ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

KorKay, Inc.
Site No. 518014
Town of Broadalbin, Fulton County

Final – April 1988

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BUREAU OF
HAZARDOUS SITE CONTROL
DIVISION OF HAZARDOUS
WASTE REMEDIATION

Prepared for:

New York State
Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling, Commissioner
Division of Hazardous Waste Remediation
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Prepared by:

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

EA REPORT DEC52A

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK PHASE II INVESTIGATIONS

KORKAY INC.
TOWN OF BROADALBIN, FULTON COUNTY
NEW YORK I.D. NO. 518014

Prepared for

Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

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Middletown, New York 10940

A Division of EA Engineering, Science, and Technology, Inc.

April 1988

CONTENTS

1. EXECUTIVE SUMMARY

The Korkay, Inc. site (New York State I.D. No. 518014) is a 1-acre parcel of land located in the Village of Broadalbin, Fulton County, New York (Figure 1-1). Korkay, Inc. is a chemical supply company which buys bulk chemical products from major chemical companies and stores them on site for use in blending or repackaging these basic products into products for the automotive trade. Korkay, Inc. obtains used barrels which are washed out, relined, and used to distribute the final products.

The used barrels are stored on site prior to being sent out to be washed off-site. Between 1969 and 1980, the operation of washing these used barrels was performed on site. The previous contents of the barrels are varied and unknown, but may have contained acetone, isopropyl alcohol, degreasers, surfactants, perfumes, and flavorings. The washwater from barrel cleaning, together with washwater from spill cleanup and vat cleaning, were discharged to the septic system. Apparently, the contents of the unwashed barrels stored on site were leaking onto the ground as well. In 1980, a 4,000-gal holding tank was installed to hold vat cleaning and spill cleanup washwater which is then hauled away for disposal by EWS of Watervliet, New York under manifest. Korkay, Inc. also began sending the used barrels out to be washed off site to Fredrickson-Cooperage of Waterford, New York.

The Phase II investigation consisted of: a record search to update information obtained for the 1983 Phase I report; a site inspection and site interview to observe and document current conditions at the site (Figure 1-2); and the

performance of field activities to evaluate hydrogeologic conditions and the potential for ground-water contamination. The field activities included the performance of geophysical surveys (conductivity and resistivity); installation of test borings/monitoring wells completed in the overburden; short-term, low-yeld pumping tests; and environmental sampling of the ground water from the monitoring wells and the North Second Avenue Village of Broadalbin well for analysis of the Hazardous Substance List of inorganic parameters and organic compounds.

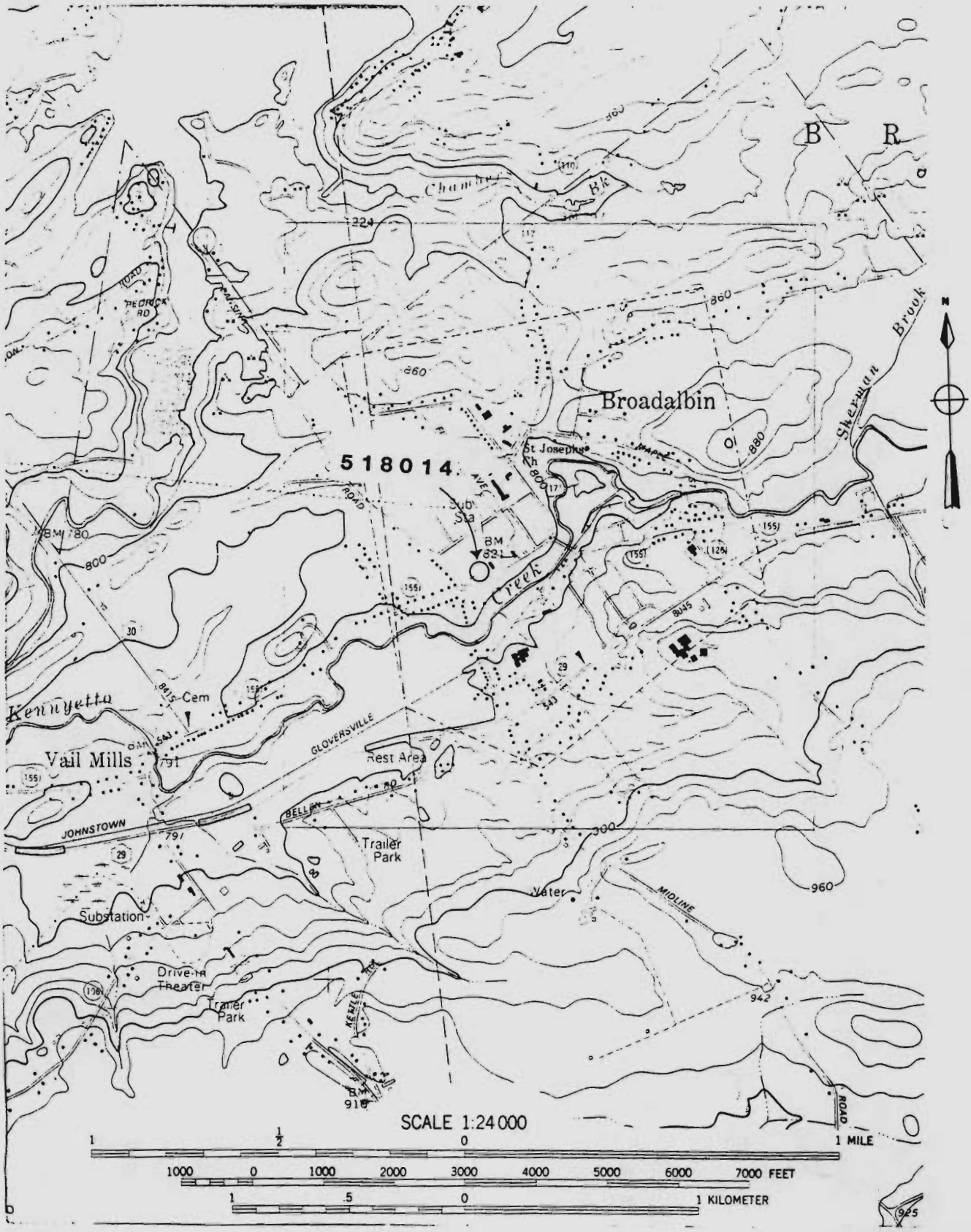
The site is located in an area that is both residential and commercial within the Village of Broadalbin. The Village is served by public water supplied by wells. The Village well located on North Second Avenue is completed in the aquifer of concern approximately 3,200 ft northwest of the site. There are also homes not served by public water which have private wells completed in the aquifer of concern within the 3-mi radius of the site. The nearest home not served by public water supply is located approximately 1,700 ft west of the site. An estimated population of 4,078 is supplied by wells completed in the aquifer of concern within a 3-mi radius of the site.

