TECHNICAL PROJECT REPORT
ENVIRONMENTAL TECHNICAL SERVICES DIVISION

DATE	TITLE	
2/22/83	1982 Kodak Park Groundwater Sampling Survey	

TYPE OF REPORT

☐ CLOSING ☒ RESULTS ☐ INVESTIGATION

Introduction

The Kodak Park groundwater monitoring program has been established to evaluate the quality of the groundwater under KP to assure the operational safety of facilities and personnel, and to identify the potential impact on groundwater quality beyond the property limits. A network consisting of 33 wells has been established to monitor the groundwater at the KPW and KPM fencelines. Additional wells have been placed in the Weiland Road Landfill, Building 329 courtyard, Building 351 area, and the Building 119 area. All wells are shown in Figure 1. The Weiland Road monitoring program has been established to fulfill requirements of the Monroe County Health Department. Wells have been placed in the latter three areas to monitor known impacts on the groundwater.

Area Hydrogeology:

Two separate aquifers are present in the Kodak Park area. An upper aquifer, composed of soils and overlying fill is separated from a lower bedrock aquifer by a dense glacial till. In areas where both aquifers are present, wells have been placed to allow monitoring of individual water-bearing units.

Area Groundwater Flows:

Figure 2 presents a general description of the groundwater flow in the KP area. Overall there appears to be little difference between the general flow pattern of the deep and shallow aquifers. Flow in KPM is generally to the north towards the area's boundaries with the groundwater flowing towards NYS Route 390 and the Ridge Road area. Flow in KPX has not been well defined at this time, although preliminary evaluation suggests the overall flow is easterly. Flow in KPW is mainly to the southeast with some flow to the north. It is theorized that the main 48" industrial sewer which runs along the south edge of KPW serves as a discharge point for groundwater and limits flow across the southern boundary of KPW. Flow in KPE has not yet been defined in detail; however, it is expected that the general flow direction is easterly towards the Genesee River. A hydrogeologic study of KP is currently being conducted by Haley and Aldrich Geologic Consultants which will better quantify the groundwater flow pattern in the KP area.

1982 Groundwater Sampling Survey

Results of the 1982 Kodak Park groundwater sampling survey have shown the major portion of the groundwater in the KP area to be free of contamination by common solvents, other organic compounds, and metals (see Table 1). However, in several areas groundwater has been affected by manufacturing operations and must be addressed by an overall groundwater quality management effort.

Sample Analysis:

Routine analysis of groundwater during the 1982 survey included common solvent and TOD measurement. At least once during the year, wells were also analyzed for metals and for various organic compounds by GC/MS (Table 1). While these analyses have defined several areas of concern, these tests do not produce a complete description of the groundwater quality. Areas in which constituents were present in detectable quantities are discussed in the following section. All other wells contained no detectable quantities of constituents for which analyses were conducted.

Groundwater Quality Summary:

KPW

Nine organic compounds were detected and quantified by GC/MS in the shallow and deep aquifers southeast of Building 137. Both aquifers also exhibited a TOD of greater than 50 ppm. Suspected sources of these organics are the drum handling area near Building 210, leakage from rail cars handled in the marshalling yards, or former drum storage and handling operations in this area.

Vinylidene chloride (VDC) was detected by GC/MS in the deep aquifer east of Building 140 and northeast of Building 119 at an average concentration of greater than 200 ppb as well as detectable quantities of p-dioxane (>500 ppb). The source of the VDC was a damaged reactor feed line in the Building 119 courtyard which was repaired approximately two years ago. A study is currently underway to determine the extent of VDC dispersion and the most appropriate remedial cleanup action. The p-dioxane is expected to have originated from leaking sewers in the Building 119 area.

Metals analyses showed aluminum, chromium, iron, sodium, nickel and phosphorus to be present in the shallow aquifer northeast of Building 105, potassium and lithium in the shallow aquifer southest of Building 151, and sodium in the shallow aquifer east

of Building 140, at a concentration greater than other areas of KP. A more meaningful interpretation of these and all other metals analyses will be prepared after determination of the most representative background levels for the area.

