4/86

SUMMARY OF OPERATIONS TO DATE
PLUME CONTROL AND TREATMENT SYSTEM
AT
HARRIS CORPORATION POUGHKEEPSIE SITE
OVEROCKER ROAD
POUGHKEEPSIE, NEW YORK

APRIL 1986

I. Introduction

The purpose of this report is to review the operation of the remedial pumping and treatment system, addressing the following issues:

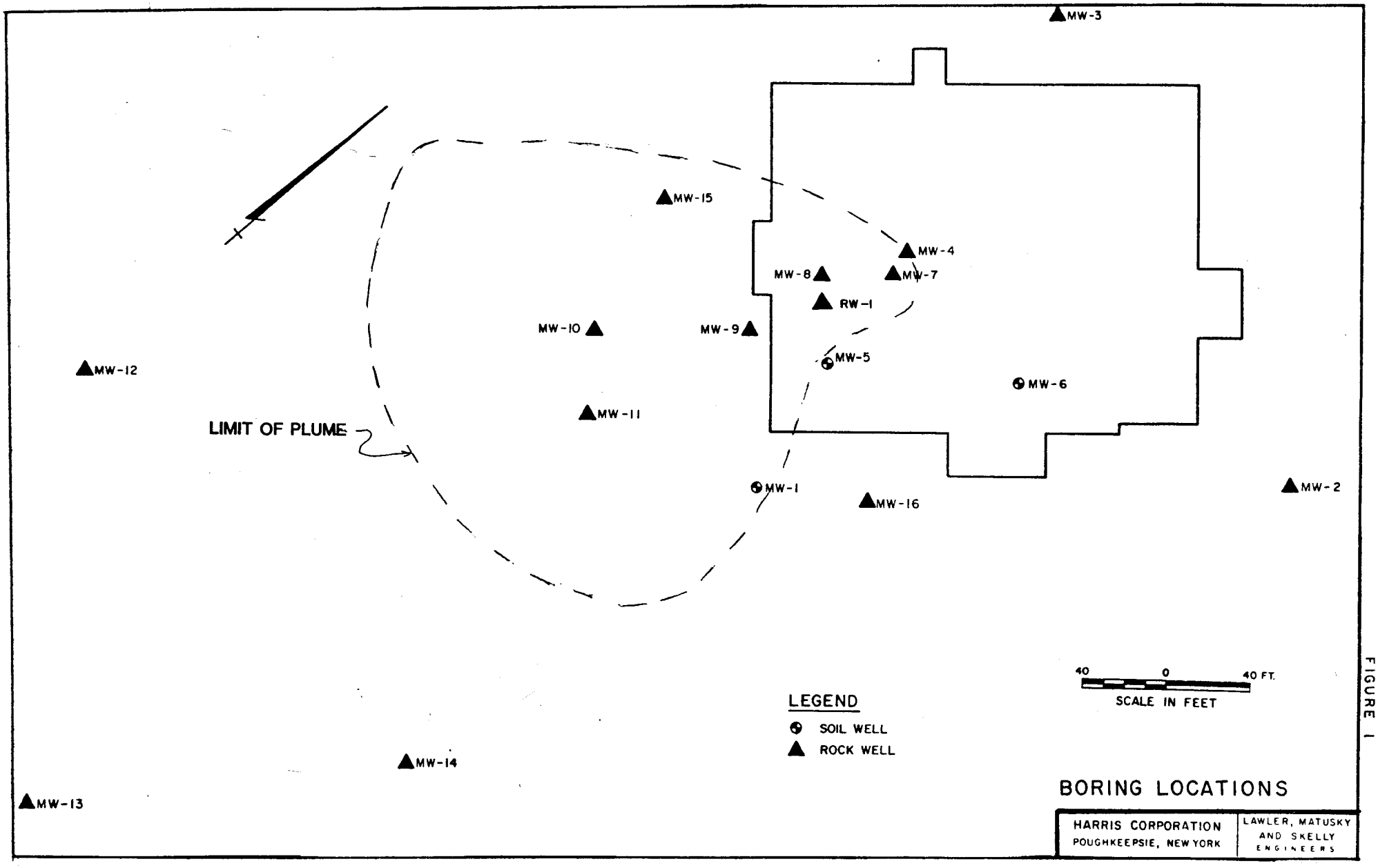
- Has the system been achieving its objective of plume control and source reduction?
- What predictions can be made specifically, and what if any modifications are necessary?

II. Summary of Current Operation

The attached map (Figure 1) shows the location of all borings that have been drilled in the program including the investigation and the remedial installation. The program consists of pumping RW-1 inside the building and MW-10 to the south, to control an area roughly equivalent to the plume shown, and treating the pumped water with activated carbon before discharging to the local Town of Poughkeepsie sewer. Operation of the system, which has been done by LMS, consists of regular visits for static water level readings, chemical sampling, and equipment maintenance. The system started up in March 1984, and has been run continuously with some interruptions due to equipment down time.

A. Static Water Levels.

Static water level readings are taken weekly and are summzarized on Table 1. These data have been reviewed by R.E. Wright Associates


MW-3
MW-15
MW-4
MW-8
MW-7
RW-1
MW-10
MW-9
MW-5
MW-6
MW-12
MW-11
LIMIT OF PLUME
MW-1
MW-16
MW-2
MW-14
MW-13
LEGEND
SOIL WELL
ROCK WELL
40
0
40 FT.
SCALE IN FEET
BORING LOCATIONS
HARRIS CORPORATION
POUGHKEEPSIE, NEW YORK
LAWLER, MATUSKY AND SKELLY ENGINEERS