The Phase II sampling program detected several organic compounds in samples from two of the onsite monitoring wells, and a pesticide in a sample from one of the wells. Iron and manganese were also detected in samples from two monitoring wells at concentrations above New York State Drinking Water Standards for ground water. A preliminary consideration of remedial alternatives is presented in Chapter 6 of this report.

The final HRS scores for this site are as follows: Migration Score (S_M) = 38.08; Direct Contact Score (S_{DC}) = 37.5.

COORDINATES
LATITUDE: 43° 03' 28"
LONGITUDE: 74° 12' 02"

KORKAY SITE



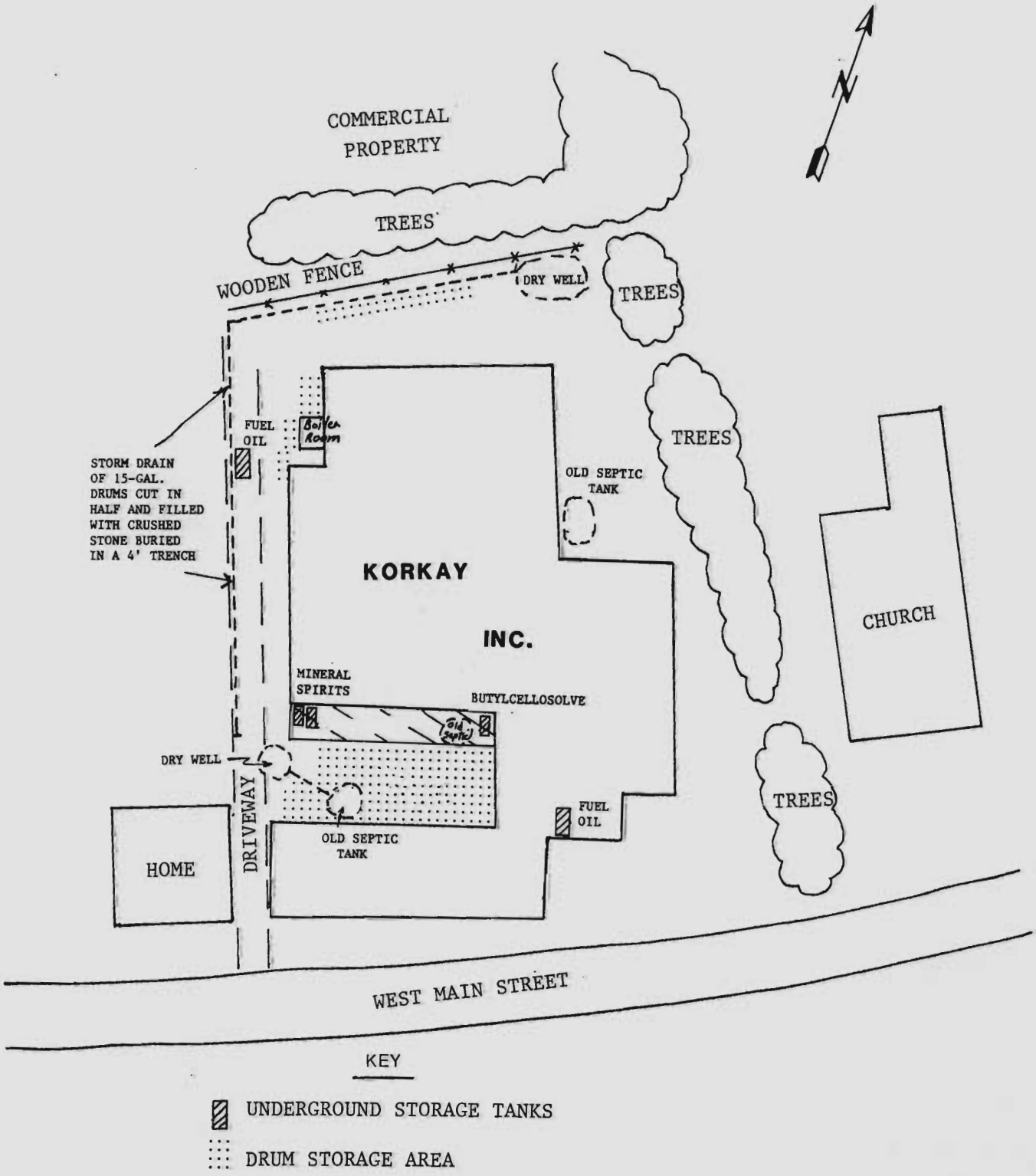
BROADALBIN QUAD

FIGURE 1-1

7.5 MINUTE SERIES

KORKAY-SITE SKETCH

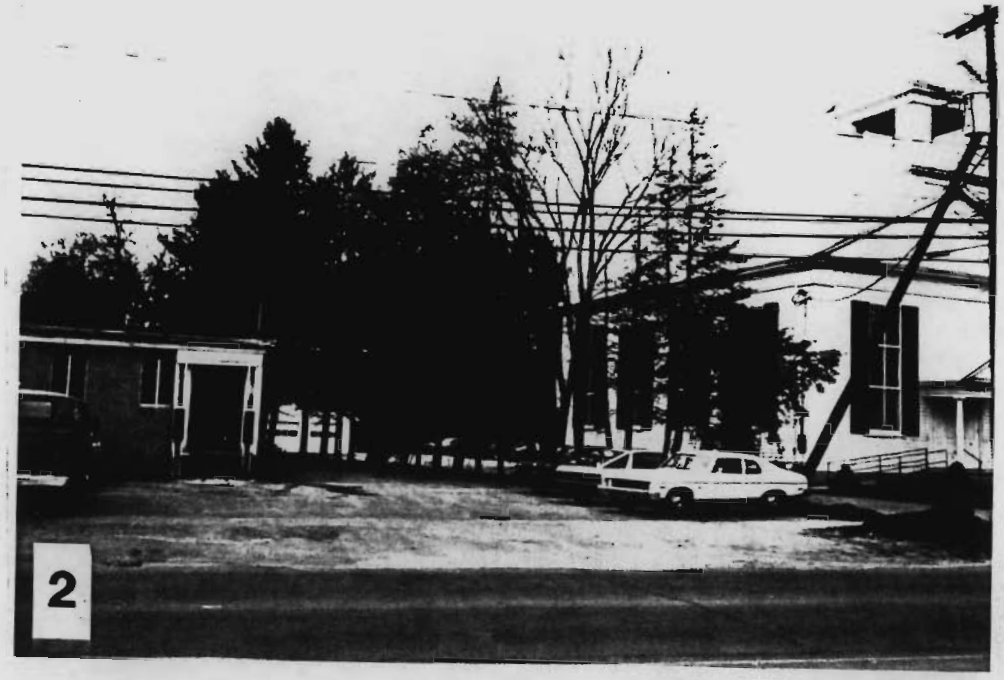
BASED UPON SITE RECON ON 3 MAY 1985



Note: Base map modified (enlarged) from 21 June 1984

FIGURE 1-2


1


2


3


4

5

6

7

8

PHOTO LOG - KORKAY SITE
(3 May 1985)

Photo No.	Description
1	Westerly view of the KorKay, Inc. building along West Main Street (Figure 1-2).
2	Northerly view of the southeastern corner of the KorKay site and a church on the adjacent property.
3	Northwesterly view of the northern corner of the KorKay site (garage in the upper right portion of the photo is on an adjacent property). A dry well is reportedly present beneath the wood pile (Figure 1-2).
4	Westerly view along the northern portion of the site. Empty drums are stored along the fence (property boundary).
5	Northerly view of the northwestern portion of the site. Empty drums are stored along the KorKay, Inc. building and along the far (northern) property boundary (previously shown in Photo No. 4).
6	Southeasterly view along a portion of the western wall of the KorKay, Inc. building where empty drums are stored prior to filling with KorKay, Inc. product and shipment to clients.
7 and 8	Panorama of the empty drum storage area located in the southwestern portion of the site. There were two reported below grade storage tanks of mineral spirits beneath the end of the wooden porch shown on the lower left portion of Photo No. 7.

2. PURPOSE

The goal of the Phase II investigation of this site was to: (1) obtain available records on the site history from state, federal, county, and local agencies to update the previous Phase I report; (2) obtain additional information since the Phase I report on site topography, geology, local surface and ground-water use, contamination assessments, and local demographics; (3) interview site owners, operators, and other groups or individuals knowledgeable of site operations; (4) conduct a site inspection to observe current conditions; (5) perform geophysical surveys at and around the site to evaluate the potential presence of ground-water contaminant plumes, and stratigraphic information; (6) install test borings/monitoring wells and perform environmental sampling; and (7) prepare a Phase II report. The Phase II report includes a final Hazard Ranking Score (HRS), an assessment of the available information, and a recommendation for remedial work.

3. SCOPE OF WORK

3.1 RECORD SEARCH/DATA COMPILATION

A record search/data compilation and interviews were conducted as part of the Phase II investigation of the Korkay site. Appendix 1.3.1-1 contains a list of agencies or individuals contacted.

3.2 FIELD ACTIVITIES

3.2.1 Site Reconnaissance