KPM

Greater than 10 ppm of both p-dioxane and ethylene glycol were detected in the shallow aquifer in the Building 351 courtyard during 1982. Samples taken northeast of Building 350 in the soil water table had a TOD concentration of 300-600 ppm. The cause of this oxygen demand has yet to be attributed to any particular compound.

Detectable quantities of methylene chloride (>500 ppm) have been measured in the groundwater under Building 329 despite continued clean-up efforts. Monitoring wells to the north end east contain no detectable quantities of the compound. The methylene chloride originated from a break in a waste solvent line in 1980. The groundwater in the area is currently being pumped to the industrial sewer to maintain a cone of depression to control migration and eventually clean-up the area.

A summary of groundwater quality data for KPW and KPM is available upon request from ETS. A map locating the areas described above is presented in Figure 3.

Groundwater Monitoring Program Evaluation

As well as identifying areas of concern for groundwater quality in KP the results from the 1982 sampling survey produced a greater confidence level in sample integrity due to improvements made to groundwater sampling methods after 1981. Concerns for sample cross-contamination have been corrected and good sample reproducibility has been demonstrated. Areas to be addressed in the future are:

1. An overall description of the hydrogeology of Kodak Park. This study is currently underway with a completion date scheduled for the second quarter of 1983.

2. Development of more sensitive routine analyses of groundwater samples such as Total Organic Carbon (TOC) and Total Organic Halogens (TOX) measurements.

3. Refinement of current sampling techniques, especially for volatile organic compounds.

4. Storage and manipulation of groundwater data by a computerized system.

Conclusions

The 1982 groundwater sampling survey identified seven areas in KP where further evaluation of groundwater quality should be conducted. These seven areas are:

1. Building 119 courtyard area
2. Building 329 courtyard area
3. Area southeast of Building 137
4. Area northeast of Building 105
5. Building 351 area
6. Area southeast of Building 151
7. Area east of Building 140

Of the seven areas listed, the Building 351 area, Building 151 area and the Building 105 area have not been previously identified. Each of these areas will be evaluated in separate investigations. It is recommended these be conducted in 1983.

Investigation of the other four areas is currently in progress and evaluations should be completed in 1983.

Thomas J. Ruggieri
Water Technology Section
Environmental Technical Services

TJR/wpc:shc

Approved: F. E. Wright
F. E. Wright

cc: L. Allen
R. Critchell
R. Forbes/B. Klanderman
D. Portland
F. Wright/S. Kennedy

Table 1

Constituents Analyzed for During
1982 Fenceline Groundwater Survey

1. Common Solvents Analysis by Gas Chromatography
(Detection Limit 1 ppm)

epichlorohydrin	acetone	isopropyl ether	styrene
ethanol	acetonitrile	methanol	tetrahydrofuran
ethyl acetate	benzene	methyl Cellosolve	toluene
ethylbenzene	Cellosolve	methylene chloride	trichloroethylene
ethylether	chloroform	methyl ethyl ketone	xylenes
hexanes	dichloroethane	n-butanol	vinylidene chloride
isobutanol	dichloropropane	p-dioxane	
isopropanol			

