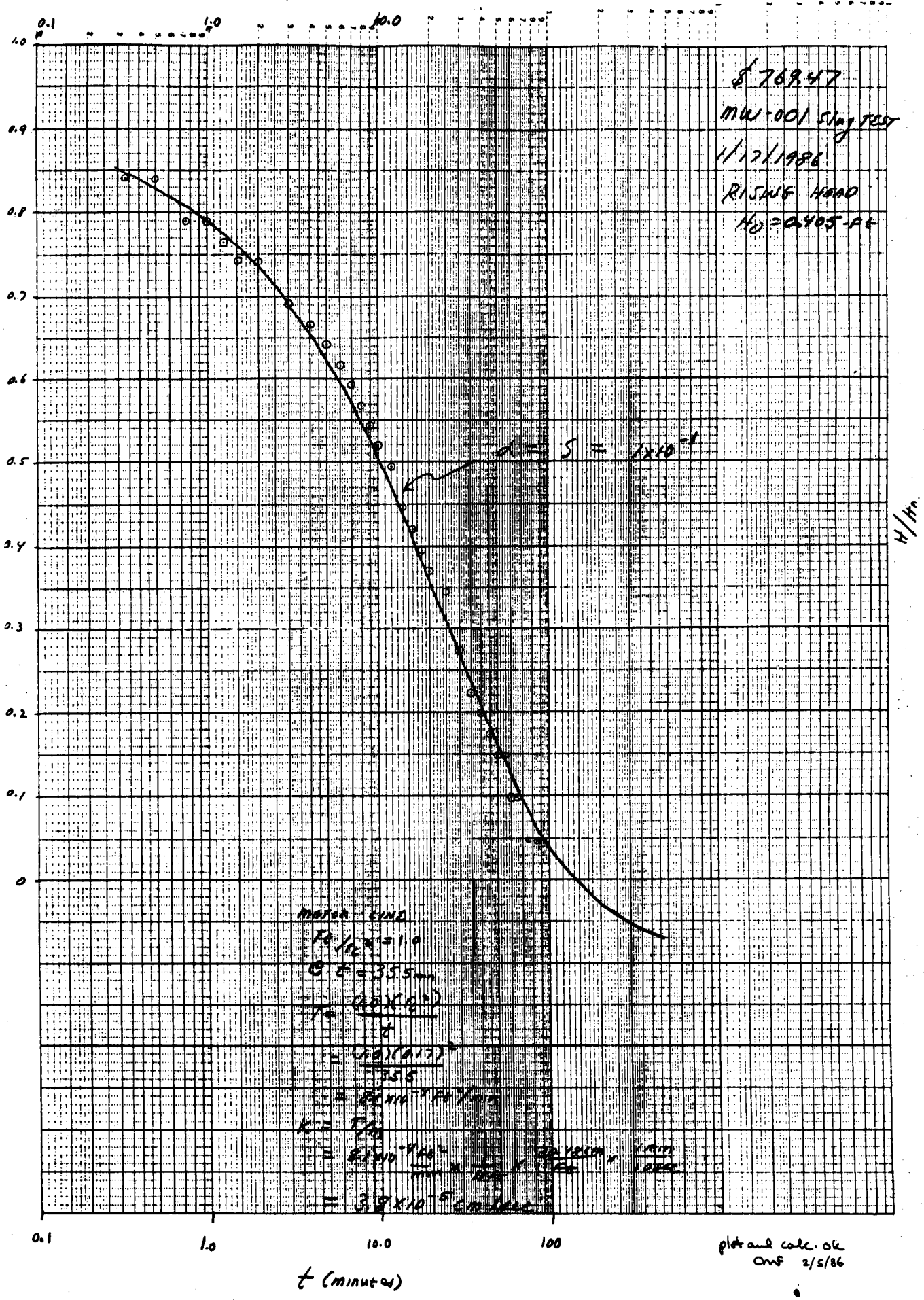
NOTE - H_0 = 0.405' from 1-l slug

FALLING HEAD

TIME (min)	D.T.W. (ft)	H (ft)	H/Ho
0	8.0 - 0.53 = 7.47	0	—
0.33	7.0 - 0.61 = 6.39	1.08	0.667
0.67	7.5 - 0.99 = 6.51	0.96	0.593
1.0	7.6 - 1.08 = 6.52	0.95	0.586
1.25	7.7 - 1.28 = 6.42	1.05	0.648
1.5	7.8 - 1.35 = 6.45	1.02	0.630
2	7.9 - 1.43 = 6.47	1.00	0.617
2.5	8 - 1.51 = 6.49	0.98	0.605
3	8.1 - 1.59 = 6.51	0.96	0.593
3.5	8.2 - 1.67 = 6.53	0.94	0.580
4	8.3 - 1.76 = 6.54	0.93	0.574
4.5	8.4 - 1.83 = 6.57	0.90	0.556
5	8.5 - 1.92 = 6.58	0.89	0.549
5.5	8.6 - 2.00 = 6.60	0.87	0.537
6	8.7 - 2.08 = 6.62	0.85	0.525
6.5	8.8 - 2.16 = 6.64	0.83	0.512
7	8.9 - 2.25 = 6.65	0.82	0.506
7.5	9 - 2.34 = 6.66	0.810	0.500
8	9.1 - 2.42 = 6.68	0.79	0.488
8.5	9.2 - 2.50 = 6.70	0.77	0.475
9	9.3 - 2.58 = 6.72	0.75	0.463
9.5	9.4 - 2.67 = 6.73	0.74	0.457
10	9.5 - 2.75 = 6.75	0.72	0.444
12	8 - 1.21 = 6.79	0.68	0.420
14	8.1 - 1.27 = 6.83	0.64	0.395
16	8.0 - 1.18 = 6.82	0.65	0.401
18	8.1 - 1.19 = 6.91	0.56	0.346
22	8.0 - 1.02 = 6.98	0.49	0.302
25	8.1 - 1.07 = 7.03	0.44	0.272
28	8.2 - 1.14 = 7.06	0.41	0.253
30	8.4 - 1.31 = 7.09	0.38	0.235

NOTE - ADDED 4-l - H_0 = 1.62'

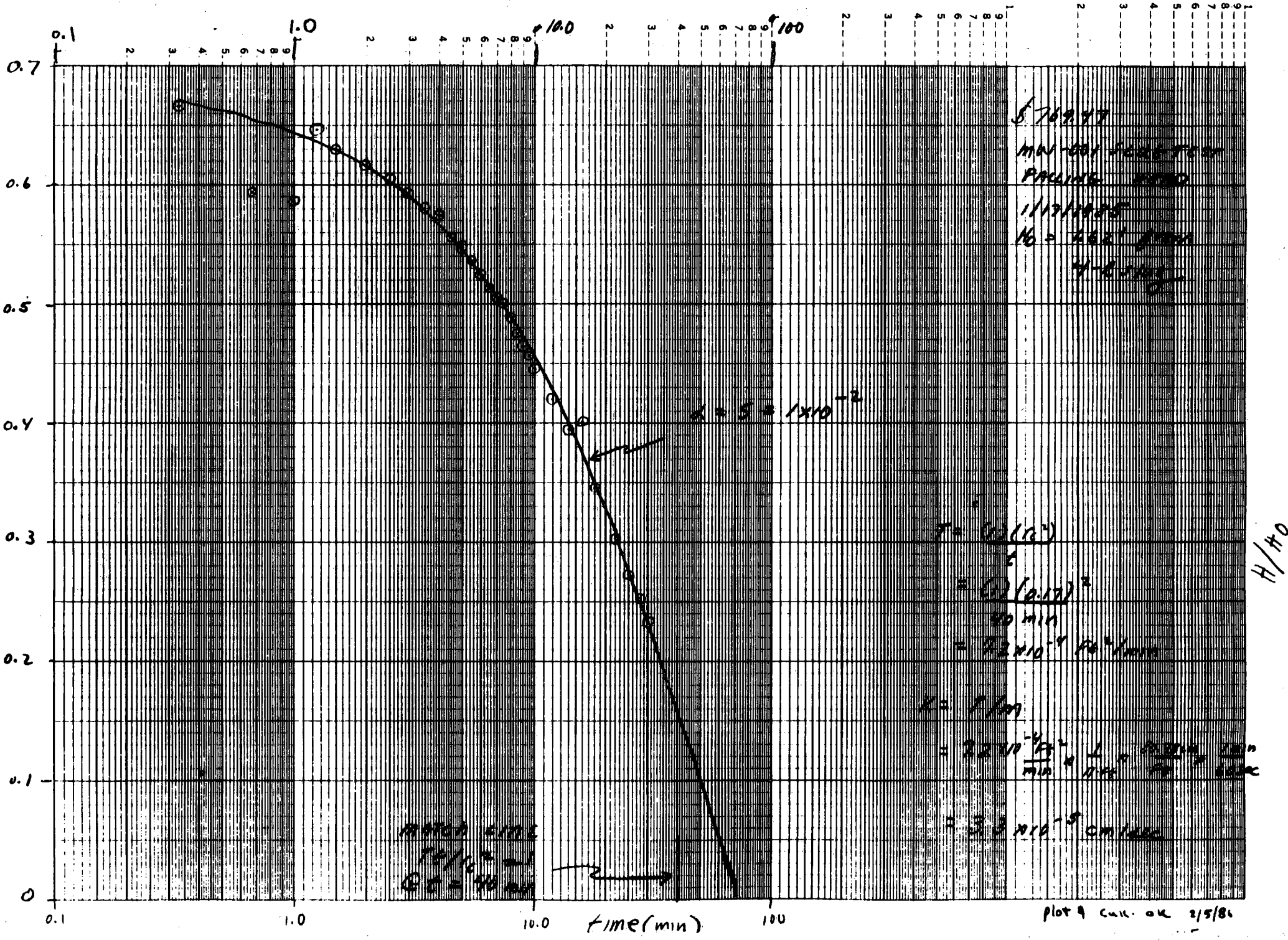
K+E SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A. 46 6210



plot and calc. ok
CMF 2/5/86

K+E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6210

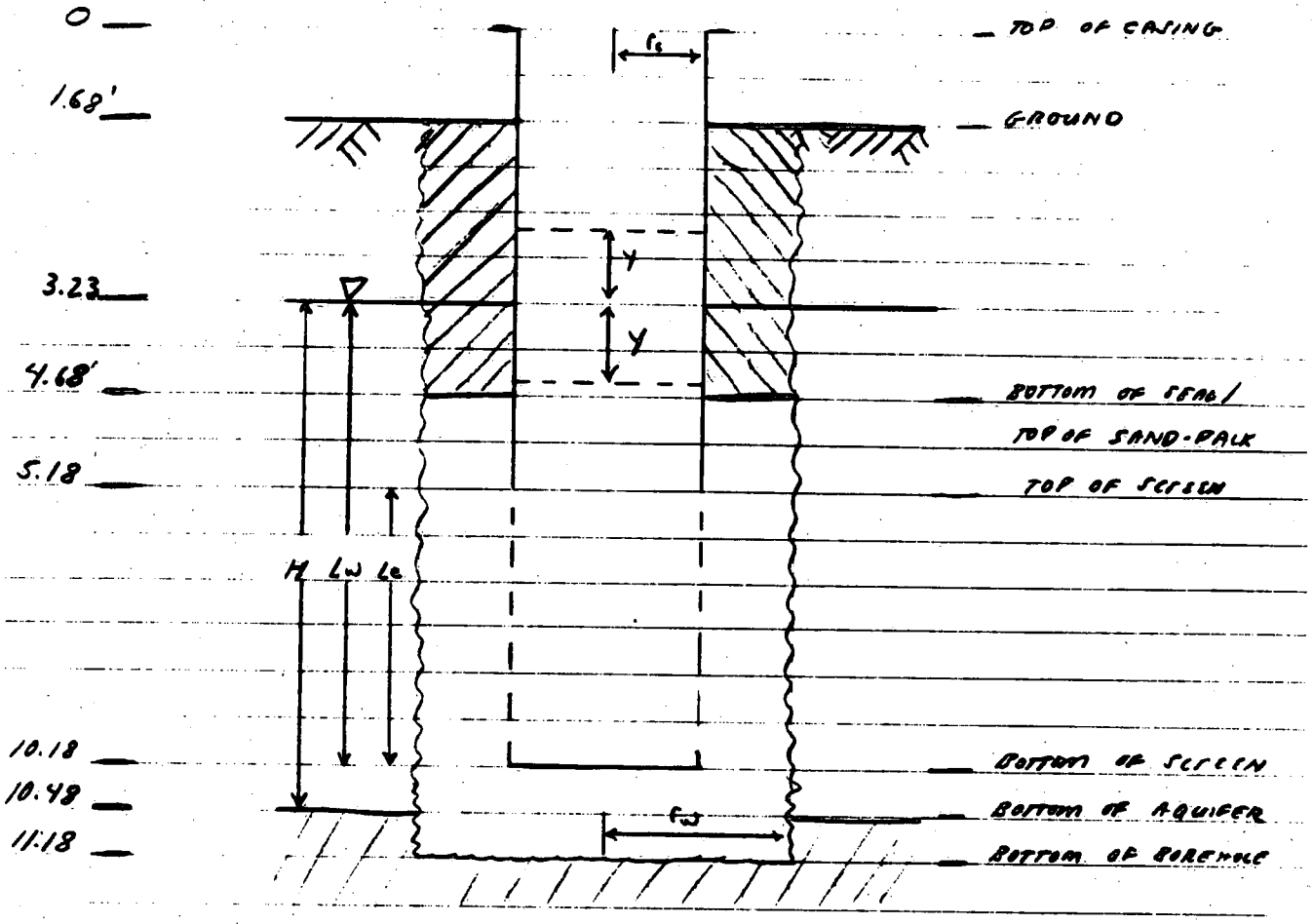


NUS CORPORATION

DATE 1/24/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT Chem. Control - MW-002 SLUG TEST Checked By MF



$H = 10.48 - 3.23 = 7.25'$

$L_w = 10.18 - 3.23 = 6.95$

$L_e = 10.18 - 5.18 = 5.00'$

$r_c = 4''/2 \times 12 = 0.17'$

$r_w = 10''/2 \times 12 = 0.42'$

$L_e/r_w = 11.90$

$A = 1.80$

$B = 0.30$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln\left(\frac{6.95}{0.42}\right)} + \frac{1.80 + 0.3 \ln\left[(7.25 - 6.95)/0.42\right]}{(11.90)} \right)^{-1}$$

$= 2.12$

NUS CORPORATION

DATE 1/24/1986

CLIENT USEPA FILE NO. 8 76947 BY R. NOWAK

SUBJECT Chem Control - MW-002 SLUG TEST Checked By MF

II. DATA

RISING HEAD DATA

Time (min)	D.T.W. (ft)	Y (ft)
0	4-0.77=3.23	0
0.17	4-0.55=	0.22
0.42	4-0.64 =	0.13
0.67	4-0.67 =	0.10
0.92	4-0.69 =	0.08
1.17	4-0.70 =	0.07
1.50	4-0.72 =	0.05
1.75	4-0.72 =	0.05
2	4-0.72 =	0.05
2.5	4-0.73 =	0.04
3	4-0.74 =	0.03
3.5	4-0.74 =	0.03
4	4-0.75 =	0.02
5	4-0.75 =	0.02
7	4-0.75 =	0.02
10	5-1.76 =	0.01

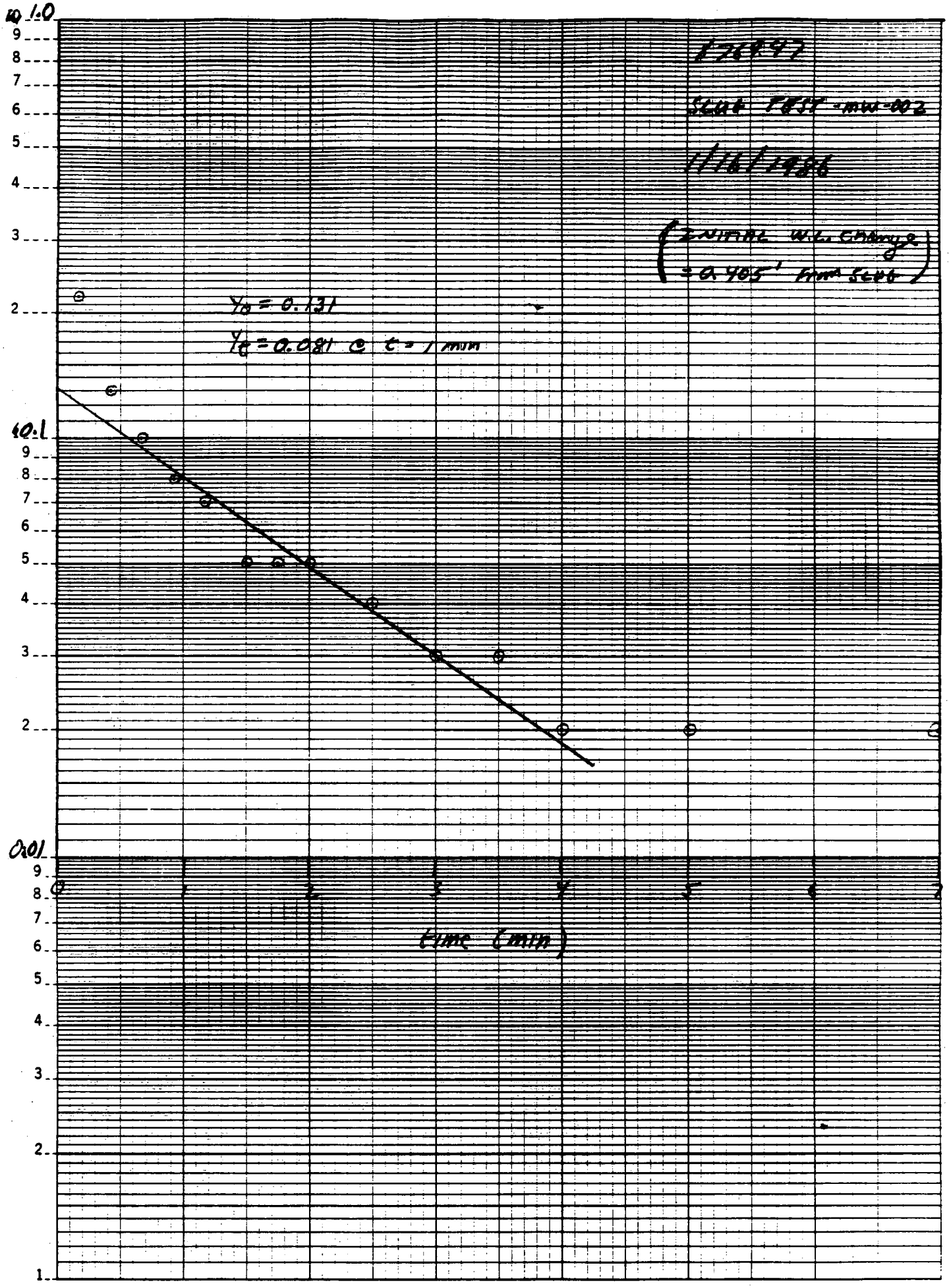
III CALCULATION

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L_e} \times \frac{1}{t} \times \ln\left(\frac{y_0}{y_t}\right)$$

$$= \frac{(0.17)^2 (2.12)}{2(5)} \times \frac{1}{1} \times \ln\left(\frac{0.131}{0.081}\right)$$

$$= 2.95 \times 10^{-3} \text{ ft/min}$$

$$= 1.50 \times 10^{-3} \text{ cm/sec}$$



46 5490
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

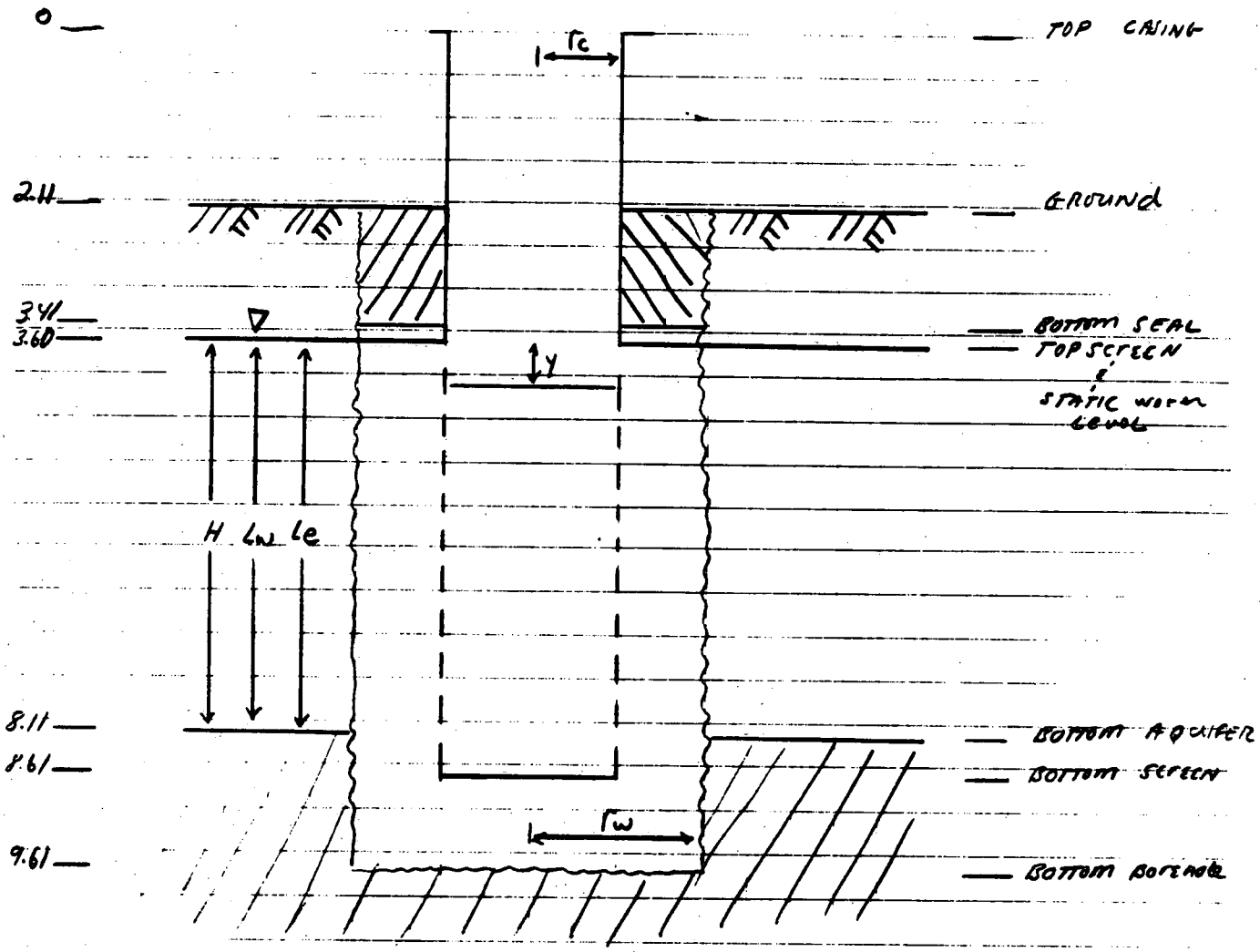
NUS CORPORATION

DATE 1/23/86

CLIENT USEPA FILE NO. 5769.47 BY R. NOWAK

SUBJECT MW-003 SLUG TEST Checked By DMK

CONSTRUCTION



$H = 8.11 - 3.60 = 4.51$

$L_w = 8.11 - 3.60 = 4.51$

$L_e = 8.11 - 3.60 = 4.51$

$r_w = 5\text{-in} = 0.42\text{-ft}$

$r_c = 2\text{-in} = 0.17\text{-ft}$ {USE FOR FALLING HEAD}

$r_c' = (2^2 + 0.306 5^2 - 2^2)^{1/2}$

$= 3.21\text{-in} = 0.27\text{-ft}$ {USE FOR RISING HEAD}

$L_e/r_w = 4.51/0.42 = 10.74$

$C = 1.35$

NUS CORPORATION

DATE 1/23/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT MW-003 SLUG TEST @ CHEM. CONTROL Checked By [illegible]

RISING HEAD - 1 mm 1-l slug (0.405 -ft)

TIME (min.)	D.T.W. (ft)	Y (ft)
0	5.00 - 1.40 = 3.60	0
0.5	5 - 1.13 = 3.87	0.27
0.75	5 - 1.18 =	0.22
1	5 - 1.22 =	0.18
1.33	5 - 1.25 =	0.15
1.75	5 - 1.29 =	0.11
2	5 - 1.30 =	0.10
2.50	5 - 1.34 =	0.06
3	5 - 1.36 =	0.04
3.5	5 - 1.36 =	0.04
4	5 - 1.37 =	0.03
5	5 - 1.38 =	0.02
6	5 - 1.39 =	0.01
7	5 - 1.39 =	0.01
10	5 - 1.40 =	0

FALLING HEAD - add 1-l slug (0.405 -ft)

TIME (min)	D.T.W. (ft)	Y (ft)
0	4 - 0.40 = 3.60	0
0.5	4 - 0.53 = 3.47	0.13
1.25	5 - 1.44 = 3.56	0.04
1.5	5.1 - 1.54 = 3.56	0.04
1.75	5.2 - 1.61 = 3.59	0.01
2	5.3 - 1.73 = 3.57	0.03
2.5	5.4 - 1.81 = 3.59	0.01
3	5.5 - 1.91 = 3.59	0.01
3.5	5.6 - 2.01 = 3.59	0.01
4.0	5.7 - 2.10 = 3.60	0
5.0	5.8 - 2.20 = 3.60	0

CALCULATIONS

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(L_w/r_w)} + \frac{C}{(L_e/r_w)}\right)^{-1}$$

$$= \left(\frac{1.1}{\ln(4.51/0.42)} + \frac{1.35}{(10.74)}\right)^{-1}$$

$$= 1.70$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L_e} \times \frac{1}{t} \times \ln\left(\frac{y_0}{y_t}\right)$$

