08:43:52- 80825 - 7 - 3 Y M WLK 036

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 325785

Date Reported 8/30/84
Date Submitted 8/27/84
Discard Date 9/ 6/84
P. O. No. none
Collected by Client

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

PW Water Sample

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	15.	ppb	418-070-005

2 COPIES TO Nassaux-Hemsley Inc. Attn: Gordon Lambert

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation
Chemical & Biological Fields of Testing

Prep 45.00 Total 50.00 299

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Pro

MAIN LABORATORY
2425 New Holland Pike, Lancaster Pa 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East, Waynesboro Pa 17268 • (717) 762-9121

Member American Council of Independent Laboratories, Inc.

08:43:59- 80825 - 7 - 3 Y M WLK 036

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 325787

Date Reported 8/30/84
Date Submitted 8/27/84
Discard Date 9/ 6/84
P. O. No. none
Collected by Client

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

IW Water Sample

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	14.	ppb	418-070-005

2 COPIES TO Nassaux-Hemsley Inc. Attn: Gordon Lambert

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The American Association for Laboratory Accreditation Chemical & Biological Fields of Testing

Prep 45.00 Total 50.00 299 Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Proc

MAIN LABORATORY
2425 New Holland Pike, Lancaster Pa 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East Waynesboro Pa 17268 • (717) 762-[illegible]

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08:43:55- 80825 - 7 - 3 Y M WLK 036

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 325786

Date Reported 8/30/84
Date Submitted 8/27/84
Discard Date 9/ 6/84
P. O. No. none
Collected by Client

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

Spring Water Sample

ANALYSIS	AS RECEIVED	LAB CODE
Trichloroethylene	< 0.5 ppb	418-070-005(

2 COPIES TO Nassaux-Hemsley Inc. Attn: Gordon Lambert

INDIAN HEAD CAVE

OR

SPRING #1

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Prep 45.00 Total 50.00 299

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Proc

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FRANKLIN DIVISION
5124 Buchanan Trail East Waynesboro Pa 17268 • (717) 762-9121

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ANALYSIS REPORT

LANCY LABORATORIES
Division, Lancy International, Inc.
525 W. New Castle St., P.O. Box 490
Zelienople, Pennsylvania 16063

SKF Industries
West King Street
Shippensburg, PA 17257

Attention: Robert Sterken

Report Date 9/7/84

Collected _____ by _____
Received 8/28/84 by LS
Analyzed 8/28 to 9/5/84 by FJR
No. of Samples 7
P.O. # 4-004623

OCT 10 1984

Sample #	MW1	MW2	MW3	MW4	IW
Lab Reference #	09285	09286	09287	09288	09289
Parameter	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Trichloroethylene	10	<2	3	<2	13
	7.4	<.5	.9	<.5	14.

Sample #	PW	Spring
Lab Reference #	09290	09291
Parameter	(ug/L)	(ug/L)
Trichloroethylene	15	<2
	15	5.5

C. John Ritzert, Manager-Analytical Services

Form 9810-0983-2M

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No WW 333832

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

Date Reported 10/17/84
Date Submitted 10/ 2/84
Discard Date 10/24/84
Collected by Client

Spring #2 Off Spring St Water Sample
Collected 9/28/84 by SKF

Volatiles in Groundwater	AS RECEIVED		
Benzene	<	1.	ppb
Toluene	<	1.	ppb
Chlorobenzene	<	1.	ppb
Ethylbenzene	<	1.	ppb
Chloromethane	<	5.	ppb
Bromomethane	<	5.	ppb
2-Chloroethylvinyl ether	<	10.	ppb
Vinyl chloride	<	1.	ppb
Chloroethane	<	1.	ppb
Methylene chloride	<	1.	ppb
1,1-Dichloroethene	<	1.	ppb
1,1-Dichloroethane	<	1.	ppb
trans-1,2-Dichloroethene	<	1.	ppb
Chloroform	<	1.	ppb
1,2-Dichloroethane	<	1.	ppb
1,1,1-Trichloroethane	<	1.	ppb
Carbon tetrachloride	<	1.	ppb
Dichlorobromomethane	<	1.	ppb
1,2-Dichloropropane	<	1.	ppb
trans-1,3-Dichloropropene	<	1.	ppb
Trichloroethene	<	1.	ppb
Dibromochloromethane		2.	ppb
1,1,2-Trichloroethane	<	1.	ppb
cis-1,3-Dichloropropene	<	1.	ppb
Bromoform	<	2.	ppb
1,1,2,2-Tetrachloroethane	<	2.	ppb
Tetrachloroethene	<	1.	ppb

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Chemical & Biological fields of testing
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MAIN LABORATORY
2425 New Holland Pike, Lancaster, Pa. 17601 • (717) 656-2301
FRANKLIN DIVISION
5424 Buchanan Trail East, Waynesboro, Pa. 17268 • (717) 762-9[illegible]

Respectfully submitted,
Lancaster Laboratories, Inc.

Reviewed and Approved by
Nelson H. Risser, B.A.
Group Leader, GC/MS

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No WW 333833

Date Reported 10/17/84
Date Submitted 10/ 2/84
Discard Date 10/24/84
Collected by Client

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

Spring #3 Water Sample
Collected 9/28/84 by SKF

Volatiles in Groundwater	AS RECEIVED		
Benzene	<	1.	ppb
Toluene	<	1.	ppb
Chlorobenzene	<	1.	ppb
Ethylbenzene	<	1.	ppb
Chloromethane	<	5.	ppb
Bromomethane	<	5.	ppb
2-Chloroethylvinyl ether	<	10.	ppb
Vinyl chloride	<	1.	ppb
Chloroethane	<	1.	ppb
Methylene chloride	<	1.	ppb
1,1-Dichloroethene	<	1.	ppb
1,1-Dichloroethane	<	1.	ppb
trans-1,2-Dichloroethene	<	1.	ppb
Chloroform		63.	ppb
1,2-Dichloroethane	<	1.	ppb
1,1,1-Trichloroethane	<	1.	ppb
Carbon tetrachloride	<	1.	ppb
Dichlorobromomethane		5.	ppb
1,2-Dichloropropane	<	1.	ppb
trans-1,3-Dichloropropene	<	1.	ppb
Trichloroethene		3.	ppb
Dibromochloromethane		3.	ppb
1,1,2-Trichloroethane	<	1.	ppb
cis-1,3-Dichloropropene	<	1.	ppb
Bromoform	<	2.	ppb
1,1,2,2-Tetrachloroethane	<	2.	ppb
Tetrachloroethene	<	1.	ppb

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FRANKLIN DIVISION
5424 Buchanan Trail East, Waynesboro, Pa 17268 • (717) 762-9[illegible]

Respectfully submitted,
Lancaster Laboratories, Inc.

Reviewed and Approved by
Nelson H. Risser, B.A.
Group Leader, GC/MS

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No WW 335154

Date Reported 10/26/84
Date Submitted 10/ 9/84
Discard Date 11/ 2/84
Collected by Client

Nassaux-Hemsley Inc.
56 North Second Street
Chambersburg, PA 17201

Spring #4 Water Sample
Collected 10/8/84 by SKF

Volatiles in Groundwater	AS RECEIVED		
Benzene	<	1.	ppb
Toluene	<	1.	ppb
Chlorobenzene	<	1.	ppb
Ethylbenzene	<	1.	ppb
Chloromethane	<	5.	ppb
Bromomethane	<	5.	ppb
2-Chloroethylvinyl ether	<	10.	ppb
Vinyl chloride	<	1.	ppb
Chloroethane	<	1.	ppb
Methylene chloride	<	1.	ppb
1,1-Dichloroethene	<	1.	ppb
1,1-Dichloroethane	<	1.	ppb
trans-1,2-Dichloroethene	<	1.	ppb
Chloroform		1.	ppb
1,2-Dichloroethane	<	1.	ppb
1,1,1-Trichloroethane	<	1.	ppb
Carbon tetrachloride	<	1.	ppb
Dichlorobromomethane	<	1.	ppb
1,2-Dichloropropane	<	1.	ppb
trans-1,3-Dichloropropene	<	1.	ppb
Trichloroethene	<	1.	ppb
Dibromochloromethane	<	1.	ppb
1,1,2-Trichloroethane	<	1.	ppb
cis-1,3-Dichloropropene	<	1.	ppb
Bromoform	<	2.	ppb
1,1,2,2-Tetrachloroethane	<	2.	ppb
Tetrachloroethene	<	1.	ppb

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The American Association for Laboratory Accreditation
Chemical & Biological fields of testing

Member American Council of Independent Laboratories Inc

MAIN LABORATORY
2425 New Holland Pike Lancaster Pa 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East Waynesboro Pa 17268 • (717) 762-9127

Respectfully submitted,
Lancaster Laboratories, Inc.

Reviewed and Approved by
Melanie H. Risser, B.A.
Group Leader, GC/MS

bcc: Jeff Molar, BWQM
File

Community Environmental Control
407 South Cameron Street
Harrisburg, Pennsylvania 17101
(717) 787-9687
November 14, 1983

Mr. Robert Weaver
Shippensburg Borough
60 West Burd Street
Shippensburg, PA 17257

Re: TCE Investigation
Shippensburg Borough
Cumberland County

Dear Mr. Weaver:

As promised, I will attempt to summarize the results of the recent sampling done in the Borough after SKF Industries, Inc. was found to be disposing of wastewater containing trichloroethylene into an injection well.

1. Results of sampling done on August 23, 1983:

   a. Shippensburg Beverage Dist. Well: TCE - None Detected

   b. R. E. Holtry Residence: TCE - None Detected

   c. Cave Behind 302 West King Street: TCE - None Detected

   d. Dykeman's Spring: TCE + PCE - None Detected

      1,1,1 - TCE - 2.0 microgram/l

2. Results of sampling done on October 6, 1983:

   Dykeman's Spring: V.O.C. Analysis - None Detected

From the above results, it appears that we do not have a problem at this time. Even though 1,1,1 - Tricholorethane was found in a minute quantity at Dykeman's Spring, the more complete follow-up analysis did not find it or other substances to be present more than a month later. We may want to monitor it from time to time, but no other action appears necessary at this moment.

Should you have any questions, please let me know.

Sincerely,

Jeffrey A. Gordon
Sanitarian
Dauphin County Office

JAG:flw

cc: Gary Naumick, Environmental Protection Agency

EF AB-13.1
8/

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number 31413

Date Received 8/23/83

ESTABLISHMENT SHIPPENSBURG BEVERAGE DISTRIBUTOR	CASE 129 W. ORANGE ST. SHIPPENSBURG, PA	FACILITY WELL	COLL NUMBER
COUNTY CUMBERLAND	MUNICIPALITY SHBG BORO	PROGRAM	COLL NAME J. A. GORDON
TYPE TR 0	STD ANALYSIS		

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1	County / Mun / 1 / Est / Caso / Fac.		0	M 08 D 23 Y 83	Hr 10 Min 28	

USGS Q 30-34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		1 3 1 0 2 1 8		

DESCRIPTION WHERE SAMPLE TAKEN OUTSIDE FAUCET — WELL WATER SUPPLY THE WATER HAD A GOOD DEAL OF GAS ENTRAINED IN IT.

ADDITIONAL LAB ANALYSES
TCE SCAN

CUSTODY LOG
No Shipped Date
Legal Seal No.
Received by:
Legal Seal Condition:

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

TCEs - none detected

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)

ANALYST J. H. Malgeiac (SIGNATURE) DATE 8/26/83

E AB-13.1
8/

Lab Number 31415

Date Received 8/23/83

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

ESTABLISHMENT	CASE	FACILITY	COLL NUMBER
E. HOLTRY	10130 POSSUM HOLLOW RD SHIPPENSBURG, PA 17257	PRIVATE WELL	

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME	TYPE TR	STD ANALYSIS
FRANKLIN	SOUTHAMPTON T		J. A. GORDON	O	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1/2	County, Mun, T, Est, Case, Fac.		0	M 08 D 23 Y 83	Hr 10 Min 54	

USGS 30-34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		1 3 1 0 2 2 0		

DESCRIPTION WHERE SAMPLE TAKEN OUTSIDE TAP NEAR FRONT DOOR

ADDITIONAL LAB ANALYSES

TCE SCAN

CUSTODY LOG

Hc Shipped Date

Le Seal No.

Received by:

Le Seal Condition:

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

TCEs - none detected

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)

ANALYST J. H. Smaljevac
SIGNATURE

DATE 8/26/83

E' 'AB-13.1
8/

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number 31414

Date Received 8/23/83

ISHMENT CORTNEY	CASE 302 W. KING ST SHIPPENSBURG, PA 17257	FACILITY CAVE	COLL NUMBER
ITY FRANKLIN	MUNICIPALITY SHBG B.	PROGRAM	COLL NAME J. A. GURDON	TYPE TR	STD ANALYSIS

CARD (3)	ID CODE (ALL CARDS) 4 16	LATITUDE 4 10	LONGITUDE 11 18	DATE 19 24	TIME 25 28	KIND 29
1 / 2	City Mun I Est Case Loc		0	M D Y 0 8 2 3 8 3	Hr Min 1 0 3 8	

USGS 30 34	BUREAU 35 37 AMIS	SAMPLE NUMBER 38 43	STREAM NAME 44 57	RELATIVE POINT 58
		1 3 1 0 2 1 9		

DESCRIPTION WHERE SAMPLE TAKEN FROM PUMP AT TOP OF CAVE'S ENTRANCE

ADDITIONAL LAB ANALYSES
TCE SCAN

CUSTODY LOG

H Shipped Date

Legal Seal No.