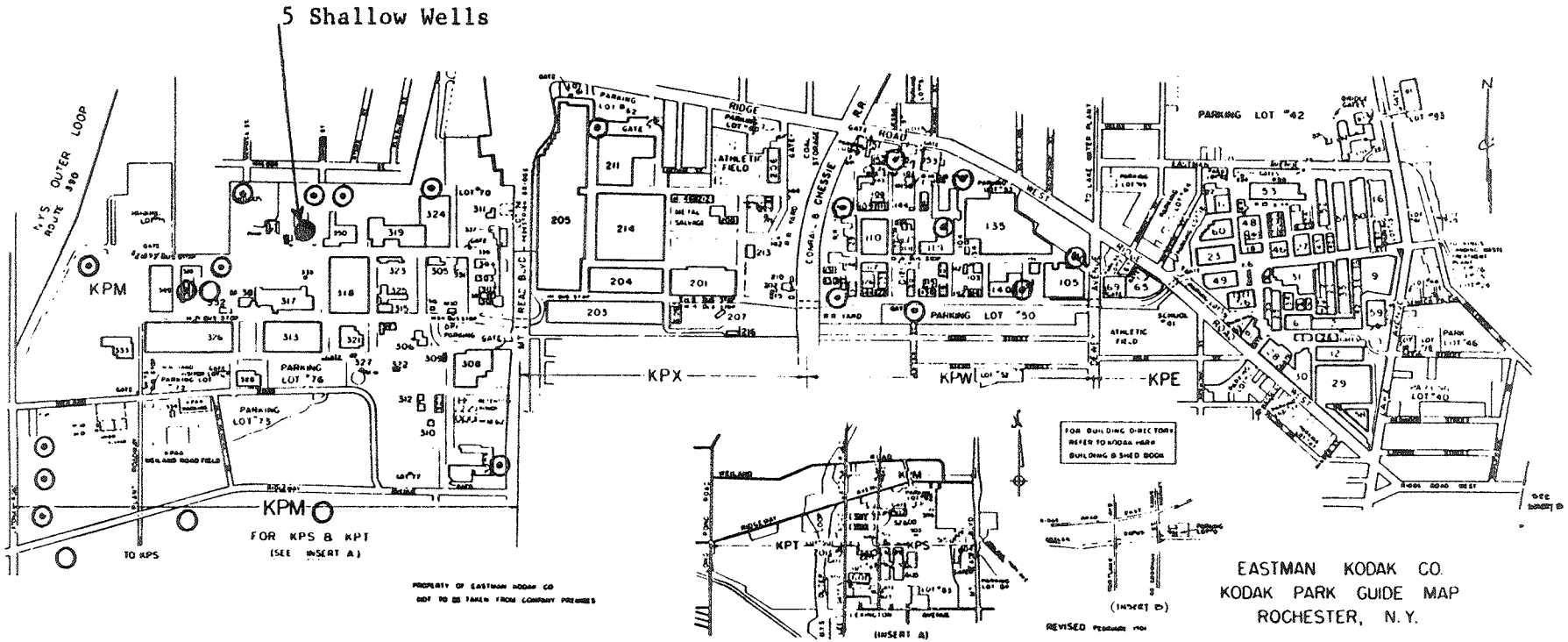
2. Organics Analysis by Gas Chromatography/Mass Spectrometry (GC/MS)

Compound	Detection LImit (ppb)
acetone	25
vinylidene chloride	1
p-dioxane	40
benzene	1
isopropyl ether	6
toluene	2
ethylbenzene	1
chlorobenzene	1
xylenes	1

3. Metals Analysis by Inductively Coupled Plasma (ICP)

Metal	Detection limit (ppm)
aluminum	0.3
barium	0.02
cadmium	0.02
calcium	0.03
chromium	0.02
cobalt	0.02
iron	0.02
lead	0.07
lithium	0.01
magnesium	0.003
manganese	0.02
molybdenum	0.4
nickel	0.2
phosphorus	0.7
potassium	10
silver	0.02
sodium	0.08
tin	0.2
zinc	0.02