1A

FIGURE 1

TABLE 1 (Page 1 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1984

DATE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
14 MAR	4'5-1/2"	-[a]	7'8"	6'6-1/2"	-[b]	7'1-1/2"	6'9-1/2"	-	7'7-1/2"	4'11"
22 MAR	4'7"	-[a]	6'8"	6'5"	-[b]	6'9"	6'7-1/2"	-	10'7"	10'9"
28 MAR	4'1-1/2"	-[a]	7'3"	6'11-1/2"	-[b]	6'11-1/2"	7'2-1/2"	-	12'9-1/2"	12'3"
4 APR	4'7"	4'3"	-[d]	6'2-1/2"	-[b]	6'8-1/2"	6'8"	-	14'8"	15'0"
12 APR	4'6"	4'5-1/2"	7'2"	6'0"	-[b]	6'5"	6'4-1/2"	-	10'1"	12'2"
18 APR	4'6-1/2"	4'4-1/4"	7'1-3/8"	6'4-3/4"	-[b]	6'5-7/8"	6'8-1/8"	-	11'1-1/4"	9'9-1/2"
24 APR	4'6"	4'5"	7'3"	6'2"	7'9"	6'9"	6'8"	-	7'8"	5'9"
2 MAY	5'2-1/2"	5'6-1/2"	8'0"	6'8-1/4"	8'7-1/2"	7'3-1/2"	7'6"	-	10'0"	12'1"
10 MAY	4'10"	5'0-3/4"	7'5"	6'6"	8'6-1/2"	7'2-1/4"	7'5-1/4"	-	12"3-1/2"	9'8-1/4"
18 MAY	5'4-1/2"	5'10-1/2"	-[d]	6'10"	8'11"	7'5-1/2"	8'0-1/2"	-	12'10"	19'4-1/4"
24 MAY	5'6"	6'1"	8'6"	6'11"	8'11-1/2"	7'7"	8'1"	-	12'11-1/2"	18'6-1/2"
1 JUN	3'7-1/2"	2'10"	6'0"	5'6-1/2"	7'1"	6'2"	6'2"	-	10'3"	19'1"
7 JUN	4'6"	4'7-1/2"	7'1"	6'3-3/4"	7'11-3/4"	7'2"	7'1-1/8"	-	8'8"	8'5-1/2"
13 JUN	5'1"	5'6"	7'9"	6'8"	8'6"	7'3-3/4"	7'5-3/4"	-	13'8-3/4"	16'11-1/2"
20 JUN	5'10"	6'7"	8'10-1/2"	7'3-1/2"	9'3-1/2"	7'8-1/2"	8'4"	-	13'5-1/2"	20'1-1/2"
27 JUN	6'3-1/4"	6'10-3/4"	9'3/4"	7'10-1/2"	9'8-1/4"	8'2"	8'9-3/4"	-	13'11"	19'7-3/4"
2 JUL	-	-	-	-	-	-	-	8'7-1/4"	-	18'2-1/4"
5 JUL	5'3-1/2"	6'5-1/2"	9'0"	7'5"	8'11"	9'1"	8'1-1/2"	8'1-1/2"	8'11-1/2"	7'1"
11 JUL	4'10"	5'5-1/4"	7'8"	6'5"	8'4-1/4"	7'4-3/4"	7'2-1/2"	-	6'6-1/2"	9'0"
17 JUL	No readings taken									
25 JUL	5'11"	6'11"	8'11"	7'8"	9'6-1/2"	8'0-1/2"	9'4"	-	13'8-1/2"	22'2"
1 AUG	6'2-1/2"	7'2"	9'4"	8'10"	9'8-1/2"	8'7-1/2"	8'9-1/2"	9'8-1/2"	13'2"	22'0-1/2"
8 AUG	6'3-1/2"	7'6"	9'7"	8'1-1/2"	10'5"	8'5"	8'9"	9'2-1/4"	12'9-1/2"	9'0-1/4"
15 AUG	6'3"	7'4"	10'0"	8'2-1/4"	9'9-1/4"	8'8"	8'6"	8'10"	9'8-1/2"	7'9-1/2"
22 AUG	6'2"	7'9"	-[d]	9'10"	10'0-1/2"	8'10"	9'3"	-[e]	13'9"	39'5-1/2"
29 AUG	6'10"	8'6"	10'5-1/2"	9'1-1/2"	10'9"	8'11"	10'3"	-[e]	13'11-1/2"	15'2-1/2"
5 SEP	6'11-3/4"	8'5"	10'9-3/4"	9'2-1/2"	10'8"	9'3-1/2"	9'11"	-[e]	9'5-1/2"	13'5-1/4"
12 SEP	7'5-1/2"	8'9"	11'0-1/2"	9'4-1/2"	11'2"	9'3"	10'3-1/2"	-[e]	13'11"	21'11-1/2"
19 SEP	7'5-1/4"	9'1-1/2"	11'4-1/4"	9'6-1/4"	11'1-3/4"	9'4-3/4"	10'8-1/2"	-[e]	18'10"	26'4-1/2"
26 SEP	7'10"	9'6-1/2"	11'9"	10'4"	11'9"	9'10"	11'3-1/2"	-[e]	13'5-1/2"	20'1-1/2"
4 OCT	7'11-1/4"	9'7-3/4"	12'0-3/4"	10'2"	11'9"	9'10"	11'0-1/4"	-[e]	16'11"	14'9-1/2"
10 OCT	8'4"	10'3"	12'3"	10'10"	12'2"	9'11"	11'10-1/2"	-[e]	16'11"	14'9-1/2"
17 OCT	8'6"	10'6"	12'6-1/2"	11'2"	12'4-1/2"	-[e]	12'1-1/2"	-[e]	17'9"	17'7-1/2"
24 OCT	7'4"	9'6-3/4"	12'5-1/2"	9'10"	11'2-1/2"	9'10-1/2"	9'6"	9'5-1/2"	18'1"	16'4"
31 OCT	8'2-1/2"	9'5-1/2"	12'4-1/2"	10'4-1/2"	11'11"	8'10-1/2"	11'8"	11'7"	17'1"	31'6-1/2"
7 NOV	6'10"	8'7-1/2"	-[d]	9'10"	10'9-1/2"	10'1-1/2"	9'9"	10'0"	12'10-1/2"	13'9"
14 NOV	6'11-3/4"	8'5-1/2"	11'8"	9'6-1/2"	10'10-1/4"	9'9-1/2"	9'7-3/4"	10'1-1/2"	15'3-1/2"	24'4-1/2"
21 NOV	7'8"	9'4"	11'8-3/4"	10'3-1/2"	11'5-3/4"	9'9"	11'3-3/4"	11'8"	16'0-3/4"	26'2-1/4"
27 NOV	7'9-1/2"	9'4-1/2"	11'10"	10'5"	11'7-1/2"	10'0"	10'11"	15'0"	18'8-1/2"	12'6"
4 DEC	6'5-1/2"	8'4"	11'5-1/2"	9'2"	10'5"	9'7-1/2"	9'3"	9'4"	12'1"	12'7"
12 DEC	6'5/1-2"	8'2"	10'5"	9'5"	10'4-1/4"	9'4"	9'5"	9'8-1/4"	14'9-3/4"	21'10"
19 DEC	6'8-1/2"	8'1"	10'5"	9'4-1/2"	10'7"	9'0-3/4"	9'8"	10'0"	19'4"	14'2-1/2

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.