RISING HEAD

$$K = \frac{(0.27)^2(1.70)}{2(4.51)} \times \frac{1}{1} \times \ln\left(\frac{0.40}{0.188}\right)$$

$$= 1.04 \times 10^{-2} \text{ ft/min}$$

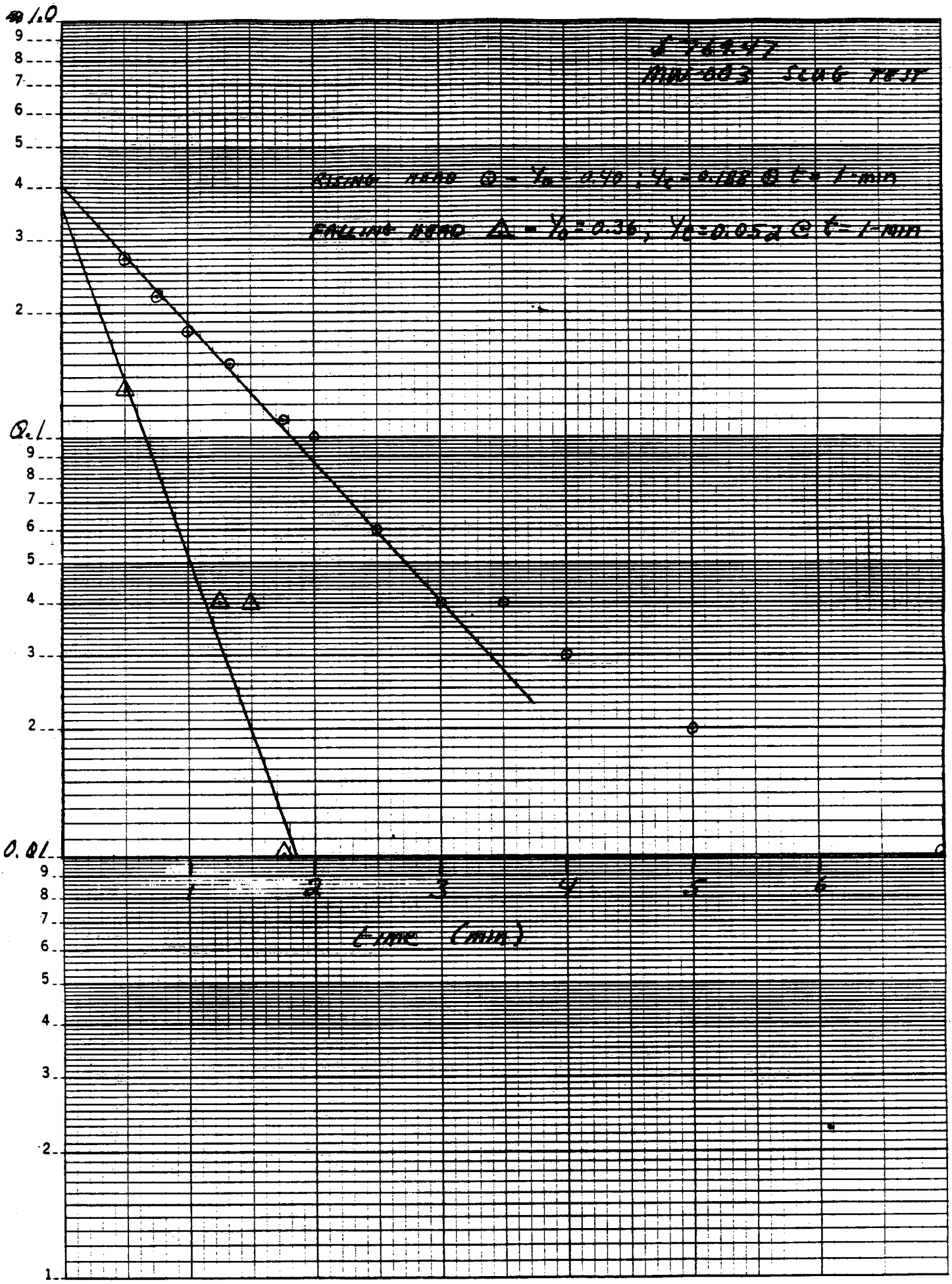
$$= 5.3 \times 10^{-3} \text{ cm/sec}$$

FALLING HEAD

$$K = \frac{(0.17)^2(1.70)}{2(4.51)} \times \frac{1}{1} \times \ln\left(\frac{0.36}{0.052}\right)$$

$$= 1.06 \times 10^{-2} \text{ ft/min}$$

$$= 5.4 \times 10^{-3} \text{ cm/sec}$$



46 5490
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

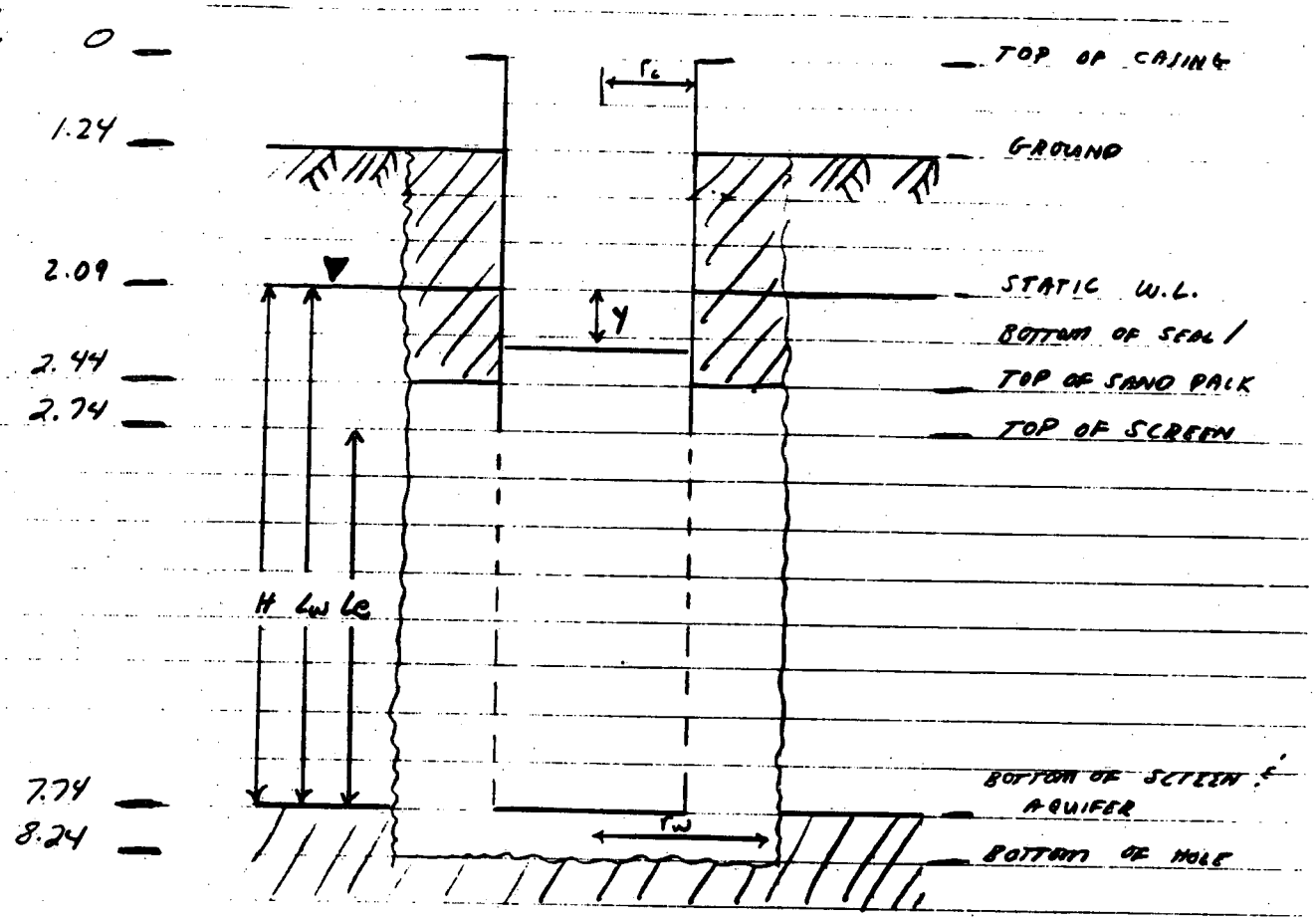
NUS CORPORATION

DATE 1/24/1986

CLIENT USEPA FILE NO. 8769.47 BY R NOWAK

SUBJECT Chem. Control - MW-004 SLUG TEST Checked By MF

I.



$H = Lw = 7.74 - 2.09 = 5.65'$

$Le = 7.74 - 2.74 = 5.00$

$r_w = 10''/2 \times 12 = 0.42'$

$r_c = 2''/2 \times 12 = 0.17'$

$Le/rw = 5.00/0.42 = 11.90$

$C = 1.25$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(Lw/rw)} + \frac{C}{(Le/rw)}\right)^{-1}$$

$$= \left(\frac{1.1}{\ln(5.65/0.42)} + \frac{1.25}{11.90}\right)^{-1}$$

$$= 1.89$$

II. DATA

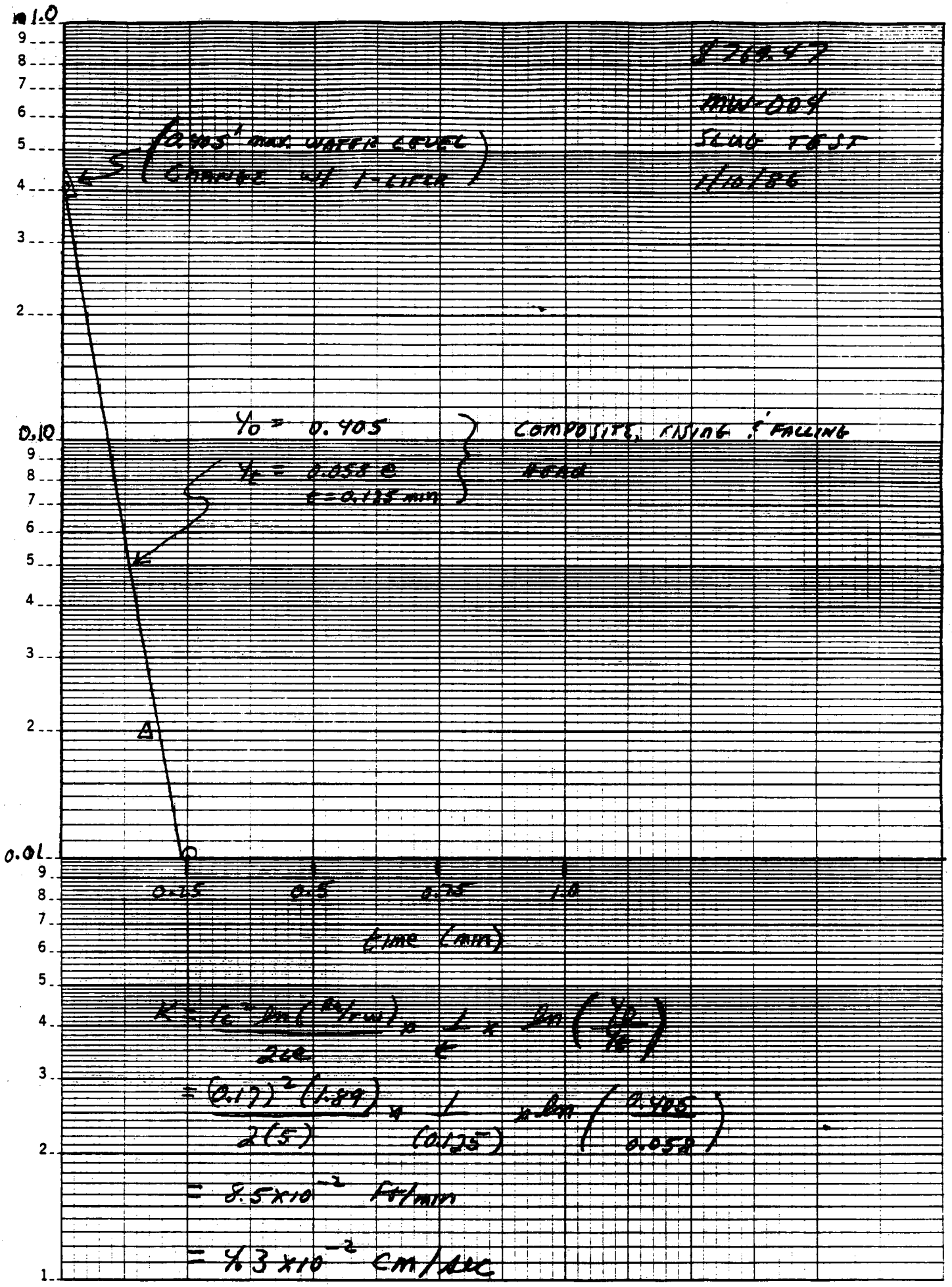
RISING HEAD

Time (min)	D.T.W. (ft)	Y (ft)
0	2.09	0
0.25	2.08	0.01
0.58	2.09	0

FALLING HEAD

0	2.09	0
0.17	2.07	0.02
0.33	2.09	0

(max. Water level change = 0.405' from 1-l bailer)

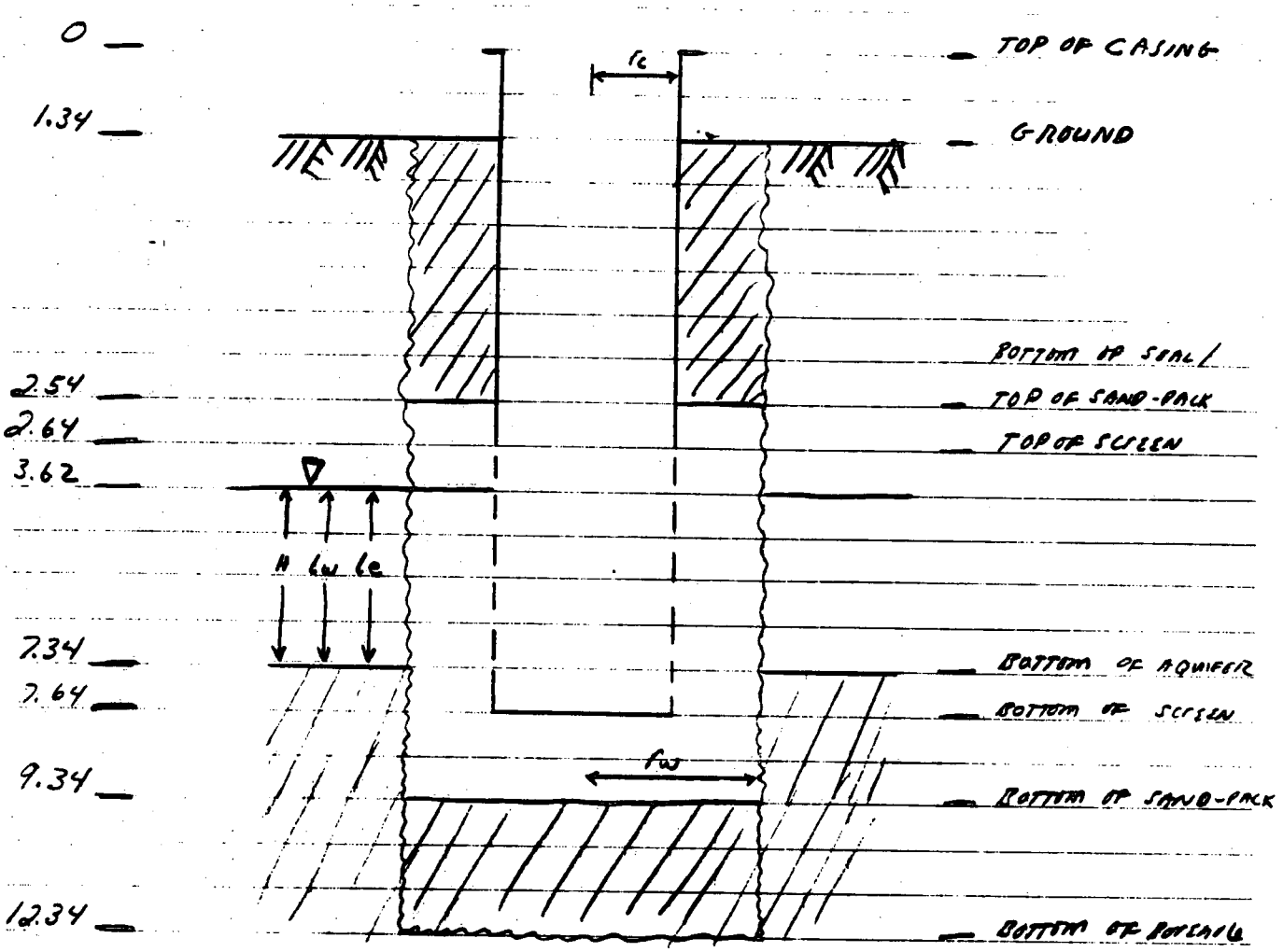

8768.47
MW-004
SLUG TEST
11/10/86
(0.405' max. water level change w/ 1-liter)
Y_0 = 0.405
Y_t = 0.058 @
t = 0.125 min
COMPOSITE, RISING & FALLING HEAD
1.0
0.10
0.01
0.25
0.5
0.75
1.0
time (min)
$K = \frac{r_c^2 \ln(R_e/r_w)}{2aL} \times \frac{1}{t} \times \ln\left(\frac{Y_0}{Y_t}\right)$
$= \frac{(0.17)^2(1.89)}{2(5)} \times \frac{1}{(0.125)} \times \ln\left(\frac{0.405}{0.058}\right)$
$= 8.5 \times 10^{-2}$ ft/min
$= 4.3 \times 10^{-2}$ cm/sec
Y(ft)
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490

NUS CORPORATION

DATE 1/23/86

CLIENT USEPA FILE NO. 1769.47 BY R NOWAK

SUBJECT Chem. Control - MW-005 SLUG TEST (1/17/86) Checked By DMF



$H = 7.34 - 3.62 = 3.72$

$l_w = 7.34 - 3.62 = 3.72$

$l_e = 7.34 - 3.62 = 3.72$

$r_c = 2'' = 0.17'$

$r_w = 5'' = 0.42'$

$r_c' = = 0.27'$ (RISING & FALLING HEAD)

$l_e/r_w = 3.72/0.42 = 8.86$

$C = 1.20$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(l_w/r_w)} + \frac{C}{(l_e/r_w)}\right)^{-1}$$

$$= \left(\frac{1.1}{\ln(3.72/0.42)} + \frac{1.20}{(3.72/0.42)}\right)^{-1} = 1.563$$

NUS CORPORATION

DATE 1/23/86

CLIENT USEPA FILE NO. 5769.47 BY R. Nowak

SUBJECT MW-005 Slug Test (1/17/86) Checked By [illegible]

II. DATA {1/17/86}

RISING HEAD			FALLING HEAD		
Time (min)	D.T.W. (ft)	Y (ft)	Time (min)	D.T.W. (ft)	Y (ft)
0	5 - 1.38 = 3.62	0	0	4 - 0.38 = 3.62	0
0.25	5 - 1.00 = 4.00	0.38	0.33	4 - 0.55 = 3.45	0.17
0.5	5 - 1.02 =	0.36	0.67	4.2 - 1.02 = 3.18	0.44
0.75	5 - 1.03 =	0.35	1.0	4.4 - 1.02 = 3.38	0.24
1.0	5 - 1.04 =	0.34	1.75	4.6 - 1.14 = 3.46	0.16
1.25	5 - 1.05 =	0.33	2.5	4.8 - 1.34 = 3.46	0.16
1.5	5 - 1.05 =	0.33	3	5 - 2.53 = 2.47	(1.15)
1.75	5 - 1.05 =	0.33	3.5	5.1 - 2.65 = 2.45	(1.17)
2	5 - 1.05 =	0.33	4	5.2 - 2.73 = 2.47	(1.15)
3	5 - 1.07 =	0.31	5	5.5 - 2.03 = 3.47	0.15
4	5 - 1.08 =	0.30	6	5.6 - 2.13 = 3.47	0.15
5	5 - 1.09 =	0.29	7	5.7 - 2.22 = 3.48	0.14
7	5 - 1.11 =	0.27	8	5.8 - 2.31 = 3.49	0.13
10	5 - 1.14 =	0.24	9	5.9 - 2.41 = 3.49	0.13
15	5 - 1.17 =	0.21	10	6.0 - 2.62 = 3.38	0.24
20	5 - 1.21 =	0.17	12	6.2 - 2.71 = 3.49	0.13
25	5 - 1.22 =	0.16	15	6.3 - 2.78 = 3.52	0.10
31	5 - 1.22 =	0.16	20	6.4 - 2.87 = 3.53	0.09
46	5 - 1.30 =	0.08	30	6.5 - 2.93 = 3.57	0.05
61	5 - 1.33 =	0.05			

NUS CORPORATION

DATE 1/23/86

CLIENT USEPA FILE NO. 5769.47 BY R. NOWAK

SUBJECT MW-005 Slug TEST - 1/10/86 Checked By WF

I. CONSTRUCTION

- D.T.W. = 3.42 ∴

$H = LW = Le = 7.34 - 3.42 = 3.92$

$r_c = 0.17$ ($r_c' = 0.27$)

$r_w' = 0.42$

$Le/rw = 3.92/0.42 = 9.33$

$C = 1.20$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(Lw/rw)} + \frac{C}{(Le/rw)}\right)^{-1}$$

$$= \left(\frac{1.1}{\ln 9.33} + \frac{1.20}{9.33}\right)^{-1}$$

$$= 1.61$$

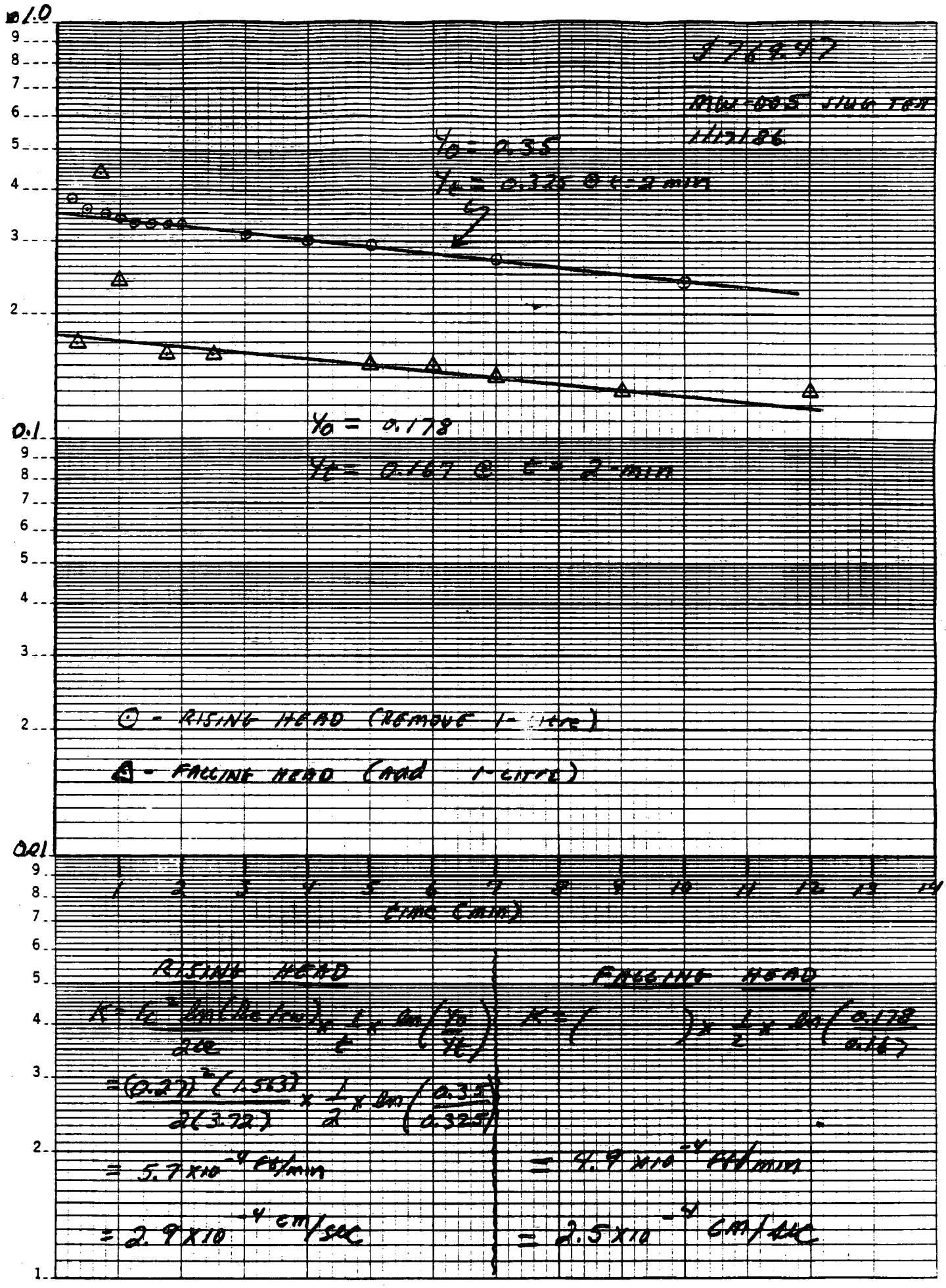
II DATA. {1/10/86}

RISING HEAD (1-2)

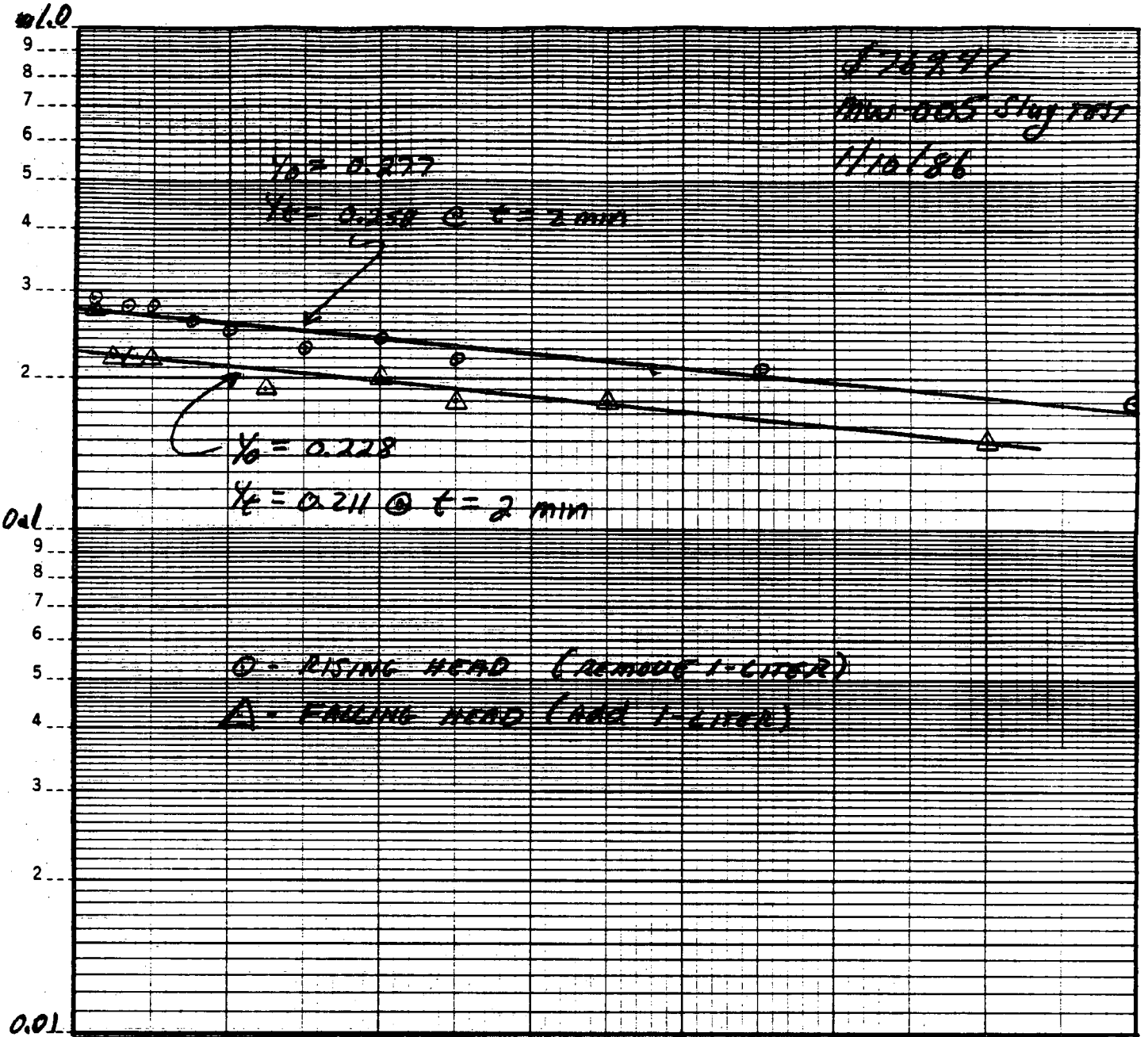
Time (min)	D.T.W. (Ft)	Y (Ft)
0	3.42	0
0.42	3.71	0.29
0.67	3.70	0.28
1	3.70	0.28
1.5	3.68	0.26
2	3.67	0.25
3	3.65	0.23
4	3.66	0.24
5	3.64	0.22
9	3.63	0.21
14	3.60	0.18
19	3.59	0.17
24	3.56	0.14
29	3.56	0.14
34	3.55	0.13
39	3.53	0.11
44	3.42	0
50	3.52	0.10

FALLING HEAD (1-2)

Time (min)	D.T.W. (Ft)	Y (Ft)
0	3.52	0
0.25	3.24	0.28
0.5	3.30	0.22
0.75	3.30	0.22
1	3.30	0.22
2.5	3.33	0.19
4	3.32	0.20
5	3.34	0.18
7	3.34	0.18
12	3.37	0.15
17	3.38	0.14
22	3.40	0.12



46 5490
K+E SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.