Received by:

Legal Seal Condition:

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

TCEs - None detected

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)

ANALYST J. H. Smaljewc
SIGNATURE

DATE 8/26/83

EF AB-13.1
8/

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number 31416

Date Received 8/23/83

SHIPMENT SHIPPENSBURG TORO MUN. AUTHORITY	CASE	FACILITY DYKEMAN SPRING SOURCE	COLL NUMBER
COUNTY CUMBERLAND	MUNICIPALITY SHBG. B	PROGRAM	COLL NAME J. A. GORDON	TYPE TR O	STD ANALYSIS

CARD	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1 / 2	County / Mun / F / Fac / Case / Fac		0	M 08 D 23 Y 83	Hr 11 Min 06	

PWS ID 30-34	BUREAU 35-37 AMD	SAMPLE NUMBER 38-43 1310221	STREAM NAME 44-57 / RELATIVE POINT 58

DESCRIPTION WHERE SAMPLE TAKEN IN SPRING HOUSE POOL

ADDITIONAL LAB ANALYSES: TCE SCAN

CUSTODY LOG

Shipped Date

Legal Seal No.

Received by:

Legal Seal Condition:

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

TCE + PCE - None detected

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
11-TCE	ug/l		0002.0

ANALYST J. H. Maljevac (SIGNATURE) DATE 8/26/83

EP LAB-13.1
8/

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number 37954

Date Received 10/7/83

ESTABLISHMENT	CASE	FACILITY	COLL NUMBER
SHIPPENSBURG BORO WA AUTH	PUBLIC WATER	DYKEMAN SPRING	

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME	TYPE TR	STD ANALYSIS
CUMBERLAND	SHIPPENSBURG		J. A. GORDON	O	109

CARD (1-3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1	City Mun I Est Case Loc		0	M D Y 1 0 0 6 8 3	Hr Min 0 8 2 0	

STATE CODE 30-34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
	0 2 5	1 3 1 0 2 7 8		

DESCRIPTION WHERE SAMPLE TAKEN FROM SPRING HOUSE

ADDITIONAL LAB ANALYSES

VOA - SCHEDULED SAMPLE

CUSTODY LOG

Shipped Date

Seal No.

Received by:

Seal Condition:

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

ECLUS 1021 - None Detected

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)

ANALYST [signature] SIGNATURE

DATE 10-14-83

APPENDIX B

WELL LOGS

NASSAUX-HEMSLEY, INCORPORATED

NSI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program
SKF MONITORING WELLS

Boring No. MW-1 Sheet 1 of 1

Date Begin 7/25/84
Date Completed 7/26/84
Weather 85°F, Clear
Driller Storm White
Assist. Driller Jerry Brooks
Eichelberger Well Drilling

Casing Size, O.D. 6-5/8"
Hammer Weight, Cas. _____ Drop _____
Spoon Size, O.D. _____
Hammer Weight, Sp. _____ Drop _____
Core Bit Size _____

Location NW corner of shop
Station between bldg and walk
Offset _____
Ground Elev. ~ 688.79'
Auger Size _____
T.O.C. Elev. 690.29'

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
7/26/84	80'	*40.8'	11:00 AM
7/27/84	80'	39.2'	11:00 AM
7/30/84	80'	36.3'	10:30 AM
7/31/84	80'	36.0'	9:30 AM

NOTES: Set 40' of casing to a depth of 38.5'

*All water levels measured form top of casing.

BORING LOG / SPOON SAMPLE & ROCK CORE DATA / REMARKS

Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	Remarks (water loss, cavities, etc.)
0' – 15'	Yellow brown silty clay, and cinders Fill material										
15' – 20'	Dark brown silty clay loam with some organic material.										
20' – 33'	Yellow Brown silty clay										
33' – 71'	Dark blue, gray limestone										Rock Dale Run Formation
71' – 74'	Fractured limestone blowing a lot of mud.										Mud seam at 71'. Blew hole for 1.0 hour.
74' – 80'	Dark blue, gray limestone mixed with mud from above. T.D.										at 50', getting some water but still muddy.

CASING BLOWS

0-1	
1-2	
2-3	
3-4	
4-5	
5-6	
6-7	
7-8	
8-9	
9-10	
10-11	
11-12	
12-13	
13-14	
14-15	
15-16	
16-17	
17-18	
18-19	
19-20	
20-21	
21-22	
22-23	
23-24	
24-25	
25-26	
26-27	
27-28	
28-29	
29-30	

GROUND SURFACE TO 80' USED air/rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger
US: Undisturbed Spoon

Proportions Used

Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %
And	35 to 50 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Med. Dense	4 - 8	Med. Stiff
30 - 50	Dense	8 - 15	Stiff
30 +	Hard		

SUMMARY

Earth Boring _____
Rock Coring _____
Samples _____

NASSAUX-HEMSLEY, INCORPORATED

NHI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program

SKF MONITORING WELLS

Boring No. MW-2 Sheet 1 of 1

Date Begin 7/26/84
Date Completed 7/26/84
Weather 85°F Clear
Driller Storm White
Assist. Driller Jerry Brooks
Eichelberger Well Drilling

Casing Size, O.D. 6-5/8" (Steel)
Hammer Weight, Cas. ____ Drop ____
Spoon Size, O.D. ____
Hammer Weight, Sp. ____ Drop ____
Core Bit Size ____

Location South end of shop in
Station Access Road to loading dock.
Offset ____
Ground Elev. ~690.00'
Auger Size ____
T.O.C. Elev. 693.00'

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
7/26/84	78'	*32.2'	3:00 PM
7/27/84	78'	31.0'	11:00 AM
7/30/84	78'	31.5'	10:30 AM
7/31/84	78'	31.8'	9:30 AM

NOTES:

Set 40' of casing to a depth of 37.0'

*All water levels measured from top of casing.

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)	0-1	
												1-2	
0	Yellow brown silty clay, highly weathered coarse fragments encountered											2-3	
												3-4	
												4-5	
												5-6	
												6-7	
23'	between 15' and 20'											7-8	
												8-9	
												9-10	
												10-11	
												11-12	
23'	Dark, blue gray limestone										Rock Dale Run Formation	12-13	
												13-14	
												14-15	
75'												15-16	
75'	Fractured limestone blowing some mud.										Water encountered at 75'	16-17	
												17-18	
78'											Driller's estimate 45 to 50 gpm.	18-19	
												19-20	
												20-21	
	T.D.											21-22	
											Muddy	22-23	
											Blew water for approximately 10 minutes.	23-24	
												24-25	
												25-26	
												26-27	
												27-28	
												28-29	
												29-30	

GROUND SURFACE TO 78' USED air/rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger
US: Undisturbed Spoon

Proportions Used	
Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %
And	35 to 50 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency		
0 - 10	Loose	0 - 4	Soft	30 + Hard
10 - 30	Med. Dense	4 - 8	Med. Stiff	
30 - 50	Dense	8 - 15	Stiff	
50 +	Very Dense	15-30	[illegible]	

SUMMARY

Earth Boring ____
Rock Coring ____
Samples ____

NASSAUX-HEMSLEY, INCORPORATED

NSI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program
SKF MONITORING WELLS

Boring No. MW-3 Sheet 1 of 1

Date Begin 8/16/84
Date Completed 8/16/84
Weather 85°F Clear
Driller Storm White
Assist. Driller Barry Meyers
EICHELBERGER WELL DRILLING

Casing Size, O.D. 6-5/8"
Hammer Weight, Cas. ____ Drop ____
Spoon Size, O.D. ____
Hammer Weight, Sp. ____ Drop ____
Core Bit Size ____

Location Corner of parking lot
Station and Orange St.
Offset ____
Ground Elev. ~ 672.43'
Auger Size ____
T.O.C. Elev. 674.43'

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
8/16/84	112'	*82.9	3:00 PM

NOTES: Set 30' of casing to a depth of 28'.

*All water levels measured from top of casing.

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)	0-1	
												1-2	
0	Dark brown silt loam											2-3	
												3-4	
												4-5	
3'												5-6	
												6-7	
3'	Lt. yellow brown silty clay										Well blowing water at 25' after second run; coming in from above rock.	7-8	
												8-9	
												9-10	
20'												10-11	
												11-12	
20'	Dark gray blue limestone, small fracture at 90'										At hole depth of 28', took water level (16' below ground) set casing at 28' sealed off soil water	12-13	
												13-14	
112'												14-15	
												15-16	
	T.D.											16-17	
												17-18	
												18-19	
												19-20	
												20-21	
											Water encountered at 90' (measured 1.5 gpm)	21-22	
												22-23	
												23-24	
												24-25	
												25-26	
												26-27	
												27-28	
												28-29	
												29-30	

GROUND SURFACE TO 112' USED air/rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger

Proportions Used	
Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency		
0 - 10	Loose	0 - 4	Soft	30 + Hard
10 - 30	Med. Dense	4 - 8	Med. Stiff	
30 - 50	Dense	8 - 15	Stiff	

SUMMARY

Earth Boring ____
Rock Coring ____
Samples ____

NASSAUX-HEMSLEY, INCORPORATED

NBI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program

SKF MONITORING WELLS

Boring No. MW-5 Sheet 1 of 2

Date Begin 9/20/84
Date Completed 9/20/84
Weather 48° Overcast
Driller Carey Knaub
Assist. Driller Barry Meyers
EICHELBERGER WELL DRILLING

Casing Size, O.D. 6-5/8" (steel)
Hammer Weight, Cas. ____ Drop ____
Spoon Size, O.D. ____
Hammer Weight, Sp. ____ Drop ____
Core Bit Size ____

Location Shippensburg
Station Franklin Hgts & N. Morris St
Offset ____
Ground Elev. ____
Auger Size ____
T.O.C. Elev. 715.58

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
9/20/84	100'	*66.0'	2:30 PM
9/21/84	100'	64.7'	9:30 AM

NOTES: Set 42' of casing to a depth of 40.5'.

*All water levels measured from top of casing

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)		
0	Yellow brown silty clay											0-1	
												1-2	
												2-3	
												3-4	
												4-5	
10												5-6	
												6-7	
10	Highly fractured limestone medium blue gray										Fractures filled with anguler limestone fragments & highly weathered limestone	7-8	
												8-9	
												9-10	
16												10-11	
16	Medium blue gray limestone solid											11-12	
												12-13	
												13-14	
18												14-15	
												15-16	
18	Highly fractured limestone-medium gray brown										Fractures filled with highly weathered limestone fragments.	16-17	
												17-18	
												18-19	
25												19-20	
												20-21	
25	Medium blue - gray limestone, solid											21-22	
												22-23	
												23-24	
27												24-25	
												25-26	
27	Fractured limestone										Fractures filled with highly weathered material.	26-27	
												27-28	
28												28-29	
												29-30	

GROUND SURFACE TO 100' USED Air-Rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger

Proportions Used

Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency		
0 - 10	Loose	0 - 4	Soft	30 + Hard
10 - 30	Med. Dense	4 - 8	Med. Stiff	
30 - 50	Dense	8 - 15	Stiff	

SUMMARY

Earth Boring 100'
Rock Coring ____
Samples ____

NASSAUX-HEMSLEY, INCORPORATED

NHI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program

SKF MONITORING WELLS

Boring No. MW-5 Sheet 1 of 2

Date Begin 9/20/84
Date Completed 9/20/84
Weather 48° Overcast
Driller Carey Knaub
Assist. Driller Barry Meyers
EICHELBERGER WELL DRILLING

Casing Size, O.D. 6-5/8" (steel)
Hammer Weight, Cas. _____ Drop _____
Spoon Size, O.D. _____
Hammer Weight, Sp. _____ Drop _____
Core Bit Size _____

Location Shippensburg
Station Franklin Hgts & N. Morris St
Offset _____
Ground Elev. _____
Auger Size _____
T.O.C. Elev. 715.58

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
9/20/84	100'	*66.0'	2:30 PM
9/21/84	100'	64.7'	9:30 AM

NOTES: Set 42' of casing to a depth of 40.5'.

*All water levels measured from top of casing

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)		
												0-1	
												1-2	
0	Yellow brown silty clay											2-3	
												3-4	
												4-5	
10												5-6	
												6-7	
10	Highly fractured limestone medium blue gray										Fractures filled with anguler limestone fragments & highly weathered limestone	7-8	
												8-9	
												9-10	
												10-11	
16												11-12	
16	Medium blue gray limestone solid											12-13	
												13-14	
												14-15	
18												15-16	
18	Highly fractured limestone-medium gray brown										Fractures filled with highly weathered limestone fragments.	16-17	
												17-18	
												18-19	
25												19-20	
												20-21	
25	Medium blue - gray limestone, solid											21-22	
												22-23	
												23-24	
27												24-25	
												25-26	
27	Fractured limestone										Fractures filled with highly weathered material.	26-27	
												27-28	
28												28-29	
												29-30	

GROUND SURFACE TO 100' USED Air-Rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger
US: Undisturbed Spoon

Proportions Used

Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %
And	35 to 50 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Med. Dense	4 - 8	Med. Stiff
30 - 50	Dense	8 - 15	Stiff
		30 +	Hard

SUMMARY

Earth Boring 100'
Rock Coring _____
Samples _____

NASSAUX-HEMSLEY, INCORPORATED

NHI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program
SKF MONITORING WELLS

Boring No. MW-4 Sheet 1 of 2

Date Begin 8/16/84
Date Completed 8/17/84
Weather 85°F Clear
Driller Storm White
Assist. Driller Barry Meyers
Eichelberger Well Drilling

Casing Size, O.D. 6 5/8"
Hammer Weight, Cas. ____ Drop ____
Spoon Size, O.D. ____
Hammer Weight, Sp. ____ Drop ____
Core Bit Size ____

Location In Field West of
Station Orange Street
Offset ____
Ground Elev. ~664.98
Auger Size ____
T.O.C. Elev. 667.78

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour

NOTES: Set 46' of Casing to a Depth of 43'.