Note: All measurements from top of casing.

TABLE 1 (Page 2 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1984

DATE	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	RW-1	COMMENTS
14 MAR	-[c]	14'6-1/4"	15'8"	9'4"	-[c]	9'2"	8'10"	Readings taken before startup of systems
22 MAR	6'3-1/2"	14'2"	15'9-1/2"	9'5"	5'11"	8'6-1/2"	14'7"	
28 MAR	6'6"	14'3"	15'10"	9'3"	7'8"	9'5"	18'9"	
4 APR	6'7-1/2"	9'5"	15'8-1/2"	14'5"	6'3-1/2"	8'10"	19'9-1/2"	Pumps shut off after heavy rains week before;
12 APR	6'11"	9'11"	16'2"	14'9"	7'0"	9'1"	15'6-1/2"	Pumps shut down
18 APR	6'5-3/4"	14'6-3/4"	15'10-3/4"	9'3-3/8"	5'8-1/4"	8'9-1/2"	18'4"	
24 APR	5'10-1/2"	14'9"	16'4-1/2"	9'8"	6'5"	9'0"	9'1"	Pump rate changed
2 MAY	7'11"	15'7-1/2"	16'8-1/2"	10'3-1/2"	8'6-1/2"	10'1"	11'8"	
10 MAY	6'8-1/2"	14'5-3/4"	15'10-1/4"	9'6-1/2"	6'10-1/2"	9'2-1/4"	29'10-3/4"	
18 MAY	9'0"	15'5"	16'5"	10'1"	8'9"	10'1-1/2"	25'11"	
24 MAY	9'3"	15'4-1/2"	16'8-1/2"	10'3"	8'8-1/2"	10'3"	28'1-1/2"	
1 JUN	5'7-1/2"	13'5"	15'6-1/2"	8'8-1/2"	5'3"	7'9"	28'5"	Heavy rains
7 JUN	6'3-1/4"	14"11-1/2"	16'7-3/4"	9'10"	7'0-1/2"	9'2-3/4"	26'1"	Pumps down
13 JUN	7'8-1/2"	15'11"	17'3-1/2"	10'10-1/2"	9'0"	11'5-1/2"	27'6"	
20 JUN	9'9-1/2"	16'1"	17'8"	11'2"	9'7-1/2"	11'4-1/2"	28'3"	
27 JUN	10'3-1/2"	16'7-1/2"	18'5"	11'9-1/2"	10'1"	11'8-1/2"	30'2-1/2"	
2 JUL	-	-	-	-	-	-	28'6-1/2"	Pumps shut down for test
5 JUL	6'8"	15'11"	16'11-1/4"	10'6-1/2"	9'0"	10'5-3/4"	10'4"	Restarted after readings
11 JUL	6'2"	14'11"	16'5-1/4"	9'11"	7'6-3/4"	9'2-3/4"	9'9"	
17 JUL	No readings taken							
25 JUL	12'10"	16'3-1/2"	17'3"	11'3"	9'8-1/2"	11'0-1/2"	28'4-1/2"	
1 AUG	9'11"	16'5-1/2"	17'4"	11'11-1/2"	10'8"	11'5"	32'6"	
8 AUG	8'9-1/2"	16'7-1/2"	17'8-1/4"	12'1-1/2"	10'3-1/2"	11'6-1/2"	25'4"	
15 AUG	8'0"	17'7"	18'9-1/2"	12'2"	8'7-3/4"	11'4-1/2"	10'11"	
22 AUG	12'11"	16'6-1/2"	16'10-1/2"	11'2"	10'5"	11'9"	-[e]	
29 AUG	14'5"	16'11"	17'10"	12'1-1/2"	12'0-1/2"	12'3-1/2"	-[e]	
5 SEP	9'11"	17'0-1/4"	17'10-1/4"	12'5"	11'3-1/2"	12'3"	-[e]	
12 SEP	14'9"	17'6-1/2"	18'3-1/2"	12'11-1/2"	12'3"	12'11-3/4"	-[e]	
19 SEP	17'3-1/2"	17'7"	18'3-1/4"	13'2-1/2"	13'1-1/4"	13'1"	-[e]	
26 SEP	13'6-1/2"	17'11"	18'7-1/2"	13'6-1/2"	13'3"	13'0-1/2"	-[e]	
4 OCT	14'7-1/2"	18'0"	18'4-1/2"	13'8-1/2"	12'7-1/2"	13'6"	-[e]	
10 OCT	14'7-1/2"	18'8"	18'6-1/2"	14'3"	14'5-1/2"	13'10-1/2"	-[e]	
17 OCT	15'2"	18'6-1/2"	18'6"	13'9"	14'11"	14'3"	-[e]	
24 OCT	15'0"	17'5-3/4"	17'7"	12'8"	11'2"	13'4-1/2"	28'3-1/2"	
31 OCT	16'5"	17'9"	17'9-1/2"	12'5"	12'2"	13'4"	28'4"	
7 NOV	8'9-3/4"	17'4"	17'5-1/2"	12'2-3/4"	11'0-1/4"	12'6-1/2"	28'1-1/2"	
14 NOV	14'6-1/2"	17'1-3/4"	17'2"	11'5-1/2"	11'7"	12'7-1/2"	25'5"	
21 NOV	15'8-3/4"	17'8-1/2	17'10"	12'2-3/4"	13'2-1/4"	13'2"	29'0-1/2"	
27 NOV	12'8"	17'8-3/4"	18'2"	12'8-3/4"	12'11-1/4"	11'9-1/2"	11'1-1/2"	
4 DEC	9'11"	-[b]	16'11"	11'6-1/2"	10'3"	12'3-1/2"	17'3"	
12 DEC	13'1-3/4"	17'1-1/4"	17'6-1/2"	11'4-1/2"	10'4-1/4"	12'4"	29'0"	
19 DEC	13'6"	17'0-1/2"	17'6"	11'8-3/4"	11'1"	12'2"	27'1"	