EA Science and Technology conducted a site reconnaissance on 3 May 1985 to familiarize key project personnel with the site. During the site reconnaissance, potential sources of contamination were located, tentative locations for test borings/monitoring wells and sampling were selected, accessibility was evaluated, and HNU measurements (upgradient and site-wide) were obtained to help the Safety Officer develop specific health and safety requirements for the field activities. No organic vapors were detected above background by the HNU photoionizer during the site reconnaissance (refer to Figure 1-2 which indicates the features observed during the site reconnaissance). Photographs of the site were taken and significant features were noted on an aerial photograph (Scale: 1" = 300', dated 21 June 1984) of the site.

3.2.2 Geophysical Surveying

Geophysical surveys of the site were conducted by Delta Geophysical, Inc. under EA's supervision on 11 July 1985. The purpose of the geophysical investigation was to non-destructively, accurately, and cost effectively evaluate possible subsurface conditions at the site, including stratigraphy, depth to water, and potential contaminant plumes.

The existing site data (geology, area size, hydrogeology, etc.) were reviewed. Upon completion of the geophysical surveys for each of the sites, interpretation of the geophysical data was made prior to leaving the site. Monitoring wells were then located in accordance with geophysical information, general hydrogeologic information, and physical accessibility for the drill rig.

The geophysical technique used first at the site was a perimeter terrain conductivity (electromagnetic or EM) survey, using a Geonics EM-31 instrument which has an effective depth of penetration of approximately 20 ft below grade. The data gathered from this type of survey indicated subsurface zones of anomalous conductivity. However, the entire site could not be evaluated due to external interferences from above ground structures (vehicles, power lines, buildings, stored drums, etc.) and buried structures (drain pipes, septic tanks, water lines, etc.). The second technique used was resistivity. This method measures vertical changes in subsurface resistivities, providing for evaluation of depth to ground water, depth to rock, and general stratigraphy (refer to Appendix 1.3.2-1 for details, e.g., specific geophysical survey locations).

3.2.3 Observation Well Installation

For the purpose of establishing ground-water flow direction and the release of contaminants to ground water at the site three monitoring wells were installed near the perimeter of the site. It was anticipated ground-water flow direction would be in a southeast direction towards Kennyetto Creek, therefore, an ambient (approximately upgradient) well was installed north of the Korkay Inc. building on the adjacent church property. Due to the size of the site (approximately 1 acre) and the numerous obstacles throughout the site (i.e., the buildings, stored barrels, parked cars, surface metal, underground lines) the geophysical data collected during the conductivity survey was limited and could not be used to aid in the selection of the downgradient monitoring wells. The monitoring wells were placed in areas considered to be potentially contaminated based on available information. Monitoring Well K-2 was located in an area of drum storage, underground storage tanks and the septic tank and dry well. Monitoring Well K-3 was near an underground fuel oil tank and downgradient of the drum storage area (Figure 1-2).

The three test borings/monitoring wells were installed at the site (Figure 3-1) on 1 August 1985. This work was performed under the fulltime supervision of an EA geologist.