RISING HEAD

$$K = \frac{r^2 \ln(L/r_w)}{2Lt} \times \frac{L}{t} \times \ln\left(\frac{Y_0}{Y_t}\right)$$

$$= \frac{(0.27)^2(161)}{2(3.97)} \times \frac{L}{2} \times \ln\left(\frac{0.277}{0.258}\right)$$

$$= 5.3 \times 10^{-4} \text{ FT/MIN}$$

$$= 2.7 \times 10^{-4} \text{ CM/SEC}$$

FALLING HEAD

$$K = (\quad) \times \frac{L}{2} \times \ln\left(\frac{0.228}{0.211}\right)$$

$$= 5.8 \times 10^{-4} \text{ FT/MIN}$$

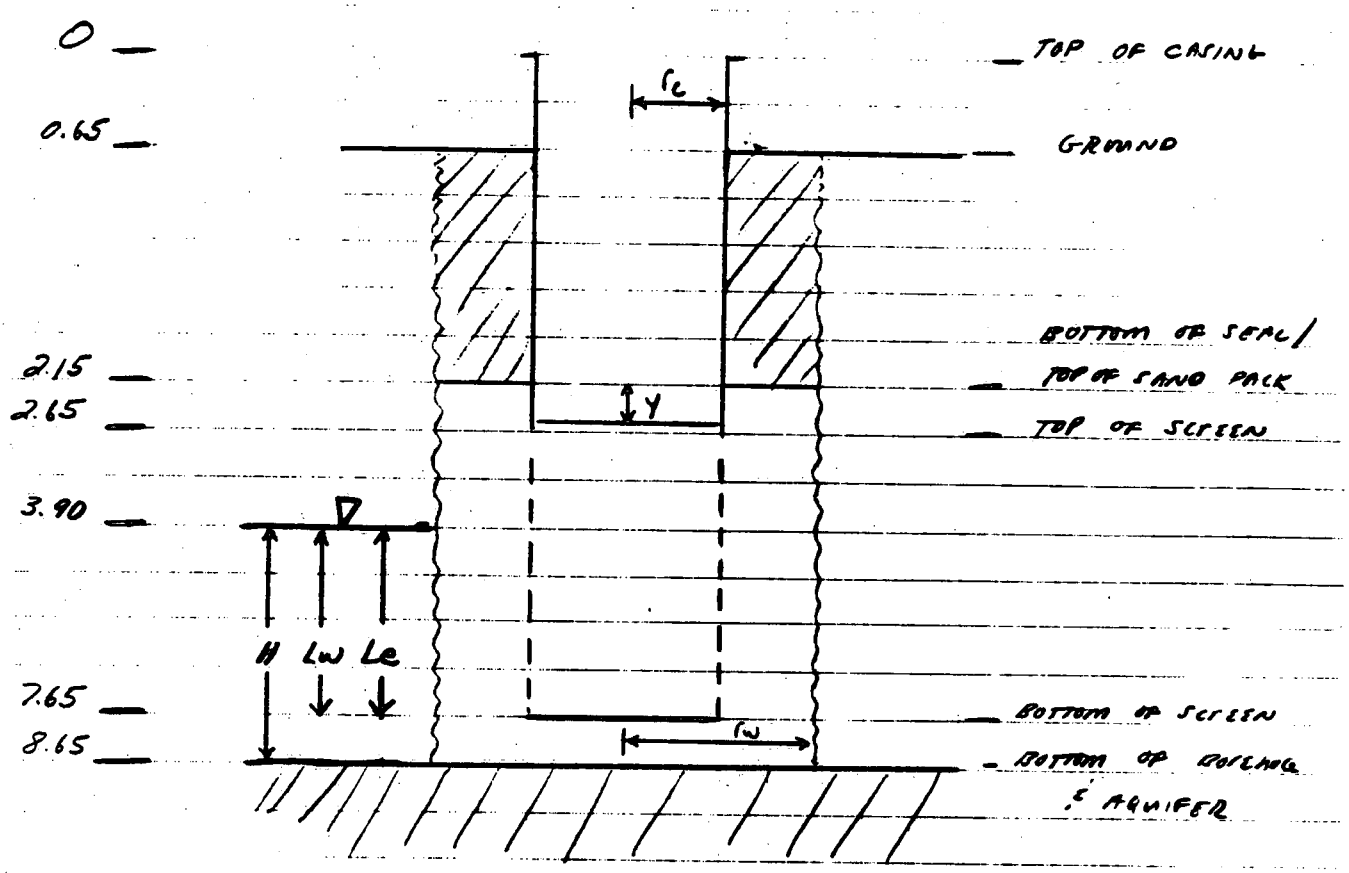
$$= 2.9 \times 10^{-4} \text{ CM/SEC}$$

NUS CORPORATION

DATE 1/24/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT Chem Control - MW-006 SLUG TEST Checked By MF



$H = 8.65 - 3.90 = 4.75$

$L_w = L_e = 7.65 - 3.90 = 3.75$

$r_w = 5''/2 \times 12 = 0.42'$

$r_c = 2''/2 \times 12 = 0.17'$

$r_c' = (2^2 + 0.3(5^2 - 2^2))^{1/2} = 0.27'$

$L_e/r_w = 3.75/0.42 = 8.93$

$A = 1.75$

$B = 0.25$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(L_w/r_w)} + \frac{A + B\ln[(H-L_w)/r_w]}{(L_e/r_w)} \right)^{-1}$$

$$= \left(\frac{1.1}{\ln(8.93)} + \frac{1.75 + 0.25\ln[1/0.42]}{8.93} \right)^{-1}$$

$$= 1.38$$

NUS CORPORATION

DATE 1/24/86

CLIENT USEPA FILE NO. 8 76947 BY R. NOWAK

SUBJECT chem centre - MW-006 SLUG TEST (1/14/86) Checked By MK

II DATA

RISING HEAD			FALLING HEAD		
TIME (min)	D.T.W. (ft)	Y (ft)	TIME (min)	D.T.W. (ft)	Y (ft)
0	5-1.10 = 3.90	0	0	5-1.04 = 3.96	0
.33	5-0.69 =	0.41	0.25	4-0.23 = 3.77	0.19
0.5	5.1-0.78 =	0.42	0.67	4.2-0.41 = 3.79	0.17
0.75	6-1.72 =	0.38	1.0	5-1.20 = 3.80	0.16
1	6-1.75 =	0.35	1.25	5.1-1.29 = 3.81	0.15
1.25	6-1.77 =	0.33	1.5	5.2-1.38 = 3.82	0.14
1.5	6-1.78 =	0.32	1.75	5.3-1.47 = 3.83	0.13
1.75	6-1.80 =	0.30			
2	6-1.82 =	0.28	2	5.4-1.57 = 3.83	0.13
2.5	6-1.85 =	0.25	2.5	5.5-1.65 = 3.85	0.11
3	6-1.86 =	0.24	3	5.6-1.74 = 3.86	0.10
3.5	6-1.88 =	0.22	3.5	5.7-1.83 = 3.87	0.09
4	6-1.89 =	0.21	4	5.8-1.92 = 3.88	0.08
5	5-0.92 =	0.18	5	5.9-2.00 = 3.90	0.06
6	5-0.94 =	0.16	6	6.0-2.08 = 3.92	0.04
7	5-0.95 =	0.15	7	6.1-2.16 = 3.94	0.02
8	5-0.97 =	0.13	8	6.2-2.26 = 3.94	0.02
9	5-0.98 =	0.12	9	6.3-2.35 = 3.95	0.01
10	5-0.99 =	0.11	10	6.4-2.44 = 3.96	0
12	5-1.00 =	0.10	20	6.6-2.62 = 3.98	+0.02
15	5-1.02 =	0.08	25	6.7-2.70 = 4.00	+0.04
20	5-1.03 = 3.97	0.07			
25	5-1.04 = 3.96	0.06			
30	5-1.05 = 3.95	0.05			
40	5-1.04 = 3.96	0.06			

NUS CORPORATION

DATE 1/24/86

CLIENT USEPA FILE NO. S769.47 BY R. NOWAK

SUBJECT MW-006 SLUG TEST (1/10/86) Checked By MF

II DATA (cm's)

RISING HEAD

TIME (min)	D.T.W. (Ft)	Y (Ft)
0	4.03	0
0.18	4.35	0.32
0.33	4.36	0.33
0.50	4.32	0.29
0.75	4.28	0.25
1	4.24	0.21
1.17	4.23	0.20
1.33	4.23	0.20
1.67	4.23	0.20
2	4.21	0.18
2.5	4.20	0.17
3	4.19	0.16
4	4.16	0.13
5	4.14	0.11
6	4.13	0.10
7	4.11	0.08
8	4.10	0.07
9	4.08	0.05
10	4.08	0.05
12	4.04	0.01
15	4.04	0.01
20	4.03	0

FALLING HEAD

TIME (min)	D.T.W. (Ft)	Y (Ft)
0	4.03	0
0.25	3.92	0.11
0.5	3.86	0.17
0.75	3.89	0.14
1.0	3.90	0.13
1.25	3.90	0.13
1.75	3.85	0.18
2.0	3.93	0.10
3	3.94	0.09
4	3.95	0.08
6	3.98	0.05
8	3.98	0.05
11	4.02	0.01
12	4.03	0

CHANGES IN FACTORS

$H = 8.65 - 4.03 = 4.62$

$L_w = L_e = 7.65 - 4.03 = 3.62$

$r_w = 0.42$

$r_c' = 0.27$

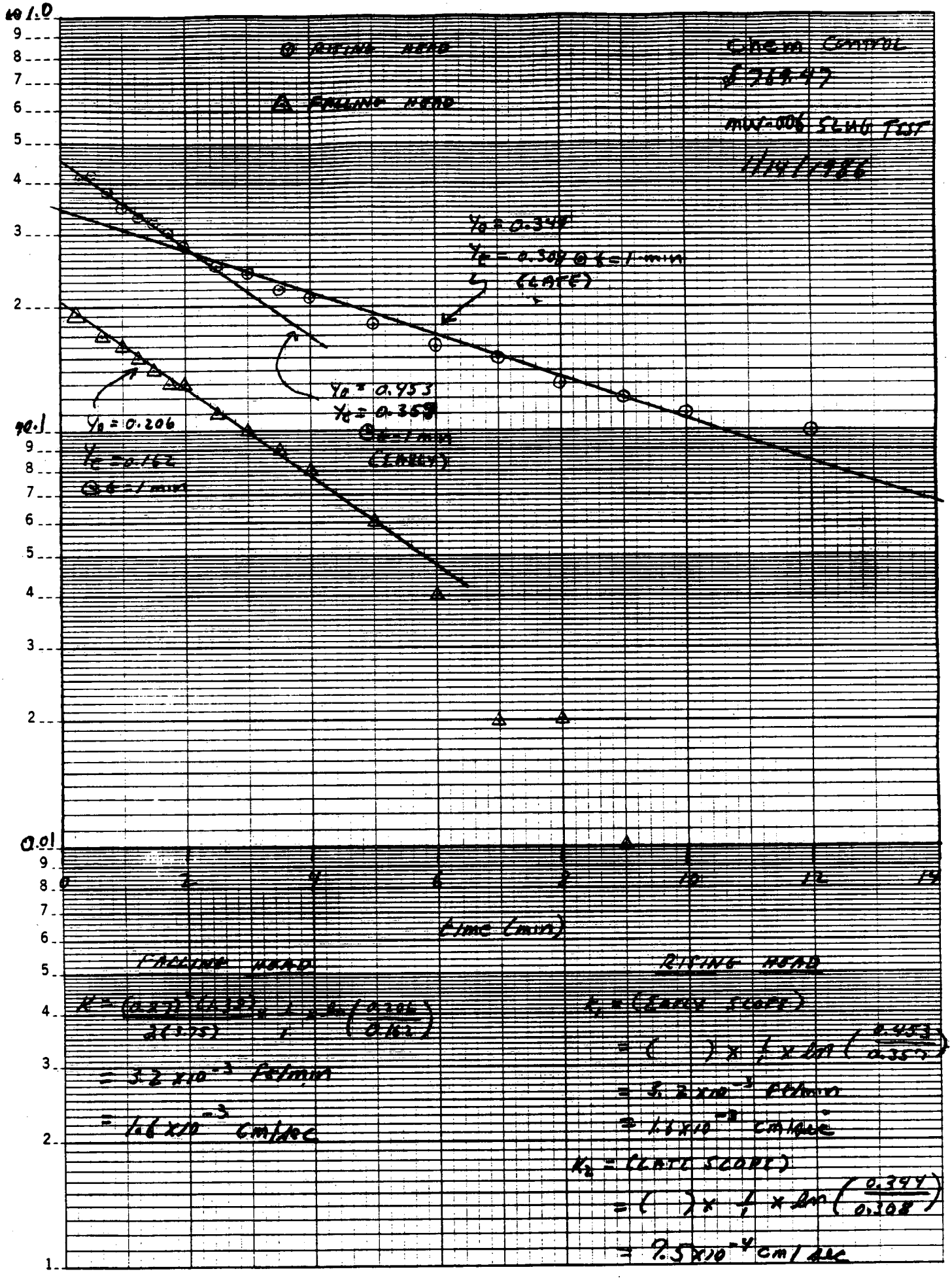
$L_e/r_w = 3.62/0.42 = 8.62$

$A = 1.75$

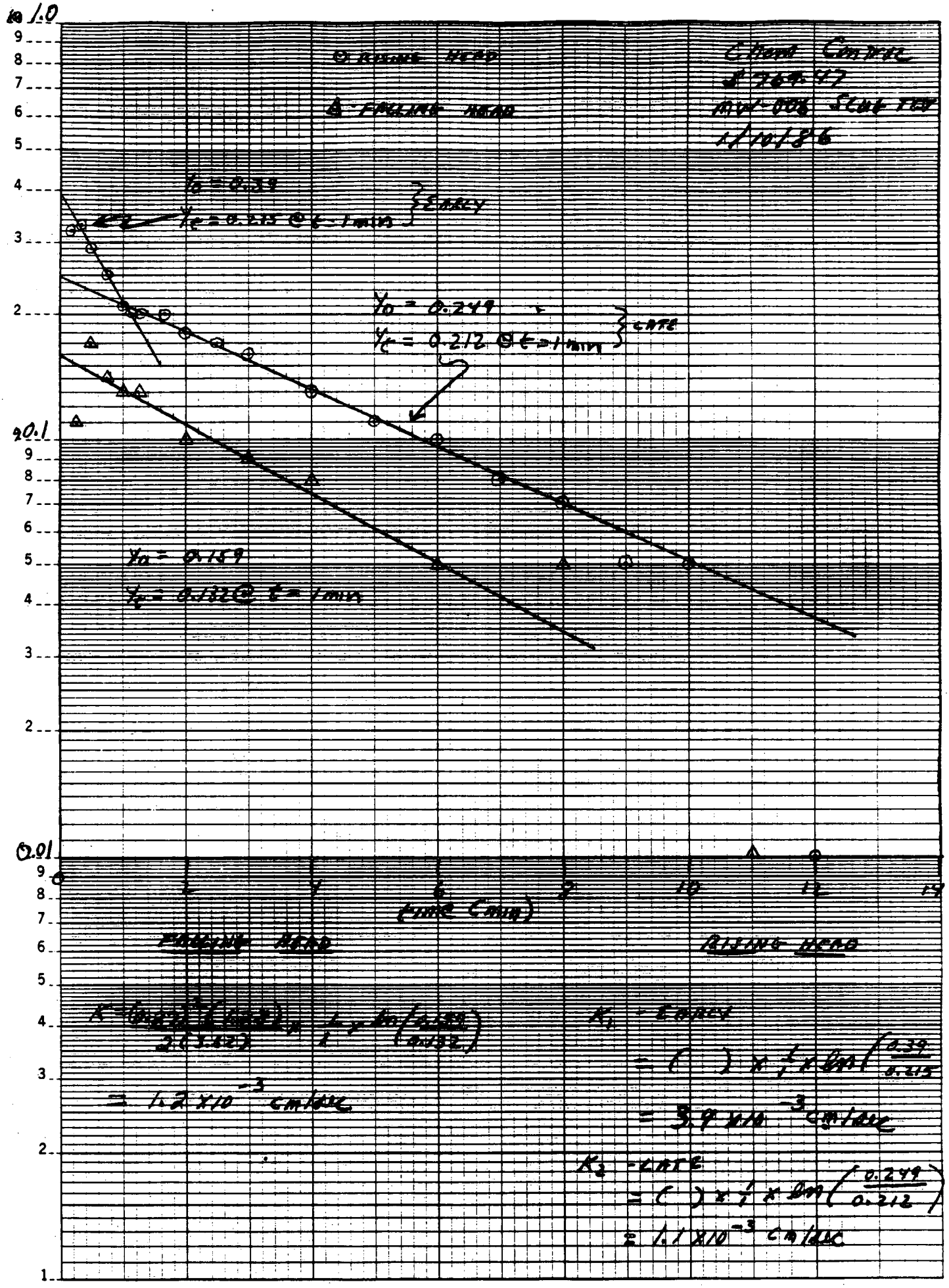
$B = 0.25$

$$\ln(R/r_w) = \left(\frac{1.1}{\ln(8.62)} + \frac{1.75 + 0.25\left[1/0.42\right]}{8.62}\right)^{-1}$$

$$= 1.28$$



K·E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A. 46 5490



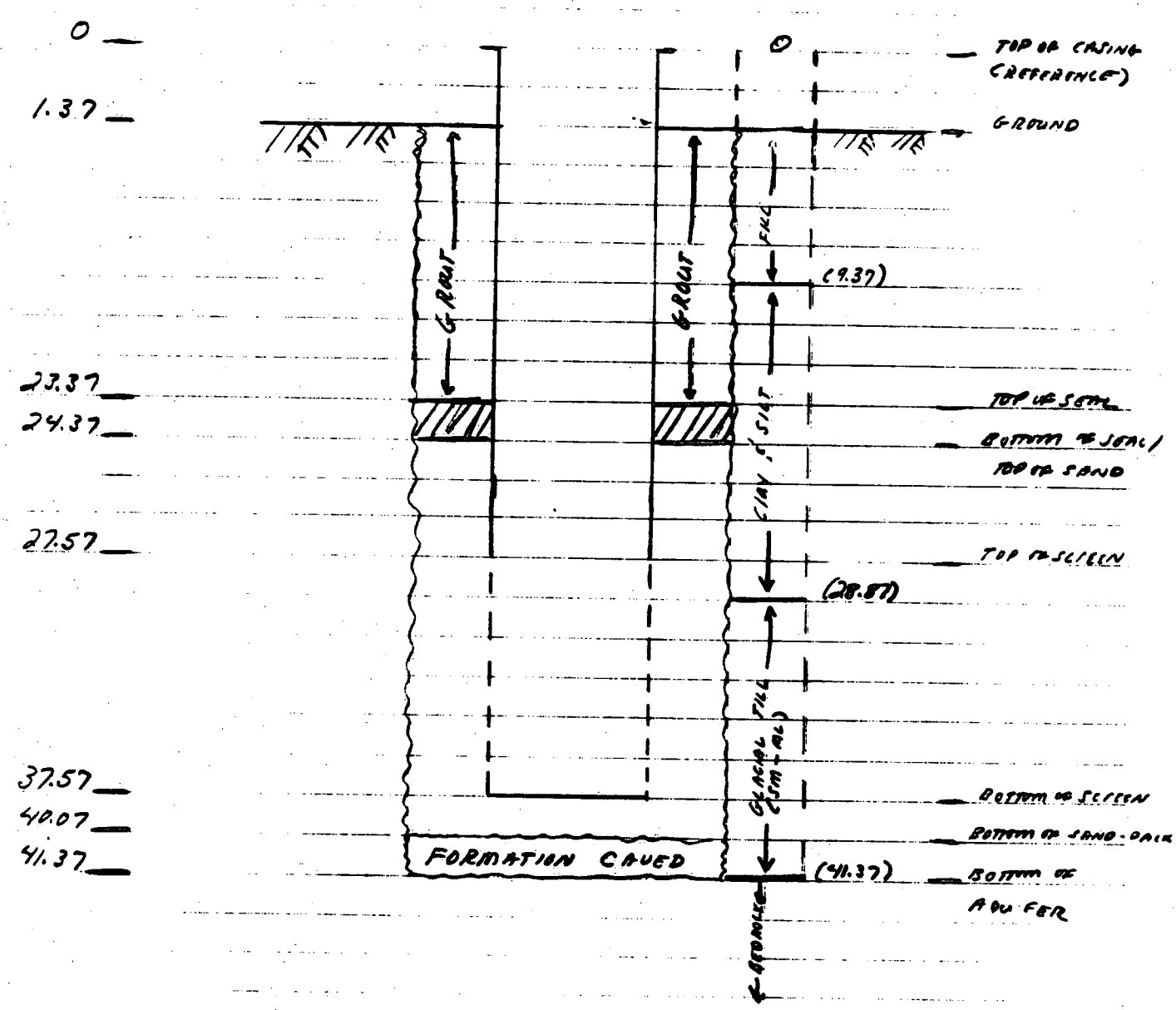
46 5490
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

NUS CORPORATION

DATE 1/27/88

CLIENT USEPA FILE NO. 5769.47 BY R. NOWAK

SUBJECT Chem. Control - MW-007 SLUG TEST Checked By EIF



NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. J 769.47 BY R. NOWAK

SUBJECT MW-007 SLUG TEST (1/14/86) Checked By DJHF

II DATA

RISING HEAD				FALLING HEAD			
TIME (min)	D.T.W. (ft)	H (ft)	H/Ho	TIME (min)	D.T.W (ft)	H (ft)	H/Ho
0	8.0-1.36 = 6.64	0	1.0	0	7-0.32 = 6.68	0	1.0
0.33	9-2.03 = 6.97	0.33	0.815	0.25	7-0.60 = 6.40	0.28	0.691
0.5	9-2.08 = 6.92	0.28	0.691	0.5	7.1-0.67 = 6.43	0.25	0.617
0.75	9-2.12 = 6.88	0.24	0.593	0.75	7.2-0.73 = 6.47	0.21	0.519
1	9-2.15 = 6.85	0.21	0.519	1.0	7.5-0.99 = 6.51	0.17	0.420
1.25	9.1-2.28 = 6.82	0.18	0.444	1.25	8.0-1.47 = 6.53	0.15	0.370
1.5	9.1-2.30 = 6.80	0.16	0.395	1.5	8.1-1.54 = 6.56	0.12	0.296
1.75	9.1-2.32 = 6.78	0.14	0.346	1.75	8.2-1.63 = 6.57	0.11	0.272
2	10-3.23 = 6.77	0.13	0.321	2	8.3-1.72 = 6.58	0.10	0.247
2.5	10-3.26 = 6.74	0.10	0.247	2.5	8.4-1.80 = 6.60	0.08	0.198
3	10-3.28 = 6.72	0.08	0.198	3	9-2.39 = 6.61	0.07	0.173
3.5	10-3.29 = 6.71	0.07	0.173	3.5	9.1-2.47 = 6.63	0.05	0.123
4	10-3.30 = 6.70	0.06	0.148	4	10-3.36 = 6.64	0.04	0.099
5	10-3.31 = 6.69	0.05	0.123	5	10.1-3.46 = 6.64	0.04	0.099
6	10-3.32 = 6.68	0.04	0.099	6	10.2-3.54 = 6.66	0.02	0.049
7	10-3.32 = 6.68	0.04	0.099	7	10.3-3.64 = 6.66	0.02	0.049
10	10-3.32 = 6.68	0.04	0.099	10	7-0.34 = 6.66	0.02	0.049
15	10-3.33 = 6.67	0.03	0.074				
25	7-0.32 = 6.68	0.04	0.099				

NOTE- REMOVE 1-ℓ slug

H_0 = 0.405'

NOTE - add 1-ℓ slug

H_0 = 0.405'

NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. 8 769.47 BY R. NOWAK

SUBJECT MW-007 SLUG TEST (1/10/86) Checked By MF

RISING HEAD

TIME (min)	D.T.W. (Ft)	H (Ft)	H/Ho
0	6.83	0	—
0.33	7.22	0.39	0.963
0.5	7.16	0.33	0.815
0.75	7.13	0.30	0.741
1	7.09	0.26	0.642
1.25	7.05	0.22	0.543
1.50	7.02	0.19	0.469
1.75	7.00	0.17	0.420
2	6.98	0.15	0.370
3	6.92	0.09	0.222
4	6.89	0.06	0.148
6	6.88	0.05	0.123
8	6.86	0.03	0.074
11	6.86	0.03	0.074
16	6.84	0.01	0.025
21	6.87	0.04	0.099
26	6.88	0.05	0.123

NOTE - H_0 = 0.405' from 1-ℓ slug

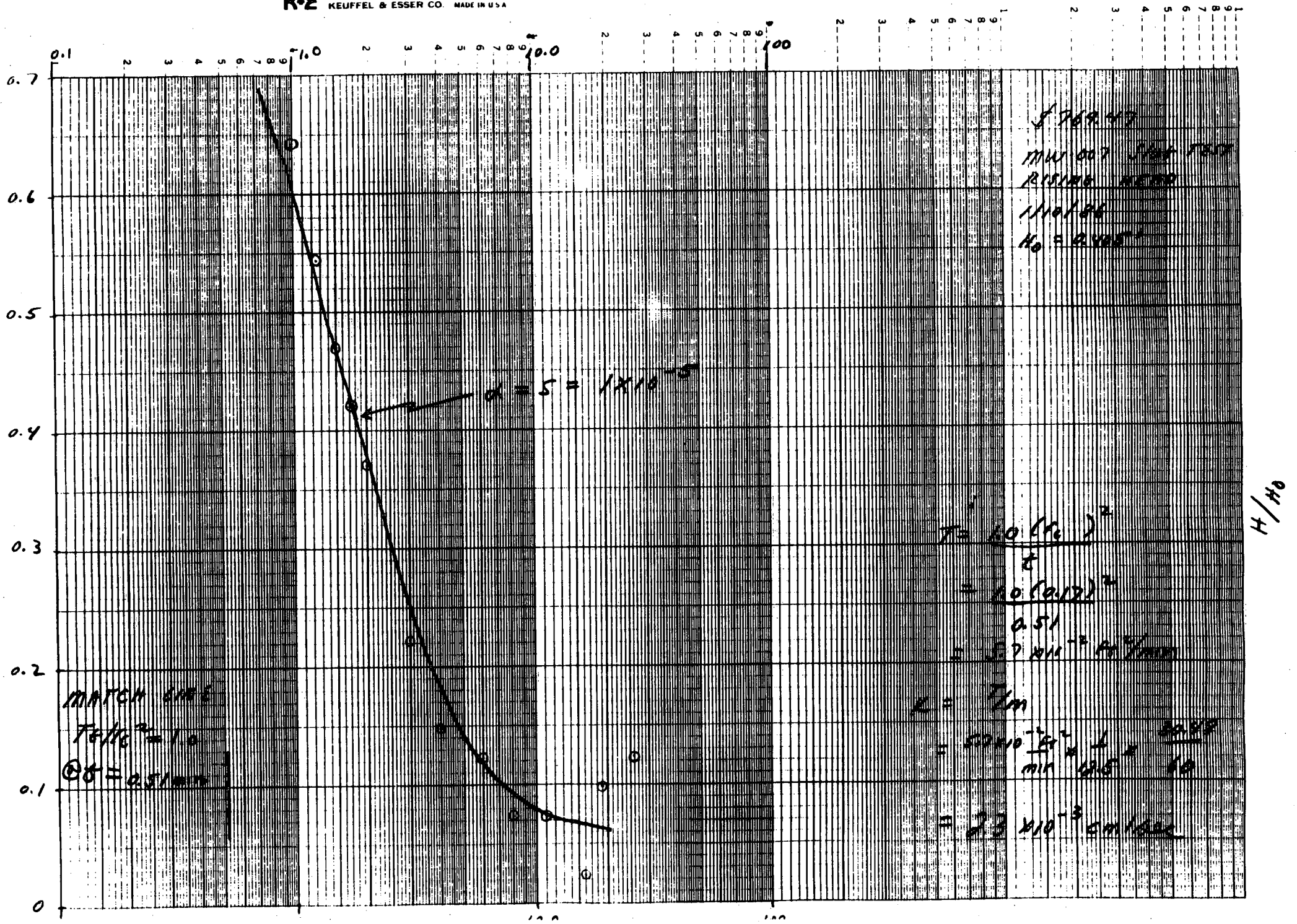
FALLING HEAD

TIME (min)	D.T.W. (Ft)	H (Ft)	H/Ho
0	6.88	0	—
0.25	6.61	0.27	0.667
0.5	6.61	0.27	0.667
0.75	6.64	0.24	0.593
1	6.68	0.20	0.494
1.25	6.71	0.17	0.420
1.5	6.72	0.16	0.395
1.75	6.75	0.13	0.321
2	6.76	0.12	0.296
2.5	6.78	0.10	0.247
3	6.79	0.09	0.222
3.5	6.82	0.06	0.148
4	6.83	0.05	0.123
5	6.83	0.05	0.123
7	6.84	0.04	0.099
10	6.86	0.02	0.049
15	6.87	0.01	0.025
20	6.86	0.02	0.049