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available

Note: All measurements from top of casing

TABLE 1 (Page 3 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1985

DATE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
2 JAN	6'5"	7'5"	9'8"	8'5"	9'11"	8'7"	9'1"	9'3"	12'11-1/2"	8'4-1/2"
9 JAN	-b	-b	-b	8'6"	10'0"	8'9"	9'1"	9'7"	-b	12'0-1/2"
9 JAN-11-FEB	-	-	-	-	-	-	-	-	-	-
11 FEB	-f	-f	-d	9'3-3/4"	10'9"	9'4"	9'9"	10'1-3/4"	15'4-3/4"	20'0"
12 FEB-27 FEB	-	-	-	-	-	-	-	-	-	-
6 MAR	6'2-1/2"	6'7-1/2"	9'3"	8'2"	9'11-1/2"	9'7-1/2"	8'5-1/2"	8'9"	12'9"	23'11-1/2"
13 MAR	5'1"	5'10"	8'5-1/2"	7'7"	8'11"	8'5"	7'6-1/2"	8'1"	9'3"	18'3"
20 MAR	5'9"	5'8"	8'5"	7'9"	9'1"	8'3"	8'1"	8'11"	12'3"	15'3"
27 MAR	6'0"	6'9-1/2"	8'10"	7'7"	9'8-3/4"	8'1-1/4"	8'4-1/4"	8'10-3/4"	12'7-1/2"	22'8-1/4"
3 APR	5'11-1/2"	6'8"	8'11-1/2"	7'8-1/2"	9'8"	-h	8'5-3/4"	8'11-1/2"	12'11-1/2"	16'9"
10 APR	5'9"	6'8"	9'5"	7'8"	9'7"	8'9"	8'9"	9'5"	11'5"	21'9"
17 APR	6'4-1/2"	7'4"	9'7"	7'8-1/2"	10'0-1/2"	9'8"	9'1"	9'2"	16'8-1/2"	22'10"
24 APR	6'5"	7'2"	9'6"	7'10"	10'0"	8'6-1/2"	9'4-1/2"	9'5-1/2"	16'2"	16'11-1/2"
1 MAY	6'4"	7'3-1/2"	9'3"	8'1"	-i	-i	8'11"	-i	15'6-1/2"	21'9-1/2"
8 MAY	6'0"	6'6"	9'8"	7'6-1/2"	9'9-1/2"	8'3"	8'5"	9'10"	12'11-1/2"	15'5-1/2"
15 MAY	5'11-1/2"	6'10"	9'1"	7'8"	9'11-1/2"	8'4"	6'8"	8'9"	9'0-1/2"	8'0"
22 MAY	5'7"	6'4"	8'5"	7'6-1/2"	9'3-1/2"	8'6"	8'1-1/2"	8'7"	9'5-1/2"	7'9"
29 MAY	5'8"	6'5-1/2"	9'0"	7'7"	9'5"	8'2"	8'5"	8'8"	11'11-1/2"	18'5-1/2"
6 JUN	5'8-1/2"	5'6"	-d	7'6"	9'2-3/4"	8'1-3/4"	8'2-1/2"	8'8-1/4"	10'11"	18'3-1/4"
14 JUN	6'0"	7'0-1/2"	9'2"	7'10-1/4"	9'8"	8'3"	8'8"	9'0-1/2"	11'7-1/4"	8'11-1/2"
19 JUN	6'3"	7'1"	9'5"	8'2"	9'9-1/2"	8'5"	8'8"	9'4"	16'6-1/2"	18'5"
26 JUN	6'4"	7'6"	9'7"	8'3"	9'10-1/2"	8'6-3/4"	9'1"	-e	13'10-1/2"	9'5"
3 JUL	6'4"	7'3-3/4"	9'9-3/4"	8'2-1/2"	9'10-1/2"	8'7-1/2"	9'10"	-e	14'3-3/4"	9'0"
10 JUL	6'6"	7'7"	10'0-3/4"	8'7-1/2"	10'4'	8'9-3/4"	9'5-1/4"	9'9"	13'5-1/2"	21'3-1/2"
17 JUL	6'5"	7'6-3/4"	9'11-1/2"	8'6-1/2"	10'2"	8'9-1/2"	9'4-1/2"	9'9"	16'0"	24'9"
1 AUG	5'7"	5'9"	9'9-1/2"	8'6-1/2"	9'4"	8'10"	8'7"	8'7-1/2"	12'2-1/2"	10'11"
13 AUG	5'8-1/2"	6'11"	9'5-1/2"	7'10"	9'5-1/2"	8'8-1/4"	8'7"	8'10-1/2"	9'8"	7'9-1/4"
21 AUG	6'7"	7'10"	10'0"	8'9"	9'10-1/2"	8'8"	9'0-1/2"	9'4"	12'7"	10'11"
28 AUG	-d	6'9"	9'10"	8'2-1/2"	9'9-1/2"	8'6-1/2"	9'0-1/2"	-e	14'11"	19'6-1/2"
4 SEP	5'11"	7'0"	9'6"	7'10"	9'7-3/4"	8'3-1/2"	8'9-1/4"	-e	15'10-1/4"	44'4"
11 SEP	5'3"	6'1"	9'1"	7'11"	-h	8'4"	8'4"	8'6"	9'3"	10'5"
18 SEP	5'9"	6'9-1/2"	9'0"	7'5-1/2"	9'4-3/4"	8'0-3/4"	-h	8'9-1/2"	12'0"	8'4-1/4"
25 SEP	6'1-1/4"	7'3-1/2"	9'5-7/8"	7'10"	-h	8'4-3/4"	8'11-1/2"	9'2-3/4"	13'2-1/2"	-h
26 SEP-18 OCT	-	-	-	-	-	-	-	-	-	-
23 OCT	5'10-1/2"	6'11"	9'2-1/4"	7'6"	9'6-1/2"	8'1"	8'6-1/2"	9'1-1/2"	11'11-1/2"	18'3"
30 OCT	6'1-1/2"	7'4"	9'5-1//2"	7'10-3/4"	9'8-1/2"	8'3"	7'9"	9'2"	12'8-3/4"	13'5-1/2"