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)	0-1	
												1-2	
0.0' - 10.0'	Dark Yellow Brown Silty Clay											2-3	
												3-4	
												4-5	
												5-6	
												6-7	
10.0' - 14.0'	Dark Gray, Blue Limestone											7-8	
												8-9	
												9-10	
												10-11	
14.0' - 30.0'	Fractured Limestone and Mud										Water at 14' 10-12 gpm (Driller's Estimate)	11-12	
												12-13	
												13-14	
												14-15	
												15-16	
30.0' - 31.0'	Dark Gray Blue Limestone											16-17	
												17-18	
												18-19	
												19-20	
31.0' - 40.0'	Fractured Limestone and Mud										Water Greater Than 30 gpm	20-21	
												21-22	
												22-23	
												23-24	
												24-25	
40.0' - 54.0'	Dark Gray Blue Limestone										Unable to Seal Casing, Water Coming in from above.	25-26	
												26-27	
												27-28	
												28-29	
												29-30	

GROUND SURFACE TO 74' USED Air Rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger

Proportions Used

Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Med. Dense	4 - 8	Med. Stiff
30 - 50	Dense	8 - 15	Stiff
		30 +	Hard

SUMMARY

Earth Boring ____
Rock Coring ____
Samples ____

NASSAUX-HEMSLEY, INCORPORATED

NHI BUILDING - 56 NORTH SECOND STREET CHAMBERSBURG, PENNSYLVANIA 17201

TEST BORING RECORD

Project Name: Subsurface Exploratory Program
SKF MONITORING WELLS

Boring No. MW-4 Sheet 2 of 2

Date Begin 8/16/84
Date Completed 8/17/84
Weather 85°F Clear
Driller Storm White
Assist. Driller Barry Meyers
Eichelberger Well Drilling

Casing Size, O.D. 6 5/8"
Hammer Weight, Cas. ____ Drop ____
Spoon Size, O.D. ____
Hammer Weight, Sp. ____ Drop ____
Core Bit Size ____

Location In Field West of
Station Orange Street
Offset ____
Ground Elev. ____
Auger Size ____
T.O.C. Elev. 667.78

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour

NOTES:

BORING LOG		SPOON SAMPLE & ROCK CORE DATA									REMARKS	CASING BLOWS	
Depth From To	Material Description	Sample No.	Sample Depth	Sample Type	Blows Spoon 6" Intervals 0/6	6/12	12/18	Run No.	Depth of Run	Core Rec. (ft)	(water loss, cavities, etc.)	0-1	
												1-2	
												2-3	
												3-4	
54.0'	Fractured Limestone and Mud											4-5	
												5-6	
												6-7	
											Some Increase of Yield at 70'.	7-8	
74.0'												8-9	
												9-10	
												10-11	
												11-12	
	T.D.										After Completion Yield Greater Than 50 gpm.	12-13	
												13-14	
												14-15	
												15-16	
												16-17	
												17-18	
												18-19	
												19-20	
												20-21	
												21-22	
												22-23	
												23-24	
												24-25	
												25-26	
												26-27	
												27-28	
												28-29	
												29-30	

GROUND SURFACE TO 74' USED Air Rotary THEN T.D.

SAMPLE TYPE

D: Dry C: Cored W: Washed
TP: Test Pit A: Auger

Proportions Used

Trace	0 to 10 %
Little	10 to 20 %
Some	20 to 35 %

140 lb. Wt. x 30" fall on 2" OD. Sampler

Cohesionless Density		Cohesive Consistency		
0 - 10	Loose	0 - 4	Soft	30 + Hard
10 - 30	Med. Dense	4 - 8	Med. Stiff	
30 - 50	Dense	8 - 15	Stiff	

SUMMARY

Earth Boring ____
Rock Coring ____
Samples ____

Department of Environmental Resources — TOPOGRAPHIC AND GEOLOGIC SURVEY — Water Well Inventory Report

OFFICE USE ONLY

St. 42 Co. ____ Lat ____ Long ____ Physio. Prov. ____ U.S. Basin ____ Topo. ____

Seq: ____ Acc. ____ Map ____ Well ____ Aquifer ____ Aquifer ____

Well Site–Township: Shippensburg

County: Cumberland

Well Owner (last name): Nassaux-Hemsley, Inc (first initial)

Address: 56 North Seoond Street

Chambersburg, Pa. 17201

Ownership (CIRCLE ONE): private, city, corp/co, state, federal, county

Water Use (CIRCLE ONE): home, public, industry, irrigation, stock, institution

Well Use (CIRCLE ONE): frequent use, dry hole, recharge, test, abandoned

Monitor Well

Saltwater Zone: yes ___ no X (CHECK ONE)

Well Depth: 80 ft.

Casing Length: 40 ft.

Well Diameter: 6 to nearest inch

Well Finish (CIRCLE ONE): open hole, screen, perforated/slotted, other

Date Drilled month year: July 26, 1984

Water Level Before Test: 42 ft.

Level at End of Test: 70 ft.

Yield: 5 gpm

Flow Measure Method (CIRCLE ONE): bailer, orifice, meter, weir, watch and bucket, estimate, other

Drawdown: 28 ft.

Length of Test: AUG 1 3 1984 min.

Depth to Bedrock: 33 ft. Landform at Site (CIRCLE ONE): level, hilltop, valley, hillside

Surface ____ OFFICE USE ONLY

Driller's License: 0198 Driller's Name: Eichelberger/White

Depth to Water Bearing Zones (1): 70(5) ft.

(2) ____ ft. (3) ____ ft. (4) ____ ft.

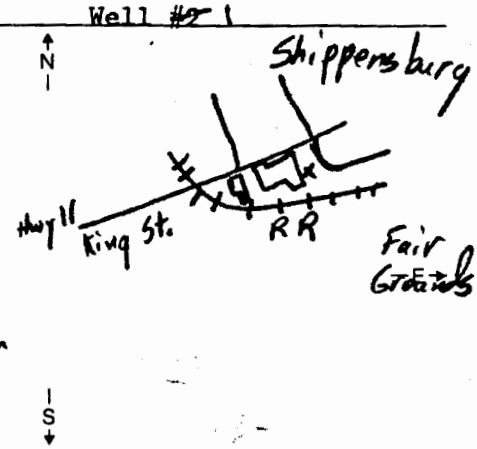
Pa. Basin ____ OFFICE USE ONLY

Written Well Location Directions: D-5100 SKF Industries Well #~~2~~ 1

Color and Rock Type	From	To
Overburden & Clay	0	33
Limestone	33	69
Void with clay & water	69	72
Limestone	72	80

Development name (if applicable) ____

Lot ____



SKETCH MAP Indicate route no's, intersections, schools, churches, cemeteries, streams, towns, and any notable feature such as quarries, bridges, railroads, etc. Be sure to show distances between these features.

ER-TGS-15 REV. 01/79

2ND COPY FOR WELL OWNER

Department of Environmental Resources — TOPOGRAPHIC AND GEOLOGIC SURVEY — Water Well Inventory Report

OFFICE USE ONLY

St. 42 Co. ____ Lat ____ Long ____ Physio. Prov. ____ U.S. Basin ____ Topo. ____

Seq: ____ Acc. ____ Map ____ Well ____ Aquifer ____ Aquifer ____

Well Site–Township: Shippensburg

County: Cumberland

Well Owner (last name): Nassaux-Hemsley, Inc (first initial)

Address: 56 North Second Street

Chambersburg, Pa. 17201

Ownership (CIRCLE ONE): private, city, corp/co, state, federal, county

Water Use (CIRCLE ONE): home, public, industry, irrigation, stock, institution

Well Use (CIRCLE ONE): frequent use, dry hole, recharge, test, abandoned

Monitor Well

Saltwater Zone: yes ___ no X (CHECK ONE)

Well Depth: 77 ft.

Casing Length: 40 ft.

Well Diameter: 6 to nearest inch

Well Finish (CIRCLE ONE): open hole, screen, perforated/slotted, other

Date Drilled month year: July 26, 1984

Water Level Before Test: 32 ft.

Level at End of Test: 67 ft.

Yield: 45-50 gpm

Flow Measure Method (CIRCLE ONE): bailer, orifice, meter, weir, watch and bucket, estimate, other

Drawdown: 35 ft.

Length of Test: AUG 30 1 3 1984 min.

Depth to Bedrock: 23 ft. Landform at Site (CIRCLE ONE): level, hilltop, valley, hillside

Surface ____ OFFICE USE ONLY

Driller's License: 0198 Driller's Name: Eichelberger/White

Depth to Water Bearing Zones (1): 75(45-50) ft.

(2) ____ ft. (3) ____ ft. (4) ____ ft.

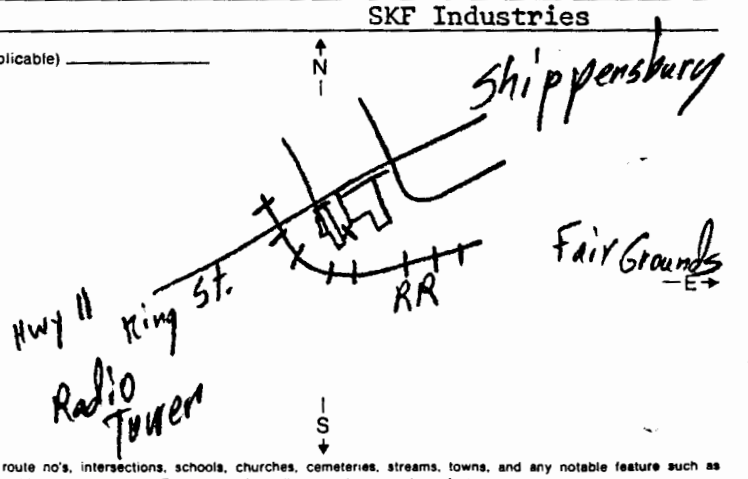
Pa. Basin ____ OFFICE USE ONLY

Written Well Location Directions: D-5097 Well #~~1~~ #2 SKF Industries

Color and Rock Type	From	To
Overburden & Clay	0	23
Limestone	23	77

Development name (if applicable) ____

Lot ____



SKETCH MAP Indicate route no's, intersections, schools, churches, cemeteries, streams, towns, and any notable feature such as quarries, bridges, railroads, etc. Be sure to show distances between these features.

ER-TGS-15 REV. 01/79

2ND COPY FOR WELL OWNER

Department of Environmental Resources — **TOPOGRAPHIC AND GEOLOGIC SURVEY** — **Water Well Inventory Report**

OFFICE USE ONLY

St. 42 Co. ____ Lat ____ Long ____ Physio. Prov. ____ U.S. Basin ____ Topo. ____

Seq: ____ Acc. ____ Map ____ Well ____ Aquifer ____ Aquifer ____

Well Site–Township: Shippensburg

County: Cumberland

Well Owner (last name): Nassaux-Hemsley, Inc (first initial)

Address: 56 North Second Street
Chambersburg, Pa. 17201

Ownership: ____ private, city, (corp/co), state, federal, county (CIRCLE ONE)

Water Use: ____ home, public, industry, irrigation, stock, institution (CIRCLE ONE)

Well Use: ____ frequent use, dry hole, recharge, test, abandoned (CIRCLE ONE)

Monitor Well

Saltwater Zone: ____ yes / X no (CHECK ONE)

Well Depth: 112 ft.

Casing Length: 30 ft.

Well Diameter: 6 to nearest inch

Well Finish: (open hole), screen, perforated/slotted, other (CIRCLE ONE)

Date Drilled month year: August 16, 1984

Water Level Before Test: 42 ft.

Level at End of Test: 102 ft.

Yield: 1½ gpm

Flow Measure Method: ____ bailer, orifice, meter, weir, (watch and bucket), estimate, other (CIRCLE ONE)

Drawdown: 60 ft.

Length of Test: ____ hr. 30 min.

Depth to Bedrock: 20 ft.

Landform at Site: ____ level, hilltop, valley, hillside (CIRCLE ONE)

Surface ____ OFFICE USE ONLY

Driller's License: 0198 Driller's Name: White

Depth to Water Bearing Zones (1): 17 (10-15) ft.
(2) 90 (1½) ft. (3) ____ ft. (4) ____ ft.

Pa. Basin ____ OFFICE USE ONLY

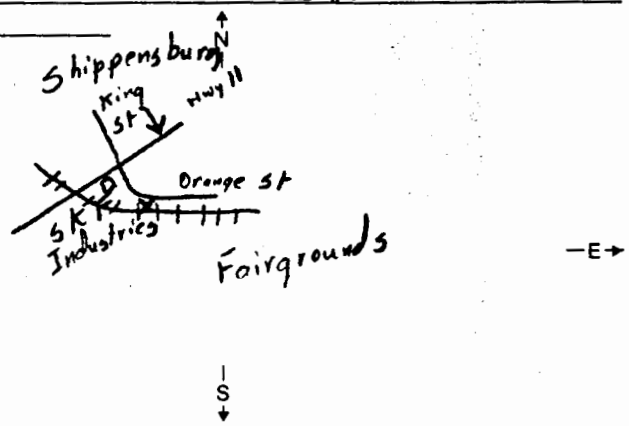
Written Well Location Directions: D-5098

Color and Rock Type	From	To
Clay	0	20
Limestone	20	112

SKF Industries
Well #3

Development name (if applicable) ____

Lot ____



SKETCH MAP — Indicate route no's, intersections, schools, churches, cemeteries, streams, towns, and any notable feature such as quarries, bridges, railroads, etc. Be sure to show distances between these features.