NOTE H_0 = 0.405' from 1-ℓ slug

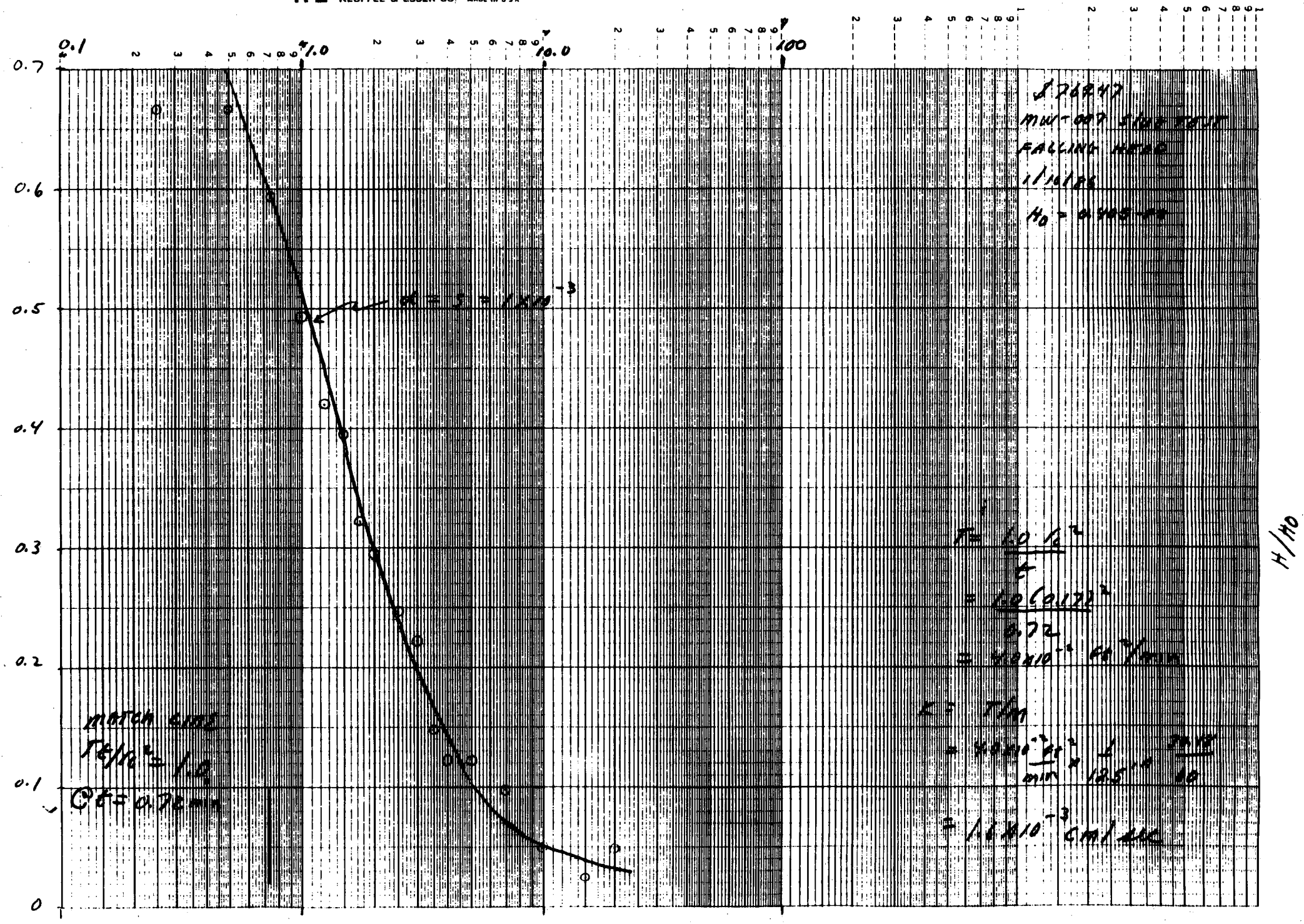
K•E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6210

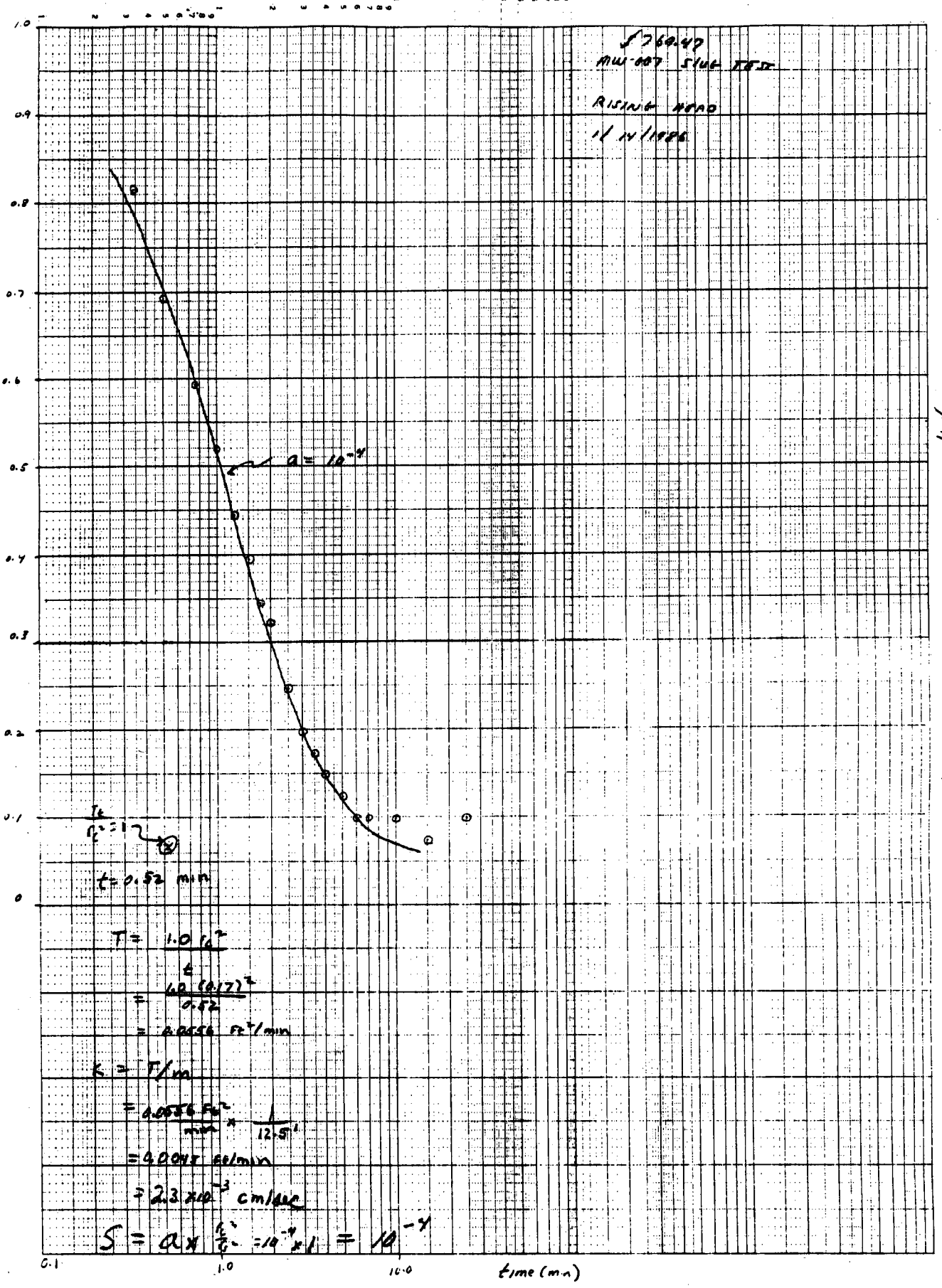


K·E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6210



K+E SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A. 46 6210



$\frac{T_t}{r_c^2} = 1$

$t = 0.52$ min

$T = \frac{1.0\, r_c^2}{t}$

$= \frac{4.0\,(0.17)^2}{0.52}$

$= 0.0556$ ft²/min

$K = T/m$

$= \frac{0.0556 \text{ ft}^2}{\text{min}} \times \frac{1}{12.5'}$

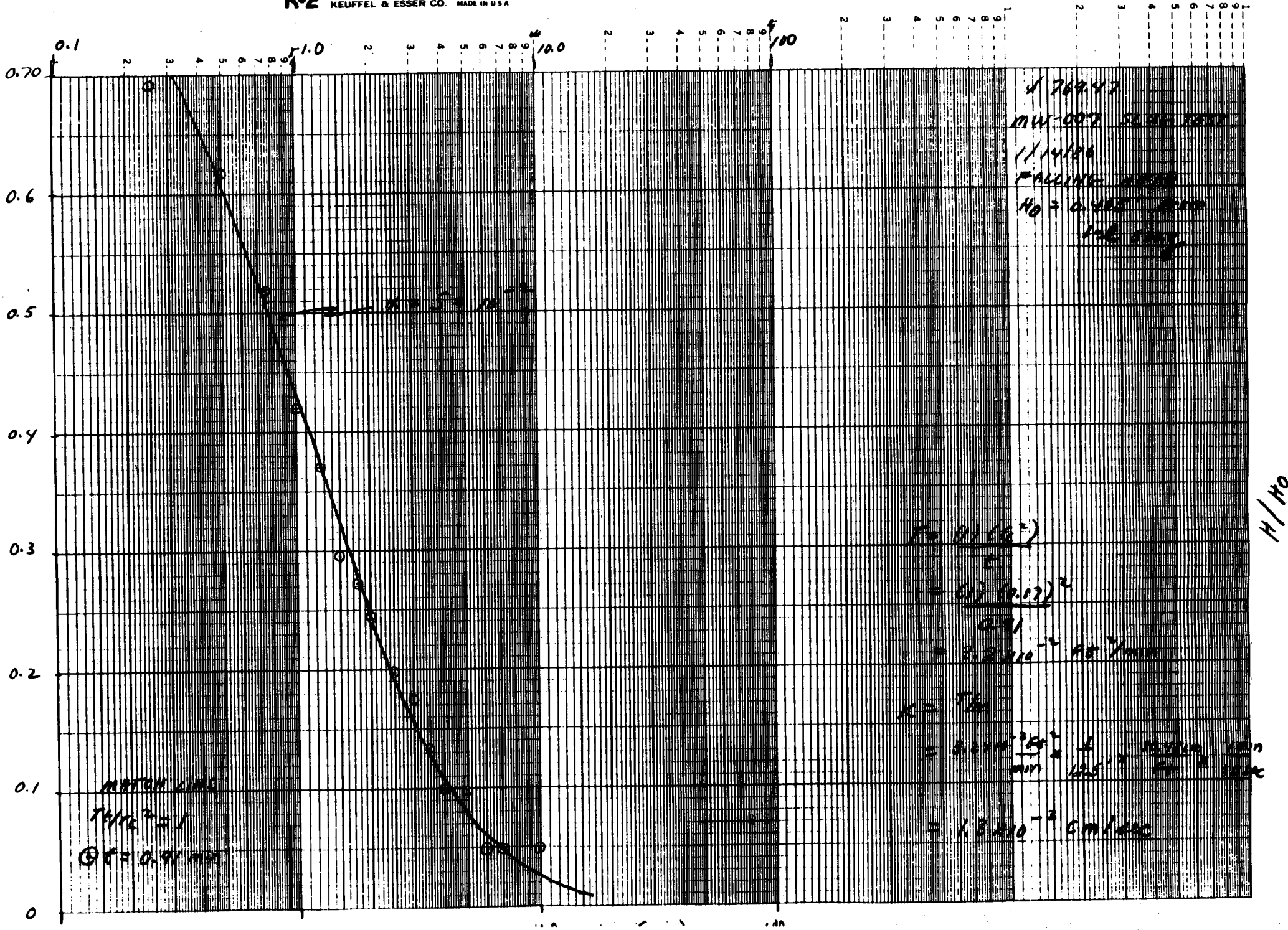
$= 0.0044$ ft/min

$= 2.3 \times 10^{-3}$ cm/sec

$S = a \times \frac{r_c^2}{T_t} = 10^{-4} \times 1 = 10^{-4}$

K+E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6210

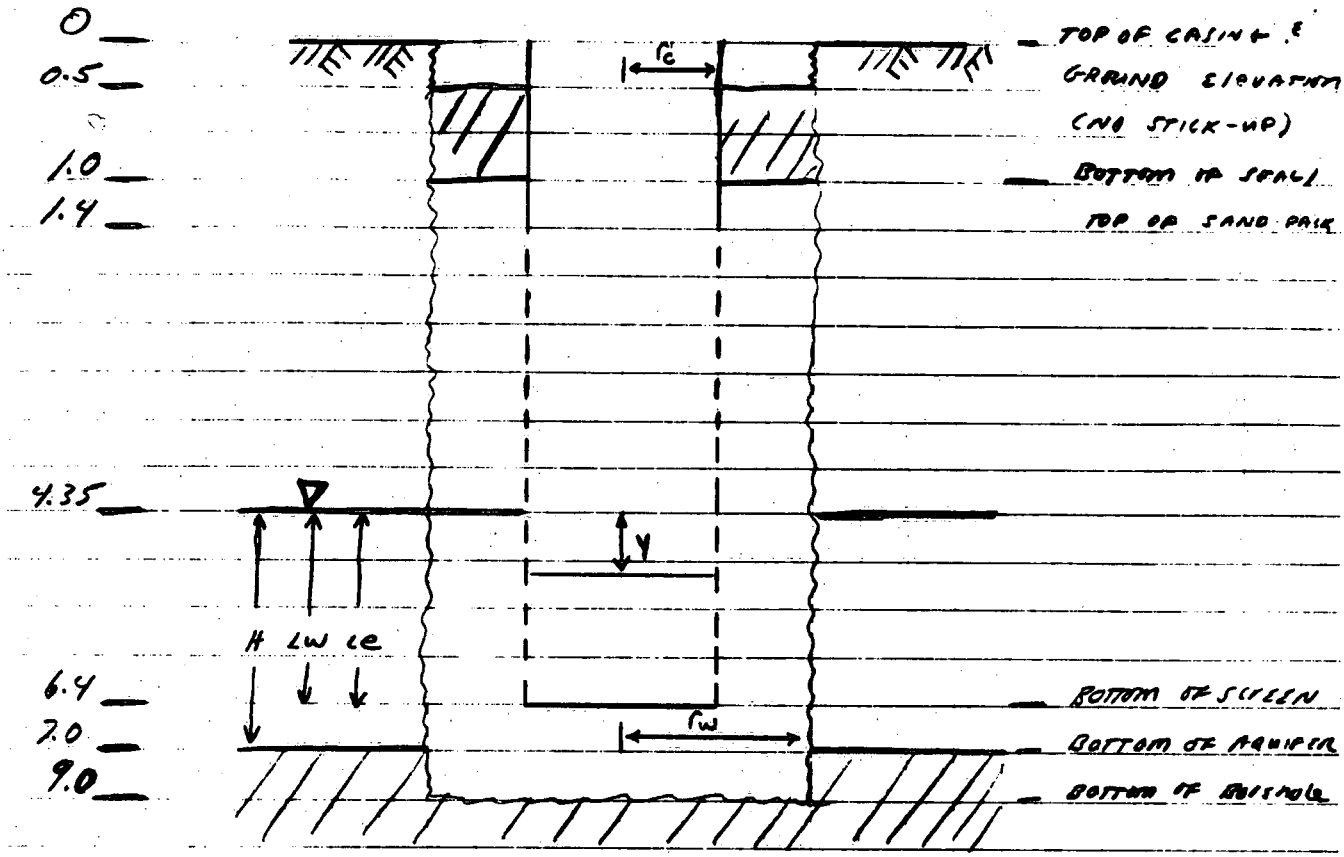


NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT Chem. Control - MW-008 SLUG TEST Checked By MF



$H = 7 - 4.35 = 2.65$

$L_w = L_e = 6.4 - 4.35 = 2.05$

$r_w = 5'' = 0.42$

$r_c = 2'' = 0.17$

$r_c' = 0.27'$

$L_e/r_w = (2.05/0.42) = 4.88$

$A = 1.75$

$B = 0.25$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln 4.88} + \frac{1.75 + 0.25 \ln(0.10/0.42)}{4.88}\right)^{-1}$$

$$= 0.934$$

NUS CORPORATION

DATE 1/23/1985

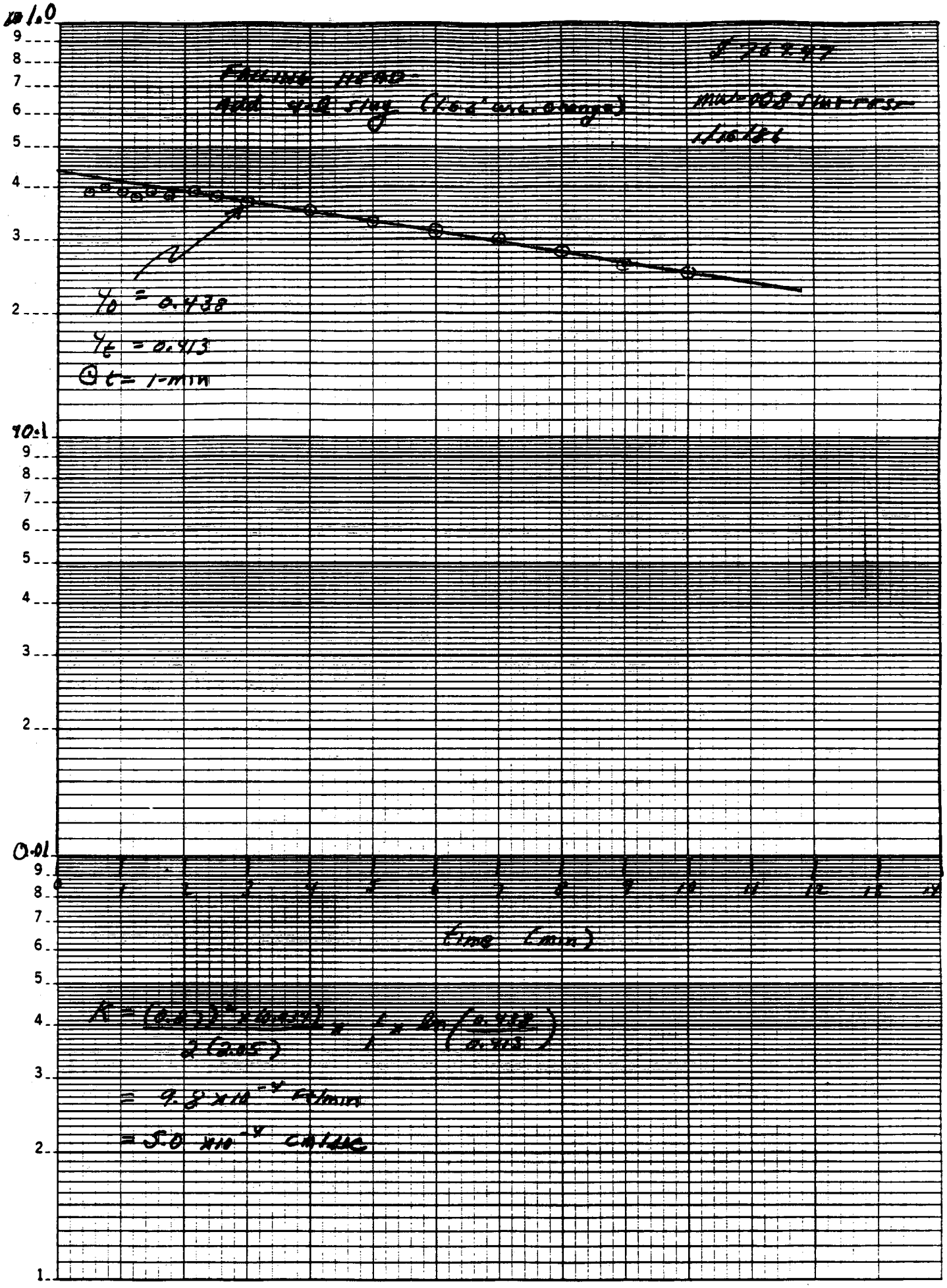
CLIENT USEPA FILE NO. S 769.47 BY R. NOWAK

SUBJECT MW-08R SLUG TEST Checked By DMF

II DATA

FALLING HEAD { Add 4-lb slug ⇒ 1.62' w.l. change }

Time (min)	D.T.W. (Ft)	Y (Ft)
0	5 - 0.65 = 4.35	0
0.5	5 - 1.04 = 3.96	0.39
0.75	5.2 - 1.25 = 3.95	0.40
1.0	5.3 - 1.34 = 3.96	0.39
1.25	5.4 - 1.43 = 3.97	0.38
1.5	5.5 - 1.54 = 3.96	0.39
1.75	5.6 - 1.63 = 3.97	0.38
2.17	5.7 - 1.74 = 3.96	0.39
2.5	5.8 - 1.83 = 3.97	0.38
3	5.9 - 1.92 = 3.98	0.37
4	5.0 - 1.00 = 4.00	0.35
5	5.1 - 1.08 = 4.02	0.33
6	5.2 - 1.16 = 4.04	0.31
7	5.3 - 1.25 = 4.05	0.30
8	5.4 - 1.33 = 4.07	0.28
9	5.5 - 1.41 = 4.09	0.26
10	5.00 - 0.90 = 4.10	0.25
15	5.5 - 1.40 = 4.10	0.25
20	5.7 - 1.50 = 4.20	0.15
25	5.8 - 1.60 = 4.20	0.15
30	5.9 - 1.68 = 4.22	0.13

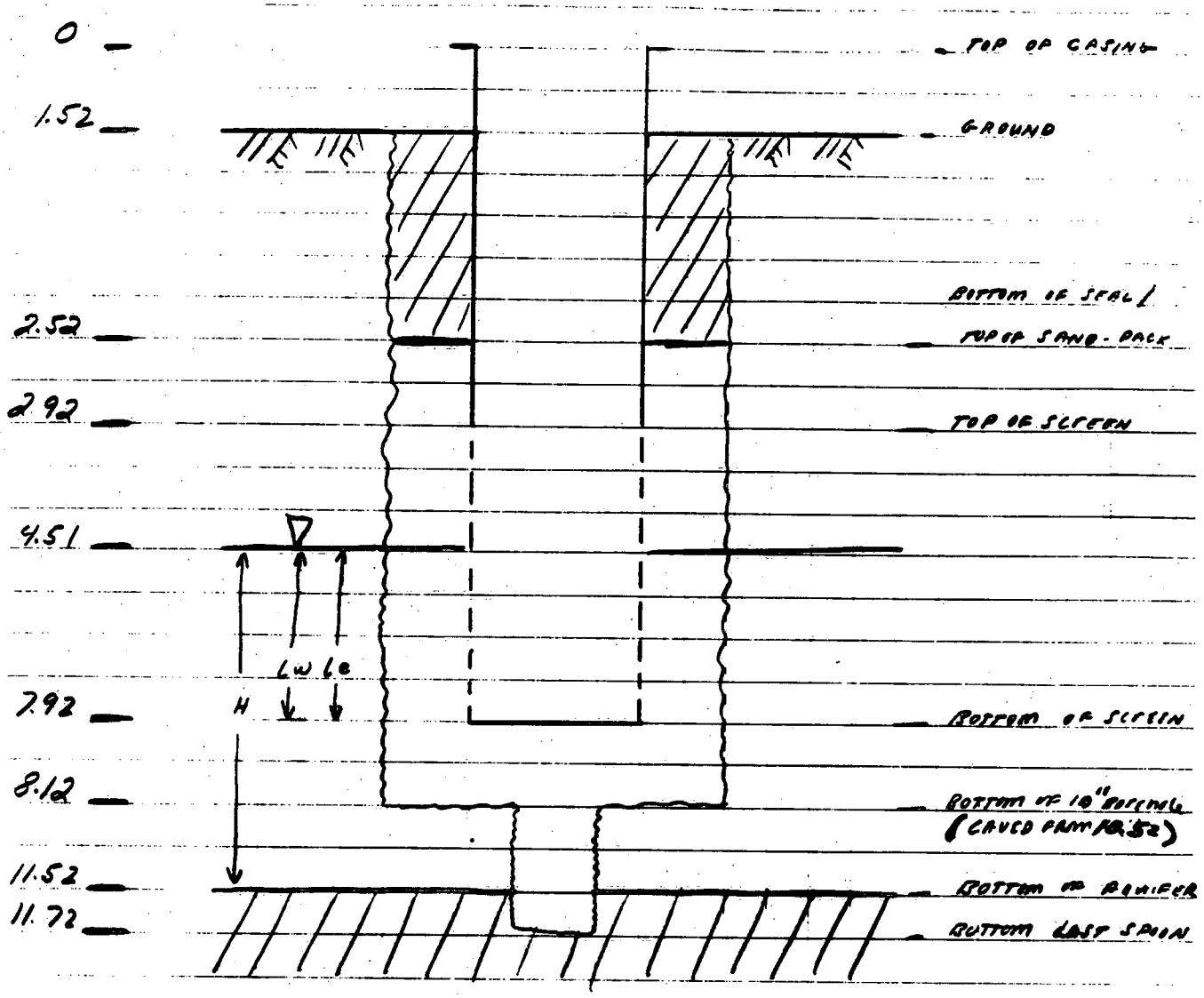

Falling head
Add 4.8 slug (to 6' circ. change)
min-108 surface
110186
Y_0 = 0.438
Y_t = 0.413
@ t = 1-min
time (min)
$K = \frac{(0.032)^2 \times (0.032)}{2(2.05)} \times \frac{1}{t} \times \ln\left(\frac{0.438}{0.413}\right)$
= 9.8 x 10^-4 ft/min
= 5.0 x 10^-4 cm/sec
46 5490
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