4. Total Oxygen Demand (TOD)
Detection Limit 50 ppm



⊙ Shallow Well and Deep Well

○ Deep Well Only

FIGURE 1

Kodak Park Groundwater

Monitoring Well Location

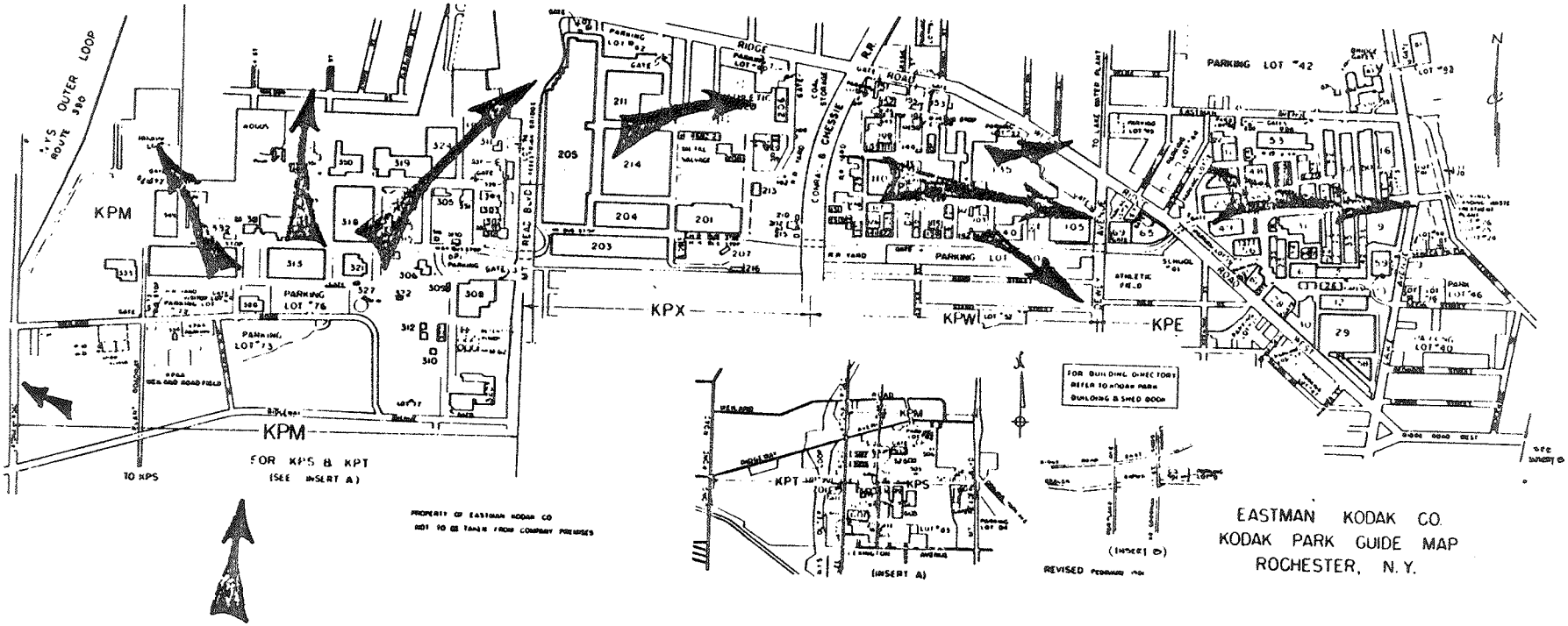


FIGURE 2

General Groundwater Flow Pattern

(Deep and Shallow Aquifers)