ER-TGS-15 REV. 01/79

2ND COPY FOR WELL OWNER

Department of Environmental Resources — **TOPOGRAPHIC AND GEOLOGIC SURVEY** — **Water Well Inventory Report**

OFFICE USE ONLY

St. 42 Co. ____ Lat ____ Long ____ Physio. Prov. ____ U.S. Basin ____ Topo. ____

Seq: ____ Acc. ____ Map ____ Well ____ Aquifer ____ Aquifer ____

Well Site–Township: Shippensburg

County: Cumberland

Well Owner (last name): Nassaux-Hemsley, Inc (first initial)

Address: 56 North Second Street
Chambersburg, Pa. 17201

Ownership: ____ private, city, (corp/co), state, federal, county (CIRCLE ONE)

Water Use: ____ home, public, industry, irrigation, stock, institution (CIRCLE ONE)

Well Use: ____ frequent use, dry hole, recharge, test, abandoned (CIRCLE ONE)

Monitor Well

Saltwater Zone: ____ yes / X no (CHECK ONE)

Well Depth: 74 ft.

Casing Length: 45 ft.

Well Diameter: 6 to nearest inch

Well Finish: (open hole), screen, perforated/slotted, other (CIRCLE ONE)

Date Drilled month year: Aug. 17, 1984

Water Level Before Test: 8 ft.

Level at End of Test: 64 ft.

Yield: 50 gpm

Flow Measure Method: ____ bailer, orifice, meter, weir, (watch and bucket), estimate, other (CIRCLE ONE)

Drawdown: 56 ft.

Length of Test: ____ hr. 30 min.

Depth to Bedrock: 10 ft.

Landform at Site: ____ level, hilltop, valley, hillside (CIRCLE ONE)

Surface ____ OFFICE USE ONLY

Driller's License: 0198 Driller's Name: White

Depth to Water Bearing Zones (1): 15 (10-15) ft.
(2) 43 (15-20) (3) 70 (40-50) (4) ____ ft.

Pa. Basin ____ OFFICE USE ONLY

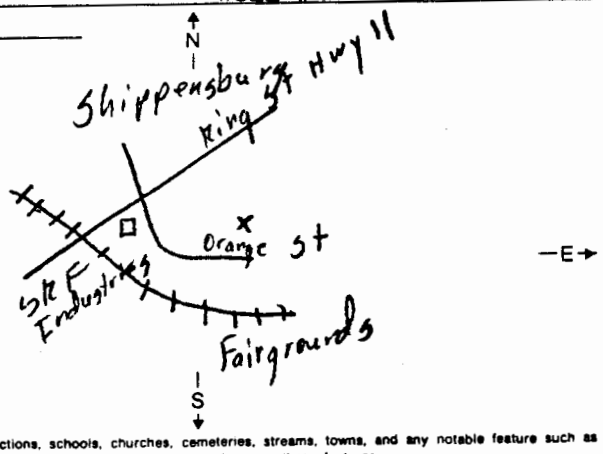
Written Well Location Directions: D-5099

Color and Rock Type	From	To
Clay	0	10
Limestone	10	15
Broken Limestone & Clay	15	38
Limestone	38	74

SKF Industries
Well #4

Development name (if applicable) ____

Lot ____



SKETCH MAP — Indicate route no's, intersections, schools, churches, cemeteries, streams, towns, and any notable feature such as quarries, bridges, railroads, etc. Be sure to show distances between these features.

ER-TGS-15 REV. 01/79

2ND COPY FOR WELL OWNER

Department of Environmental Resources — **TOPOGRAPHIC AND GEOLOGIC SURVEY** — **Water Well Inventory Report**

OFFICE USE ONLY

St. 42 Co. ____ Lat ____ Long ____ | Physio. Prov. ____ U.S. Basin ____ Topo. ____

Seq: ____ Acc. ____ Map ____ Well ____ | Aquifer ____ Aquifer ____

OCT 11 1984

Well Site–Township: Shippensburg

County: Cumberland

Well Owner (last name): Nassaux-Hemsley, Inc. (first initial) ____

Address: 56 N. Second Street
Chambersburg, Pa. 17201

Ownership ____ private, city, corp/co, state, federal, county (CIRCLE ONE)

Water Use ____ home, public, industry, irrigation, stock, institution (CIRCLE ONE)

Well Use ____ frequent use, dry hole, recharge, test, abandoned (CIRCLE ONE)

Monitor Well

Saltwater Zone ____ yes ____ no X (CHECK ONE)

Well Depth 100 ft.

Casing Length 42 ft.

Well Diameter 6 to nearest inch

Well Finish ____ open hole, screen, perforated/slotted, other (CIRCLE ONE)

Date Drilled month year 9/27/84

Water Level Before Test 64 ft.

Level at End of Test 90 ft.

Yield 10 gpm

Flow Measure Method ____ bailer, orifice, meter, weir, watch and bucket, estimate, other (CIRCLE ONE)

Drawdown 26 ft.

Length of Test 30 hr. ____ min.

Depth to Bedrock 15 ft.

Landform at Site (CIRCLE ONE) level, hilltop, valley, hillside

Surface ____ OFFICE USE ONLY

Driller's License 0198 Driller's Name Eichelberger/Knaub

Depth to Water Bearing Zones (1) 84-100(10) ft.

(2) ____ ft. (3) ____ ft. (4) ____ ft.

Pa. Basin ____ OFFICE USE ONLY

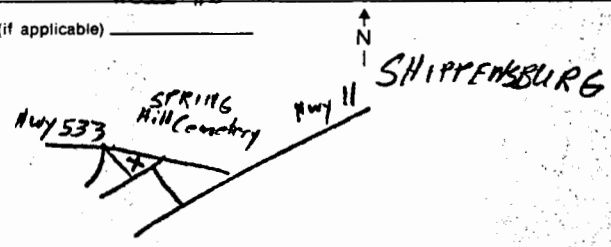
Written Well Location Directions D-5136

Color	Rock Type	From	To
	Clay	0	11
	Broken Limestone	11	15
	Limestone	15	20
	Broken Limestone & Clay	20	27
	Limestone	27	34
	Clay	34	39
	Limestone w/ Dolomite Beds	39	84
	Clay & Broken Limestone	84	100

Well #5 SKF INDUSTRIES

Development name (if applicable) ____

Lot ____



SKETCH MAP Indicate route no's, intersections, schools, churches, cemeteries, streams, towns, and any notable feature such as quarries, bridges, railroads, etc. Be sure to show distances between these features.

ER-TGS-15 REV. 01/79

2ND COPY FOR WELL OWNER

eichelberger
well drilling inc.

AUG 1 3 1984

•DRILLING SERVICES •WATER SYSTEMS •WATER TREATMENT

DRILLING LOG

August 1, 1984

Job Name: SKF Industries Monitor Well
Location: Shippensburg, Pa.
Well No: #2-1
Eichelberger Well Drilling No: D-5100
Date Started: 7/26/84
Date Completed: 7/26/84
Operators: White/Books
Casing Set: 40' of 6¼" steel
Casing Remaining: same
Total Depth: 80'
Static Water Level: 42'
Total Yield: 5 GPM

Depth	Rock Formation	Depth to Fracture/GPM Cumm.
0-33	Overburden and clay	
33-69	Limestone	
69-72	Void with clay and water	70' 5 GPM
72-80	Limestone	

841 WEST TRINDLE ROAD
MECHANICSBURG, PA 17055
717 766-7674

PENNSYLVANIA ONLY
800 382-1434

RD#1 BOX 207A
GALETON, PA 16922
814 435-8521

eichelberger well drilling inc.

AUG 1 3 1984

•DRILLING SERVICES •WATER SYSTEMS •WATER TREATMENT

DRILLING LOG

August 1, 1984

Job Name: SKF Industries Monitor Well
Location: Shippensburg, Pa.
Well No: #2
Eichelberger Well Drilling No: D-5097
Date Started: 7/26/84
Date Completed: 7/26/84
Operators: White/Books
Casing Set: 40' of 6¼"
Casing Remaining: same
Total Depth: 77'
Static Water Level: 32'
Total Yield: 45-50 GPM

Depth	Rock Formation	Depth to Fracture/GPM Cumm.
0-23	Overburden and clay	
23-77	Limestone	75' (45-50 GPM)

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eichelberger well drilling inc.

OCT 1 1 1984

•DRILLING SERVICES •WATER SYSTEMS •WATER TREATMENT

DRILLING LOG

August 28, 1984

Job Name: SKF Industries
Location: Shippensburg, Pa. (along RR tracks)
Well No: 3
Eichelberger Well Drilling No: D-5098
Date Started: 8/16/84
Date Completed: 8/16/84
Operators: White/Myers
Casing Set: 30' of 6¼"
Casing Remaining: Same
Total Depth: 112'
Static Water Level:
Total Yield: 1½ GPM

Depth	Rock Formation	Depth to Fracture/GPM Cumm.	
0-20	Clay	17'	10-15 GPM cased off
20-112	Limestone	90'	1½ GPM

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well drilling inc.

•DRILLING SERVICES •WATER SYSTEMS •WATER TREATMENT

DRILLING LOG

August 28, 1984

Job Name: SKF Industries
Location: Shippensburg, Pa.
Well No: 4
Eichelberger Well Drilling No: D-5099
Date Started: 8/16/84
Date Completed: 8/17/84
Operators: White/Myers
Casing Set: 45' of 6¼" & drive shoe
Casing Remaining: Same
Total Depth: 74'
Static Water Level: 8'
Total Yield: 50 GPM

Depth	Rock Formation	Depth to Fracture/GPM Cumm.	
0-10	Clay		
10-15	Limestone		
15-24	Clay, broken limestone & water		
24-38	Clay, badly weathered limestone		
38-74	Limestone	43'	15-20 GPM
		70'	40-50 GPM

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eichelberger well drilling inc.

•DRILLING SERVICES •WATER SYSTEMS •WATER TREATMENT

DRILLING LOG

September 28, 1984

Job Name: SKF Industries Monitor Well
Location: Shippensburg, Pa. - Rte 533 & Franklin Heights Drive
Well No: #5
Eichelberger Well Drilling No: D-5136
Date Started: 9/27/84
Date Completed: 9/27/84
Operators: Knaub/Myers
Casing Set: 42' of 6¼"
Casing Remaining: Same
Total Depth: 100'
Static Water Level: 64'
Total Yield: 10 GPM

Depth	Rock Formation	Depth to Fracture/GPM Cumm.	
0-11	Clay		
11-15	Broken limestone		
15-20	Limestone		
20-27	Broken limestone & clay		
27-34	Limestone		
34-39	Clay		
39-84	Limestone with dolomite beds		
84-100	Clay and broken limestone	84'- 100'	10 GPM

841 WEST TRINDLE ROAD
MECHANICSBURG, PA 17055
717 766-7674

PENNSYLVANIA ONLY
800 382-1434

RD#1 BOX 207A
GALETON, PA 16922
814 435-8521

DEPARTMENT OF ENVIRONMENTAL RESOURCES — TOPOGRAPHIC AND GEOLOGIC SURVEY

Well Owner: S.K.F. Co.
Address: W. KING ST
SHIPPENSBURG

Well Location (County): FRANKLIN
(~~Township~~): SHIPPENSBURG BORO.
Well Location Description:
W. KING ST

Sketch Map of Well Location
(Include nearest state, county, or twp. route no.)

KEEP

WELL LOG

WW 1 Revised 1972

Well Depth: 98 ft. Depth Cased: 21 ft. Diameter: 8 in.
Casing Material: STEEL Screened, Perforated
Method Drilled: Air Rot. X, Cable, Other (Specify)
Pump Intake Setting Depth ft.
Type of Pump: Centrifugal, Jet, Piston,
Rotary, Submersible
Depth To Water Before Pump Test: 24 ft.
Date Measured: 6-3-75 Test Yield 175 gpm
Method of Determining Yield
Depth to Water Near End of Yield Test ft.
Drawdown ft. Pumping Period hrs.
Date Well Completed
Water Use: Home, Industry X, Livestock,
Irrigation, Public Supply, Other (Specify)
Well Use: Frequent Plumbing, Unused, Test
Recharge, Waste, Abandoned & Plugged
Type of Water-Bearing Rock: Shale
Sandstone, Limestone X, Sand and
Gravel, Schist, Slate
Gneiss, Other (Specify)
Depth of Water Bearing Zones:
First 71 ft. Second ft.
Third ft. Fourth ft.
Date Sampled:
Quality Chemical Analysis: Yes No
Quality Biological Analysis: Yes No
Temperature °F Comments

Driller:
Name: E.E. FUNK
Address:
NEWVILLE PA
License No. 0878
Depth to Bedrock 16'
Type of Surficial Material: CLAY

LOG OF FORMATIONS

Rock Type	Feet From--To
CLAY	0-16
Limestone	16-71
Broken Rock	71-73
Limestone	73-98

2ND COPY FOR WELL OWNER

2ND INJECTION WELL

well? pump spec?

WELL DESCRIPTION

WELL LOG

State the kind of formations penetrated, their depth, their thickness, and if water-bearing

FEET from.....to.....

Casing 18 ins above ground

28 ft Clay

28 ft of Casing Cement Casing in Rock sixty ft.

Limestone formation on down

First small stream at 70 ft.

127 ft at this point

approx 90 gal per Minute

CASING AND SCREEN RECORD

State the kind and size of casing, liner, shoe, screen, and other accessories (if no casing used, give diameter of well)

DIAM. (inches) | FEET from.....to.....

6 in. well

Permit Number.....

Name of Owner

.....

PUMPING TEST

Hours Pumped 1 hr. 45

Type of Pump Used Turb

Pumping Rate Gallons per Minute 90

WATER LEVEL

Distance from land surface water:

Before Pumping 31 F

When Pumping 127 F

APPEARANCE OF WATER

Clear .....