[a]Could not open, lock upside down.
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[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

TABLE 1 (Page 4 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1985

DATE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
7 NOV	6'2-1/4"	6'11"	9'7-3/4"	7'11-1/4"	9'11"	-h	8'10-1/2"	9'2-1/4"	12'2"	28'7"
12 NOV	6'1"	5'2-1/4"	8'2"	7'11-3/4"	9'9"	8'6-1/2"	8'9-1/2"	8'9"	12'9-1/2"	19'0-1/2"
20 NOV	5'0"	5'8-1/4"	8'4"	6'8"	-h	7'10-1/2"	7'8-1/2"	8'2-1/2"	8'11-1/2"	10'2-3/4"
25 NOV	5'3"	5'11-1/4"	8'1-3/4"	6'9-1/2"	8'10-1/4"	7'8-3/4"	8'0"	8'5-3/4"	12'7"	30'10"
4 DEC	-d	5'4-1/2"	7'10"	6'10-3/4"	8'1"	-h	7'4"	8'8-1/2"	8'6-1/4"	6'5-1/2"
11 DEC	5'2-1/2"	6'0-1/4"	8'3"	6'8-1/2"	8'9-1/4"	7'5-1/2"	7'10"	8'3-1/2"	13'2-3/4"	18'5-1/2"
17 DEC	4'10-1/2"	5'8-1/2"	-b	6'8-1/4"	8'5"	-h	7'6"	8'0"	12'0"	7'1-1/2"
24 DEC	-b	-b	-b	6'1-1/2"	8'9"	-h	8'0-1/4"	8'4-1/2"	12'3"	7'2-1/4"
31 DEC	-b	-b	-b	7'4-1/4"	9'4-3/4"	-h	8'6"	9'0"	14'8-1/2"	-b

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

Note: All measurements from top of casing.

TABLE 1 (Page 5 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1985

DATE	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	RW-1	COMMENTS
2 JAN	10'4"	16'11"	17'5"	10'11"	8'8-1/2"	11'6"	26'7-1/2"	
9 JAN	10'0-1/2"	-[b]	17'3-1/2"	11'3"	10'0"	11'8"	15'5"	
9 JAN-11 FEB	-	-	-	-	-	-	-	System shut down
11 FEB	10'1"	17'5-1/2"	17'10-3/4"	12'6-1/2"	10'11"	-[f]	25'6-1/4"	
12 FEB-27 FEB	-	-	-	-	-	-	-	System shut down
6 MAR	7'5"	15'9"	16'7"	10'7-1/2"	9'2-1/2"	10'6"	29'5"	
13 MAR	6'4"	14'6-1/2"	15'6-1/2"	9'8"	7'3"	8'9-1/2"	11'1"	
20 MAR	8'1"	16'2"	16'8"	10'4"	9'3"	11'1"	28'10"	
27 MAR	11'7-3/4"	15'10-1/2"	16'11-3/4"	11'8-1/2"	10'3-3/4"	-[g]	25'9-3/4"	
3 APR	11'3"	15'10-1/2"	16'10"	11'4"	10'0"	-[g]	28'11-3/4"	
10 APR	6'8"	15'5"	16'6"	10'9"	9'2"	12'2"	26'2"	
17 APR	12'8"	15'11-1/2"	16'11-1/2"	12'2"	11'2-1/2"	11'4"	27'3"	
24 APR	12'9"	15'11"	17'0"	11'5"	10'11"	11'6-1/2"	26'3"	
1 MAY	12'10"	16'2-3/4"	17'1"	11'10-1/2"	11'4-1/2"	11'7-1/2"	-[i]	
8 MAY	10'4-1/2"	15'2"	17'0-1/2"	10'11"	9'4"	10'5-1/2"	26'2-1/2"	
15 MAY	8'0-1/2"	15'11-1/2"	17'1"	12'0"	-[d]	10'11"	11'10"	
22 MAY	6'10-1/2"	15'6"	16'10"	11'6"	9'2-1/2"	11'10-1/2"	11'6-1/2"	
29 MAY	8'1-1/2"	15'7-1/2"	16'8"	8'5"	9'4-1/2"	10'11"	19'8-1/2"	
6 JUN	8'6-1/2"	15'8-1/2"	16'11-1/2"	11'8-1/4"	9'3-1/2"	10'10-3/4"	13'5-1/2"	
14 JUN	9'10-1/2"	16'5"	17'5-1/4"	12'3-1/2"	10'7-1/2"	11'9"	31'6"	
19 JUN	10'3"	16'6"	17'7"	12'2-1/2"	10'9-1/2"	11'10-1/2"	32'1-1/2"	
26 JUN	11'1-1/4"	17'1"	18'0-1/4"	12'10-1/2"	11'0-1/2"	12'1-1/4"	-[e]	
3 JUL	11'6"	16'9-3/4"	17'8-3/4"	12'7-1/2"	10'2-1/2"	12'1-3/4"	-[e]	
10 JUL	12'8-1/2"	16'10-1/4"	17'8-1/4"	12'10-1/2"	10'1-1/4"	12'1"	25'0"	
17 JUL	14'4"	16'9-1/2"	17'7-1/2"	12'3-1/4"	11'0-1/2"	12'2"	28'9"	
1 AUG	6'5-1/2"	15'9"	17'0"	10'1"	8'1"	10'9"	28'10"	
13 AUG	7'9-3/4"	16'2-1/4"	17'5-3/4"	12'0-1/4"	9'7-1/4"	11'1"	19'7-3/4"	
21 AUG	9'4"	17'2"	18'0-1/2"	12'10"	11'1"	12'2"	29'0"	
28 AUG	12'11"	17'4-1/2"	17'8-1/2"	12'0-1/4"	10'3-3/4"	13'0"	-[e]	
4 SEP	14'6-1/2"	17'0"	17'6-1/2"	11'10-1/4"	10'9"	12'8"	-[e]	
11 SEP	6'4"	15'4-1/2"	16'8"	10'7"	7'10"	10'11-1/2"	10'10"	
18 SEP	9'2"	16'5-3/4"	17'5-1/2"	11'9-1/4"	9'9"	12'1-3/4"	25'11-1/4"	
25 SEP	10'6-3/4"	17'3-1/2'	17'8-3/4"	12'0-3/4"	10'5"	12'10-3/4"	32'1-1/2"	
26 SEP-18 OCT	-	-	-	-	-	-	-	System shut down
23 OCT	11'4-1/4"	16'10"	17'3-3/4"	12'1-1/4"	10'5"	12'4-3/4"	30'2-1/2"	
30 OCT	11'9"	17'0-1/4"	18'7-1/2"	12'6"	11'6"	12'4"	18'1-1/2"	