A truck-mounted CME-55 drill rig was used to drill the borings/wells. The three threaded-joint PVC monitoring wells (Wells K-1, K-2, and K-3) were completed in unconsolidated sediment using a 4-1/4-in. I.D. hollow-stem auger.

Drilling was performed smoothly with no problems. All wells were completed approximately 14.5 ft below ground surface in the first ground water encountered. Well installation methods are presented in Appendix 1.3.2-2.

The boring logs and well schematics of the test borings/monitoring wells are shown in Figures 3-2 through 3-4. The grain size analysis was performed on selected representative sediment samples collected during drilling. The resultant data curves are presented in Figures 3-5 through 3-13.

The monitoring wells were developed using a centrifugal pump on the same day they were installed. Polyethylene flexible pipe with a flat washer attached approximately 6 inches from the end was used as the suction line. The washer allowed the well to be surged as it was pumped. New polyethylene flexible pipe and washers were used in each well. Wells K-1 and K-2 recharged poorly, while Well K-3 recharged relatively quickly. During development, discharged water from Well K-2 was foamy, with a slight odor, and an HNU reading 2.8 ppm above background.

Upon completion and development of the monitoring wells, the vertical elevation of the upper rim of each PVC well casing was surveyed to aid in evaluation of the ground-water flow direction. A Kern-Swiss Automatic Construction Level GKO-A was used to perform the surveying. Elevations were determined in feet below/above an assumed datum of 100 ft, established on the upper rim of the Well K-1 PVC well casing. A short-term, low-yield pumping test was performed in each monitoring well using a centrifugal pump. New polyethylene flexible pipe was used as the suction line in each well. The pumping test data curves are shown on Figures 3-14 to 3-19. The pumping test and surveying were

performed on 9 October 1985. Table 3-1 provides a summary of well data for the site. Development and pumping test procedures are detailed in Appendix 1.3.2-2.

3.2.4 Sampling

Sampling of the Korkay site was completed in two days, 20 and 21 November 1985, by EA personnel. The program included four ground-water samples (one from each Phase II well, and one from the Village of Broadalbin municipal water supply well located on North Second Avenue). Refer to Figure 3-1 for sample locations. A centrifugal pump was used to purge the three Phase II monitoring wells. New polyethylene flexible pipe was used in each well. Discharge from Well K-2 was collected in a 55-gallon drum because it appeared yellowish and was foamy with a distinct odor. However, the HNU reading for the discharge was not 5 ppm above background. The sampling procedures are detailed in Appendix 1.3.2-3. EA's Field Data Sheets for purging and sampling are provided as Figures 3-20 to 3-23. During a previous sampling of the Korkay site, the sample security was invalidated due to an error by the overnight shipping company which sent the samples to a wrong address, requiring the site to be resampled on 20 and 21 November 1985.

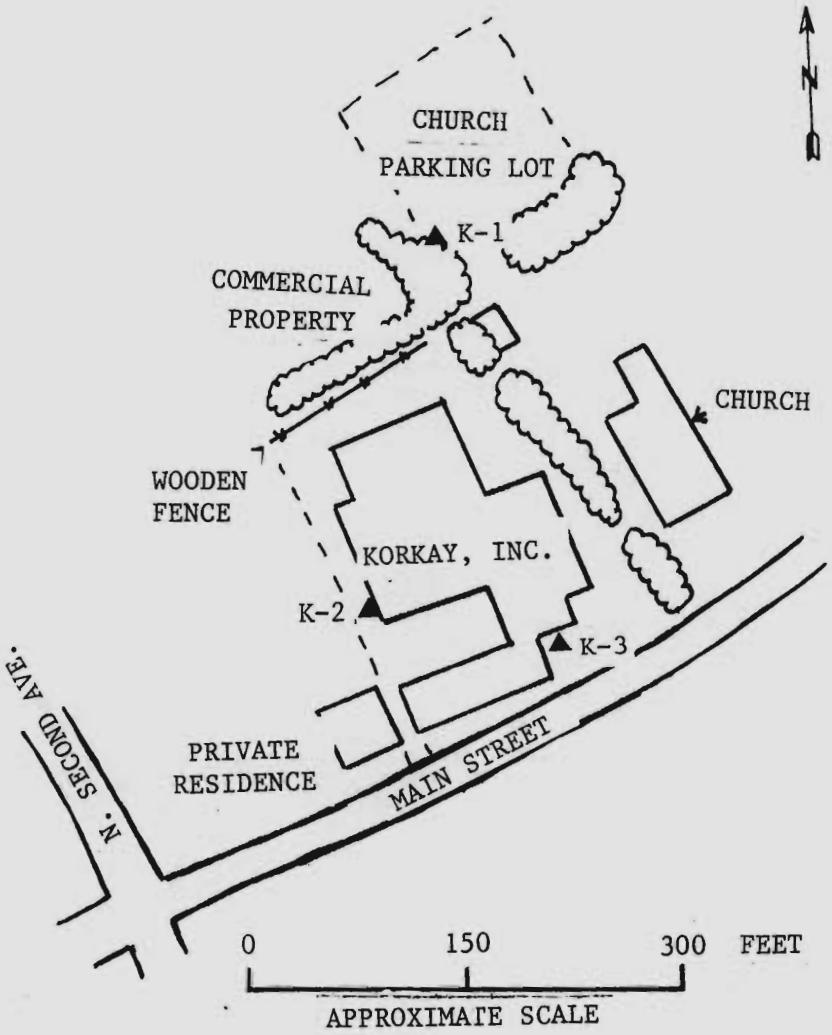
Due to missed holding times, the wells were resampled on 20 April 1987 and analyzed for Base Neutral/Acid Extractable Organics and Pesticides of the Hazardous Substance List. Well K-1, located on the church property adjacent to the site at the edge of a parking area, no longer existed. The steel casing and PVC well stickup had apparently been removed. The two wells onsite were still intact, however, the locking cap on Well K-3 was broken, apparently

during snow removal over the winter and was no longer secure. The related EA Field Data Sheets for purging and sampling are provided as Figures 3-24 to 3-26.

The analytical program for the four ground-water samples included the inorganic parameters and the organic compounds of the Hazardous Substance List, plus identification and quantification of all non-priority pollutant GC/MS major peaks (those whose peak area is 10 percent or greater than the calibrating standards). The program was performed in accordance with NYSDEC-CLP. The CLP package for the November 1985 sampling event was previously submitted to NYSDEC in September 1986. The CLP package for the April 1987 sampling event has been submitted with, but bound separately from, the draft Phase II report.