Cloudy ✓

Taste .....

Odor .....

Height of Casing Above Land Surface 18 ins F

PUMP INSTALLED

Type .....

Capacity

Gallons per Minute.....

Gallons per Hour.....

Pump Column Length.....F

REMARKS

Water was Cloudy

Well Was Completed

Date April 4th 19

Well Driller Ralph E. Rob

Marion, Penn

Signature

APPENDIX C

WELL TESTING DATA

NASSAUX–HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET NO. 1/2
		BY: B.B.	CHECKED:
		CONDUCTIVITY PROFILE	

Monitoring Well No. 1

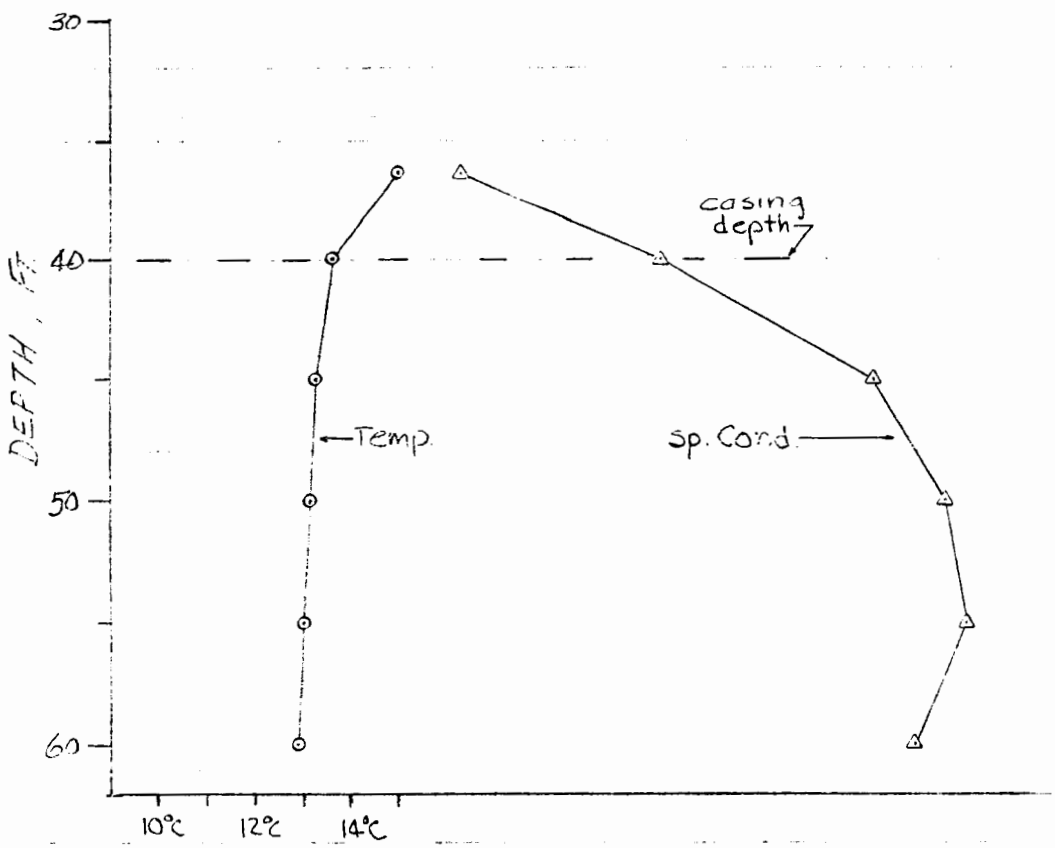
Static water level - 36.1' below T.O.C.

Bridged at - 60.5'

Depth of well - 80.0' below ground surface

Depth of casing - 38.5' below ground surface

Depth from T.O.C. ft.	Temperature °C	Specific Conductivity µmohs
36.4	15.0	172
40.0	13.6	339
45.0	13.3	513
50.0	13.2	574
55.0	13.0	592
60.0	12.9	550

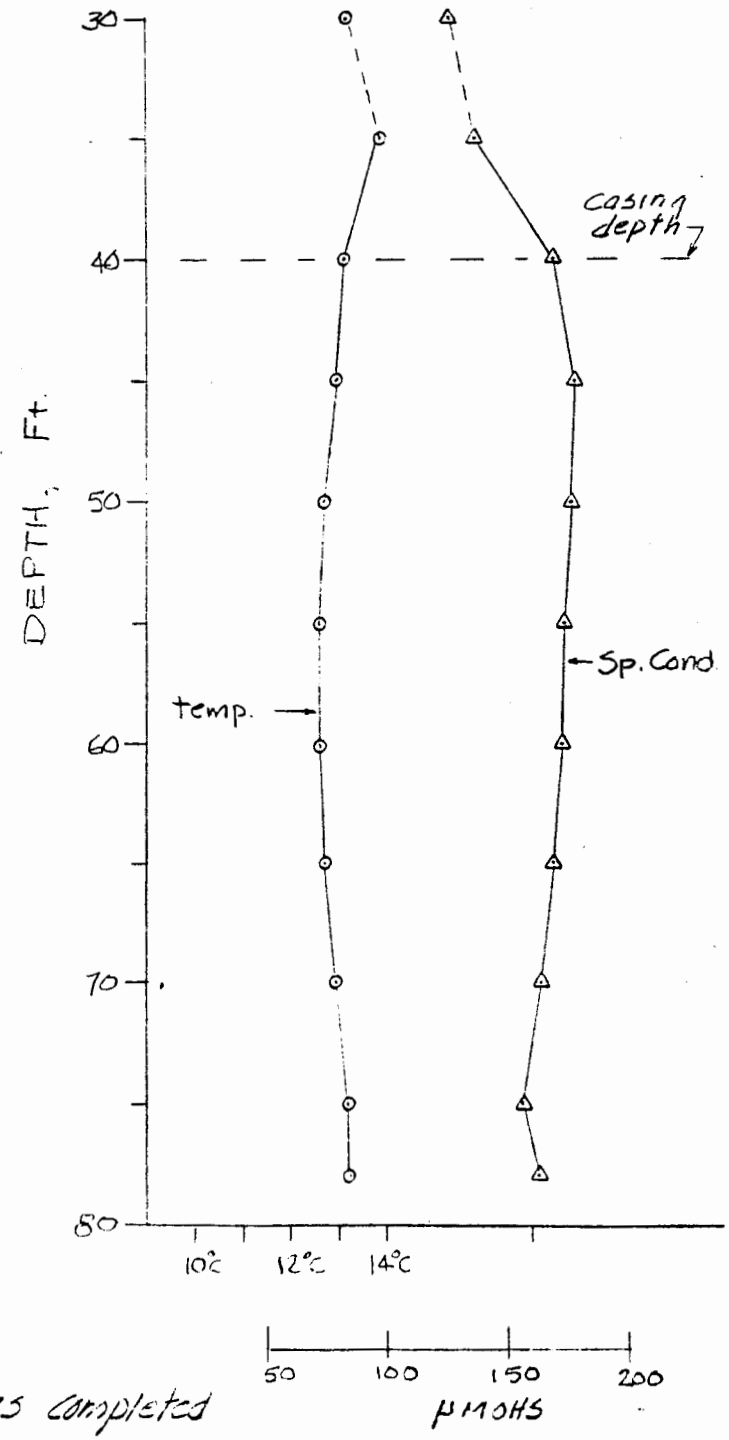


NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-23-84	SHEET No. 1/2
		BY: B.B	CHECKED:
		CONDUCTIVITY PROFILE	

Monitoring Well No. 2

Static Water level - 32.82' below T.O.C.
Depth of Well - 78.0' below ground Surface
Depth of Casing - 37.0' below ground Surface

Depth from T.O.C.	Temp. °C	Specific Cond. µMohs
	*13.2	*126
32.8'	20.4	065
35.0'	13.8	136
40.0'	13.1	168
45.0'	12.9	178
50.0'	12.7	176
55.0'	12.6	174
60.0'	12.6	172
65.0'	12.7	169
70.0'	12.9	164
75.0'	13.3	157
78.0'	13.3	161



*Readings re-taken after profile was completed

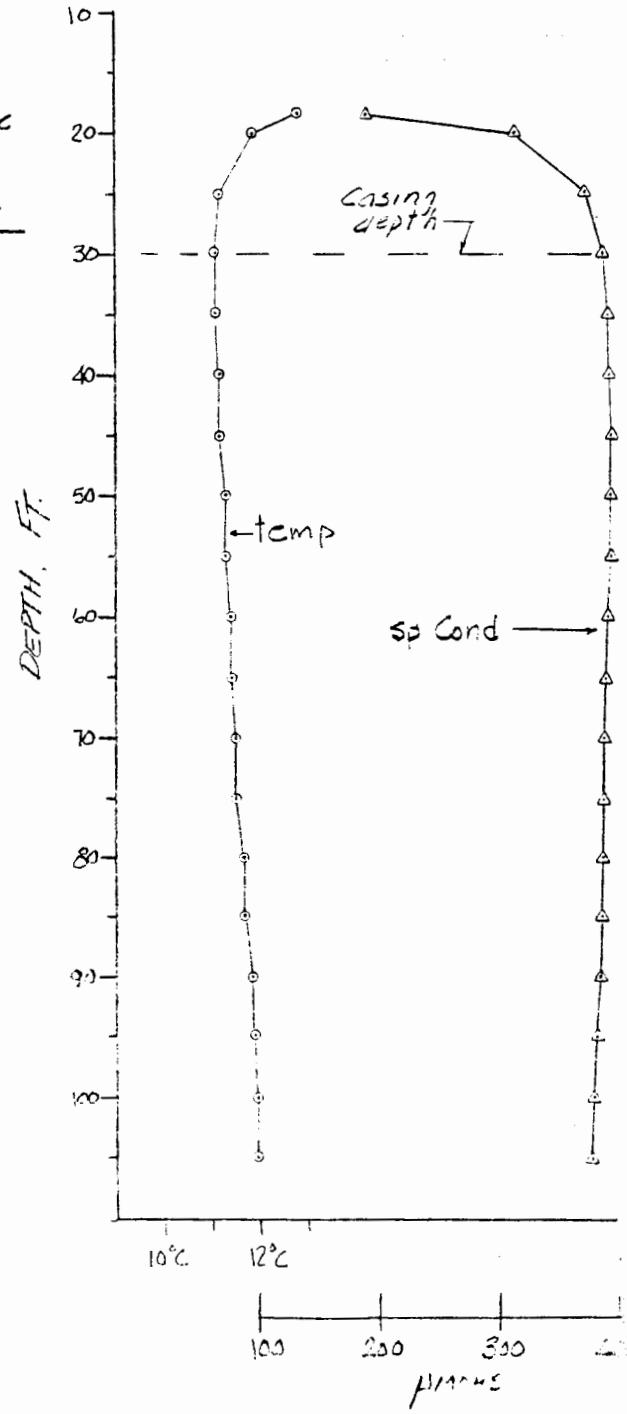
NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET No. 1/2
		BY: B.B.	CHECKED:
		CONDUCTIVITY PROFILE	

Monitoring Well No. 3

Static Water Level - 18.25' below T.O.C.

Depth of Well - 112' below ground Surface
Depth of Casing - 28' below ground Surface

Depth from T.O.C. ft.	Temperature °C	Specific Cond. µmohs
18.3	12.7	186
20	11.7	312
25	11.2	371
30	11.1	385
35	11.1	388
40	11.2	391
45	11.2	393
50	11.3	392
55	11.3	393
60	11.4	391
65	11.4	388
70	11.5	386
75	11.5	385
80	11.6	384
85	11.6	383
90	11.7	381
95	11.8	380
100	11.9	378
105	11.9	377

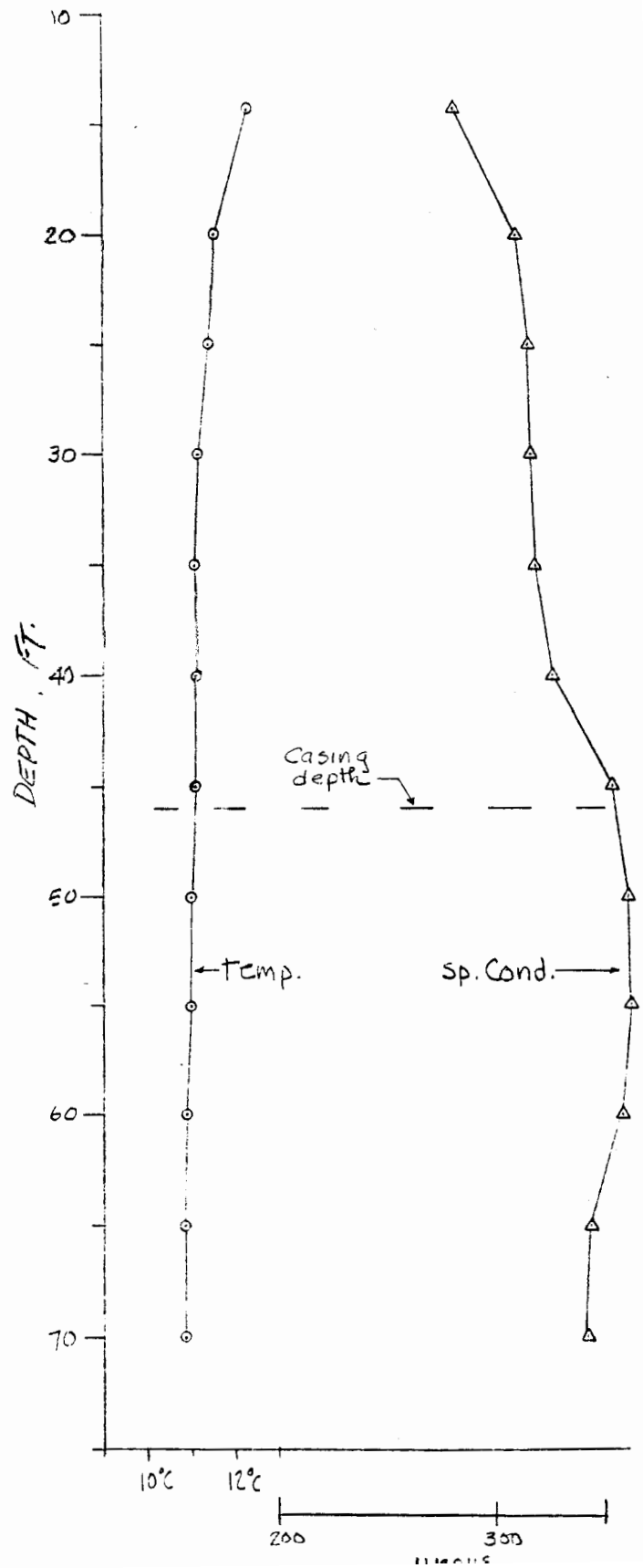


NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET NO. 1/2
		BY: B.B.	CHECKED:
		CONDUCTIVITY PROFILE	