NUS CORPORATION

DATE 1/24/86

CLIENT USEPA FILE NO. 769.47 BY R. NOWAK

SUBJECT Chem. Control - MW-009 SLUG TEST Checked By MR



NUS CORPORATION

DATE 1/24/86

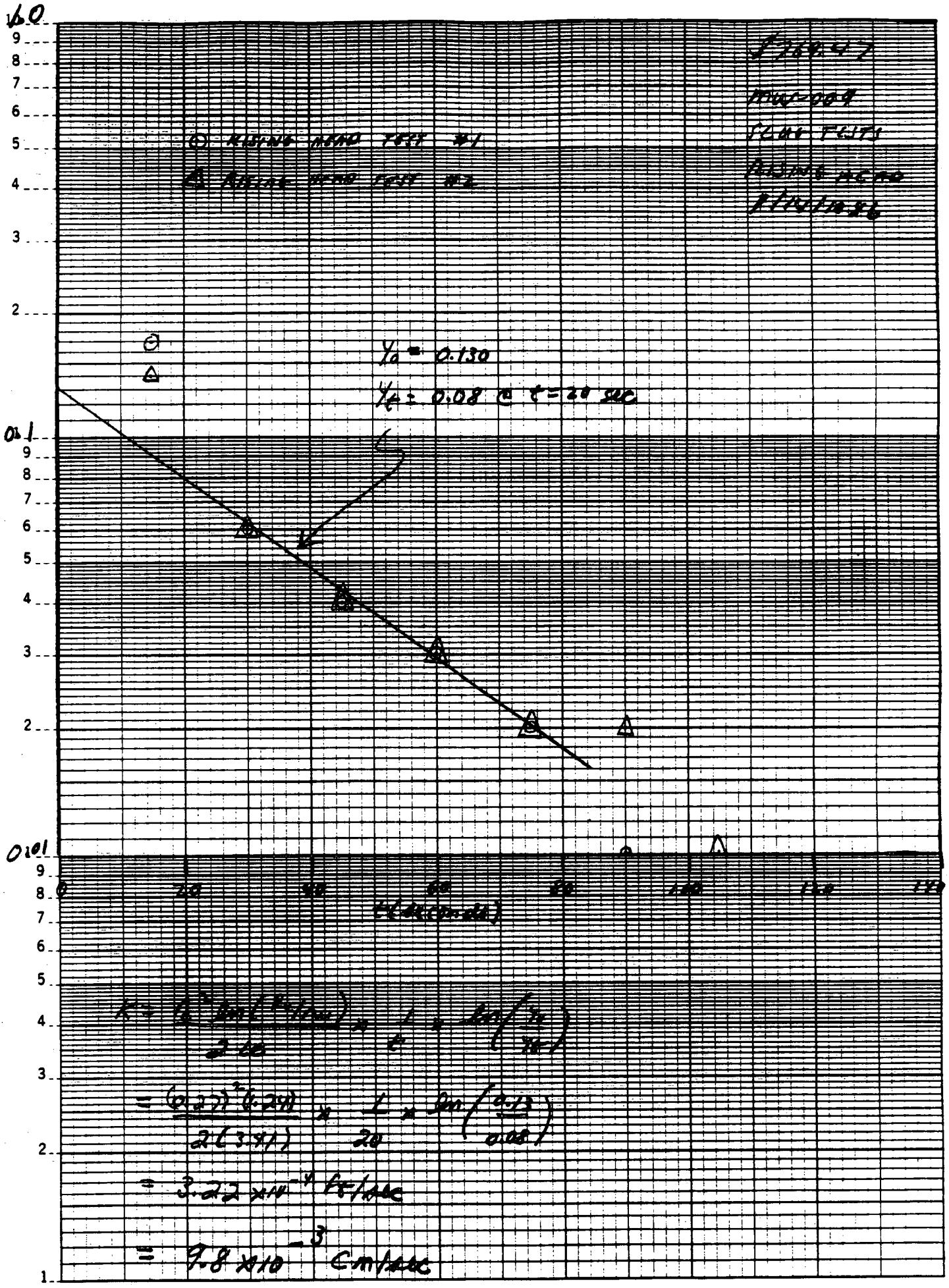
CLIENT EPA FILE NO. Chemical Control ($769.47) BY MK

SUBJECT Slug Tests - Well 009 Checked By R. Nowak

✓ Rising head test (1/14/86 @ 12:51) RUN NO. 1

time (sec)	D.T.W.	Ye	time	DTW	Ye
15	4.68	0.17	16	4.70	0.20
30	4.58	0.06	30	4.55	0.05
45	4.55	0.04	45	4.55	0.05
60	4.54	0.03	60	4.51	0.01
75	4.53	0.02	75	4.43	0.07
90	4.52	0.01	105	4.43	0.07
105	4.52	0.01			
120	4.51	0.00			
135	4.51	0.00			
150	4.51	0.00			

Falling head (1/14/86 @ 13:32)			RUN NO. 2 ✓ Rising head test (1/14/86 14:20)		
15	4.44	0.09	15	4.64	0.14
20	4.47	0.06	30	4.56	0.06
30	4.49	0.04	45	4.54	0.04
40	4.47	0.06	60	4.53	0.03
60	4.49	0.04	75	4.52	0.02
75	4.46	0.07	90	4.52	0.02
90	4.42	0.11	105	4.51	0.01
105	4.41	0.12	120	4.50	0.0
120	4.46	0.07	135	4.50	0.0



K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A. 46 5490

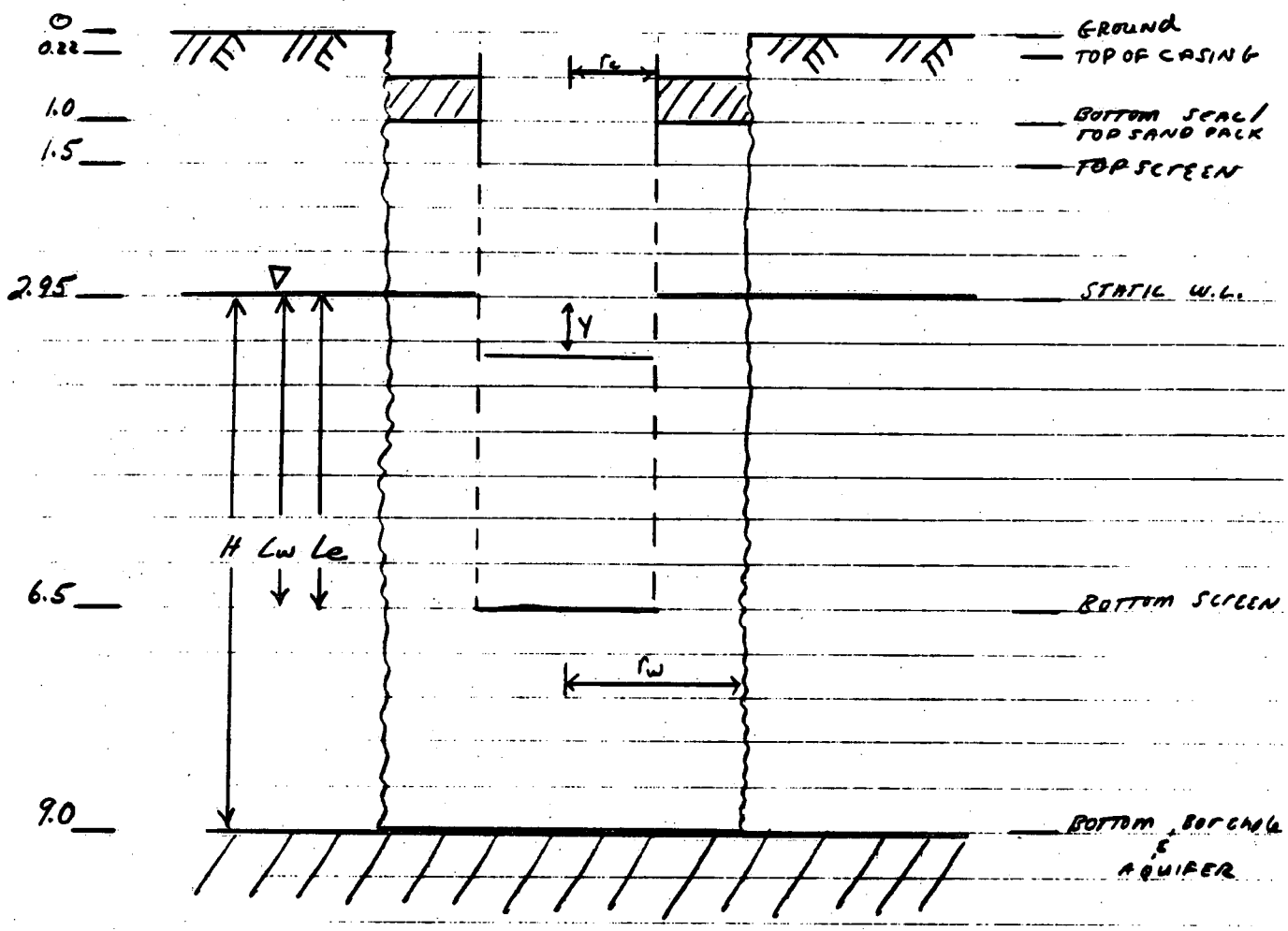
NUS CORPORATION

DATE 1/27/86

CLIENT USEPA FILE NO. 876947 BY R. NOWAK

SUBJECT MW-010 SLUG TEST Checked By MVF

I CONSTRUCTION



$H = 9.0 - 2.95 = 6.05$

$L_w = L_e = 6.5 - 2.95 = 3.55$

$r_w = 0.42'$

$r_c = 0.17'$

$r_c' = 0.27'$

$L_e/r_w = 3.55/0.42 = 8.45$

$A = 1.75$

$B = 0.25$

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln 8.45} + \frac{1.75 + 0.25 \ln(6.05 - 3.55/0.42)}{8.45} \right)$$

$$= 1.29$$

NUS CORPORATION

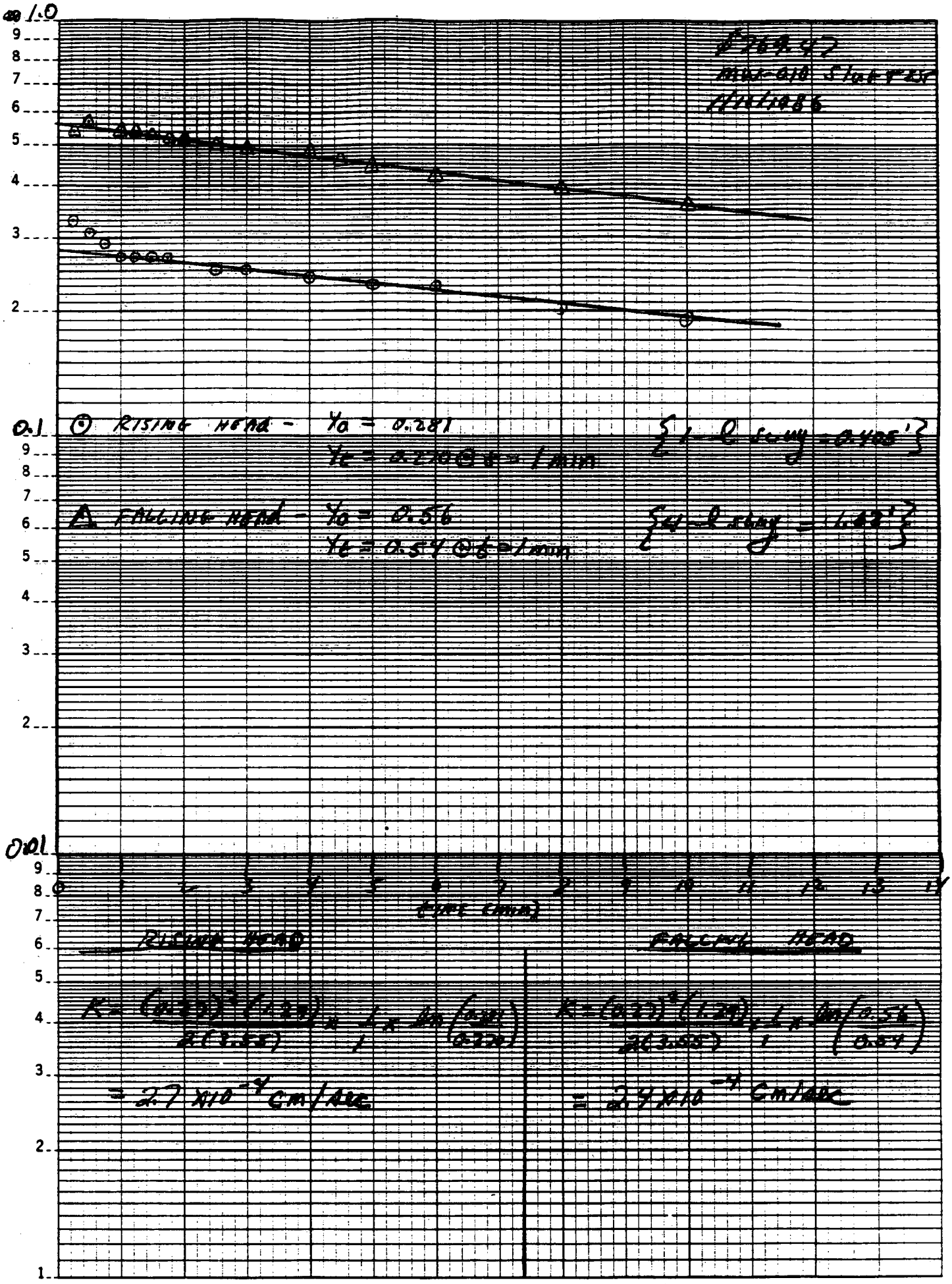
DATE 1/27/86

CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT MW-010 SLUG TEST Checked By [illegible]

II DATA

RISING HEAD			FALLING HEAD		
Time (min)	D.T.W. (ft)	Y (ft)	Time (min)	D.T.W. (ft)	Y (ft)
0	3 - 0.27 = 2.73	0	0	3.1 - 0.33 = 2.77	0
0.25	4 - 0.94 =	0.33	0.25	3.0 - 0.77 = 2.23	0.54
0.5	4 - 0.96 =	0.31	0.50	3.1 - 0.90 = 2.20	0.57
0.75	4 - 0.98 =	0.29	1.00	3.4 - 1.17 = 2.23	0.54
1.00	4 - 1.0 =	0.27	1.25	3.5 - 1.27 = 2.23	0.54
1.25	4 - 1.0 =	0.27	1.5	3.6 - 1.36 = 2.24	0.53
1.5	4 - 1.0 =	0.27	1.75	3.7 - 1.45 = 2.25	0.52
1.75	4 - 1.0 =	0.27	2.00	3.8 - 1.55 = 2.25	0.52
2.5	4 - 1.02 =	0.25	2.5	3.9 - 1.63 = 2.27	0.50
3	4 - 1.02 =	0.25	3	4 - 1.72 = 2.28	0.49
4	4 - 1.03 =	0.24	3.5	4 - 1.81 = 2.19	0.58 (?)
5	4 - 1.04 =	0.23	4	4.1 - 1.81 = 2.29	0.48
6	4 - 1.04 =	0.23	4.5	4.2 - 1.89 = 2.31	0.46
8	4 - 1.07 =	0.20	5	4.4 - 2.07 = 2.33	0.44
10	4 - 1.08 =	0.19	6	4.5 - 2.15 = 2.35	0.42
15	4 - 1.11 =	0.16	8	4.6 - 2.22 = 2.38	0.39
20	4 - 1.13 =	0.14	10	4.7 - 2.29 = 2.41	0.36
25	4 - 1.15 =	0.12	15	3.0 - 0.53 = 2.47	0.30
30	4 - 1.16 =	0.11	20	3.1 - 0.60 = 2.50	0.27
			25	3.2 - 0.66 = 2.54	0.23
			30	3.3 - 0.74 = 2.56	0.21



46 5490
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

NUS CORPORATION

DATE 11/20/86

CLIENT US EPA FILE NO. 1769.47 BY R. NOWAK

SUBJECT MW-002 PUMP TEST (11/12/1985) Checked By MF
(water level in MW-002

t (min)	t' (min)	D.T.W. (ft)	s (ft)	s_c (ft)	s' (ft)	s_c' (ft)	$(s_c - s_c')$ (ft)
(10:30A) 0		3.16	0	0			
0.5		3.64	0.48	0.46			
1.0		3.71	0.55	0.53			
(Q = 1.4375 gpm) 1.5		3.71	0.55	0.53			
2.5		4.54	1.38	1.25			
3.0		4.92	1.76	1.55			
3.5		5.00	1.84	1.61			
(Q = 1.75 gpm) 4.0		5.00	1.84	1.61			
7.0		5.42	2.26	1.91			
8.0		5.53	2.37	1.99			
9.0		5.61	2.45	2.04			
10.0		5.70	2.54	2.10			
12.0		5.83	2.67	2.18			
14.0		5.97	2.81	2.27			
15.0		6.12	2.96	2.36			
(Q = 1.75 gpm) 16.0		6.19	3.03	2.40			
17.0		6.23	3.07	2.43			
18.0		6.26	3.10	2.44			
19.0		6.30	3.14	2.47			
20.0		6.33	3.17	2.48			
22.0		6.42	3.26	2.53			
25.0		6.53	3.37	2.59			
(Q = 1.4375 gpm) 30.0		6.76	3.60	2.71			
35.0		6.98	3.82	2.82			
(Q = 1.4375 gpm) 40.0		7.18	4.02	2.92			
45		7.45	4.29	3.03			
50		7.74	4.58	3.15			
55		8.15	4.99	3.29			
60		8.53	5.37	3.40			
64		8.79	5.63	3.46			
65		8.83	5.67	3.47			
68		8.98	5.82	3.51			
74		9.34	6.18	3.57			
(11:45A) 75		9.40	6.24	3.58			

(STOP PUMP @ 75 min

NUS CORPORATION

DATE 1/20/86

CLIENT USEPA FILE NO. 8 76947 BY RN

SUBJECT MW-002 water levels Checked By MP

t (min)	t' (min)	D.T.W. (ft)	t/t'	A (ft)	A_c (ft)	A' (ft)	A_c' (ft)	$(A_c - A_c')$ (ft)
(11:45.5) 75.5	0.5	8.88	151		3.58	5.72	3.49	0.09
76	1.0	8.33	76		3.59	5.17	3.34	0.25
76.5	1.5	7.76	51		3.60	4.60	3.15	0.45
77	2.0	7.30	38.5		3.60	4.14	2.97	0.63
77.5	2.5	6.97	31		3.60	3.81	2.82	0.78
78	3.0	6.69	26		3.61	3.53	2.68	0.93
78.5	3.5	6.44	22.4		3.61	3.28	2.55	1.06
79	4.0	6.20	19.8		3.62	3.04	2.41	1.21
79.5	4.5	5.90	17.7		3.62	2.74	2.23	1.39
80	5.0	5.73	16.0		3.62	2.57	2.12	1.50
80.5	5.5	5.59	14.6		3.63	2.43	2.03	1.60
81	6.0	5.42	13.5		3.63	2.26	1.91	1.72
81.5	6.5	5.27	12.5		3.63	2.11	1.81	1.82
82	7.0	5.18	11.7		3.64	2.02	1.74	1.90
82.5	7.5	5.10	11.0		3.64	1.94	1.68	1.96
83	8.0	5.00	10.4		3.65	1.84	1.61	2.04
84	9.0	4.90	9.3		3.66	1.74	1.53	2.13
85	10.0	4.83	8.5		3.67	1.67	1.48	2.19
86	11.0	4.75	7.8		3.68	1.59	1.42	2.26
87	12.0	4.68	7.3		3.68	1.52	1.36	2.32
88	13.0	4.63	6.8		3.69	1.47	1.32	2.37
89	14.0	4.59	6.4		3.69	1.43	1.29	2.40
90	15.0	4.55	6.0		3.70	1.39	1.26	2.44
91	16.0	4.51	5.7		3.71	1.35	1.23	2.48
92	17.0	4.47	5.4		3.72	1.31	1.19	2.53
94	19.0	4.41	4.9		3.73	1.25	1.14	2.58
95	20	4.38	4.8		3.74	1.22	1.12	2.62
100	25	4.28	4.0		3.78	1.12	1.03	2.75
105	30	4.19	3.5		3.81	1.03	0.96	2.85
110	35	4.12	3.1		3.84	0.96	0.90	2.94
115	40	4.01	2.9		3.87	0.85	0.80	3.07
120	45	3.99	2.7		3.90	0.83	0.78	3.12
126	51	3.93	2.5		3.93	0.77	0.73	3.20
130	55	3.90	2.4		3.95	0.74	0.70	3.25

NUS CORPORATION

DATE 1/20/86

CLIENT USEPA FILE NO. 8769.47 BY RN

SUBJECT MW-002 water levels Checked By JMF

	t (min)	t' (min)	t/t'	D.T.W. (ft)	s (ft)	s_c (ft)	s' (ft)	s'_c (ft)	$(s_c - s_c')$ (ft)
	135	60	2.3	3.83		3.98	0.67	0.64	3.34
	140	65	2.2	3.81		4.00	0.65	0.62	3.38
	150	75	2.0	3.79		4.05	0.63	0.60	3.45
(1:10p)	160	85	1.9	3.70		4.09	0.54	0.52	3.57
(1:20p)	170	95	1.8	3.66		4.13	0.50	0.48	3.65
(1:30p)	180	105	1.7	3.62		4.17	0.46	0.45	3.72
(1:40p)	190	115	1.7	3.60		4.21	0.44	0.43	3.78
(1:50p)	200	125	1.6	3.55		4.24	0.39	0.38	3.86
(2:00)	210	135	1.6	3.52		4.28	0.36	0.35	3.93
(2:10)	220	145	1.5	3.52		4.31	0.36	0.35	3.96
(2:20)	230	155	1.5	3.47		4.34	0.31	0.30	4.04
(2:36)	246	171	1.4	3.44		4.38	0.28	0.27	4.11
(2:45)	255	180	1.4	3.45		4.41	0.29	0.28	4.13
(2:49)	259	184	1.4	3.42		4.42	0.26	0.26	4.16
(2:57)	267	192	1.4	3.43		4.44	0.27	0.27	4.17

t = time since pumping started, min

t' = time since pumping stopped, min

D.T.W. = Depth to water, ft.

s = drawdown, ft

s_c = drawdown corrected for dewatering, ft

s' = residual drawdown, ft

s_c' = residual drawdown corrected for dewatering

$(s_c - s_c')$ = corrected recovery, ft

NUS CORPORATION

DATE 1/20/86

CLIENT USEPA FILE NO. 8769.47 BY R Nowak

SUBJECT MW-002 pump test - water level in NJDEP #1 Checked By DMR

r_{DEL} = 25' DRAWDOWN

	t (min)	t' (min)	D.T.W. (ft)	t/t'	A (ft)	A' (ft)	(A-A') (ft)
10:30	0		4.0 - 0.86 = 3.14		0		
	0.5		4.1 - 0.96 = 3.14		0		
	1.25		4.2 - 1.07 = 3.13		+0.01		
	2		4.3 - 1.16 = 3.14		0		
	3		4.4 - 1.26 = 3.14		0		
	4		4.5 - 1.36 = 3.14		0		
	5		4.6 - 1.46 = 3.14		0		
	6		4.7 - 1.58 = 3.14		0		
	8		4.8 - 1.67 = 3.13		+0.01		
	10		4.9 - 1.76 = 3.14		0		
	15		4.0 - 0.86 = 3.14		0		
	20		4.2 - 1.06 = 3.14		0		
	25		4.3 - 1.14 = 3.16		0.02		
	30		4.4 - 1.23 = 3.17		0.03		
	35		4.5 - 1.31 = 3.19		0.05		
	40		4.6 - 1.66 = 2.94		–		
	46		4.0 - 0.77 = 3.23		0.09		
	50		4.0 - 0.77 = 3.23		0.09		
	55		4.2 - 0.93 = 3.27		0.13		
(11:30	60		4.3 - 1.03 = 3.27		0.13		
	66		4.5 - 1.21 = 3.29		0.15		
	69		4.6 - 1.30 = 3.30		0.16		
	74		4.0 - 0.68 = 3.32		0.18		
(11:45)	75		4.0 - 0.68 = 3.32		0.18		
	Pump off @ 75 min (11:45 A)						
	76		4.0 - 0.68 = 3.32		0.18		
	77		4.0 - 0.68 = 3.32		0.18		
	79		4.0 - 0.67 = 3.33		0.19		
	81		4.0 - 0.67 = 3.33		0.19		
	83		4.0 - 0.65 = 3.35		0.21		
	84		4.0 - 0.65 = 3.35		0.21		
	86		4.0 - 0.65 = 3.35		0.21		
	88		4.0 - 0.63 = 3.37		0.23		

NUS CORPORATION

DATE 1/20/86

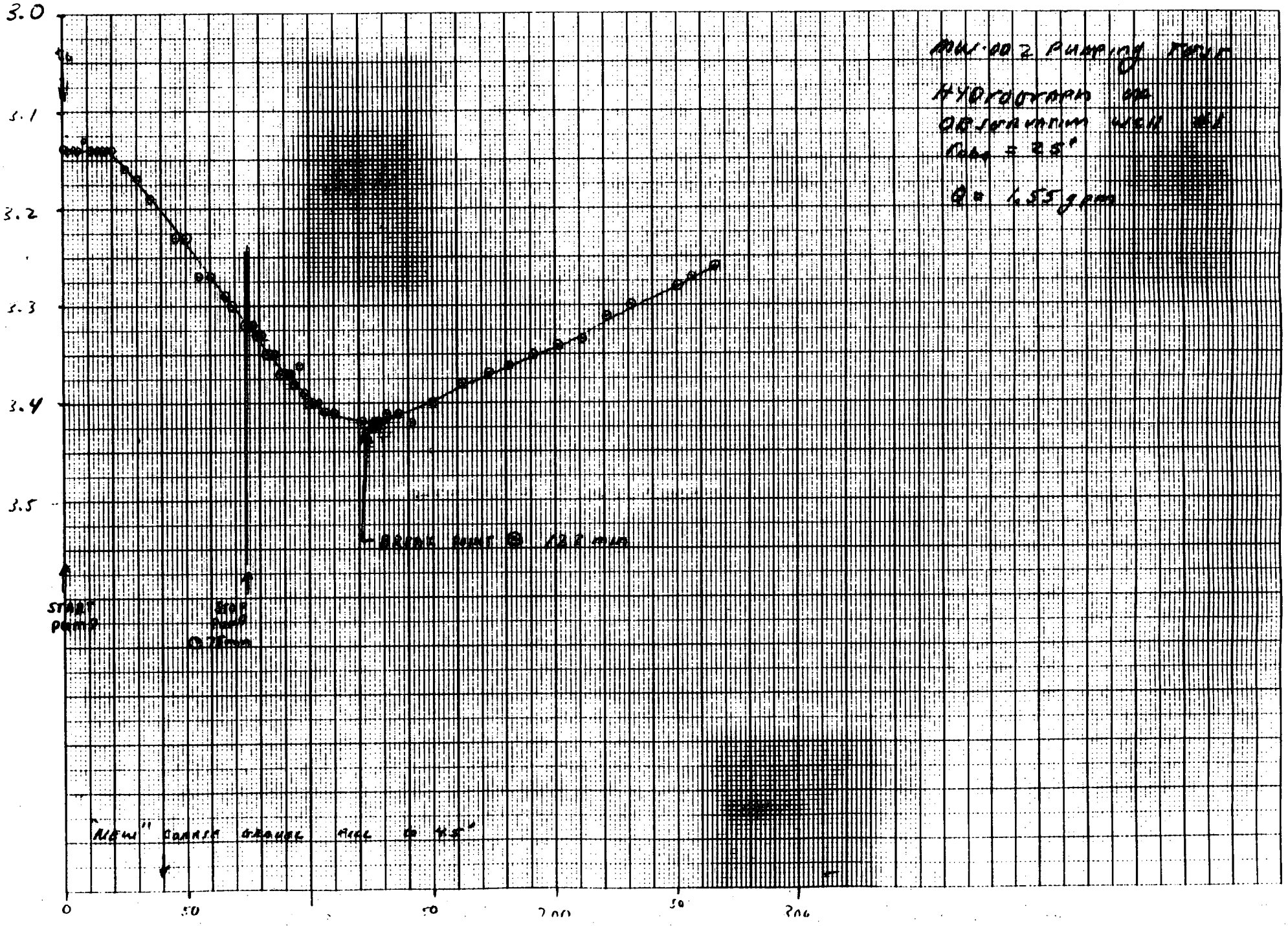
CLIENT USEPA FILE NO. 8769.47 BY R. NOWAK

SUBJECT MW-002 PUMP TEST - NJDEP #1 WATER TOWER Checked By MP

t (min)	t' (min)	D.T.W. (ft)	t/t'	s (ft)	s' (ft)	(s-s') ft
89		4.0 - 0.63 = 3.37		0.23		
(12:00) 90		4.0 - 0.63 = 3.37		0.23		
92		4.1 - 0.73 = 3.37		0.23		
94		4.0 - 0.62 = 3.38		0.24		
96		4.1 - 0.74 = 3.36		0.22		
98		4.0 - 0.61 = 3.39		0.25		
100		4.1 - 0.70 = 3.40		0.26		
102		4.2 - 0.80 = 3.40		(0.26)		
104		4.0 - 0.60 = 3.40		0.26		
106		4.1 - 0.69 = 3.41		0.27		
110		4.2 - 0.79 = 3.41		0.27		
121		4.6 - 1.18 = 3.42		0.28		
126		4.0 - 0.58 = 3.42		0.28		
131		4.2 - 0.79 = 3.41		0.27		
136		4.0 - 0.59 = 3.41		0.27		
141		4.1 - 0.68 = 3.42		(0.28)		
(13:00) 150		4.5 - 1.10 = 3.40				
162		4.0 - 0.62 = 3.38				
173		4.0 - 0.63 = 3.37				
181		4.0 - 0.64 = 3.36				
191		4.0 - 0.65 = 3.35				
201		4.0 - 0.66 = 3.34				
(14:01) 211		4 - 0.67 = 3.33				
221		4.1 - 0.79 = 3.31				
231		4.0 - 0.70 = 3.30				
250		4.0 - 0.72 = 3.28				
256		4.0 - 0.73 = 3.27				
(14:56) 266		5.0 - 1.74 = 3.26				