Test boring/Monitoring well

Location Map



Note: Map modified from 21 June 1984 aerial photo (enlarged).

FIGURE 3-1

TABLE 3-1 KORKAY SITE: SUMMARY OF MONITORING WELL DATA

Well No.	Observation Well: Stickup (Ft. above Ground Surface)	Observation Well: Total Depth (Ft. below Ground Surface)	Observation Well: Elevation of MP*	Ground Water: Date	Ground Water: Depth (Ft. below MP)*	Ground Water: Elevation**
K-1	2.6	14.0	100.00	10/09/85	8.16	91.84
K-1	2.6	14.0	100.00	11/14/85	8.55	91.45
K-1	2.6	14.0	100.00	11/21/85	8.55	91.45
K-2	1.8	14.5	100.20	10/09/85	8.72	91.48
K-2	1.8	14.5	100.20	11/14/85	8.27	91.93
K-2	1.8	14.5	100.20	11/21/85	7.76	92.44
K-2	1.8	14.5	100.20	04/20/87	7.10	93.10
K-3	1.0	14.0	99.17	10/09/85	8.30	90.87
K-3	1.0	14.0	99.17	11/14/85	7.94	91.23
K-3	1.0	14.0	99.17	11/21/85	7.57	91.60
K-3	1.0	14.0	99.17	04/20/87	6.52	92.65

* MP = Measuring point (top of PVC or steel well casing).
** Feet above or below an assumed datum of 100 feet, established at K-1.

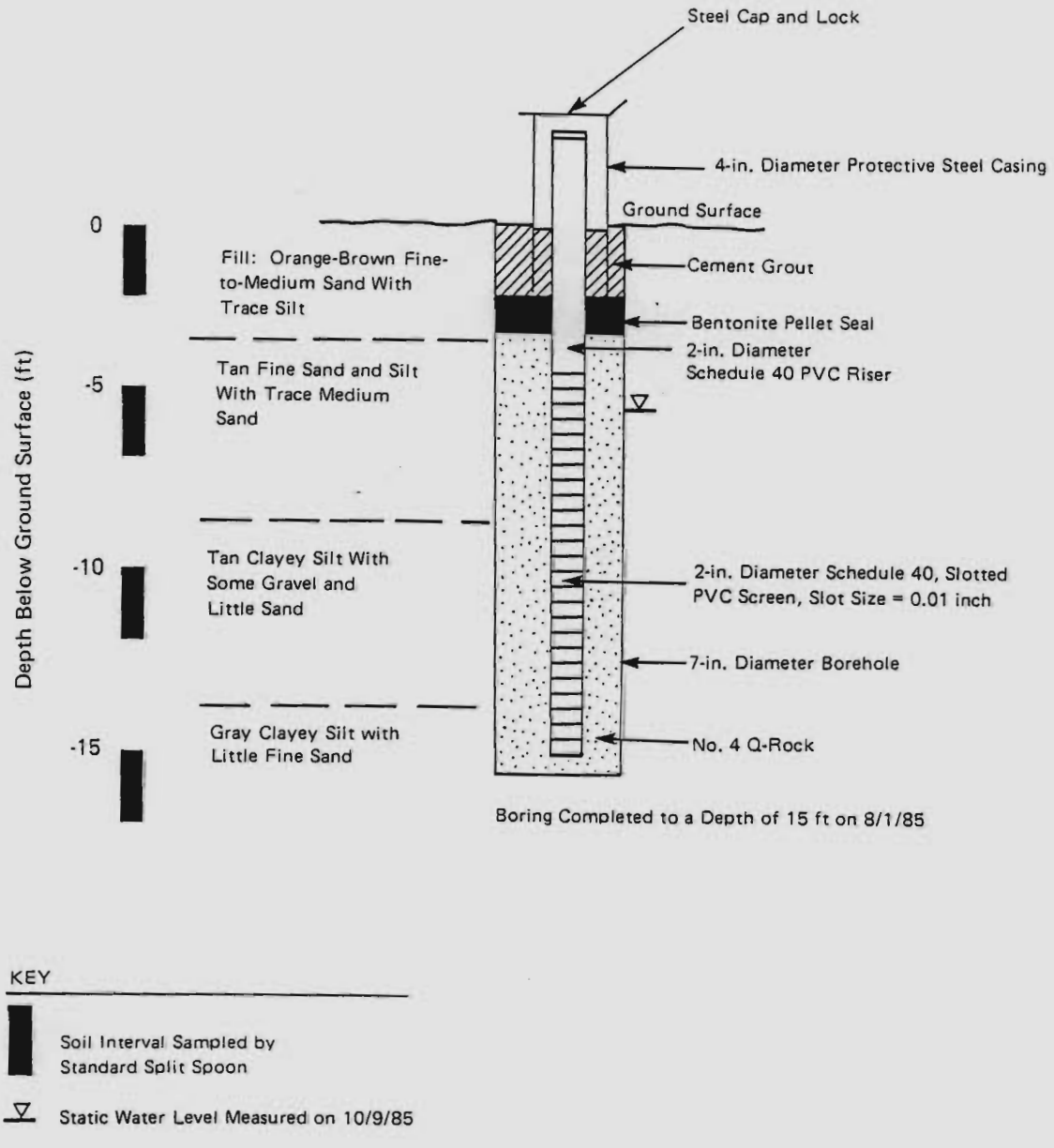


Figure 3-2. Boring log and well schematic, Korkay Site.