Monitoring Well No. 4

Static Water Level - 14.35 below T.O.C.
Mud at - 71' below T.O.C.
Depth of Well - 74' below ground
Depth of Casing - 43' below ground

Depth from T.O.C. ft	Temp. °C	Specific Cond. µMOHS
14.35	12.3	280
20	11.5	309
25	11.4	314
30	11.2	315
35	11.1	318
40	11.1	325
45	11.1	353
50	11.0	360
55	11.0	361
60	10.9	356
65	10.9	344
70	10.9	341



NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-27-84	SHEET No. 1/1
		BY: B.B	CHECKED:
		TEMP & CONDUCTIVITY	

Location	Temp. °C	Sp. Cond. μmohs
Inj. Well	19.9-21.5	370-375
Pump Well	11.5	380
Indian head Spring	11.3	355

NASSAUX–HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET No. 2/2
		BY: B.B.	CHECKED:
		PUMPING TESTS	

Monitoring Well No. 1

Static Water Level - 36.1' below T.O.C.

Water Level after pump was set - 35.2' T.O.C.

Pump Intake set at - 53.5'

Time since pump started min.	Depth ft.	Drawdown S ft.	Temperature °C	Specific Cond. µmohs	Pumping rate gpm
0	35.2	-			
1.0	42.15	6.95	16.1	572	10
2.0	48.68	13.48			
*3.0	-		14.9	433	
Recovery	-				
4.0	47.6				
6.0	47.47				
8.0	47.35				
10.0	47.35				
15.0	47.25				

* Shut-off pump after 3.0 minutes, pumping very muddy water (soupy)

NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET No. 2/2
		BY: B.B	CHECKED:
		PUMPING TESTS	

Monitoring Well No. 2

STATIC WATER LEVEL - 32.82' below TOC.

PUMP INTAKE SET AT - 75'

	Time Since pump started min.	Depth, ft.	Drawdown, s ft	TEMP. °C	Specific Conductivity µmohs	Pumping rate gpm.
	0	32.82	-	>17	174	
	0.5	33.4	0.58			
	1.0	33.55	0.73	15.8	169	
	1.5	33.58	0.76			
	2.0	33.6	0.78			
	2.5	33.61	0.79			
	3.0	33.62	0.80	15.2	169	
	4.0	33.62	0.80			
	5.0	33.64	0.82	15.0	169	
	10	33.7	0.88	14.9	179	
	15	33.71	0.89	14.6	187	7.9
	20	33.75	0.93	14.3	194	7.9
	25	33.80	0.98	14.3	201	8.1
	30	33.80	0.98	14.2	207	8.1
	35	33.80	0.98	14.3	211	
GENERATOR SLOWS-DOWN	40	33.50	0.68	14.4 ?	216	
	45	33.83	1.01	14.3	216	8.1
	50	33.80	0.98	14.3	218	8.1
	55	33.80	0.98	14.3	218	8.1
WATER BECOMING CLEARER.	60	33.80	0.98	14.3	220	8.3
	65	33.80	0.98	14.3	221	8.3
	70			14.3	224	
	75			14.2	225	
	80			14.2	226	
	85	33.80	0.98	14.2	227	8.3
	90			14.2	227	
	95			14.2	228	
	100			14.2	230	
	105			14.2	230	
GENERATOR SHUT-OFF	110	33.70	0.88			
	120	33.80	0.98	14.2	232	8.3

NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET No. 2/2
		BY: B.B.	CHECKED:
		PUMPING TEST	

Monitoring Well No. 3

Static Water Level - 18.25' below T.O.C.
Water level after pump was set - 17.96'
Pump Intake set at - 98.5'

time since pump started min.	Depth ft.	Drawdown s ft	temperature °C	Specific Cond. µmhos	pumping rate gpm.
0	17.96	-			
0.5	21.70	3.74			
1.0	25.0	7.04			
1.5	27.32	9.36			
2.0	30.61	12.65	12.6	402	
2.5	33.25	15.29			
3.0	36.0	18.04			
3.5	39.0	21.04			
4.0	41.82	23.86			
4.5	44.20	26.24			
5.0	47.25	29.29			
6.0			12.2	403	
7.0					
8.0					9.4
9.0					
10	73.30	55.34	12.1	402	
11			17.0	393	8.8
12	82.0	64.04			
13					
14	89.8	71.84	12.1	386	
15					
16	pump-off Well dry				

NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 8-30-84	SHEET No. 2/2
		BY: B.B.	CHECKED:
		PUMPING TEST	

Monitoring Well No. 4

Static Water Level - 14.35' below T.O.C.
Pump Intake Set at - 40.0' below ground surface

Time since pump started min.		Depth ft.	Drawdown s ft.	temperature °C	Specific Cond. µmohs	pumping rate gpm
0		14.35	-			
0.5		17.01	2.66			
1.0		17.01	2.66			
1.5		17.01	2.66			
2.0		16.97	2.62	12.3	357	
3.0		16.91	2.56			10
4.0		16.75	2.40			
5.0				11.9	375	
	7.0			11.8	381	10
10						
	11			11.7	379	
15		16.68	2.33	11.7	382	10
	19			11.7	381	
20		16.56	2.21			
	23			11.7	382	10
25		16.42	2.07			
	27			11.7	382	
30		16.43	2.08			
	32			11.7	381	10
35		16.43	2.08			
	37			11.8	381	
40		16.43	2.08			
45		16.42	2.07			
	46			11.8	380	10
50		16.41	2.06			
55		16.42	2.07			
	56			11.8	380	10
60		16.39	2.04			
	63			11.8	380	
70		16.38	2.03			
	72			11.8	380	10
80		16.38	2.03			
	82			11.8	381	
90		16.39	2.04			
	92			11.9	381	10
100		16.40	2.05			
110		16.42	2.07			

Generator shut-off at 94 min.

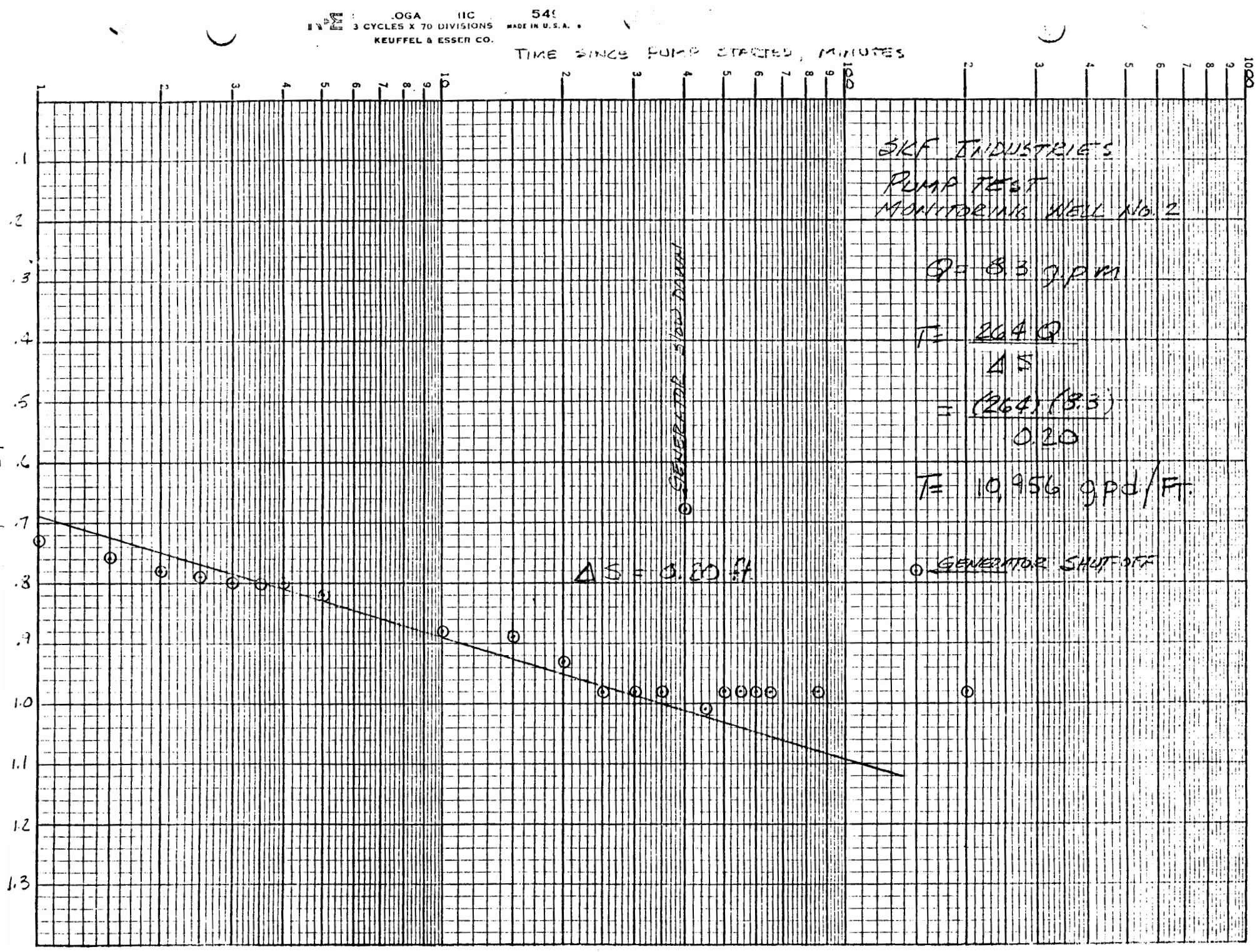
NASSAUX-HEMSLEY, INC. CONSULTING ENGINEERS N.H.I. BLDG. 56 N. SECOND ST. CHAMBERSBURG, PA. 17201	PROJECT SKF INDUSTRIES GROUNDWATER STUDY	DATE: 10-1-84	SHEET No. 1/1
		BY: B.B.	CHECKED:
		Pumping Test	