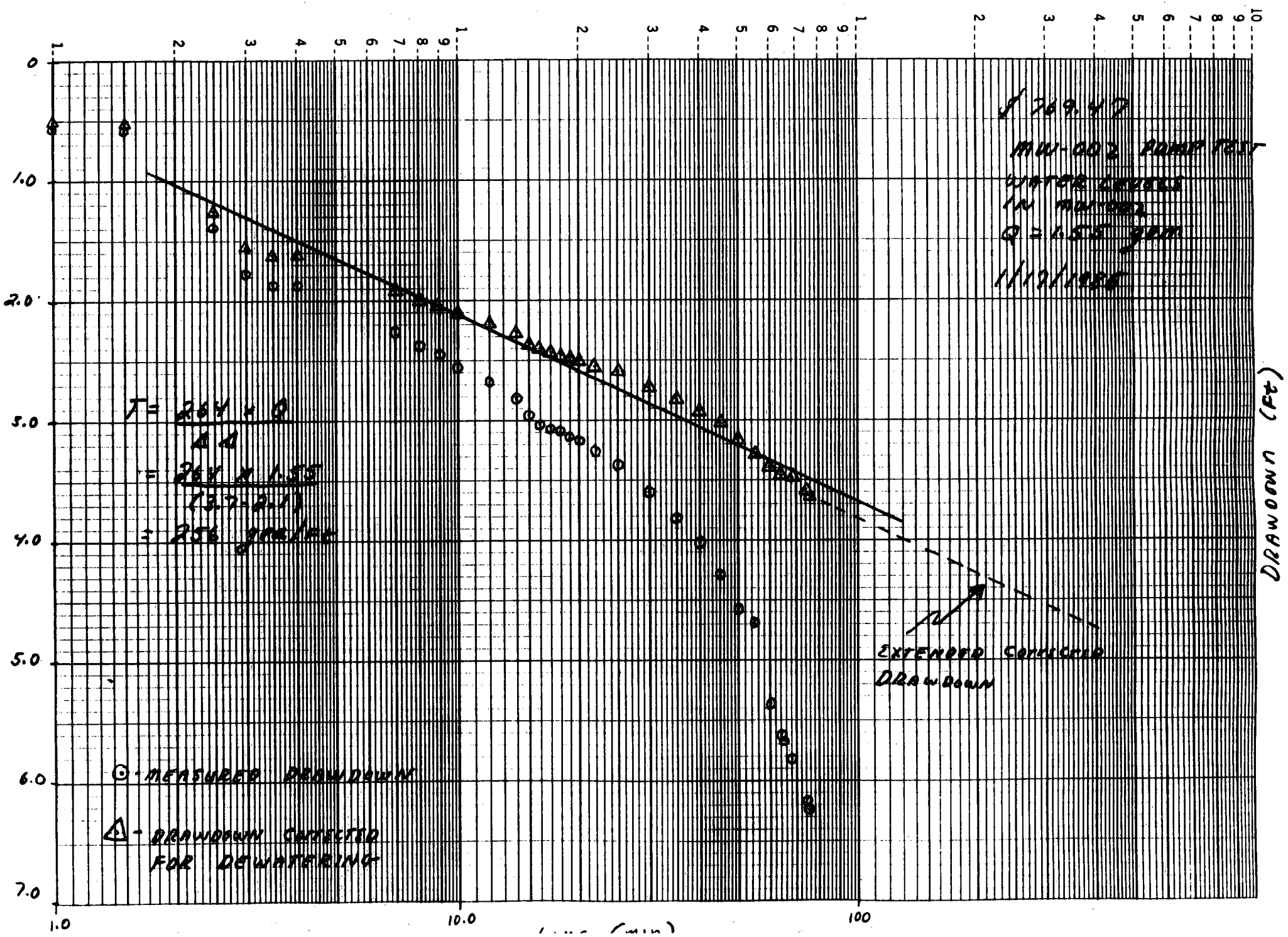
K+E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510



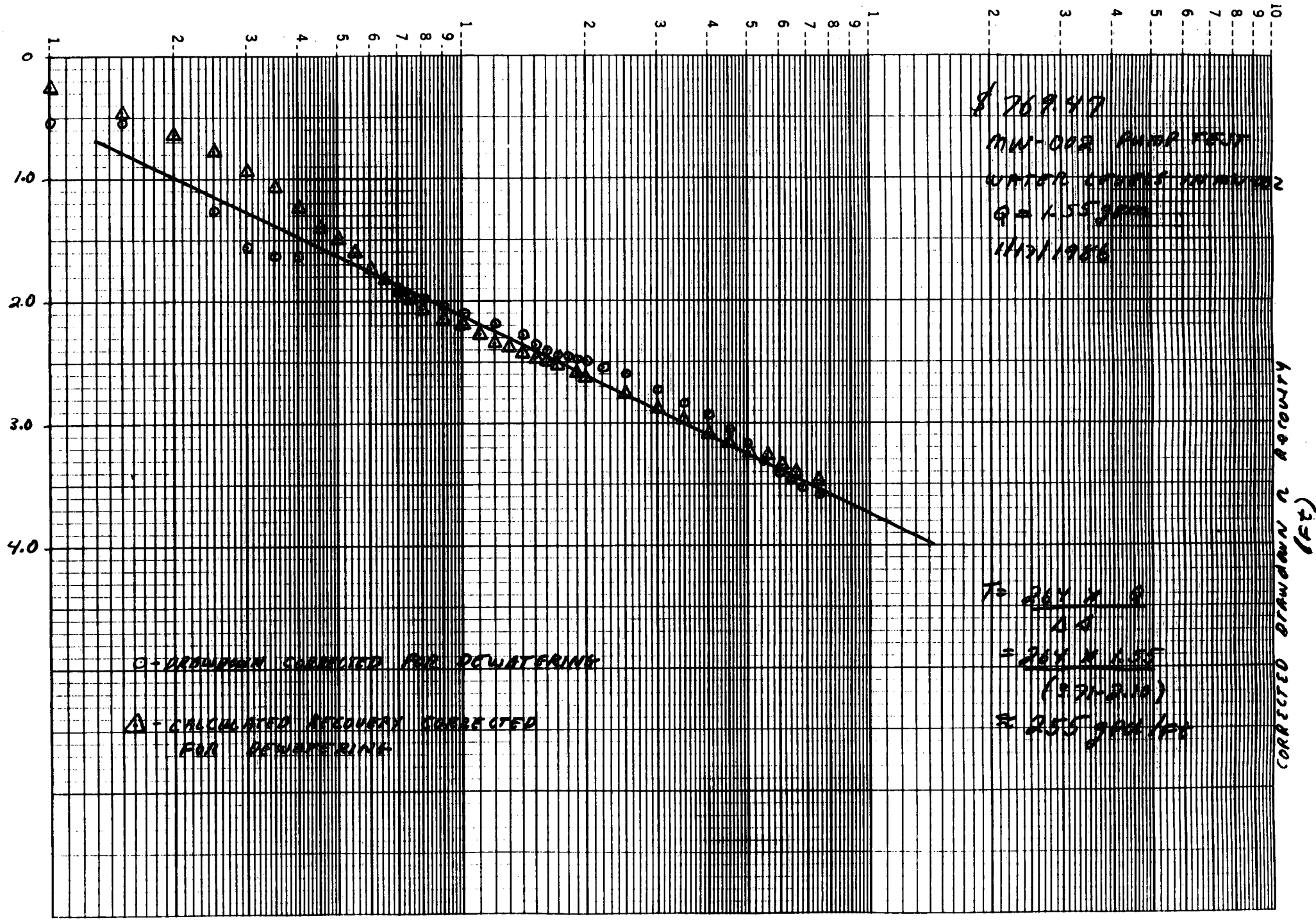
K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 5490



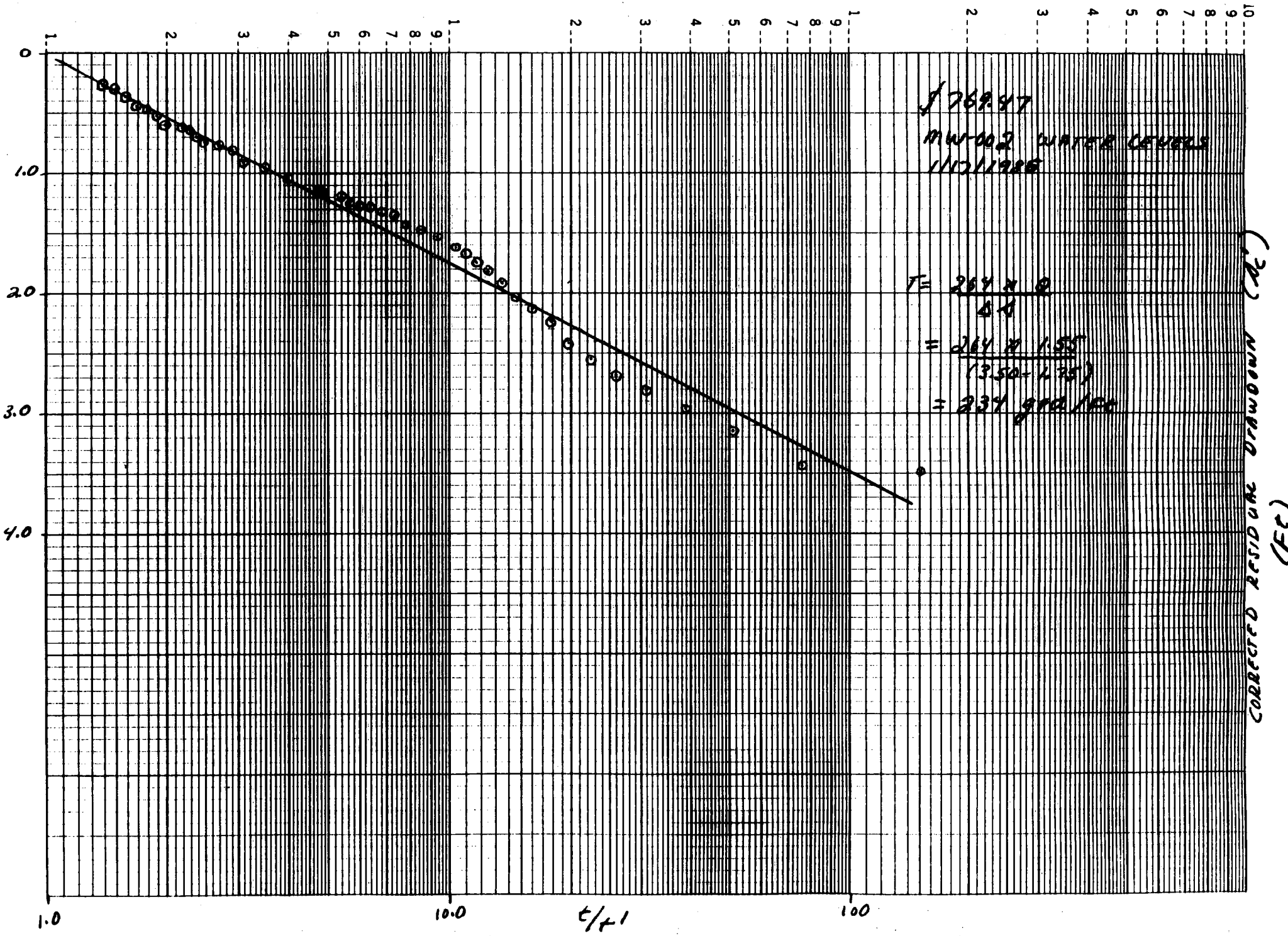
K•E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 5490

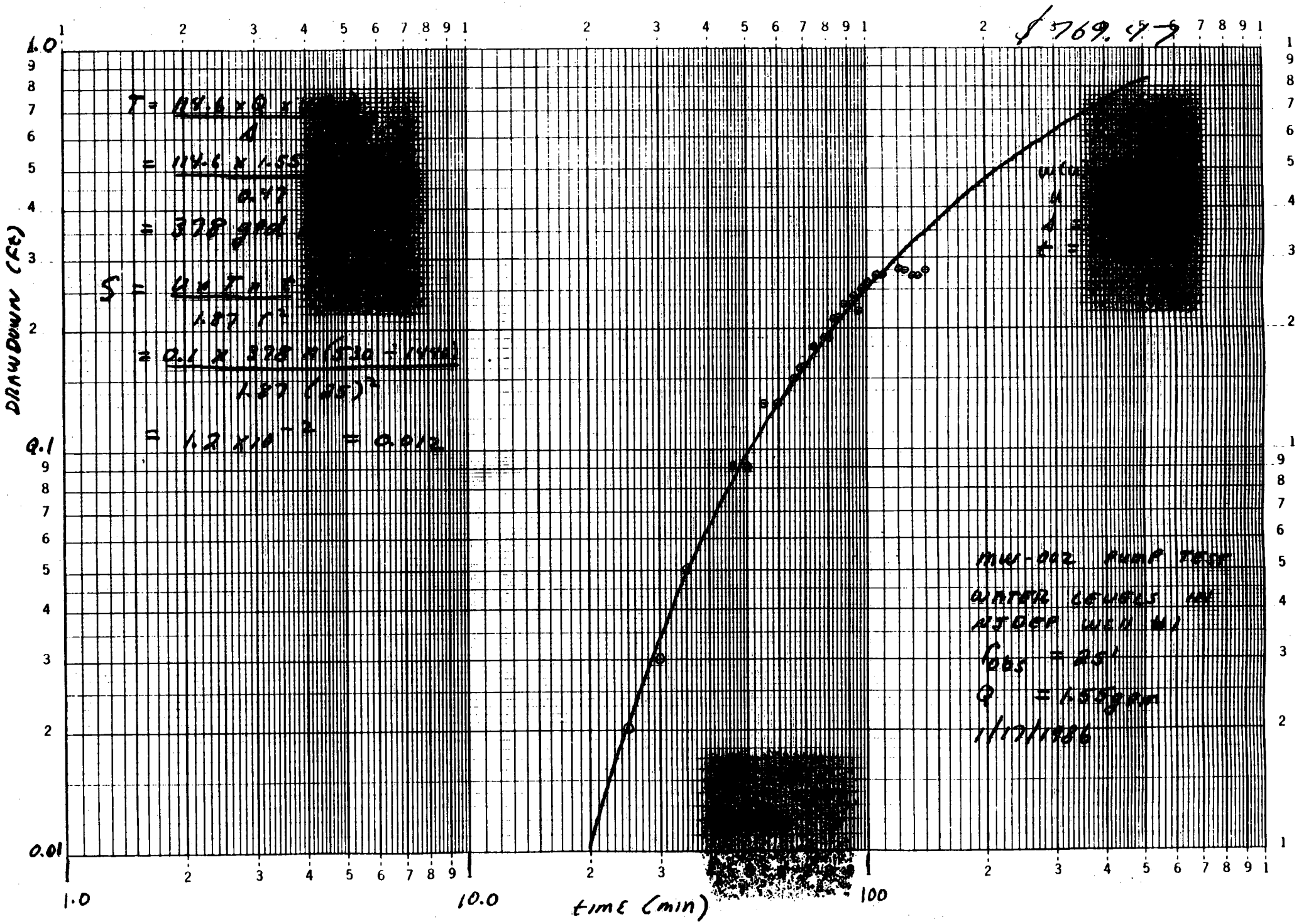


K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 5490



K+E LOGARITHMIC • 2 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 7323



NUS CORPORATION

DATE 1/23/1986

CLIENT USEPA FILE NO. 769.47 BY R. NOWAK

SUBJECT MW-002 PUMP TEST Checked By MVF

PROBLEM: ESTIMATE STORAGE COEFFICIENT OF UPPER AQUIFER BY DETERMINING THE VOLUME OF MATERIAL DEWATERED

Radius (ft)	Corrected drawdown (ft)	Estimated actual drawdown (ft)	Thickness (ft)	Avg. radius (ft)	Volume (ft³)
0	3.58	6.24			
0.6		6.24	0.54	0.4	0.27
0.8	4.08	5.70	0.29	0.9	0.74
1.0	3.82	5.41	1.13	1.5	7.99
2	3.03	4.28	0.95	2.5	18.65
3	2.57	3.33	0.55	3.5	21.17
4	2.25	2.78	0.39	4.5	24.81
5	2.00	2.39	0.30	5.5	28.51
6	1.79	2.09	0.25	6.5	33.18
7	1.61	1.84	0.18	7.5	31.81
8	1.47	1.66	0.19	8.5	43.13
9	1.32	1.47	0.15	9.5	42.53
10	1.20	1.32	0.24	11	91.23
12	1.00	1.08	0.21	13	111.50
14	0.82	0.87	0.32	16	257.36
18	0.53	0.55	0.12	19	136.09
20	0.42	0.43	0.10	21	138.54
22	0.32	0.33	0.11	23	182.81
24	0.22	0.22	0.10	25	196.35
26	0.12	0.12	0.11	27.5	261.34
29	0.01	0.01			

TOTAL - 1628.01

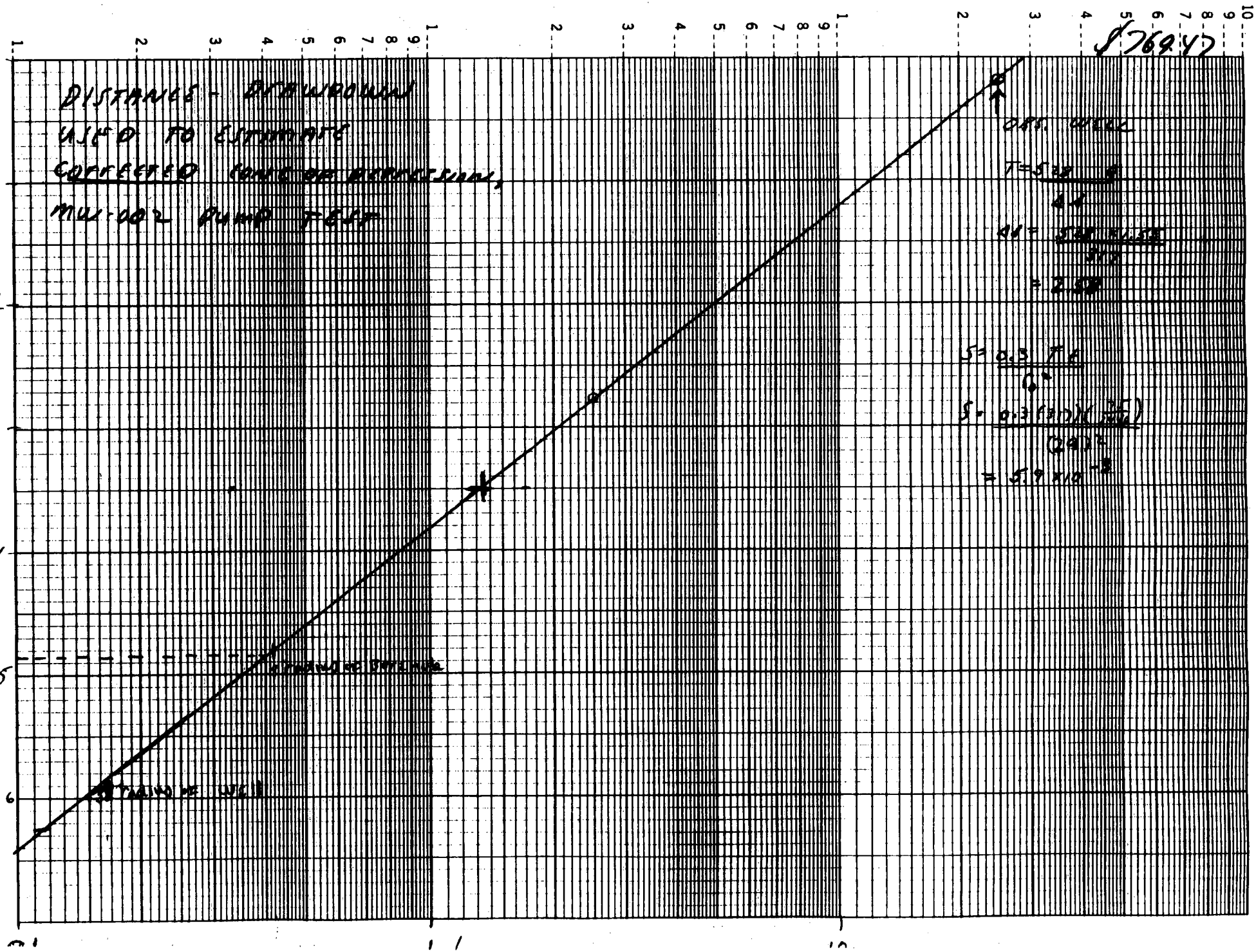
Volume Dewatered = 1628.01 ft³

Volume Pumped = $1.55 \frac{gallons}{min} \times 75\ min \times \frac{1\ ft^3}{7.48\ gal} = 15.54\ ft^3$

$$S = \frac{15.54\ ft^3}{1628.01\ ft^3} = 9.55 \times 10^{-3} \approx 0.01 \text{ or } 1.0 \times 10^{-2}$$

K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 5490



APPENDIX E

ELIZABETH RIVER TIDE RECORDS

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING December 6,1985 19____

DATE		TIME		GAGE READING
Nov. 30	High Water	9.39A	M.	+ 3.00
"	Low "	3.32A	"	—
	High "	10.21P	"	+ 3.00
"	Low "	4.22P	"	- 2.00
Dec. 1	High "	10.16A	M.	+ 3.10
	Low "	3.58A	"	—
"	High "	11.09P	"	+ —
	Low "	5.48P	"	- 2.00
2	High "	11.03A	M.	+ 3.40
	Low "	4.30A	"	—
"	High "	11.59P	"	+ —
	Low "	5.36P	"	- 3.2
3	High "	11.54A	M.	+ 2.80
	Low "	5.11A	"	—
"	High "	0.00	"	+ —
	Low "	6.26P	"	- 3.3
4	High "	0.50A	M.	+ —
	Low "	6.07A	"	—
"	High "	12.49P	"	+ 3.10
	Low "	7.32P	"	- 2.00
5	High "	1.42A	M.	+ —
	Low "	7.49A	"	- 1.4
"	High "	1.45P	"	+ 1.9
	Low "	8.37P	"	- 2.00
6	High "	2.37A	M.	+ —
	Low "	9.11A	"	- 2.00
"	High "	2.50P	"	+ 3.00
"	Low "	9.36P	"	- 2.00

DEC 1985
DEPT. OF ENGINEERING AND PLANNING

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING Dec. 20,1985 19

DATE		TIME		GAGE READING
14	High Water	9.57A	M.	+ 3.1
"	Low "	3.34A	"	- —
	High "	10.35P	"	+ 3.80
	Low "	4.22P	"	- 1.00
15	High "	10.53A	M.	+ 2.2
"	Low "	4.24A	"	- —
	High "	11.33P	"	+ —
	Low "	5.12P	"	- 0
16	High "	11.49A	M.	+ 4.10
"	Low "	5.17A	"	- —
	High "	0.00	"	+ —
	Low "	6.04P	"	- 2.00
17	High "	0.29A	M.	+ —
"	Low "	6.18A	"	- —
	High "	12.41P	"	+ 3.80
	Low "	7.03P	"	- 2.00
18	High "	1.22A	M.	+ —
"	Low "	7.26A	"	- 1.0
	High "	1.34P	"	+ .8
	Low "	8.02P	"	- 1.00
19	High "	2.13A	M.	+ —
"	Low "	8.32A	"	- 2.00
	High "	2.26P	"	+ -.3
	Low "	8.58P	"	- 2.6
20	High "	3.08A	M.	+ —
"	Low "	4.31A	"	- —
	High "	3.18P	"	+ 1.0
	Low "	9.49P	"	- 2.3

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING Dec. 13,1985 19____

DATE	TIME			GAGE READING
7	High Water	3.37A	M.	+ —
"	Low "	10.13A	"	- 2.00
"	High "	3.56P	"	+ 2.6
	Low "	10.25P	"	- 2.00
8	High "	4.38A	M.	+ —
"	Low "	11.09A	"	- 2.00
"	High "	5.00P	"	+ 2.3
	Low "	11.18P	"	- —
9	High "	5.34A	M.	+ —
"	Low "	0.00	"	- —
"	High "	5.58P	"	+ 2.2
	Low "	12.04P	"	- 1.00
10	High "	~~6.27A~~	M.	+ —
"	Low "	0.09A	"	- —
"	High "	6.53P	"	+ 3.40
	Low "	12.57P	"	- 2.6
11	High "	7.17A	M.	+ 3.80
"	Low "	1.01A	"	- —
"	High "	7.46P	"	+ 2.4
	Low "	1.50P	"	- 1.00
12	High "	8.09A	M.	+ 4.60
"	Low "	1.52A	"	- —
"	High "	8.39P	"	+ 3.00
	Low "	2.41P	"	- ~~1.8~~ 2.00
13	High "	~~9.02A~~	M.	+ 4.80
"	Low "	2.44A	"	- —
"	High "	9.36P	"	+ 3.00
	Low "	3.33P	"	- 1.40

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING Dec 27,1985 19

DATE		TIME		GAGE READING
21	High Water	4.00A	M.	+ —
"	Low "	10.23A	"	- 1.9
	High "	4.15P	"	+ 3.5
	Low "	10.36P	"	- 2.00
22	High "	4.52A	M.	+ —
"	Low "	11.12A	"	- 1.00
	High "	5.09P	"	+ 1.1
	Low "	11.18P	"	- —
23	High "	5.39A	M.	+ —
"	Low "	11.59A	"	- 0
	High "	6.00P	"	+ 3.00
	Low "	0.00P	"	- —
24	High "	6.22A	M.	+ —
"	Low "	0.03A	"	- —
	High "	6.45P	"	+ 2.00
	Low "	12.43P	"	- 1.10
25	High "	7.01A	M.	+ 3.00
"	Low "	0.45A	"	- —
	High "	7.25P	"	+ 3.80
	Low "	1.28P	"	- 1.00
26	High "	7.39A	M.	+ 1.6
"	Low "	1.27A	"	- —
	High "	8.06P	"	+ 3.80
	Low "	2.11P	"	- 2.6
27	High "	8.15A	M.	+ 1.7
"	Low "	2.07A	"	- —
	High "	8.45P	"	+ 3.80
	Low "	2.53P	"	- 2.4

ZERO OF GAGE = ELEV. _____ C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING January 3,1986 19____

DATE	TIME				GAGE READING
Dec. 28	High Water		8.52A	M.	+ 1.8
"	Low	"	2.45A	"	—
	High	"	9.25P	"	+ 1.2
	Low	"	3.30P	"	- 3.3
29	High	"	9.28A	M.	+ 2.00
"	Low	"	3.19A	"	—
	High	"	10.06P	"	+ 1.0
	Low	"	4.06P	"	- 3.0
30	High	"	10.07A	M.	+ 2.0
	Low	"	3.54A	"	—
"	High	"	10.53P	"	+ 3.00
	Low	"	4.42P	"	- 1.00
31	High	"	10.51A	M.	+ 2.00
"	Low	"	4.29A	"	—
	High	"	11.38P	"	+ —
	Low	"	5.16P	"	- 1.40
Jan.	High	"	11.33A	M.	+ 2.00
	Low	"	5.06A	"	—
1	High	"	0.00	"	+ —
"	Low	"	5.51P	"	- 3.0
2	High	"	0.21A	M.	+ —
"	Low	"	5.57A	"	—
	High	"	12.23P	"	+ 2.00
	Low	"	6.39P	"	- 1.00
3	High	"	1.07A	M.	+ —
"	Low	"	7.11A	"	- 1.9
	High	"	1.15P	"	+ 2.0
	Low	"	7.43P	"	- 0

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front Street, Elizabeth, N.J.