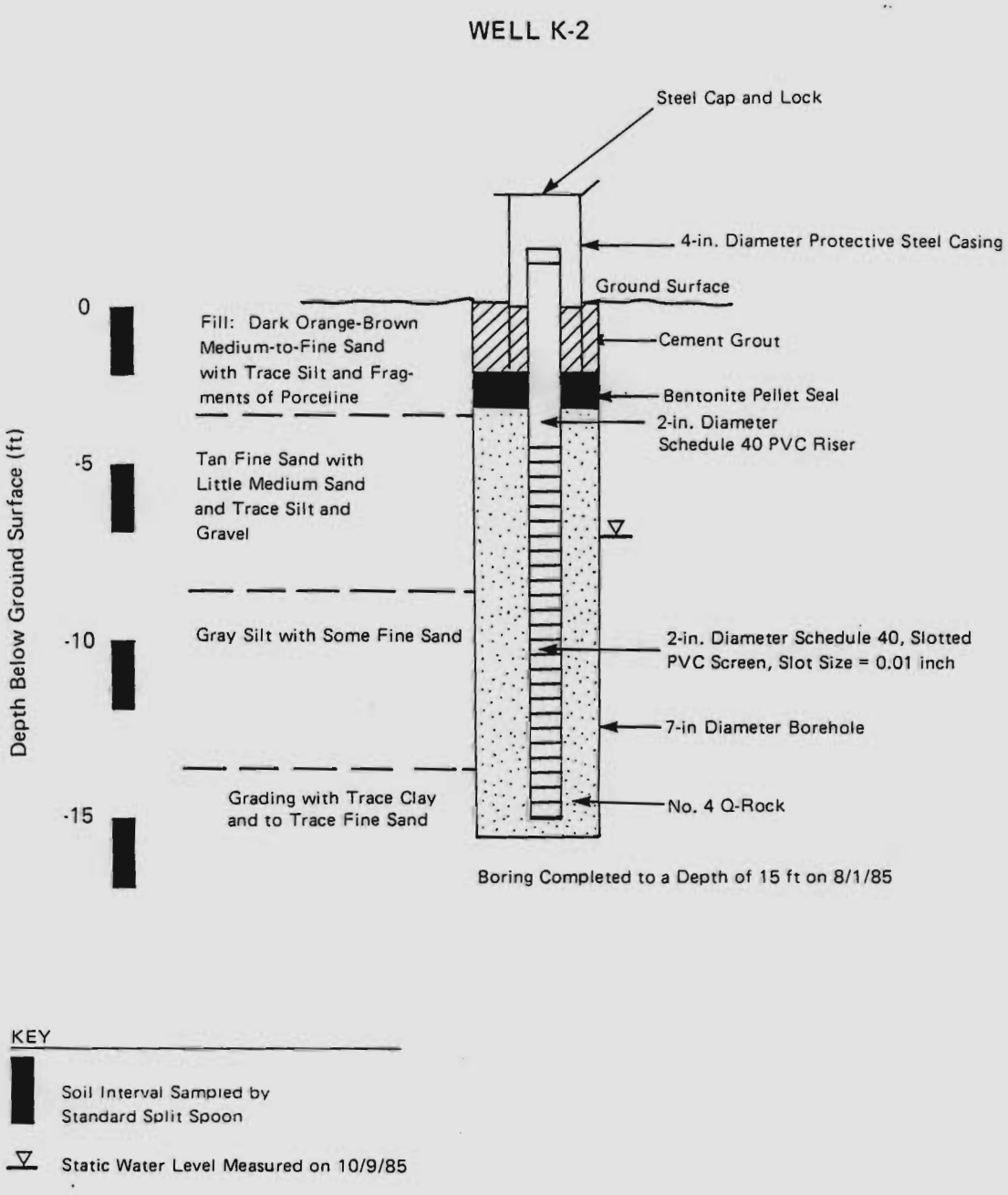


Figure 3-3. Boring log and well schematic, Korkay Site.

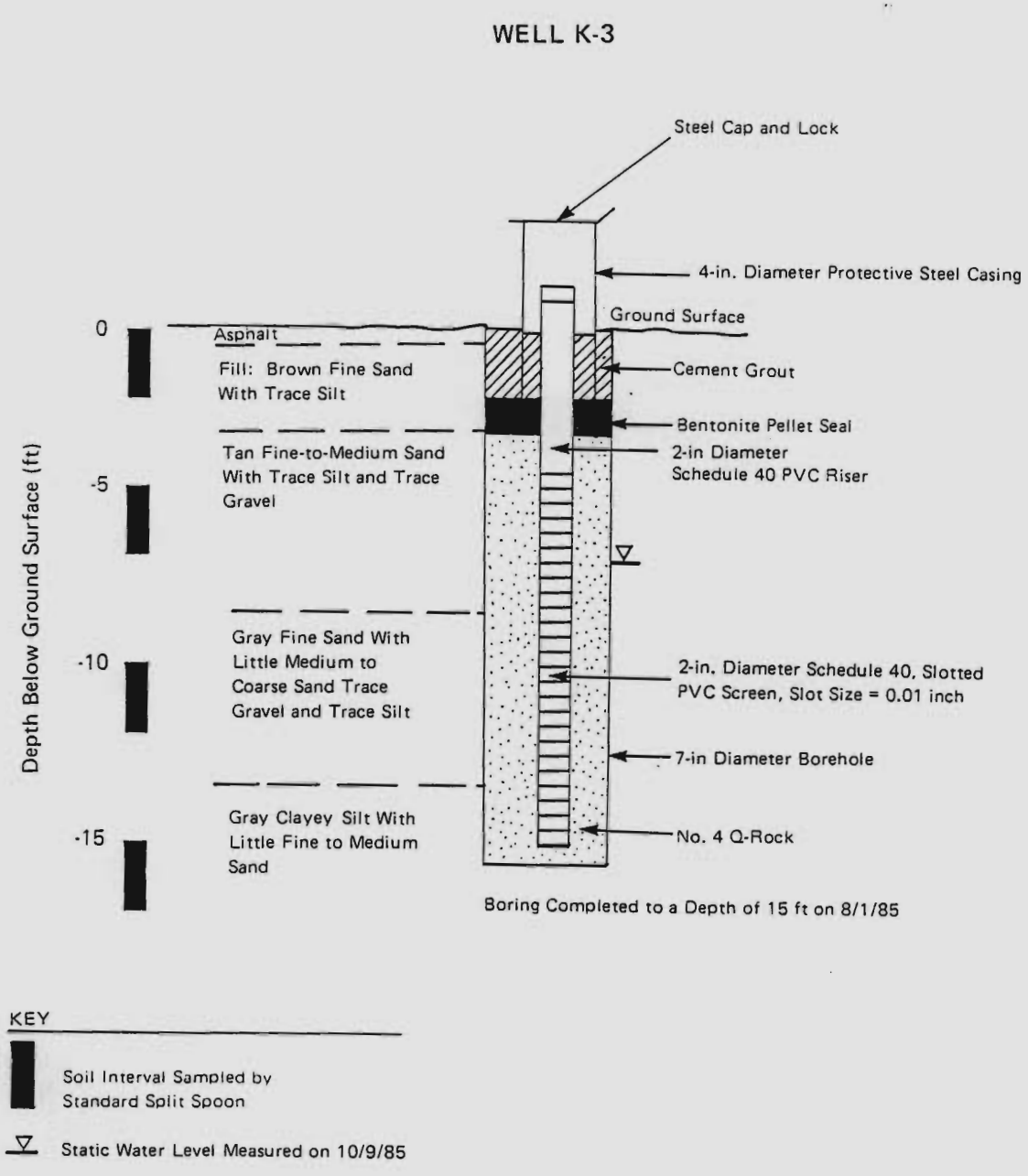


Figure 3-4. Boring log and well schematic, Korkay Site.