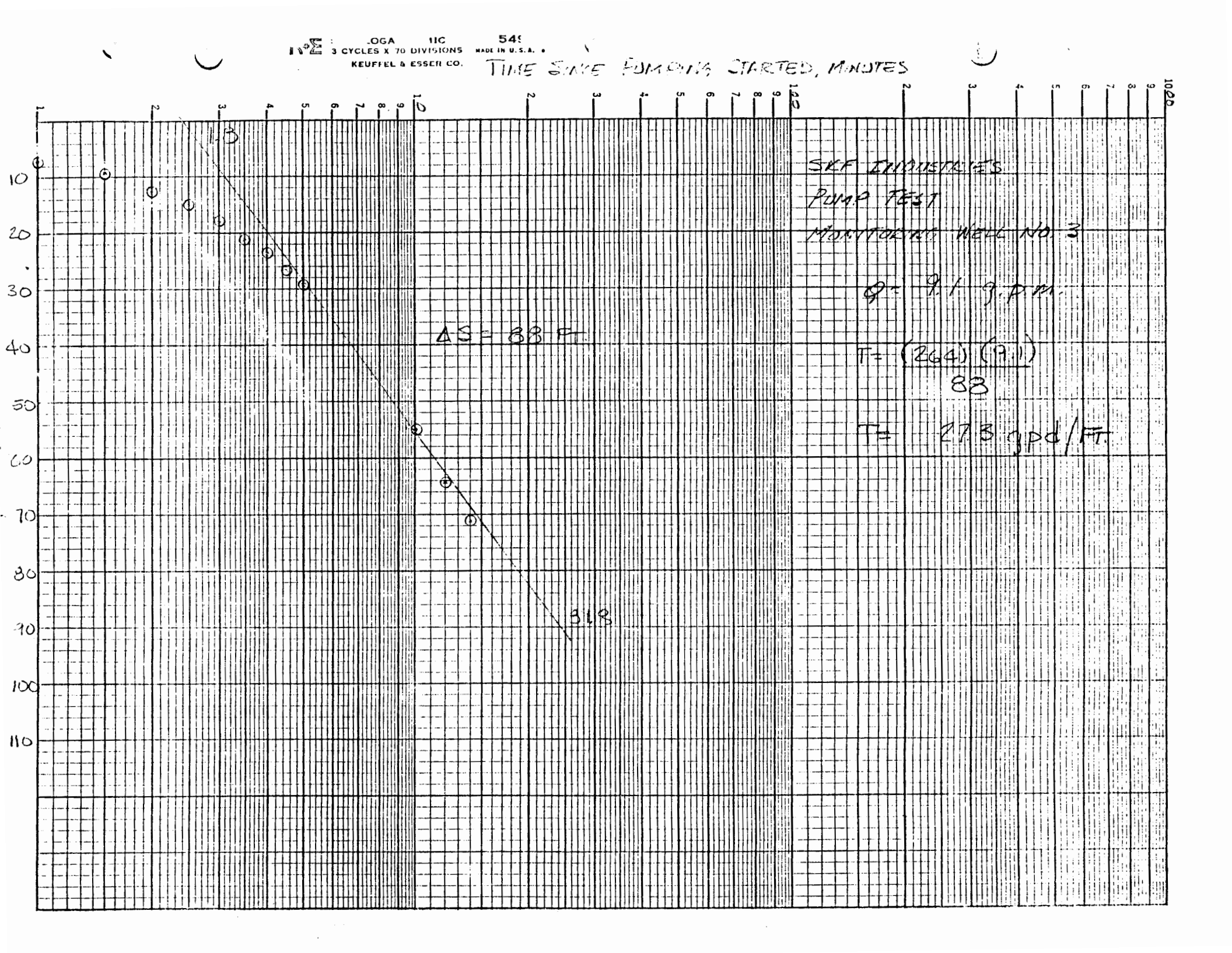
Monitoring Well No. 5

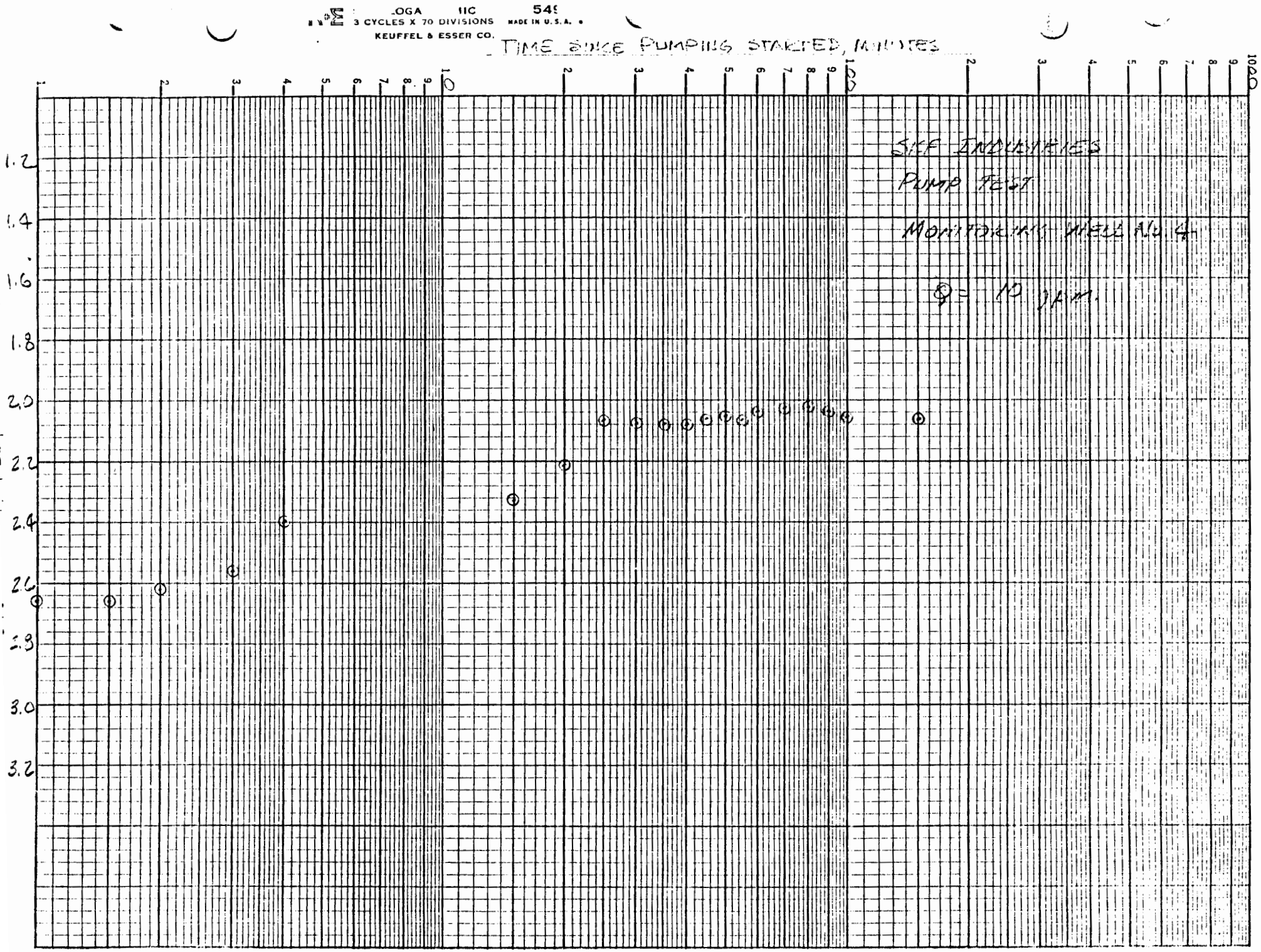
Static Water Level - 64.7' below t.o.c.
Pump Intake Set at - ~85' below ground Surface

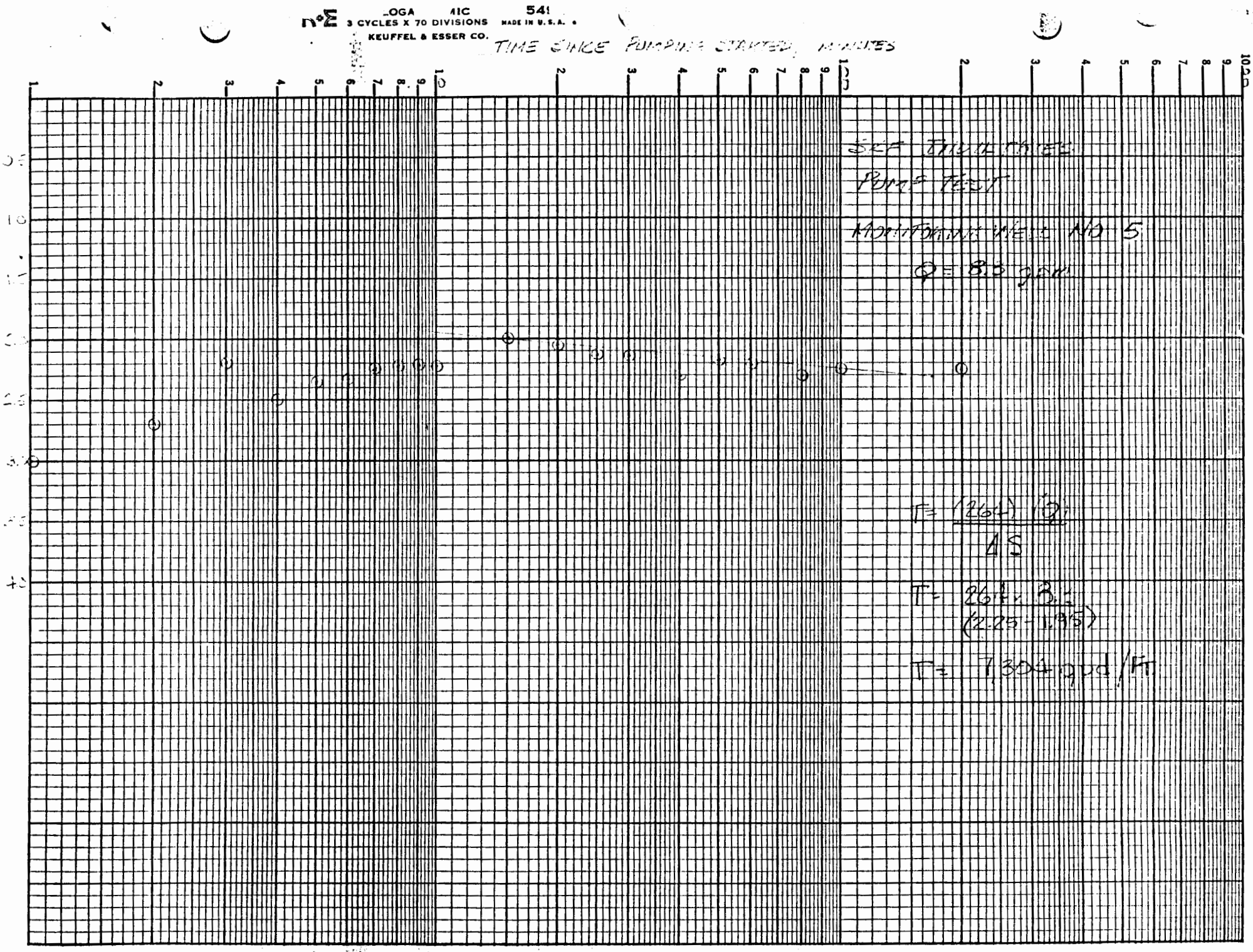
Time Since pump started MIN.	Depth FT.	Drawdown S FT.	Pumping rate GPM
0	64.7	–	
0.5	66.85	2.15	
1.0	67.7	3.0	
2.0	67.4	2.7	
3.0	66.9	2.2	
4.0	67.2	2.5	
5.0	67.05	2.35	
6.0	67.02	2.32	
7.0	66.95	2.25	
8.0	66.90	2.2	
9.0	66.90	2.2	
10.	66.90	2.2	7.9
15	66.7	2.0	7.9
20	66.75	2.05	
25	66.83	2.13	
30	66.83	2.13	8.3
40	67.0	2.3	8.3
50	66.88	2.18	8.3
60	66.91	2.21	8.3
80	67.0	2.30	
100	66.95	2.25	
120	66.95	2.25	

NOTE: Water was very muddy at the start of the test and got thicker (soup-like) at ~10 min. into the test. However at the end of 2 hours the water had cleared significantly but was still not clear.


LOGA IIC 549
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.
TIME SINCE PUMP STARTED, MINUTES
SKF INDUSTRIES
PUMP TEST
MONITORING WELL NO. 2
Q = 83 gpm
T = 264 Q / ΔS
= (264)(83) / 0.20
T = 10,956 gpd/ft.
GENERATOR SLOW DOWN
GENERATOR SHUT-OFF
ΔS = 0.20 ft


LOGA 11C 54
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.
TIME SINCE PUMPING STARTED, MINUTES
SKF INDUSTRIES
PUMP TEST
MONITORING WELL NO. 3
Q = 9.1 g.p.m.
ΔS = 88 FT.
T = (264) (9.1) / 88
T = 27.3 gpd/FT.
318


LOGA 11C 549
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.
TIME SINCE PUMPING STARTED, MINUTES
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
3.2
SEE INDUCTIES
PUMP TEST
MONITORING WELL No 4
Q = 10 GPM.


LOGARITHMIC 541
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.
TIME SINCE PUMPING STARTED, MINUTES
SEE TRANSMISSIVITY
PUMP TEST
MONITORING WELL NO 5
Q = 8.5 gpm
T = (264) (Q)
4S
T = 264 x 8.5
(2.25 - 1.95)
T = 7,304 gpd/ft

APPENDIX D

AIR STRIPPER STUDY

GROUNDWATER TECHNOLOGY
US RT. 1 & PA RT. 100 • CHADDS FORD, PA 19317 • 215-388-1466 • TELEX 82-0245

21 September 1984

Mr. J. Peffer
Nassaux-Hemsley, Inc.
Consultants
NHI Building
56 North Second Street
Chambersburg, PA 17201

SEP 24 1984

Re: Aeration Pilot Test for SKF, Shippensburg, PA

Dear Mr. Peffer:

Groundwater Technology is pleased to submit this report of an aeration pilot test performed 31 July 1984 at the subject facility. The test equipment consisted mainly of a counter current circulation aeration tower (air stripper), randomly packed with telerettes. The test results indicate that the tower now on site can meet the required level of treatment for removing volatile organic hydrocarbon compounds from the influent.

The test also indicates that the 3 ft. diameter air stripper now on site is probably larger than necessary for the design influent flow of 100 gpm, given the chemical characteristics of the influent. The recommendations provided below speak to a 2 ft. diameter tower, which will provide assurance that removal rates will remain optimal at lower flow rates.

Test Results

The stripper was installed at a temporary location near a sump (dimensions = 2 ft. X 2 ft. X 1.5 ft.) fed by two discharge pipes (one at diameter = 3 in.; the other at diameter = 2.5 in.). The sump normally drains through 6 inch diameter pipe to an injection well. The drainage system reportedly operates under gravity head at 100 gpm.

To facilitate the test, the client supplied a centrifugal pump to withdraw water from the influent side of the sump. Aerated effluent was discharged back into the sump. Mixing of influent and effluent in the sump was prevented by fitting the sump with a plywood baffle between the two discharge pipes and the injection well intake.

Discharge from the contrifugal pump (i.e., influent to stripper) was estimated at 90 gpm and 125 ft. total head. Influent to the stripper thus entered the tower at 50 to 55 psi; influent temperature was approximately 55°F. The stripper was operated at two air flow rates (500 cfm and 1,000 cfm); air temperature ranged between 80 and 88°F. Samples of influent and effluent were analyzed for trichloroethylene. Certificates are enclosed herewith and results are summarized below:

Sampling Point	Concentration (ppb)
3 inch influent line	12
2 inch influent line	12
Stripper effluent @ 500 cfm	0.5
Stripper effluent @ 1,000 cfm	3.0

The analytical results indicate removal efficiencies of 95.8% and 75%, respectively, for air flows of 500 and 1,000 cfm. The lower removal efficiency at higher air flow suggests that air-water contact within the tower was incomplete. The root cause of this problem probably was a non-optimal channelization of downward water flow within the tower, suggesting that the water influent flow rate was insufficient to promote adequate air-water contact under normal operating conditions. The recommended solution is to downsize the stripper, provided that design influent flow rates remain at approximately 100 gpm. This consideration is particularly important if the stripper is to operate during winter months, when air chill would normal reduce stripper efficiency even at optimal operating conditions.