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

TABLE 1 (Page 6 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1985

DATE	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	RW-1	COMMENTS
7 NOV	10'11"	16'9"	17'3-1/4"	11'11"	10'5-1/2"	12'1"	13'9-1/4"	
12 NOV	9'5"	16'6"	17'0"	11'11-1/2"	7'2"	11'10"	12'8-1/2"	
20 NOV	6'5-1/2"	15'4-1/2"	16'10-1/2"	11'1-3/4"	7'8-3/4"	10'0"	10'3"	
25 NOV	8'0-1/2"	15'7"	16'7-1/2"	11'0-1/4"	8'8"	10'8"	27'4"	
4 DEC	5'11-3/4"	15'1-3/4"	16'7-1/2"	11'0"	7'11-1/2"	10'1"	16'11-1/2"	
11 DEC	6'11-1/2"	15'10"	16'10"	11'5-1/2"	9'7-1/4"	11'0"	29'2"	
17 DEC	6'4"	15'6-1/2"	16'9"	11'0-1/2"	8'1"	10'4-1/2"	26'11-3/4"	
24 DEC	-[f]	16'2-1/2"	17'1-1/4"	11'5-1/2"	9'4"	11'0"	29'2-1/2"	
31 DEC	-[f]	16'9-1/4"	17'7"	12'1-1/2"	10'9-1/4"	11'8-1/2"	25'10"	

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

Note: All measurements from top of casing.

TABLE 1 (Page 7 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1986

DATE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
7 JAN	-[d]	-[b]	-[b]	7'8-1/4"	9'6"	-[h]	8'9"	9'1-1/4"	15'0-1/2"	17'7-1/2"
15 JAN	-[b]	-[b]	-[b]	7'10"	9'10"	8'5-1/2"	9'10-1/2"	9'7-1/2"	14'8"	12'4"
24 FEB	4'10-1/2"	-	-	-	-	-	-	-	11'9-1/2"	7'4-1/2"
20 MAR	4'6"	4'8-1/2"	7'1"	5'11-3/4"	7'9"	-[h]	6'11"	7'3-3/4"	12'2"	12'8"

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

Note: All measurements from top of casing.

TABLE 1 (Page 8 of 8)

HARRIS CORPORATION
Poughkeepsie, New York

SWL READINGS FOR SURROUNDING BORINGS (ft/in.)

1986

DATE	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	RW-1	COMMENTS
7 JAN	-[b]	16'6"	17'2-1/2"	11'8-1/2"	10'6"	11'5"	28'9"	
15 JAN	-[b]	17'0"	17'5-1/2"	12'6-1/2"	10'11-1/2"	12'0-1/2"	25'11-1/2"	
24 FEB	6'0"	14'0-1/2"	16'3"	10'9"	7'7-1/4"	-	-	Annual sampling
20 MAR	6'5-1/2"	14'3"	15'11"	10'3-3/4"	6'9-1/2"	9'7"	-[e]	

[a]Could not open, lock upside down.
[b]Could not open.
[c]Covered with water.
[d]Car parked over manhole.
[e]Equipment not available.
[f]Couldn't locate.
[g]Covered with dirt.
[h]Obstructed.
[i]Wet Cement.

Inc., (REWAI), who have determined that the objective of hydraulic control has been achieved. According to their review, the area of influence of the two pumped wells has been as predicted, roughly equal to the plume boundaries shown on Figure 1. The original hydraulic predictions are contained in the report, Installation of Groundwater Recovery and Treatment System, April 1984, by REWAI.

B. Chemistry Summary.

The results of chemical analyses since start-up are given in Table 2. These data show the influent to the treatment system, the effluent from it and results from individual wells. Once to twice a year in conformance with the program in the proposed consent agreement, wells are sampled in the plume and at the property boundary to check chemistry trends. The results are discussed in Section III.

C. Pumped Volume.

The pumping system includes separate flow meters for the two wells. LMS takes readings weekly, and provides monthly summaries of these data to the Arlington Sanitary District (ASD), owners and operators of the sewers and treatment plant to which the Harris sytem discharges.

Between March 1984 and October 1985, a total volume of 623,000 gallons was pumped or a gross (overall) pumping rate of 0.71 gpm.

III. Data Interpretation

A. Amount of Chemical Pumped

The amount of chemical retrieved from the ground is calculated from the total volume of water pumped and the average concentration of

TABLE 2 (Page 1 of 3)

SUMMARY OF CHEMISTRY 1984-1986

Harris Corporation, Poughkeepsie, New Nork

A. Treatment Effluent (Unit 2 Effluent)

COMPOUND	DATE 4/84	5/84	6/84	7/84	8/84	9/84	12/84	3/85	4/85	7/85	10/85	1/86
Xylene	<3	<10	<10	<10	<10	<10	<3	<3	<3	<3	<3	<3
1,2-dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<3	<1	<1	<1	<3
1,3-dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<3	<1	<1	<1	<3
1,4-dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<3	<1	<1	<1	<3
Chloroethane	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
1,1-dichloroethylene	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethylene	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
Trichloroethylene	<1	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1
COD, mg/l	10	19	20	20	2	18	2	<10	20	<10	7	8

All concentrations in μg/l unless noted otherwise.