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-1 Sample No. 2

Depth 4.5-6.5 Elevation

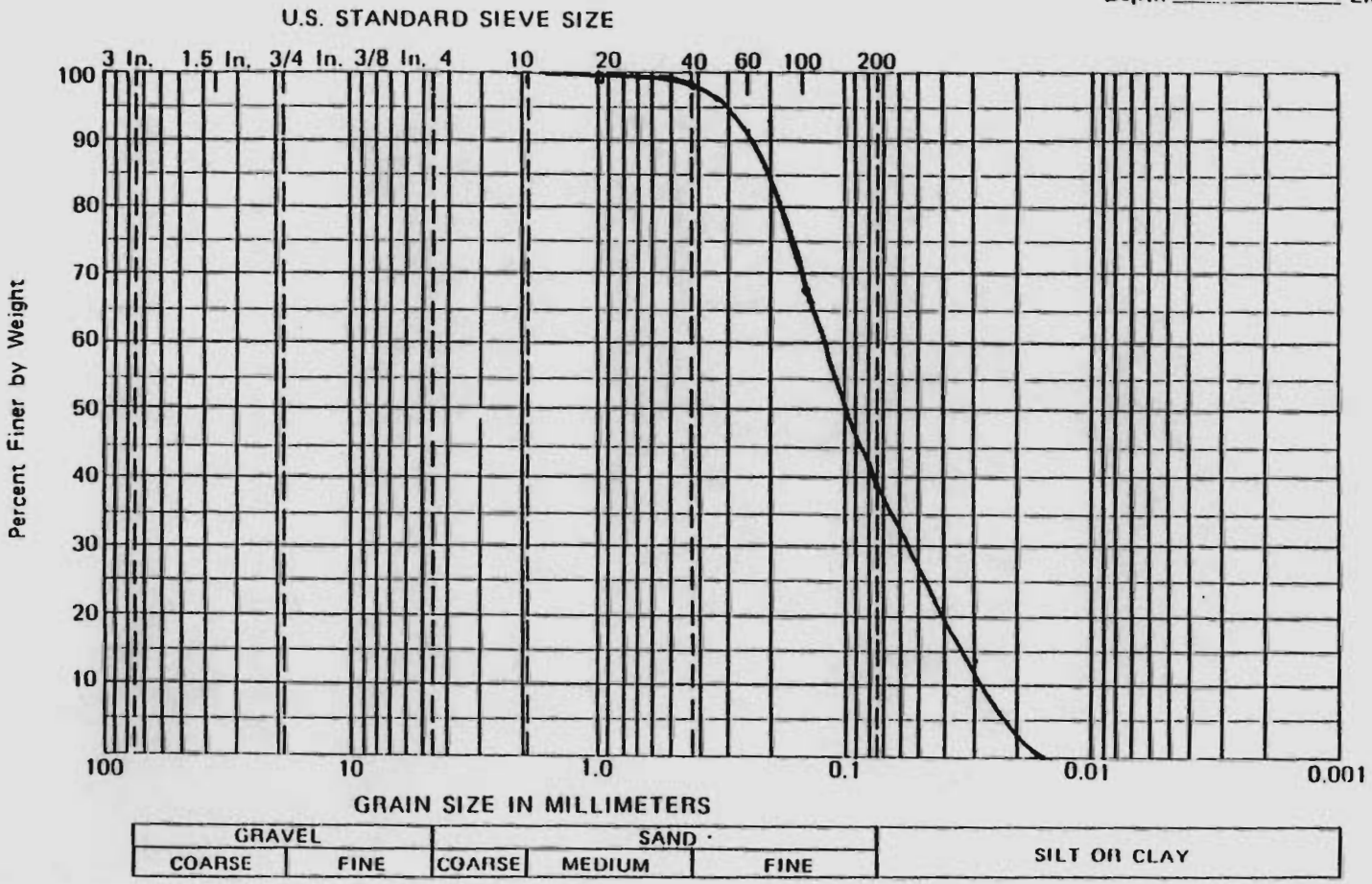


Figure 3-5

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-1 Sample No. 3

Depth 9.5-11.5 Elevation

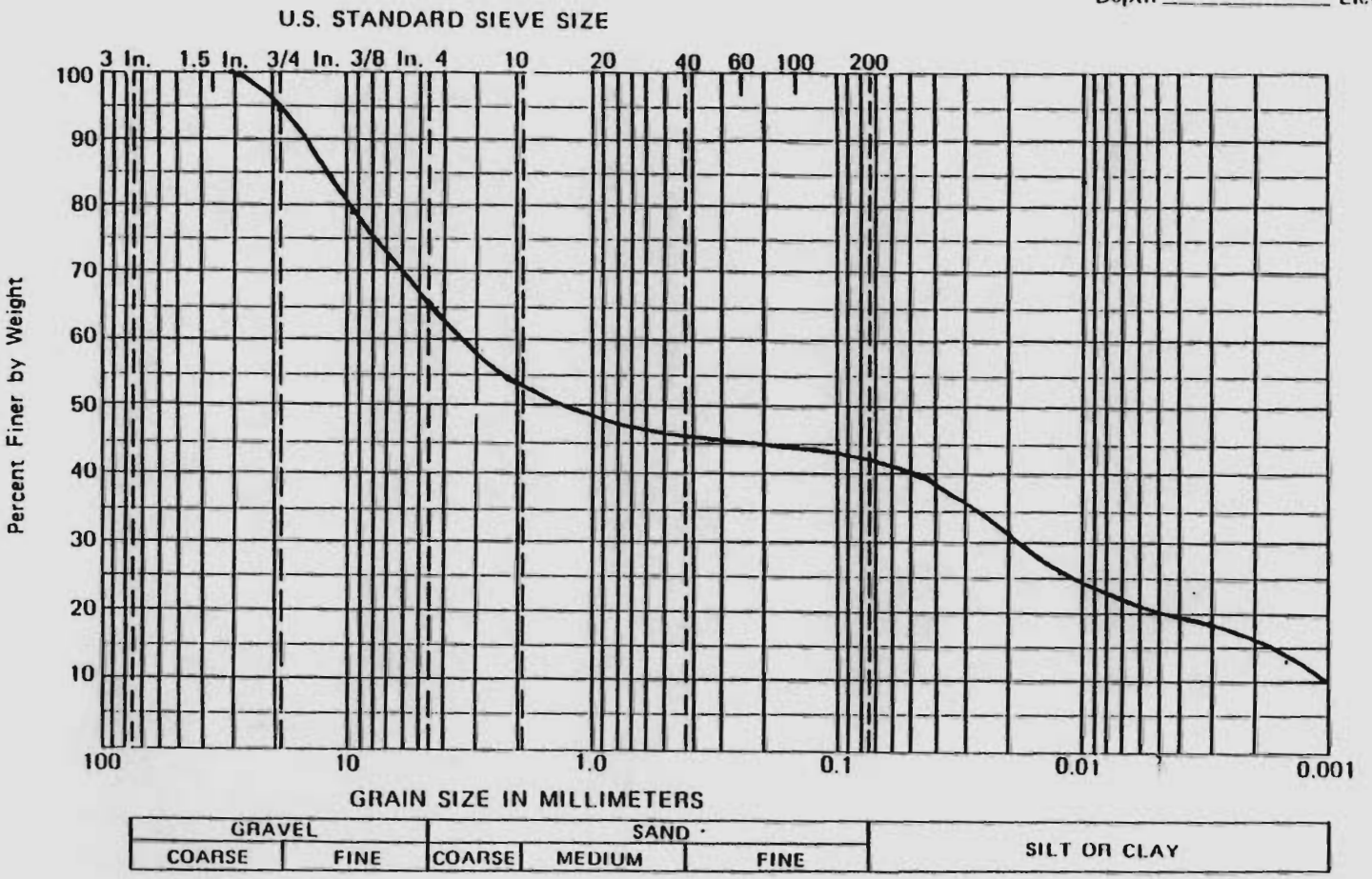