WEEK ENDING January 10,1986 19____

DATE	TIME			GAGE READING
4	High Water	2.01A	M.	+ —
"	Low "	8.38A	"	- 1.3
	High "	2.14P	"	+ 2.80
	Low "	8.52P	"	- 1.00
5	High "	3.01A	M.	+ —
	Low "	9.48A	"	- 2.4
"	High "	3.22P	"	+ 2.80
	Low "	9.53P	"	- 1.00
6	High "	4.07A	M.	+ —
	Low "	10.49A	"	- 1.40
"	High "	4.36P	"	+ 2.00
	Low "	10.52P	"	- 1.00
7	High "	5.13A	M.	+ —
	Low "	11.48A	"	- 1.10
"	High "	5.43P	"	+ 2.00
	Low "	11.47P	"	- —
8	High "	6.11A	M.	+ —
	Low "	0.00A	"	- —
"	High "	6.43P	"	+ 3.60
	Low "	12.43P	"	- 2.6
9	High "	7.07A	M.	+ 1.80
	Low "	0.46A	"	- —
"	High "	7.37P	"	+ 1.8
	Low "	1.37P	"	- 2.8
10	High "	7.58A	M.	+ 1.6
	Low "	1.41A	"	- —
"	High "	8.39P	"	+ 2.80
	Low "	2.29P	"	- 2.6

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

TIDE RECORD

LOCATION South Front S[illegible], Elizabeth, N.J.

WEEK ENDING Jan. 17,1986 19____

DATE		TIME		GAGE READING
11	High Water	8.49A	M.	+ 3.00
"	Low "	2.34A	"	- —
	High "	9.23P	"	+ 1.8
	Low "	3.17P	"	- 3.00
12	High "	9.42A	M.	+ 3.80
"	Low "	3.23A	"	- —
	High "	10.15P	"	+ 1.8
	Low "	4.02P	"	- 3.00
13	High "	10.32A	M.	+ 3.80
	Low "	4.11A	"	- —
"	High "	11.07P	"	+ 0.8
	Low "	4.45P	"	- 2.6
14	High "	11.23A	M.	+ 3.00
	Low "	9.57A	"	- 1.10
"	High "	11.57P	"	+ —
	Low "	5.29P	"	- 2.3
15	High "	0.00	M.	+ —
	Low "	5.46A	"	- —
"	High "	12.10P	"	+ ~~3.80~~
	Low "	6.~~15P~~	"	- ~~X~~ 3.00
16	High "	0.42A	M.	+ —
	Low "	6.39A	"	- —
	High "	12.55P	"	+ 0.1
"	Low "	7.06P	"	- 2.00
17	High "	1.30A	M.	+ —
"	Low "	7.43A	"	- 1.8
	High "	1.39P	"	+ 0.4
	Low "	8.03P	"	- 3.0

ZERO OF GAGE = ELEV._____C. & G. S. DATUM.

APPENDIX F

TOXICITY PROFILES

APPENDIX F
TOXICITY PROFILES

Toxicity profiles are provided for the critical contaminants identified in Section 6.2. These profiles, where indicated, were obtained from Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites (Clement Associates, Inc., 1985).

Acetone (Clement Associates, Inc., 1985)

Health Effects

Acetone has not been tested in a carcinogenicity bioassay but gave negative results in a skin painting test and was not mutagenic in the Ames assay. No studies on animals for teratogenicity or reproductive toxicity have been done, but acetone was negative in a chicken egg injection study for teratogenicity.

Acetone is generally regarded as having low toxicity and therefore has not been extensively studied. Prolonged inhalation of high concentrations may produce irritation of the respiratory tract, coughing, headache, drowsiness, incoordination, and in severe cases, coma.

In animal studies, rats consuming doses of 18 mg/kg/day for 4 months showed reduced food consumption and growth. In behavioral studies, rats exposed to 6,000 ppm (14,200 mg/m^3) acetone for 4 hours/day, 5 days/week for 2 weeks showed modified avoidance and escape behavior after one exposure, but no changes after subsequent exposures. At 16,000 ppm (37,800 mg/m^3), altered responses were noted throughout the 2-week exposure period. No chronic health hazards have been associated with exposure to acetone.

Toxicity to Wildlife and Domestic Animals

The toxicity of acetone to aquatic organisms is low. The LC_{50} value for sunfish was reported to be 14.2 g/liter, and the threshold concentration for immobilization of Daphnia magna was reported to be over 9 g/liter (McKee and Wolf, 1963).

No information on the toxicity of acetone to terrestrial wildlife or domestic animals was found in the literature reviewed.

Arsenic (Clement Associates, Inc., 1985)

Health Effects

Arsenic has been implicated in the production of skin cancer in humans. There is also extensive evidence that inhalation of arsenic compounds causes lung cancer in workers. Arsenic compounds cause chromosome damage in animals, and humans exposed to arsenic compounds have been reported to have an elevated incidence of chromosome aberrations. Arsenic compounds have been reported to be teratogenic, fetotoxic, and embryotoxic in several animal species, and an increased incidence of multiple malformations among children born to women occupationally exposed to arsenic has been reported. Arsenic compounds also cause noncancerous, possibly precancerous, skin changes in exposed individuals. Several cases of progressive polyneuropathy involving motor and sensory nerves and particularly affecting the extremities and myelinated long-axon neurons have been reported in individuals occupationally exposed to inorganic arsenic. Polyneuropathies have also been reported after the ingestion of arsenic-contaminated foods.

Toxicity to Wildlife and Domestic Animals

Various inorganic forms of arsenic appear to have similar levels of toxicity; they all seem to be much more toxic than organic forms. Acute toxicity to adult freshwater animals occurs at levels of arsenic trioxide as low as 812 µg/liter and at levels as low as 40 µg/liter in early life stages of aquatic organisms. Acute

toxicity to saltwater fish occurs at levels around 15 mg/liter, while some invertebrates are affected at much lower levels (508 µg/liter). Arsenic toxicity does not appear to increase greatly with chronic exposure, and it does not seem that arsenic is bioconcentrated to a great degree.

Arsenic poisoning is a rare but not uncommon toxic syndrome among domestic animals. Arsenic causes hyperemia and edema of the gastrointestional tract, hemorrhage of the cardiac serosal surfaces and peritoneum, and pulmonary congestion and edema; and it may cause liver necrosis. Information on arsenic toxicity to terrestrial wildlife was not reported in the literature reviewed.

Benzene (Clement Associates, Inc., 1985)

Health Effects

Benzene is a recognized human carcinogen (IARC, 1982). Several epidemiological studies provide sufficient evidence of a causal relationship between benzene exposure and leukemia in humans. Benzene is a known inducer of aplastic anemia in humans, with a latent period of up to 10 years. It produces leukopenia and thrombocytopenia, which may progress to pancytopenia. Similar adverse effects on the blood-cell-producing system occur in animals exposed to benzene. In both humans and animals, benzene exposure is associated with chromosomal damage, although it is not mutagenic in microorganisms. Benzene was fetotoxic and caused embryolethality in experimental animals.

Exposure to very high concentrations of benzene [about 20,000 ppm (66,000 mg/m^3) in air] can be fatal within minutes (IARC, 1982). The prominent signs are central nervous system depression and convulsions, with death usually following as a consequence of cardiovascular collapse. Milder exposures can produce vertigo, drowsiness, headache, nausea, and eventually unconsciousness if exposure continues. Deaths from cardiac sensitization and cardiac arrhythmias have also been reported after exposure to unknown concentrations. Although most benzene hazards are associated with inhalation exposure, dermal absorption of liquid

benzene may occur, and prolonged or repeated skin contact may produce blistering, erythema, and a dry, scaly dermatitis.

Toxicity to Wildlife and Domestic Animals

The EC_{50} values for benzene in a variety of invertebrate and vertebrate freshwater aquatic species range from 5,300 µg/liter to 386,000 µg/liter. However, only values for the rainbow trout (5,300 µg/liter) were obtained from a flow-through test and were based on measured concentrations. Results based on unmeasured concentrations in static tests are likely to underestimate toxicity for relatively volatile compounds like benzene. A chronic test with Daphnia magna was incomplete, with no adverse effects observed at test concentrations as high as 98,000 µg/liter.

For saltwater species, acute values for one fish and five invertebrate species range from 10,900 µg/liter to 924,000 µg/liter. Freshwater and saltwater plant species that have been studied exhibit toxic effects at benzene concentrations ranging from 20,000 µg/liter to 525,000 µg/liter.

Bis(2-ethylhexyl)phthalate (Clement Associates, Inc., 1985)

Health Effects

Bis(2-ethylhexyl)phthalate (BEHP) is reported to be carcinogenic in rats and mice, causing increased incidences of hepatocellular carcinomas or neoplastic nodules after oral administration (NTP, 1982). Its status as a human carcinogen is considered indeterminate by the International Agency for Research on Cancer (IARC). The results of dominant lethal experiments with mice suggest that BEHP is mutagenic when injected intraperitoneally. However, most experiments conducted with microorganisms and mammalian cells have failed to demonstrate genotoxic activity. Teratogenic and fetotoxic effects have been observed in

experimental animals after oral and intraperitoneal administration. Other reproductive effects, including testicular changes in rats and mice, have also been reported.

BEHP appears to have a relatively low toxicity in experimental animals. The oral, intraperitoneal, and intravenous LD_{50} values reported for BEHP in rats are 31 g/kg, 30.7 g/kg, and 0.25 g/kg, respectively. BEHP is poorly absorbed through the skin, and no irritant response or sensitizing potential from dermal application has been noted in experimental animals or humans.

Chronic exposure to relatively high concentrations of BEHP in the diet has caused retardation of growth and increased liver and kidney weights in experimental animals.

Toxicity to Wildlife and Domestic Animals

Acute median effect values ranged from 1,000 to 11,100 µg/liter BEHP for the freshwater cladoceran Daphnia magna. The LC_{50} values for the midge, scud, and bluegill all exceeded the highest concentrations tested, which were 18,000, 32,000, and 770,000 µg/liter, respectively. As these values are greater than the water solubility of the chemical, it is unlikely that BEHP will be acutely toxic to organisms in natural waters. In a chronic toxicity test with Daphnia magna, significant reproductive impairment was found at the lowest concentration tested, 3 µg/liter. A chronic toxicity value of 8.4 µg/liter was reported for the rainbow trout. No acute or chronic values were reported for saltwater invertebrates or vertebrates. Reported bioconcentration factors for BEHP in fish and invertebates range from 14 to 2,680.

Although insufficient data were presented to calculate the acute-chronic ratio for BEHP, it is apparently on the order of 100 to 1,000. Therefore, acute exposure to the chemical is unlikely to affect aquatic organisms adversely, but chronic exposure may have detrimental effects on the environment.

2-Butanone (methyl ethyl ketone) (Clement Associates, Inc., 1985)

Health Effects

Methyl ethyl ketone has not been adequately tested for carcinogenicity and has produced only equivocal evidence of mutagenicity in a few bacterial assays. Schwetz et al. (1974) reported that MEK caused retarded fetal development and some teratogenic effects (acaudia, imperforate anus, and brachygnathia) at air concentrations of 3,000 ppm (approximately 9,000 mg/m^3). Methyl ethyl ketone is of relatively low toxicity but at high doses it affects the nervous system and causes irritation of the eyes, nose, and skin. The oral LD_{50} value for the rat was 2,750 mg/kg.

Although MEK is not strongly neurotoxic alone, it apparently strongly potentiates the neurotoxicity of n-hexane and n-hexanone (methyl n-isobutyl ketone).

Toxicity to Wildlife and Domestic Animals

Only limited information was available on the toxicity of methyl ethyl ketone to wildlife. LC_{50} concentrations for two freshwater fishes were around 5,600 µg/liter (Turnball et al., 1954; Wallen et al., 1957). MEK was toxic to brine shrimp at LC_{50} levels of 1,950 mg/liter.

No information on the toxicity of MEK to terrestrial wildlife or domestic animals was found in the literature reviewed.

4-Chloroaniline

Health Effects

4-Chloroaniline is presently being tested for carcinogenicity by the National Toxicology Program (NTP) (USDHHS, 1985). Short-term in vivo mammalian cell assay results indicate that 4-chloroaniline is mutagenic (OHMTADS, 1984).

4-chloroaniline is acutely toxic if inhaled or ingested (OHMTADS). It is adsorbed through the intact skin and may cause methemoglobinemia upon exposure to high concentrations (Clayton and Clayton, 1981). The oral rat LD_{50} is 310 mg/kg (USDHHS, 1985).

<u>Chlorobenzene</u> (Clement Associates, Inc., 1985)

Health Effects

A study of the carcinogenicity of chlorobenzene was recently completed by the National Toxicology Program and preliminary results show that chlorobenzene caused neoplastic nodules in the liver of male rats but was not carcinogenic in female rats or in mice.

Occupational studies suggest that chronic exposure to monochlorobenzene vapor may cause blood dyscrasia, hyperlipidemia, and cardiac dysfunction in humans. Like many organic solvents, monochlorobenzene is a central nervous system depressant in overexposed humans, but no chronic neurotoxic effects have been reported. Animals exposed to chlorobenzene have exhibited liver and kidney damage and atrophy of the seminiferous tubules in the testes. The oral LD_{50} value for rats was 2,910 mg/kg.

Toxicity to Wildlife and Domestic Animals

Chlorobenzene was acutely toxic to fish at levels greater than 25 mg/liter and to aquatic invertebrates at levels greater than 10 mg/liter. No chronic studies on the toxicity of chlorobenzene to aquatic life were found in the literature reviewed. Monochlorobenzene was shown to have a bioaccumulation factor of about 1,000 in freshwater species. No studies on terrestrial wildlife or domestic animals were reported in the literature reviewed.

<u>Chloroform</u> (Clement Associates, Inc., 1985)

Health Effects

Chronic administration of chloroform by gavage is reported to produce a dose-related increase in the incidence of kidney epithelial tumors in rats and a dose-related increase in the incidence of hepatocellular carcinomas in mice (IARC, 1979; USEPA, 1980). Epidemiological studies suggest that higher concentrations of chloroform and other trihalomethanes in water supplies may be associated with an increased frequency of bladder cancer in humans. However, these results are not sufficient to establish causality. An increased incidence of fetal abnormalities was reported in offspring of pregnant rats exposed to chloroform by inhalation. Oral doses of chloroform that caused maternal toxicity produced relatively mild fetal toxicity in the form of reduced birth weights. There are limited data suggesting that chloroform has mutagenic activity in some test systems. However, negative results have been reported for bacterial mutagenesis assays.

Humans may be exposed to chloroform by inhalation, ingestion, or skin contact. Toxic effects include local irritation of the skin or eyes, central nervous system depression, gastrointestinal irritation, liver and kidney damage, cardiac arrhythmia, ventricular tachycardia, and bradycardia. Death from chloroform overdosing can occur and is attributed to ventricular fibrillation. Chloroform anesthesia can produce delayed death as a result of liver necrosis.

Exposure to chloroform by inhalation, intragastric administration, or intraperitoneal injection produces liver and kidney damage in laboratory animals. The oral LD_{50} and inhalation LC_{LO} values for the rat are 908 mg/kg and 39,000 mg/m^3 per 4 hours, respectively (ACGIH, 1980).

Toxicity to Wildlife and Domestic Animals

Limited information is available concerning the toxicity of chloroform to organisms exposed at known concentrations (USEPA, 1980). Median effect concentrations for two freshwater and one invertebrate species range from 28,900 to 115,000 µg/liter. Twenty-seven day LC_{50} values of 2,030 and 1,240 µg/liter were reported for embryo-larval tests with rainbow trout in water at two levels of hardness. The only reliable result concerning the toxicity of chloroform to saltwater aquatic life is a 96-hour LC_{50} value of 81,500 µg/liter for pink shrimp.

An equilibrium bioconcentration factor of 6 with a tissue half-life of less than 1 day was determined for the bluegill. Although chloroform is not strongly bioaccumulated, it is thought to be widely distributed in the environment and can be detected in fish, water birds, marine mammals and various crops.

<u>Chromium</u> (Clement Associates, Inc., 1985)

Health Effects

The hexavalent form of chromium is of major toxicological importance in higher organisms. A variety of chromate (Cr VI) salts are carcinogenic in rats and an excess of lung cancer has been observed among workers in the chromate-producing industry. Cr VI compounds can cause DNA and chromosome damage in animals and humans, and Cr (VI) trioxide is teratogenic in the hamster. Inhalation of hexavalent chromium salts causes irritation and inflammation of the nasal mucosa, and ulceration and perforation of the nasal septum. Cr VI also produces kidney damage in animals and humans. The liver is also sensitive to the toxic effects of hexavalent Cr, but apparently less so than the kidneys or respiratory system. Cr III is less toxic than Cr VI; its main effect in humans is a form of contact dermatitis in sensitive individuals.

Toxicity to Wildlife and Domestic Animals

Chromium is an essential nutrient and is accumulated in a variety of aquatic and marine biota, especially benthic organisms, to levels much higher than in ambient water. Levels in biota, however, usually are lower than levels in the sediments. Passage of chromium through the food chain can be demonstrated. The food chain appears to be a more efficient pathway for chromium uptake than direct uptake from seawater.

Water hardness, temperature, dissolved oxygen, species, and age of the test organism all modify the toxic effects of chromium on aquatic life. Cr III appears to be more acutely toxic to fish than Cr VI; the reverse is true in long-term chronic exposure studies.

None of the plants normally used as food or animal feed are chromium accumulators. Chromium absorbed by plants tends to remain primarily in the roots and is poorly translocated to the leaves. There is little tendency for chromium to accumulate along food chains in the trivalent inorganic form. Organic chromium compounds, about which little is known, can have significantly different bioaccumulation tendencies. Little information concerning the toxic effects of chromium on mammalian wildlife and domestic animal species is available.

<u>Dichlorobenzene</u> (Clement Associates, Inc., 1985)

Health Effects

It is generally thought that the available data are inadequate for assessing the carcinogenic potential of DCB in animals and humans. One case study suggests an association between exposure to dichlorobenzene and several cases of leukemia. DCB is reported to be nonmutagenic in <u>Salmonella typhimurium</u> tester strains. Mutagenic and clastogenic activity reportedly occurs in some plant test systems. No data are available for evaluating the teratogenic or reproductive effects in animals or humans.

Symptoms of acute inhalation intoxication in humans include headache, nausea, and throat irritation. DCB is also a skin and eye irritant.

A variety of other symptoms, including weakness, fatigue, and anemia, have been observed after chronic dermal and inhalation exposure to dichlorobenzene.

Inhalation of DCB causes eye and upper respiratory tract irritation, central nervous system depression, and liver and kidney damage in experimental animals. An LC_{20} of approximately 4,900 mg/m^3/7 hours is reported for the rat. No toxic effects were observed after daily 7-hour inhalation exposures of up to 560 mg/m^3 for as much as 7 months in several species of experimental animals. Hepatic porphyria is reported to occur in rats after daily tracheal intubation of 455 mg/m^3 for up to 15 days. Oral exposure results in stimulation of liver microsomal enzyme systems and cumulative toxicity. The oral LD_{50} for the rat is 500 mg/kg. Chronic oral exposure to 188 mg/kg/day causes liver and kidney damage in rats. Exposure to 0.01-0.1 mg/kg/day produces changes in the hematopoietic system, increased prothrombin time, and altered conditioned reflexes and enzyme activities in chronically exposed rats. In general, toxicity increases in the order 1,4-DCB, 1,3-DCB, 1,2-DCB.

Toxicity to Wildlife and Domestic Animals

The 48-hour and 96-hour LC_{50} values for Daphnia and bluegills, respectively, tested under static conditions, were 2,440 and 5,590 µg/liter (1,2-DCB); 28,100 and 5,020 µg/liter (1,3-DCB); and 11,000 and 4,280 µg/liter (1,4-DCB). Two flow-through 96-hour LC_{50} tests using fathead minnows and rainbow trout gave values of about 3,000 µg/liter. A freshwater chronic value of 2,000 µg/liter is reported for the fathead minnow. Acute values for three saltwater species ranged from 1,970 µg/liter for the mysid shrimp to 9,660 µg/liter for the sheepshead minnow. No saltwater chronic values are available. A whole body bioconcentration factor of about 80 is reported for the bluegill.

The 96-hour median effect levels for chlorophyll a and cell number are 179,000 and 149,000 µg/liter, respectively, in the freshwater alga Selenastrum capricornutum. In the saltwater alga Skeletonema costatum the corresponding values are 44,200 and 44,100 µg/liter, respectively.

1,2-Dichloroethane (Clement Associates, Inc., 1985)

Health Effects

1,2-Dichloroethane is carcinogenic in rats and mice, producing a variety of tumors. When administered by gavage, it produced carcinomas of the forestomach and hemangiosarcomas of the circulatory system in male rats; adenocarcinomas of the mammary gland in female rats; lung adenomas in male mice; and lung adenomas, mammary adenocarcinomas, and endometrial tumors in female mice. It is mutagenic when tested using bacterial test systems. Human exposure by inhalation to 1,2-dichloroethane has been shown to cause headache, dizziness, nausea, vomiting, abdominal pain, irritation of the mucous membranes, and liver and kidney dysfunction. Dermatitis may be produced by skin contact. In severe cases, leukocytosis (an excess of white blood cells) may be diagnosed; and internal hemorrhaging and pulmonary edema leading to death may occur. Similar effects are produced in experimental animals.

Toxicity to Wildlife and Domestic Animals

1,2-Dichloroethane is one of the chlorinated ethanes least toxic to aquatic life. For both fresh- and saltwater species, it is acutely toxic at concentrations greater than 118 mg/liter, while chronic toxicity has been observed at 20 mg/liter. 1,2-Dichloroethane is not likely to bioconcentrate, as its steady-state bioconcentration factor was 2 and its elimination half-life was less than 2 days in bluegill.

No information on the toxicity of 1,2-dichloroethane to domestic animals or terrestrial wildlife was available in the literature reviewed.

1,2-Dichloroethene (Clement Associates, Inc., 1985)

Health Effects

Very little information concerning exposure only to 1,2-trans-dichloroethene (1,2-trans-DCE) is available. There are no reports of carcinogenic or teratogenic activity by 1,2-trans-DCE in animals or humans. It is reportedly nonmutagenic in a variety of test systems. Like other members of the chlorinated ethene series, 1,2-trans-DCE has anesthetic properties. Exposure to high vapor concentrations has been found to cause nausea, vomiting, weakness, tremor, and cramps in humans. Repeated exposure via inhalation of 800 mg/m^3 (8 hours/day, 5 days/week, for 16 weeks) was reported to produce fatty degeneration of the liver in rats. The intraperitoneal injection LD_{50} value for the rat is 7,536 mg/kg.

Although nephrotoxic and cardiac sensitizing effects are associated with exposure to 1,1-dichloroethene, the 1,2-DCE isomers have not been investigated with respect to this type of effects. 1,2-trans-Dichloroethene can inhibit aminopyrine demethylation in rat liver microsomes in vitro, and it may thus interact with the hepatic drug-metabolizing monooxygenase system.

Toxicity to Wildlife and Domestic Animals

Practically no information concerning the toxicity of 1,2-trans-DCE to wildlife and domestic animals exists. The reported 96-hour LC_{50} value under static conditions is 135,000 µg/liter for the bluegill. Under the same test conditions, the LC_{50} value for 1,1-dichloroethene is 73,900 µg/liter. Recommended criteria for protection of aquatic life are based primarily on data concerning 1,1-dichloroethene.

DDT (Clement Associates, Inc., 1985)

Health Effects

DDT, DDE, and DDD have been shown to be carcinogenic to mice, primarily causing liver tumors, but also causing lung tumors and lymphomas. DDT does not appear to be mutagenic, but it has caused chromosomal damage. There is no evidence that DDT is a teratogen; but it is a reproductive toxin, causing reduced fertility, reduced growth of offspring, and fetal mortality.

Chronic exposure to DDT causes a number of adverse effects, especially to the liver and central nervous system (CNS). DDT induces various microsomal enzymes and therefore probably affects the metabolism of steroid hormones and exogenous chemicals. Other effects on the liver include hypertrophy of the parenchymal cells and increased fat deposition. In the CNS, exposure to DDT causes behavioral effects such as decreased aggression and decreased conditional reflexes. Acute exposure to large doses or chronic exposure to lower doses causes seizures. The oral LD_{50} is between 113 and 450 mg/kg for the rat and is generally higher for other animals.

DDT, DDD, and DDE are bioconcentrated and stored in the adipose tissues of most animals.

Toxicity to Wildlife and Domestic Animals

DDT has been extensively studied in freshwater invertebrates and fishes and is quite toxic to most species. The range of toxicities was 0.18 to 1,800 µg/liter and the freshwater final acute value for DDT and its isomers was determined by EPA to be 1.1 µg/liter. Saltwater species were somewhat more sensitive to DDT; the saltwater final acute value for the DDT isomers was 0.13 µg/liter. Only one chronic toxicity test on aquatic species was reported. This test indicated that the

acute-chronic ratio for DDT might be high (65 in the reported study), but the data were insufficient to allow calculation of a final acute-chronic ratio. DDT, DDD, and DDE are bioconcentrated by a factor of 10^3 to 10^5.

DDT, DDD, DDE, and the other persistent organochlorine pesticides are primarily responsible for the great decrease in the reproductive capabilities and consequently in the populations of fish-eating birds such as the bald eagle, brown pelican, and osprey. DDT has also been shown to significantly decrease the populations of numerous other species of waterbirds, raptors, and passerines.

Ethylbenzene (Clement Associates, Inc., 1985)

Health Effects

Ethylbenzene has been selected by the National Toxicology Program to be tested for possible carcinogenicity, although negative results were obtained in mutagenicity assays in *Salmonella typhimurium* and *Saccharomyces cerevisiae*. There is recent animal evidence that ethylbenzene causes adverse reproductive effects. Ethylbenzene is a skin irritant, and its vapor is irritating to the eyes at a concentration of 200 ppm (870 mg/m^3) and above. When experimental animals were exposed to ethylbenzene by inhalation, 7 hours/day for 6 months, adverse effects were produced at concentrations of 600 ppm (2,610 mg/m^3) and above, but not at 400 ppm (1,740 mg/m^3). At 600 ppm rats and guinea pigs showed slight changes in liver weight, and monkeys and rabbits experienced histopathologic changes in the testes. Similar effects on the liver and kidney were observed in rats fed ethylbenzene at 408 and 680 mg/kg/day for 6 months.

Toxicity to Wildlife and Domestic Animals

Ethylbenzene was acutely toxic to freshwater species at levels greater than 32 mg/liter. No chronic toxicity was reported, but the highest test dose (440 µg/liter) was only one-hundredth of the 96-hour LC_{50} for the particular species being tested. No studies on the bioaccumulation of ethylbenzene were

reported in the information reviewed, but a bioconcentration factor of 95 was calculated using the log octanol/water partition coefficient. No information on the toxicity of ethylbenzene to domestic animals and terrestrial wildlife was found in the sources reviewed.

Lead (Clement Associates, Inc., 1985)

Health Effects

There is evidence that several lead salts are carcinogenic in mice or rats, causing tumors of the kidneys after either oral or parenteral administration. Data concerning the carcinogenicity of lead in humans are inconclusive. The available data are not sufficient to evaluate the carcinogenicity of organic lead compounds or metallic lead. There is equivocal evidence that exposure to lead causes genotoxicity in humans and animals. The available evidence indicates that lead presents a hazard to reproduction and exerts a toxic effect on conception, pregnancy, and the fetus in humans and experimental animals (USEPA, 1977 and 1980).