TABLE 2 (Page 2 of 3)

SUMMARY OF CHEMISTRY 1984-1986

Harris Corporation, Poughkeepsie, New York

B. Wells - On-Site Effectiveness

COMPOUND	MW-1				MW-8	MW-9				MW-10					MW-11				MW-15				RW-1
	9/84	4/85	10/85	2/86	6/84	9/84	4/85	10/85	2/86	6/84	9/84	4/85	10/85	2/86	9/84	4/85	10/85	2/86	9/84	4/85	10/85	2/86	6/84
Xylene	<2	<3	<3	<3	NR	<2	<3	5	<3,<3	NR	<2	<3	<3	<3	<4	<3	<3	<3	<2	3	9	<3	NR
Trichloroethylene	20	44	49	52	NR	16	12	30	20,21	NR	15	13	9	7	20	1	19	5	49	24	38	16	NR
1,1,1-trichloroethane	NR	<1	NR	NR	NR	NR	<1	NR	NR,NR	NR	NR	<1	NR	NR	NR	<1	NR	NR	NR	<1	NR	NR	NR
1,2-dichlorobenzene	NR	NR	NR	<3	1200	NR	10	NR	9, 9	10	NR	NR	NR	<3	NR	NR	NR	<3	NR	NR	NR	<3	180

C. Wells - Property Boundary Condition

COMPOUND	MW-12			MW-13			MW-14	
	4/85	5/85	2/86	4/85	5/85	2/86	4/85	2/86
Xylene	<1	NR	<3	<1	NR	<3	<1	<3
Trichloroethylene	37	21	34	6	8	5	2	3
1,1,1-trichloroethylene	<3	NR	NR	<3	NR	NR	<3	NR
1,2-dichlorobenzene	NR	<3	<3	NR	<3	<3	NR	<3

All concentrations in μg/l unless noted otherwise.

TABLE 2 (Page 3 of 3)

SUMMARY OF CHEMISTRY 1984-1986

Harris Corporation, Poughkeepsie, New York

D. Influent and Effluent of Unit 1

	INFLUENT				EFFLUENT			
DATE	XYLENE	TRANS-1-2 DICHLORO-ETHYLENE	TRICHLORO-ETHYLENE	COD*	XYLENE	TRANS-1-2 DICHLORO-ETHYLENE	TRICHLORO-ETHYLENE	COD*
4/26/84	<3	10	19	30	<3	<1	<1	10
5/24/84	<10	15	26	29	<10	<10	<10	10
6/27/84	<10	15	35	20	<10	<10	<10	10
7/25/84	<10	<10	52	30	<10	<10	<10	10
8/22/84	<10	11	17	28	<10	<10	<10	19
9/12/84	<10	11	27	9	<10	<10	<10	9
10/17/84	<10	<10	43	210	<10	<10	<10	40
11/21/84	<3	21	2	29	<3	<1	<1	20
12/19/84	<3	12	19	147	<10	<5	<5	156
3/28/85	<3	9	22	<10	<3	<1	<1	<10
4/11/85	<3	7	23	40	<3	<1	<1	<10
5/8/85	<3	10	22	25	<3	<1	<1	25
6/26/85	<3	21	19	20	<3	<1	<1	10
8/1/85	<3	5	12	20	<3	<1	<1	<10
8/21/85	<1	23	13	10	<1	<1	<1	15
10/23/85	<3	8	19	6	<3	<1	<1	14
11/21/85	3	9	19	13	<3	<1	<1	<5
12/31/85	<3	9	19	<5	<3	<1	1	<5
1/22/86	<3	11	24	16	<3	<1	<1	23
2/19/86	<3	5	15	9	<3	1	2	8
AVERAGE	<5.0	<11.6	22.4	<35.3	<5.4	<3.9	<4.0	<21.0

All concentrations in μg/l unless noted otherwise.
*mg/l.

chemicals in the treatment system influent.

The most pertinent values are:

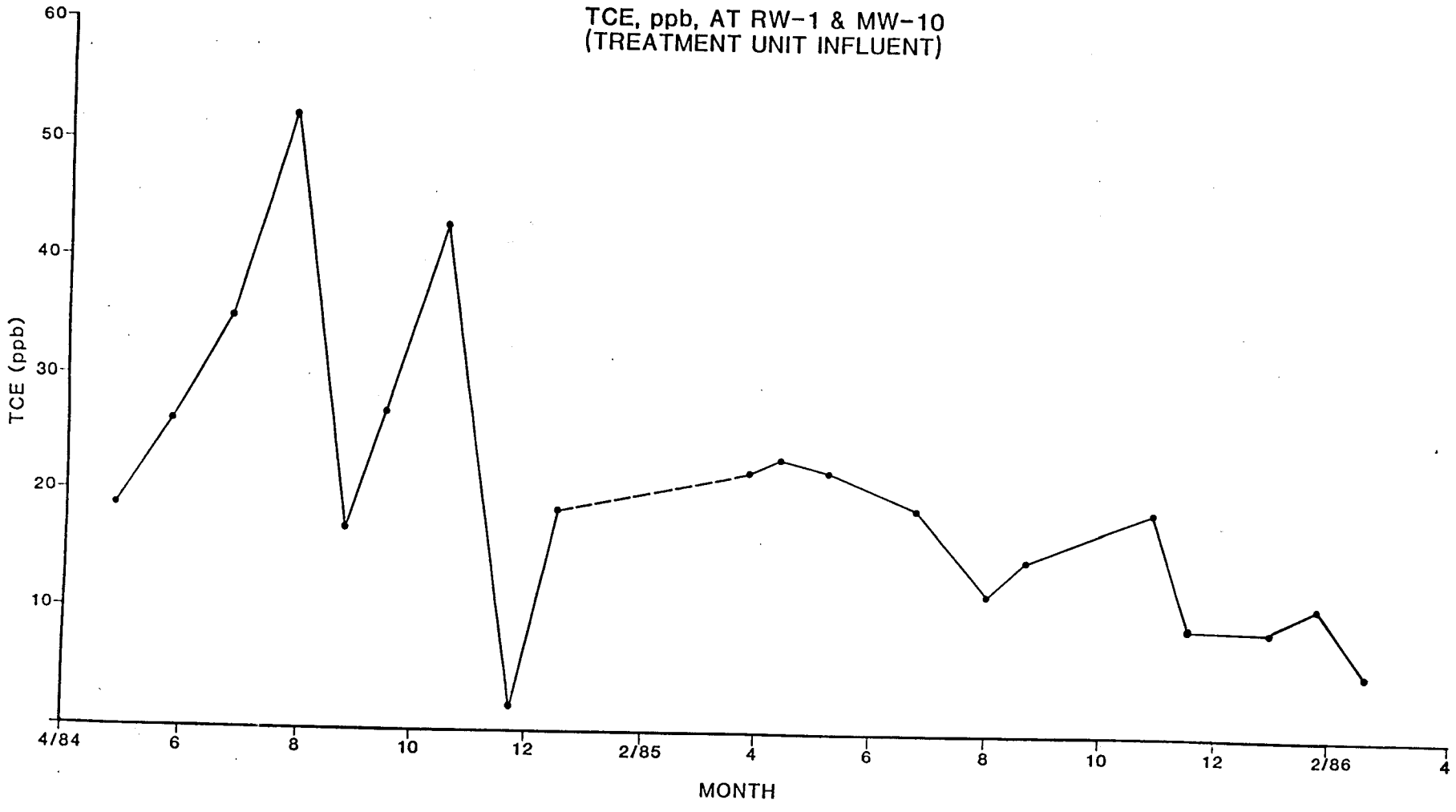
- Total COD pumped: at 41 mg/l, total mass pumped is 212 lb in 20 mos, or about 0.35 lb per day, 127 lb per year.
- Total TCE pumped: at 23 ppb, total mass pumped is 0.12 lb, or 0.0002 lb/day, or 0.07 lb/year.
- Total priority organics pumped: at 165 ppb, total mass pumped is 0.86 lb, or 0.0014 lb/day and 0.51 lb/year.