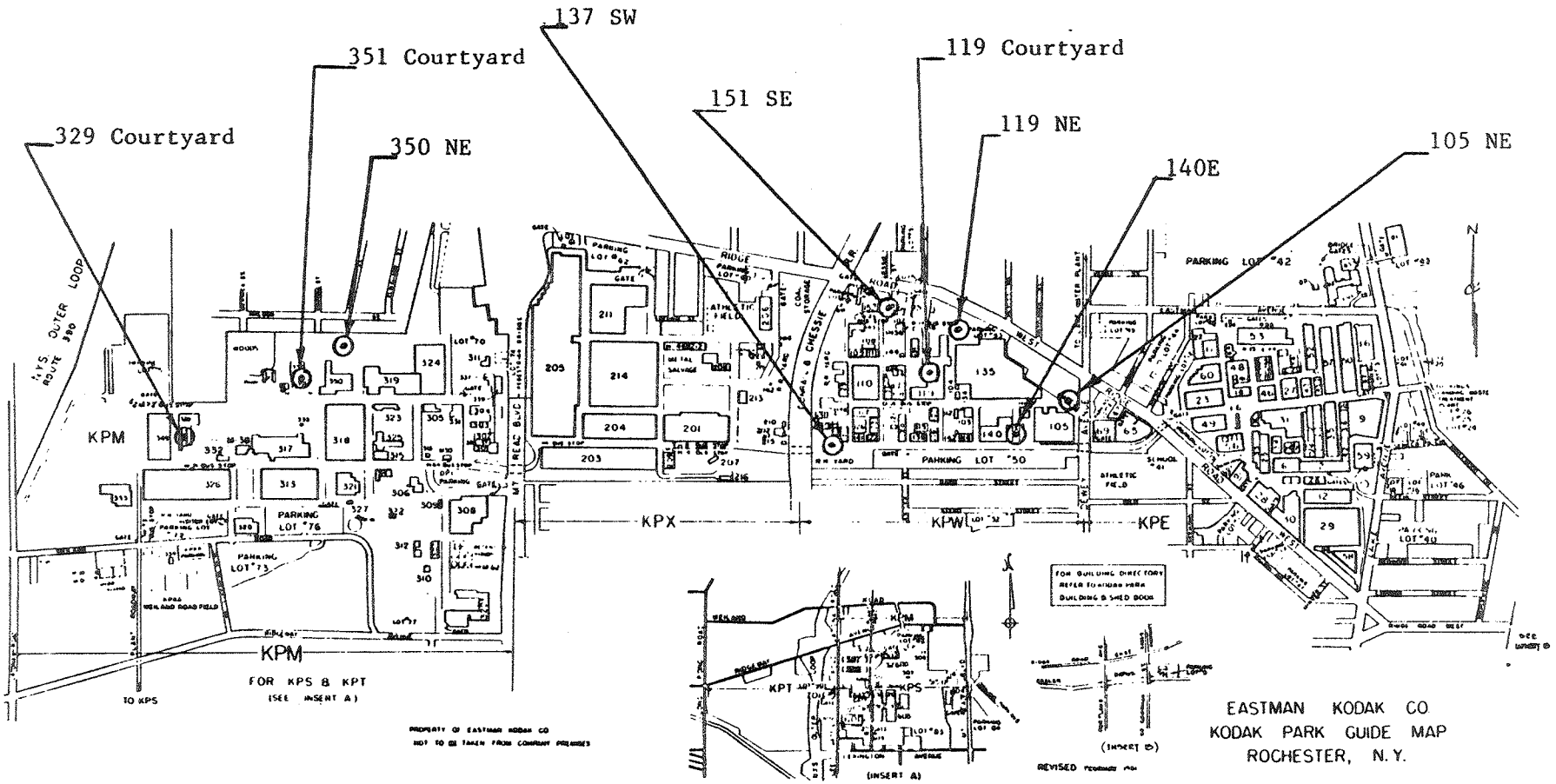


FIGURE 3

Kodak Park Monitoring

Well Locations

1982 KODAK PARK GROUNDWATER QUALITY SUMMARY

PARAMETER	Shallow 137SW	Deep 137SW	Deep 140E	Shallow 119NE	Deep 119NE	Shallow 350NE	Shallow 352SW	Shallow 350M	Shallow 105NE	Shallow 151SE	Shallow 140E
				- Well -							
Number of Analyses	3	3	3	3	3	1	4	2	1	1	1
acetone	0.60	<0.030	ND(0.030)	ND(0.030)	ND(0.030)	0.46					
benzene	0.49	0.60	0.015	0.010	0.004	ND(0.001)					
chlorobenzene	0.36	0.31	0.013	ND(0.001)	ND(0.001)	ND(0.001)					
ethylbenzene	0.65	0.10	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)					
ethyl ether	0.40	0.57	0.005	0.010	0.013	-					
isopropyl ether	0.25	0.058	0.002	ND(0.001)	0.009	ND(0.001)					
p-dioxane	7.1	9.3	0.55	0.70	0.66	0.096	12				
toluene	0.039	0.011	0.004	ND(0.001)	0.001	0.014					
vinylidene chloride	ND(0.001)	ND(0.001)	0.35	ND(0.001)	0.27	ND(0.001)					
xylenes	1.5	0.29	0.001	0.059	ND(0.001)	ND(0.001)					
ethylene glycol							30	ND(10)			
TOD	170	80	<50	<50	<50	380(1)	<50	75			
aluminum									5.4	3.0	1.3
chromium									6.6	0.06	0.03
iron									42	1.5	6.4
lithium									0.06	0.73	0.08
nickel									2.4	0.06	0.03
phosphorus									1.6	-	<0.07
potassium									-	650	21
sodium									1100	130	1200

Results are average concentrations in parts per million (ppm)

ND: Not detected, detection limit follows

(1) Number of analyses = 4