Recommendations

The following items are recommended for permanent installation and operation of an air stripper at the SKF facility:

- Mount the stripper tower on the roof of the pump house, as shown on the enclosed plan
- Install transfer pump in the sump.
- Install an air stipper with a 2 ft. diameter tower, instead of the 3 ft. tower now on site.
- Perform maintenance on the stripper at 6 month intervals.
- Winterize all water lines not enclosed within heated structures.

These recommendations can be implemented within the cost framework provided to you in our proposal of 3 July 1984. Please call Kevin Martin or James Warburton for additional information.

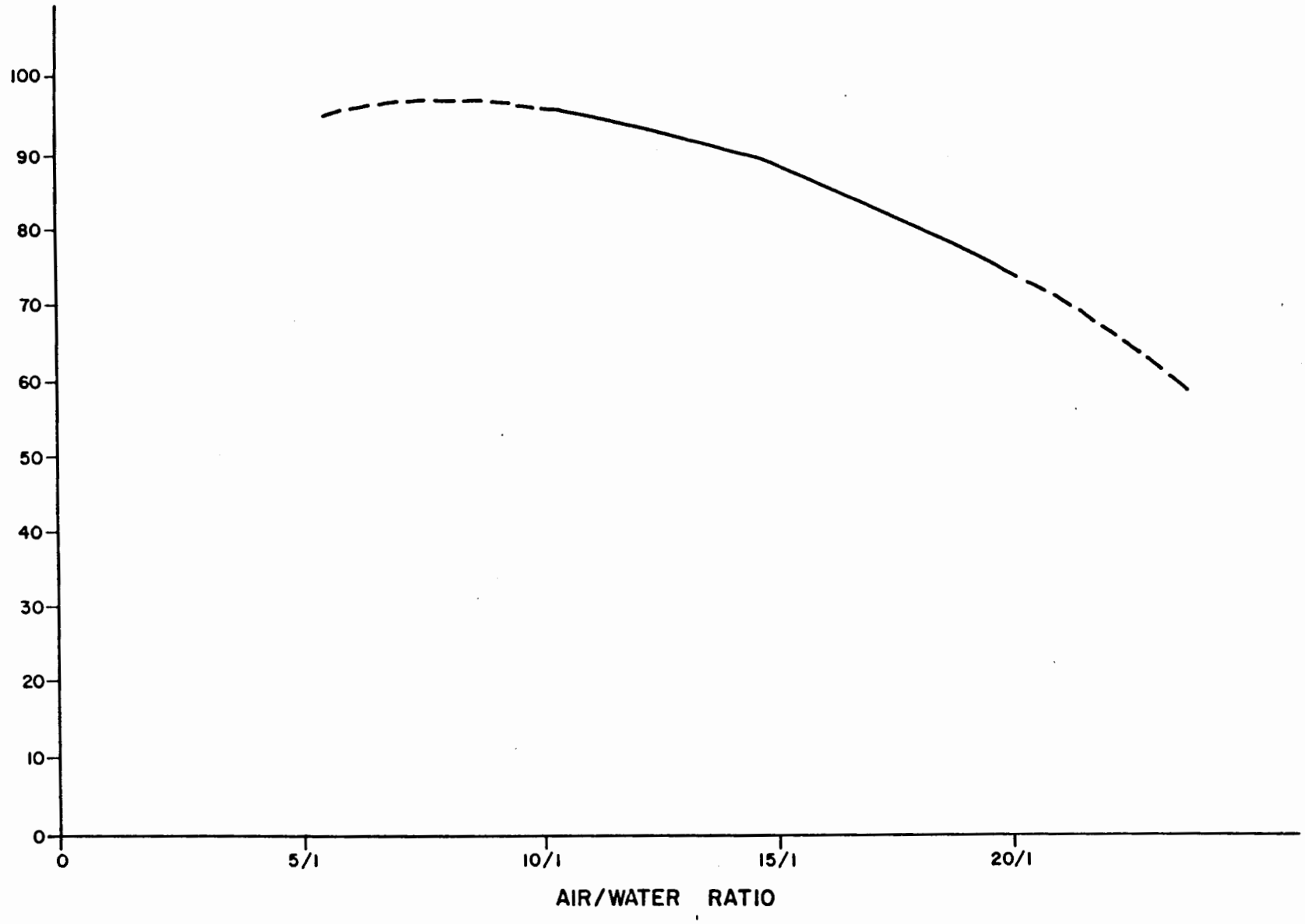
Yours truly,

David H. Dike ds.

David H. Dike
Senior Hydrogeologist

DHD:ds

Enclosure



AIR STRIPPER REMOVAL EFFICIENCY
SKF INDUSTRIES

09:04:17- 79221 - 5 - 2 Y D WLK 027

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 321062

Date Reported 8/10/84
Date Submitted 8/ 6/84
Discard Date 8/17/84
P. O. No.
Collected by Client

Groundwater Technology, Inc.
Routes 1 & 100
Chadds Ford, PA 19317

SKF #1 Water Sample
Collected on 7/31/84

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	12.	ppb	418-049-0050

2 COPIES TO Groundwater Technology, Inc. Attn: Frank Aceto

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Prep 45.00 Total 50.00 1401

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Rissen, B.A.
Tech. Assoc. Instrumental Prog

MAIN LABORATORY
2425 New Holland Pike, Lancaster, Pa 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East Waynesboro Pa 17268 • (717) 762-9[illegible]

ember American Council of
ndependent Laboratories, Inc

09:04:20- 79221 - 5 - 2 Y D WLK 027

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 321063

Date Reported 8/10/84
Date Submitted 8/ 6/84
Discard Date 8/17/84
P. O. No.
Collected by Client

Groundwater Technology, Inc.
Routes 1 & 100
Chadds Ford, PA 19317

SKF #2 Water Sample
Collected on 7/31/84

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	12.	ppb	418-049-0050

2 COPIES TO Groundwater Technology, Inc. Attn: Frank Aceto

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Member American Council of Independent Laboratories, Inc

Prep 45.00 Total 50.00 1401

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Prog

MAIN LABORATORY
2425 New Holland Pike Lancaster, Pa 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East Waynesboro Pa 17268 • (717) 762-9[illegible]

09:04:23- 79221 - 5 - 2 Y D WLK 027

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 321065

Date Reported 8/10/84
Date Submitted 8/ 6/84
Discard Date 8/17/84
P. O. No.
Collected by Client

Groundwater Technology, Inc.
Routes 1 & 100
Chadds Ford, PA 19317

SKF #4A Water Sample
Collected on 7/31/84

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	3.0	ppb	418-049-005C

2 COPIES TO Groundwater Technology, Inc. Attn: Frank Aceto

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Prep 45.00 Total 50.00 1401

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Prog

MAIN LABORATORY
2425 New Holland Pike, Lancaster, Pa. 17601 • (717) 656-2301

FRANKLIN DIVISION
5424 Buchanan Trail East, Waynesboro, Pa. 17268 • (717) 762-9[illegible]

ember American Council of
ndependent Laboratories, Inc.

09:04:25- 79221 - 5 - 2 Y D WLK 027

ANALYSIS REPORT

Lancaster Laboratories INCORPORATED

LLI Sample No. WW 321066

Date Reported 8/10/84
Date Submitted 8/ 6/84
Discard Date 8/17/84
P. O. No.
Collected by Client

Groundwater Technology, Inc.
Routes 1 & 100
Chadds Ford, PA 19317

SKF #5A Water Sample
Collected on 7/31/84

ANALYSIS	AS RECEIVED		LAB CODE
Trichloroethylene	< 0.5	ppb	418-049-005C

2 COPIES TO Groundwater Technology, Inc. Attn: Frank Aceto

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Prep 45.00 Total 50.00 1401

Respectfully submitted
Lancaster Laboratories, Inc.

Reviewed and Approved by:
Nelson H. Risser, B.A.
Tech. Assoc. Instrumental Prog

MAIN LABORATORY
2425 New Holland Pike, Lancaster, Pa 17601 • (717) 656-2301
FRANKLIN DIVISION
5424 Buchanan Trail East, Waynesboro, Pa 17268 • (717) 762-9[illegible]

Member American Council of Independent Laboratories, Inc

[illegible] OF PROPOSED GROUND WATER STU[illegible]

PREPARED FOR:

SKF ROLLER BEARINGS DIVISION
SHIPPENSBURG PLANT

PREPARED BY:

NASSAUX-HEMSLEY, INCORPORATED

JULY 5, 1984

I.
INTRODUCTION

In June 1984, SKF Roller Bearings Division of SKF Industries, Incorporated retained Nassaux-Hemsley, Incorporated (NHI) to conduct a study of the source and extent of the TCE contamination of ground water in the area of their Shippensburg Plant. An outline of NHI's proposed Ground Water Study is presented in the following sections along with a description of initial remedial action necessary to bring an existing direct discharge to ground water to within drinking water quality limits. The necessity or extent of any subsequent remedial action cannot be gauged until completion of the ground water study.

II.
GROUND WATER STUDY

The Ground Water Study, which has been broken into discrete tasks as described below, will begin with the gathering of general data, move to collection of critical specific data, and end with conclusions based on data synthesis, plotting, and interpretation.

TASK 1: Define Basic Hydrogeologic Setting in the plant area from a review of available published and unpublished information including well driller's records; interpretation of available SCS and USGS aerial photographs (1:20,000 and 1:24,000 Scale); and completion of field mapping. The goal of this task will be to identify geologic controls on ground water movement such as fractured or solution-prone zones within the underlying limestone. As ground water flows along bedding plane partings, joints, and other fractures, the orientation of these features will be mapped to determine probable patterns of ground water flow.

TASK 2: Assess Ground Water Quality Data Collected By The Pennsylvania Department of Environmental Resources (DER) and SKF up to the date of initiation of the study. This information will be used to establish the preliminary pattern of on-site and off-site contamination and will identify those portions of the study area that are of greatest concern.

TASK 3: Drill a Minimum of Four (4) Monitoring Wells encircling the plant. Wells will be inspected and logged by a NHI Staff Geologist. The exact locations of wells will be based on ease of access and location of geologically critical zones. The location of these wells wil also take into account existing monitoring points such as the plant wells. Each well will be nominal 6" diameter, with steel casing, bentonite casing grout and locking cap.

TASK 4: Water Table Contour Map. Static water levels at accessible wells will be measured. The surface elevation of water level monitoring points will be established by NHI Surveyors to the nearest 0.1 foot. Using measured water levels and reference surface elevations, a detailed water table contour map will be prepared for the study area.

TASK 5: Ground Water Quality Survey. New on-site monitoring wells and existing wells and springs will be sampled to determine the concentration of contaminants at the same relative point in time.

Samples will be analyzed by NHI's Laboratory for Trichloroethylene (TCE) and other key organic or inorganic parameters.

The inorganic parameter of specific condutance (electrical conductivity or E.C.) will be determined at the same time as this is a general indicator of different zones of natural ground water quality, as well as an indicator of other sources of pollution.

TASK 6: Iso-Concentration Maps. Ground water concentrations of TCE and specific conductance and any other measured parameters will be plotted on base maps of the same scale as the water table contour map in the form of iso-concentration maps. These plots will depict the spatial pattern of the various contaminants, and will form the basis for final interpretations.

TASK 7: Data Interpretation and Report Preparation. Site geology and the water table contour map will be interpreted to derive ground water flow directions. These will be compared to the pattern of contaminants depicted on the iso-concentration maps. From this process, conclusions will be drawn as to the source areas and extent of the organic solvent contaminants in ground water.

A report will be prepared presenting collected data, interpretations, and conclusions. The report will include the water table contour map and contaminant iso-concentration maps.

III.
INITIAL REMEDIAL ACTION

Approximately 100 gpm of ground water containing TCE in the range of 10 to 40 ppb is currently being withdrawn from an on-site supply well. An estimated 80 gpm of the flow is returned to an on-site injection well after use in non-contact cooling operations. The initial remedial action is intended to reduce the level of TCE in the reinjected water to within a drinking water limit of 4.5 ppb.

A pilot air stripping program will be conducted at SKF. The pilot air stripping tower will be left on-line to treat the reinjected water until replaced by a permanent air stripping tower. The goal of the pilot program will be to select a permanent tower configuration with an efficiency high enough to reduce TCE in the reinjected water to less than 4.5 ppb.

IV.
SCHEDULE

GROUND WATER STUDY:

Initial work on the Ground Water Study begain in June 1984. Drilling is tentatively scheduled for the first week in August, with completion of the entire Study by Mid-September.

INITIAL REMEDIAL ACTION:

The Pilot Air Stripping Study will take place during the last two (2) weeks in July 1984. The pilot air stripping tower will be left in place until replaced by a permanent air stripping tower by the end of August.

SUBSEQUENT REMEDIAL ACTION (IF NECESSARY):

It is impossible to estimate what subsequent remedial action, if any, will be necessary until completion of the Ground Water Study. Any required subsequent remedial work will be identified at the conclusion of the ground water study, and an implementation schedule developed at that time.

V.
COMMUNICATIONS

All communications between the Pennsylvania Department of Environmental Resources and Nassaux-Hemsley, Incorporated should be directed through SKF.