Many lead compounds are sufficiently soluble in body fluids to be toxic (USEPA, 1977 and 1980). Exposure of humans or experimental animals to lead can result in toxic effects in the brain and central nervous system, the peripheral nervous system, the kidneys, and the hematopoietic system. Chronic exposure to inorganic lead by ingestion or inhalation can cause lead encephalopathy, and severe cases can result in permanent brain damage. Lead poisoning may cause peripheral neuropathy in adults and children, and permanent learning disabilities that are clinically undetectable in children may be caused by exposure to relatively low levels. Short-term exposure to lead can cause reversible kidney damage, but prolonged exposure at high concentrations may result in progressive kidney damage and possibly kidney failure. Anemia, due to inhibition of hemoglobin synthesis and a reduction in the life span of circulating red blood cells, is an early manifestation of lead poisoning. Several studies with experimental animals suggest that lead may interfere with various aspects of the immune response.

Toxicity to Wildlife and Domestic Animals

Freshwater vertebrates and invertebrates are more sensitive to lead in soft water than in hard water (USEPA, 1980 and 1983). At a hardness of about 50 mg/liter $CaCO_3$, the median effect concentrations for nine families range from 140 µg/liter to 236,600 µg/liter. Chronic values for Daphnia magna and the rainbow trout are 12.26 and 83.08 µg/liter, respectively, at a hardness of about 50 mg/liter. Acute-chronic ratios calculated for three freshwater species ranged from 18 to 62. Bioconcentration factors, ranging from 42 for young brook trout to 1,700 for a snail, were reported. Freshwater algae show an inhibition of growth at concentrations about 500 µg/liter.

Acute values for twelve saltwater species range from 476 µg/liter for the common mussel to 27,000 µg/liter for the softshell clam. Chronic exposure to lead causes adverse effects in mysid shrimp at 37 µg/liter, but not at 17 µg/liter. The acute-chronic ratio for this species is 118. Reported bioconcentration factors range from 17.5 for the quahog clam to 2,570 for the blue mussel. Saltwater algae are adversely affected at concentrations as low as 15.8 µg/liter.

Although lead is known to occur in the tissue of many free-living wild animals, including birds, mammals, fishes, and invertebrates, reports of poisoning usually involve waterfowl. There is evidence that lead, at concentrations occasionally found near roadsides and smelters, can eliminate or reduce populations of bacteria and fungi on leaf surfaces and in soil. Many of these microorganisms play key roles in the decomposer food chain.

Cases of lead poisoning have been reported for a variety of domestic animals, including cattle, horses, dogs, and cats. Several types of anthropogenic sources are cited as the source of lead in these reports. Because of their curiosity and their indiscriminate eating habits, cattle experience the greatest incidence of lead toxicity among domestic animals.

Mercury (Clements Associates, Inc., 1985)

Health Effects

When administered by intraperitoneal injection, metallic mercury produces implantation-site sarcomas in rats. No other studies were found connecting mercury exposure with carcinogenic effects in animals or humans. Several mercury compounds exhibit a variety of genotoxic effects in eukaryotes. In general, organic mercury compounds are more toxic than inorganic compounds. Although brain damage due to prenatal exposure to methylmercury has occurred in human populations, no conclusive evidence is available to suggest that mercury causes anatomical defects in humans. Embryotoxicity and teratogenicity of methylmercury has been reported for a variety of experimental animals. Mercuric chloride is reported to be teratogenic in experimental animals. No conclusive results concerning the teratogenic effects of mercury vapor are available.

In humans, alkyl mercury compounds pass through the blood brain barrier and the placenta very rapidly, in contrast to inorganic mercury compounds. Major target organs are the central and peripheral nervous systems, and the kidney. Methylmercury is particulary hazardous because of the difficulty of eliminating it from the body. In experimental animals, organic mercury compounds can produce toxic effects in the gastrointestinal tract, pancreas, liver, heart, and gonads, with involvement of the endocrine, immunocompetent, and central nervous systems.

Elemental mercury is not highly toxic as an acute poison. However, inhalation of high concentrations of mercury vapor can cause pneumonitis, bronchitis, chest pains, dyspnea, coughing, stomatitis, gingivitis, salivation, and diarrhea. Soluble mercuric salts are highly poisonous on ingestion, with oral LD_{50} values of 20 to 60 mg/kg reported. Mercurous compounds are less toxic when administered orally. Acute exposure to mercury compounds at high concentrations causes a variety of gastrointestinal symptoms and severe anuria with uremia. Signs and symptoms associated with chronic exposure involve the central nervous system and include behavioral and neurological disturbances.

Toxicity to Wildlife and Domestic Animals

The toxicity of mercury compounds has been tested in a wide variety of aquatic organisms. Although methylmercury appears to be more toxic than inorganic mercuric salts, few acute or chronic toxicity tests have been conducted with it. Among freshwater species, the 96-hour LC_{50} values for inorganic mercuric salts range from 0.02 µg/liter for crayfish to 2,000 µg/liter for caddisfly larvae. Acute values for methylmercuric compounds and other mercury compounds are only available for fishes. In rainbow trout, methylmercuric chloride is about ten times more toxic to rainbow trout than mercuric chloride, which is acutely toxic at about 300 µg/liter at 10°C. Methylmercury is the most chronically toxic of the tested compounds, with chronic values for Daphnia magna and brook trout of 1.00 and 0.52 µg/liter, respectively. The acute-chronic ratio for Daphnia magna is 3.2.

Mean acute values for saltwater species range from 3.5 to 1,680 µg/liter. In general, molluscs and crustaceans are more sensitive than fish to the acute toxic effects of mercury. A life-cycle experiment with the mysid shrimp showed that inorganic mercury at a concentration of 1.6 µg/liter significantly influences time of appearance of first brood, time of first spawn, and productivity. The acute-chronic ratio for the mysid shrimp is 2.9.

Chronic dietary exposure of chickens to mercuric chloride at growth-inhibitory levels causes immune suppression, with a differential reduction effect on specific immunoglobulins.

Methylene Chloride (Clement Associates, Inc. 1985)

Health Effects

Methylene chloride is currently under review by the National Toxicology Program (NTP, 1984). Preliminary results indicate that it produced an increased incidence of lung and liver tumors in mice and mammary tumors in female and male rats. In a chronic inhalation study, male rats exhibited an increased incidence of sarcomas

in the ventral neck region (Burek et al. 1984). However, the authors suggested that the relevance and toxicological significance of this finding were uncertain in light of available toxicity data. Methylene chloride is reported to be mutagenic in bacterial test systems. It also has produced positive results in the Fischer rat embryo cell-transformation test. However, it has been suggested that the observed cell-transforming capability may have been due to impurities in the test material. There is no conclusive evidence that methylene chloride can produce teratogenic effects.

In humans, direct contact with methylene chloride produces eye, respiratory passage, and skin irritation. Mild poisonings due to inhalation exposure produce somnolence, lassitude, numbness and tingling of the limbs, anorexia, and lightheadedness, followed by rapid and complete recovery. More severe poisonings generally involve correspondingly greater disturbances of the central and peripheral nervous systems. Methylene chloride also has acute toxic effects on the heart, including the induction of arrhythmia. Fatalities reportedly due to methylene chloride exposure have been attributed to cardiac injury and heart failure. Methylene chloride is metabolized to carbon monoxide in vivo, and levels of carboxyhemoglobin in the blood are elevated after acute exposure. In experimental animals, methylene chloride is reported to cause kidney and liver damage, convulsions, and distal paresis. An oral LD_{50} value of 2,136 mg/kg, and an inhalation LC_{50} value of 88,000 mg/m^3/30 min. are reported for the rat.

Toxicity to Wildlife and Domestic Animals

Very little information concerning the toxicity of methylene chloride to domestic animals and wildlife exists. Acute values for the freshwater species Daphnia magna, the fathead minnow, and the bluegill are 224,000, 193,000, and 224,000 µg/liter, respectively. Acute values for the saltwater species, mysid shrimp and sheepshead minnow, are 256,000 and 331,000 µg/liter, respectively. No data concerning chronic toxicity are available. The 96-hour EC_{50} values for both freshwater and saltwater algae are greater than the highest test concentration, 662,000 µg/liter.

Nickel (Clement Associates, Inc., 1985)

Health Effects

There is extensive epidemiological evidence indicating excess cancer of the lung and nasal cavity for workers at nickel refineries and smelters, and weaker evidence for excess risk in workers at nickel electroplating and polishing operations. Respiratory tract cancers have occurred in excess at industrial facilities that are metallurgically diverse in their operations. The nickel compounds that have been implicated as having carcinogenic potential are insoluble dusts of nickel subsulfide and nickel oxides; the vapor of nickel carbonyl; and soluble aerosols of nickel sulfate, nitrate, or chloride. Inhalation studies with experimental animals suggest that nickel subsulfide and nickel carbonyl are carcinogenic in rats. Evidence for the carcinogenicity of nickel metal and other compounds is relatively weak or inconclusive. Studies with experimental animals indicate that nickel compounds can also produce various types of malignant tumors in experimental animals after administration by other routes, including subcutaneous, intramuscular, implantation, intravenous, intrarenal, and intrapleural. Carcinogenic potential is not strongly dependent on route or site of adminstration but appears to be inversely related to the solubility of the compounds in aqueous media. Insoluble compounds, such as nickel dust, nickel sulfide, nickel carbonate, nickel oxide, nickel carbonyl, and nickelocene are carcinogenic, whereas soluble nickel salts such as nickel chloride, nickel sulfate, and nickel ammonium sulfate, are not.

Mammalian cell transformation data indicate that several nickel compounds are mutagenic and can cause chromosomal alterations. The available information is inadequate for assessing teratogenic and reproductive effects of nickel in humans and experimental animals.

Dermatitis and other dermatological effects are the most frequent effects of exposure to nickel and nickel-containing compounds. The dermatitis is a sensitization reaction. Most information regarding acute toxicity of nickel involves inhalation exposure to nickel carbonyl. Clinical manifestations of acute

poisoning include both immediate and delayed symptoms. Acute chemical pneumonitis is produced, and death may occur at exposures of 30 ppm (107 mg/m^3) for 30 minutes. Rhinitis, nasal sinusitis, and nasal mucosal injury are among the effects reported among workers chronically exposed to various nickel compounds. Studies with experimental animals suggest that nickel and nickel compounds have relatively low acute and chronic oral toxicity.

Toxicity to Wildlife and Domestic Animals

In freshwater, toxicity depends on hardness; nickel tends to be more toxic in softer water. Acute values for exposure to a variety of nickel salts, expressed as nickel, range from 510 µg/liter for Daphnia magna to 46,200 µg/liter for banded killifish at comparable hardness levels. Chronic values range from 14.8 µg/liter for Daphnia magna in soft water to 530 µg/liter for the fathead minnow in hard water. Acute-chronic ratios for Daphnia magna range from 14 in hard water to 83 in soft water, and are approximately 50 in both hard and soft water for the fathead minnow. Residue data for the fathead minnow indicate a bioconcentration factor of 61. Freshwater algae experience reduced growth at nickel concentrations as low as 100 µg/liter.

Acute values for saltwater species range from 152 µg/liter for mysid shrimp to 350,000 µg/liter for the mummichog. A chronic value of 92.7 µg/liter is reported for the mysid shrimp, which gives an acute-chronic ratio of 5.5 for the species. Reduced growth is seen in saltwater algae at concentrations as low as 1,000 µg/liter. Bioconcentration factors ranging from 299 to 416 have been reported for the oyster and mussel.

N-nitrosodiphenylamine

Health Effects

N-nitrosodiphenylamine is a suspected animal carcinogen (USDHHS, 1985). It has been tested for carcinogenicity in one experiment in rats and mice by oral

administration (OHMTADS). It was not carcinogenic in mice, however in male and female rats, it produced transitional cell carcinomas of the urinary bladder (OHMTADS). It is nonmutagenic and did not induce unscheduled DNA synthesis or chromosome damage during extensive testing in short-term assays (OHMTADS).

Few data are available on the acute and chronic effects on N-nitrosodiphenylamine. As a class, N-nitroso compounds produce both acute and chronic effects in animals (Clayton and Clayton, 1981). Acute accidental exposure of humans to the lower-molecular-weight amines has resulted in severe liver damage (Clayton and Clayton, 1981). The oral rat and mouse LD_{50}s are 900 and 3,850 mg/kg, respectively (Clayton and Clayton, 1981).

Toxicity to Wildlife and Domestic Animals

Acute tests show N-nitrosodiphenylamine is toxic to freshwater species at 5.85 mg/l and in saltwater species at 3,300 mg/l (OHMTADS).

<u>Phenol</u> (Clement Associates, Inc., 1985)

Health Effects

Phenol appears to have tumor-promoting activity in many strains of mice when repeatedly applied to the shaved skin after initiation with known carcinogens. Although there is equivocal evidence that phenol may be weakly carcinogenic when applied to the skin of one sensitive strain of mice, it does not appear to be carcinogenic when applied to the skin of standard strains of mice. NCI reported that phenol was not carcinogenic when administered in drinking water to rats and mice. There is equivocal evidence that phenol may have mutagenic effects, although further evaluation is needed. There are no reports of teratogenic effects caused by exposure to phenol.

Subchronic inhalation exposure to phenol is reported to cause liver, kidney, lung, and heart damage in guinea pigs. Slight liver and kidney damage was seen in rats

exposed by gavage to 100 mg/kg/day for 20 days. The oral and skin LD_{50}s for the rat are 414 and 669 mg/kg, respectively, and the inhalation LC_{50} is 316 mg/m^3. Phenol is an eye, nose, and throat irritant and can cause systemic damage to the nervous system in humans following dermal, oral, or inhalation exposure.

Toxicity to Wildlife and Domestic Animals

The acute toxicity of phenol to freshwater species is expressed over a range of 2 to 3 orders of magnitude. Acute values for fish species range from 5,020 µg/liter for juvenile rainbow trout to 67,500 µg/liter for the fathead minnow. The acute value for the rainbow trout, and a value of 5,000 µg/liter for Daphnia magna are the lowest acute values observed. An early life-stage test on the fathead minnow resulted in a chronic value of 2,560 µg/liter, with an acute-chronic ratio of 14. Median effect concentrations for oyster and clam embryos are approximately 55,000 µg/liter. For the grass shrimp and the mountain bass, LC_{50} values of 5,800 and 11,000 µg/liter, respectively, are reported. No chronic effects are available for saltwater species. Reported bioconcentration factors of 1.2 to 2.3 for goldfish suggest that no residue problem should occur from exposure to phenol. No appropriate data concerning effects of phenol on other wildlife or domestic animals are available.

Polychlorinated Biphenyls (PCBs) (Clement Associates, Inc., 1985)

Health Effects

In humans exposed to polychlorinated biphenyls (PCBs) (in the workplace or via accidental contamination of food), reported adverse effects include chloracne (a long-lasting, disfiguring skin disease), impairment of liver function, a variety of neurobehavioral and affective symptoms, menstrual disorders, minor birth abnormalities, and probably increased incidence of cancer. Animals experimentally exposed to PCBs have shown most of the same symptoms, as well as impaired reproduction; pathological changes in the liver, stomach, skin, and other organs; and suppression of immunological functions. PCBs are carcinogenic in rats and

mice and, in appropriate circumstances, enhance the effects of other carcinogens. Reproductive and neurobiological effects of PCBs have been reported in rhesus monkeys at the lowest dose level tested, 11 µg/kg body weight/day over a period of several months.

Toxicity to Wildlife and Domestic Animals

Polychlorinated biphenyls are bioaccumulated and can be biomagnified. Therefore, their toxicity increases with length of exposure and position of the exposed species on the food chain. The toxicity of the various PCB mixtures is also dependent on their composition. Because of the complexity of PCB toxicity, only general effects will be discussed here.

The 96-hour LC_{50} values for rainbow trout, bluegills, and channel catfish were around 20 mg/liter. The same species exposed for 10 to 20 days had LC_{50} values of about 0.1 mg/liter. Invertebrate species were also adversely affected, with some species having 7-day LC_{50} values as low as 1 µg/liter. In general, juvenile organisms appeared more susceptible to the effects of PCBs than either eggs or adults.

Three primary ways in which PCBs can affect terrestrial wildlife are outright mortality, adversely affecting reproduction, and changing behavior. PCB doses greater than 200 ppm in the diet or 10 mg/kg body weight (bw) caused some mortality in sensitive bird species exposed for several days. Doses around 1,500 ppm (diet) or about 100 mg/kg bw caused extensive mortality in these sensitive species. They generally caused some mortality in all species, with the level being dependent on the length of exposure and the particular PCB mixture. Some mammalian species are especially susceptible to PCBs. For example, mink died when fed as little as 5 ppm in the diet (equivalent to less than 1 mg/kg bw/day). PCBs caused lower egg production; deformities; decreased hatchability, growth, and survival; and some eggshell thinning in reproductive studies on chickens fed doses of 20 ppm in the diet (1 mg/kg bw). Mink fed 1 ppm in the diet (0.2 mg/kg bw) had lower reproductive success, and there are indications that an

increased incidence of premature births in some marine animals was linked to PCB exposure. Behavioral effects on wildlife include increased activity, decreased avoidance response, and decreased nesting, all of which could significantly influence survival in the wild.

No toxic effects on domestic animals other than chickens were reported in the sources reviewed, but susceptible species would probably be affected in a similar manner to laboratory animals and wildlife.

Polycyclic Aromatic Hydrocarbons (Clement Associates, Inc., 1985)

Health Effects

The potential for polycyclic aromatic hydrocarbons (PAHs) to induce malignant transformation dominates the consideration of health hazards resulting from exposure, because there often are no overt signs of toxicity until the dose is high enough to produce a high tumor incidence.

No case reports or epidemiological studies concerning the significance of human exposure to individual PAHs are available. However, coal tar and other materials known to be carcinogenic to humans contain PAHs.

PAHs administered by various routes have been found to be carcinogenic in several animal species and to have both local and systemic carcinogenic effects. On oral administration, carcinogenic PAHs produce tumors of the forestomach in mice. Lung tumors are produced in hamsters after intratracheal administration and in mice after intravenous administration. In skin painting experiments with mice, carcinogenic PAHs produced skin carcinomas. Other observed effects include induction of local sarcomas and an increased incidence of lung adenomas in mice following single, subcutaneous injections. Studies in other species, while indicating the PAHs have universal carcinogenic effects, are less complete. Carcinogenic

PAHs are reported to be mutagenic in a variety of test systems. The limited available information suggests that PAHs are not very potent teratogens or reproductive toxins.

There is very little information regarding nonmalignant changes caused by exposure to PAHs. Application of carcinogenic PAHs to mouse skin is reported to cause destruction of sebaceous glands, hyperplasia, hyperkeratosis, and ulceration. Many carcinogenic PAHs also have immunosuppressive effects. Subcutaneous injections of some PAHs for several weeks reportedly caused hemolymphatic changes in the lymph nodes in rats. Workers exposed to PAH-containing materials have exhibited chronic dermatitis, hyperkeratoses, and other skin disorders.

Toxicity to Wildlife and Domestic Animals

There is very little information on the environmental toxicity of PAHs; they probably are not very toxic to aquatic organisms.

<u>Tetrachloroethene</u> (Clement Associates, Inc., 1985)

Health Effects

Tetrachloroethene was found to produce liver cancer in male and female mice when administered orally by gavage (NCI, 1977). Unpublished gavage studies in rats and mice performed by the National Toxicology Program (NTP) showed hepatocellular carcinomas in mice and a slight, statistically insignificant increase in a rare type of kidney tumor. NTP is also conducting an inhalation carcinogenicity study. Elevated mutagenic activity was found in <u>Salmonella</u> strains treated with tetrachloroethene. Delayed ossification of skull bones and sternebrae were reported in offspring of pregnant mice exposed to 2,000 mg/m^3 of tetrachloroethene for 7 hours/day on days 6-15 of gestation. Increased fetal resorptions were observed after exposure of pregnant rats to tetrachloroethene. Renal toxicity and hepatoxicity have been noted following chronic inhalation exposure of rats to tetrachloroethene levels of 1,356 mg/m^3. During the first

2 weeks of a subchronic inhalation study, exposure to concentrations of 1,622 ppm (10,867 mg/m^3) of tetrachloroethene produced signs of central nervous system depression, and cholinergic stimulation was observed among rabbits, monkeys, rats, and guinea pigs.

Toxicity to Wildlife and Domestic Animals

Tetrachloroethene is the most toxic of the chloroethenes to aquatic organisms but is only moderately toxic relative to other types of compounds. The limited acute toxicity data indicated that the LC_{50} value for saltwater and freshwater species were similar, around 10,000 µg/liter; the trout was the most sensitive (LC_{50} = 4,800 µg/liter). Chronic values were 840 and 450 µg/liter for freshwater and saltwater species respectively, and an acute-chronic ratio of 19 was calculated.

No information on the toxicity of tetrachloroethene to terrestrial wildlife or domestic animals was available in the literature reviewed.

<u>Toluene</u> (Clement Associates, Inc., 1985)

Health Effects

There is no conclusive evidence that toluene is carcinogenic or mutagenic in animals or humans. The National Toxicological Program is currently conducting an inhalation carcinogenicity bioassay in rats and mice.

Oral administration of toluene at doses as low as 260 mg/kg produced a significant increase in embryonic lethality in mice. Decreased fetal weight was observed at doses as low as 434 mg/kg, and an increased incidence of cleft palate was seen at doses as low as 867 mg/kg. However, other researchers have reported that toluene is embryotoxic but not teratogenic in laboratory animals. There are no accounts of a teratogenic effect in humans being linked to toluene exposure.

Acute exposure to toluene at concentrations of 375-1,500 mg/m^3 produces central nervous system depression and narcosis in humans. However, even exposures to quantities sufficient to produce unconsciousness fail to produce residual organ damage. The rat oral LD_{50} value and inhalation LC_{LO} value are 5,000 mg/kg and 15,000 mg/m^3, respectively. Chronic inhalation exposure to toluene at relatively high concentrations produces cerebellar degeneration and an irreversible encephalopathy in mammals.

Toluene, in sufficient amounts, appears to have the potential to significantly alter the metabolism and resulting bioactivity of certain chemicals. For example, coadministrations of toluene along with benzene or styrene has been shown to suppress metabolism of the benzene or styrene in rats.

Toxicity to Wildlife and Domestic Animals

Of five freshwater species acutely tested with toluene, the cladoceran Daphnia magna was most resistant. The EC_{50} and LC_{50} values for all species range from 12,700 to 313,000 µg/liter. No chronic tests are available for freshwater species. The two freshwater algal species tested are relatively insensitive to toluene with EC_{50} values of 245,000 µg/liter or greater being reported. For saltwater species, EC_{50} and LC_{50} values range from 3,700 µg/liter for the bay shrimp to 1,050 mg/liter for the Pacific oyster. The chronic value in an embryo-larval test for the sheepshead minnow is reported to be between 3,200 and 7,700 µg/liter, and the acute-chronic ratio is between 55 and 97. In several saltwater algal species and kelp, effects occur at toluene concentrations from 8,000 to more than 433,000 µg/liter.

Trichloroethene (Clement Associates, Inc., 1985)

Health Effects

Trichloroethene is carcinogenic to mice after oral administration, producing hepatocellular carcinomas (NCI, 1976; NTP, 1982). It was found to be mutagenic

using several microbial assay systems. Trichloroethene does not appear to cause reproductive toxicity or teratogenicity. TCE has been shown to cause renal toxicity, hepatotoxicity, neurotoxicity, and dermatological reactions in animals following chronic exposure to levels greater than 2,000 mg/m^3 for 6 months. Trichloroethylene has low acute toxicity; the acute oral LD_{50} value in several species ranged from 6,000 to 7,000 mg/kg.

Toxicity to Wildlife and Domestic Animals

There was only limited data on the toxicity of trichloroethene to aquatic organisms. The acute toxicity to freshwater species was similar in the three species tested, with LC_{50} values of about 50 mg/liter. No LC_{50} values were available for saltwater species. However, a dose of 2 mg/liter caused erratic swimming and loss of equilibrium in the grass shrimp. No chronic toxicity tests were reported.

No information on the toxicity of trichloroethene to domestic animals or terrestrial wildlife was available in the literature reviewed.

<u>Vinyl Chloride</u> (Clement Associates, Inc., 1985)

Health Effects

IARC considers vinyl chloride to be a Category I human carcinogen, causing angiosarcomas of the liver and tumors of the brain, lung, and hemolymphopoietic system in humans. Vinyl chloride is carcinogenic in mice, rats, and hamsters; it produces tumors at several sites, including angiosarcomas of the liver, after oral or inhalation exposure. Vinyl chloride, both as a vapor and in solution, is mutagenic in several biological assay systems. In addition, chromosome aberrations including fragments, dicentics and rings, breaks, and gaps have been found in workers occupationally exposed to vinyl chloride. The evidence on its teratogenic and reproductive effects is equivocal. Minor skeletal abnormalities and increased fetal death rates have been observed in the offspring of experimental animals exposed by

inhalation to vinyl chloride. In humans, a significant increase in fetal deaths was seen in women whose husbands were exposed to vinyl chloride. Also, an excess number of central nervous system disorders and deformities of the upper alimentary tract, genital organs, and feet were observed in stillborn and live children born in cities with vinyl chloride facilities. However, further research is necessary before the link between vinyl chloride and these observed effects can be positively established.

Acute occupational exposure to high concentrations of vinyl chloride can produce symptoms of narcosis in humans. Respiratory tract irritation, bronchitis, headache, irritatability, memory disturances, and tingling sensations may also occur. Chronic exposure to vinyl chloride is associated with multiple systemic disorders, including a sclerotic syndrome, acro-osteolysis, thrombocytopenia, and liver damage, consisting of damage to parenchymal cells, fibrosis of the liver capsule, periportal fibrosis associated with hepatomegaly, and splenomegaly. Concentrations encountered by workers in industries using or producing vinyl chloride are reportedly quite variable and may range from less than the limit of detection to several grams per cubic meter.

Acute inhalation exposure of experimental animals to high concentrations of vinyl chloride can result in narcosis and death. The 2-hour LC_{50} value for rats is 390 g/m^3. Chronic exposure of experimental animals can result in growth disturbances and histopathological and histochemical lesions in the liver, kidneys, spleen, and lungs.

Toxicity to Wildlife and Domestic Animals

No information is available concerning the toxicity of vinyl chloride to domestic animals or wildlife.

<u>Xylenes</u> (Clement Associates, Inc., 1985)

Health Effects

The National Toxicology Program (NTP) is testing xylene for carcinogenicity by administering it orally to rats and mice. Although the results have not been finalized, it does not appear to be carcinogenic in rats. Results have not been reported for mice. Xylene was found not to be mutagenic in a battery of short-term assays. Xylene was not teratogenic but has caused fetotoxicity in rats and mice. Acute exposure to rather high levels of xylene affects the central nervous system and irritates the mucous membranes. There is limited evidence of effects on other organ systems, but it was not possible to attribute these effects solely to xylene as other solvents were present. The oral LD_{50} value of xylene in rats was 5,000 mg/kg.

Toxicity to Wildlife and Domestic Animals

Xylene adversely affected adult trout at concentrations as low as 3.6 mg/liter in a continuous flow system and trout fry avoided xylene at concentrations greater than 0.1 mg/liter. The LC_{50} value in adult trout was determined to be 13.5 mg/liter. LC_{50} values for other freshwater fish were around 30 mg/liter in a static system, which probably underestimated toxicity. Only a few studies have been done on the toxicity of xylene to saltwater species. These indicated that the m- and o-xylene isomers probably have similar toxicities and are probably less toxic than p-xylene, and that saltwater species are generally more susceptible than freshwater species to the detrimental effects of xylene (LC_{50} = 10 mg/liter for m- and o-xylene and LC_{50} = 2 mg/liter for p-xylene). However, it should be stressed that these generalizations are based on results from limited data.

No information on the toxicity of xylenes to terrestrial wildlife and domestic animals was available in the literature reviewed. However, because of the low acute toxicity of xylenes it is unlikely that they would be toxic to wild or domestic birds and mammals.

REFERENCES

Clayton, G. D., and F. E. Clayton, 1981. Patty's Industrial Hygiene and Toxicology, Third Revised Edition, John Wiley and Sons, New York, New York.

Oil and Hazardous Materials Technical Assistance Data System, OHMTADS, 1984.

Clement Associates, Inc., 1985. Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites. Prepared for U.S. Environmental Protection Agency, Washington, D.C.

USDHHS, October 1985. Registry of Toxic Effects of Chemical Substances. National Institute of Occupational Safety and Health, Washington, D.C.