At the outset of the project, in obtaining permission to discharge from the ASD, conservatively high concentrations of COD=534 mg/l, TCE=85 ppb, total priority organics=1100 ppb were used as the influent concentrations. These coupled with a then projected maximum pumping rate of 2 gpm led to design treatment influent values of 12.8 lb/day COD, 0.002 lb/day TCE, and 0.026 lb/day total priority organics. With predicted performance of the activated carbon system, we projected a maximum discharge to the sewer of 10 lb/day of COD and 0.02 lb/day of total priority organics. Note that the influent to the treatment system has been much less than the maximum allowed under this agreement with ASD.

The reasons for this are:

- The flow rate to the system has been about 0.7 gpm, less than the 2 gpm used in the original calculations (before pump testing).
- The concentration of chemicals has been less than that used in the calculations. Figure 2 shows the history of TCE concentration influent to the system. This shows that concentrations fluctuated for the first nine months or so, at about 20-50 ppb, and then have remained steady at about 20 ppb recently. The initial concentration was already less than the 85 ppb predicted.

FIGURE 2


TCE, ppb, AT RW-1 & MW-10
(TREATMENT UNIT INFLUENT)
TCE (ppb)
60
50
40
30
20
10
4/84
6
8
10
12
2/85
4
6
8
10
12
2/86
4
MONTH

The calculations that formed the basis of the ASD negotiations were intentionally conservative, in order not to mislead ASD. We stated that we were calculating initial loading values, that would drop over time.

B. Amount of Chemical in Place.

The amount of chemical in the groundwater at the outset of remedial pumping has been calculated, in preparing this report:

COD:	243.5 lb
TCE:	0.025 lb
Total Priority Organics	0.803 lb

The calculations in (A), have indicated that more chemical has been pumped than was in the groundwater at the outset. We have concluded that the reason for this is that there is free product TCE in the rock, that is acting as a continuing source of this chemcial to the groundwater. The continuing source hypothesis, is supported by the shape of the influent chemical history, i.e., a leveling off after initial concentration reduction.

C. Chemistry at Property Boundary.

MW-12 and 13 are the two wells in the downgradient plume direction near the property boundary (Figure 1).

Sampling of these was done in 1985 for TCE. The April results showed 37 ppb at MW-12, which was re-sampled in May giving 21 ppb. MW-13 showed 6 ppb and 8 ppb, in April and May, respectively. In February 1986, the wells were resampled with MW-12 showing 34 ppb TCE.

In the original investigation, MW-12 had a TCE concentration of 13 ppb. We concluded in 1983, that this value was on outlier for two reasons:

- TCE concentration was greater than expected by extrapolation of other data in the plume.
- A finding of TCE at this concentration should have been accompanied by findings of other volatile organics, as in other wells in the plume if the concentration of 13 ppb was accurate.

This initial conclusion notwithstanding, it now appears that a part of the plume is outside the area of control; some TCE at unknown concentration, has moved beyond MW-12. We have concluded that the reason for the apparent lack of complete plume control resulted from movement of the chemical between the time of plume definition and the establishment of control.

The chemistry data used to delineate the plume, which then became the target area for hydraulic control, was taken on 27 December 1982, or roughly, the start of 1983. The plume was delineated in the report of March 1983, the hydraulic testing was conducted in June 1983, reported on and used for conceptual design in August 1983, and the system was installed in April 1984. It appears that, in the time between chemical sampling and initiation of hydraulic control, the leading edge of the plume had moved so that some of the chemical was beyond the area influenced by the pumping.

Based on the information available, the plume on the property probably has a shape similar to that previously defined (Figure 1), but with the leading edge moved to the south. The east edge of the plume has not moved as far as MW-13 or 14, but is probably close to them. The lateral limit to the west cannot be fixed accurately because the existing monitoring wells do not bound the plume on that side. However, given the directional permeability of the

shale bedrock, which tends to draw the groundwater (and the plume) to the southeast, we think that the plume will not move westward. Based on this probable plume shape, MW-12 should be at a near the centerline of the plume, which also is expected to exhibit higher concentrations than the lateral edges.

Remedial Action

The existing pump and treat system requires expansion in order to establish plume control at the property boundary. Because the exact extent of the plume is not known, final remedial design is not possible at this time. Pumping MW-12 as an initial step should have some success, and be part of an overall solution, because:

- It is in the plume, near the property boundary.
- It had a measurable (1-2 gpm) blown yield when it was constructed. This indicates that it can be expected to establish relatively effective hydraulic control.

The proposed system is scheduled to start operation in the week of 3/31/86, and will include:

- MW-12 well pump, with level (on-off) controls.
- 2" pipe from MW-12 to inside building. This pipe is sized to handle other wells that may be required in the overall system. Pipe is buried 4' deep.
- Power cable from the building sized to handle additional pumps.
- Separate meter and sampling port, inside building.
- Tie-in to existing MW-10 discharge pipe, inside building, to MW-10 meter and activated carbon system.