Figure 3-6

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-1 Sample No. 4

Depth 14.5-16.5 Elevation

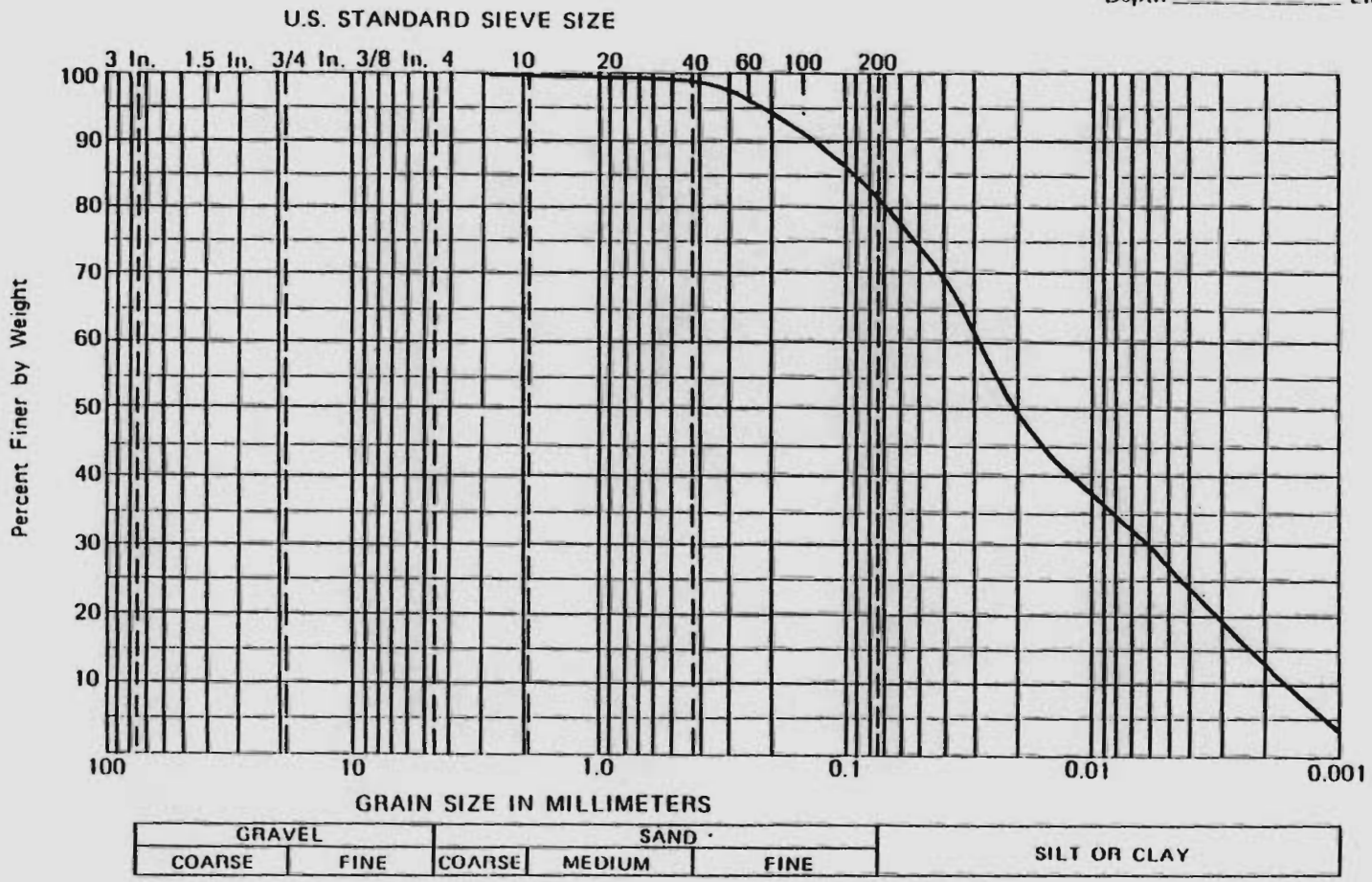


Figure 3-7

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-2 Sample No. 2

Depth 4.5-6.5 Elevation

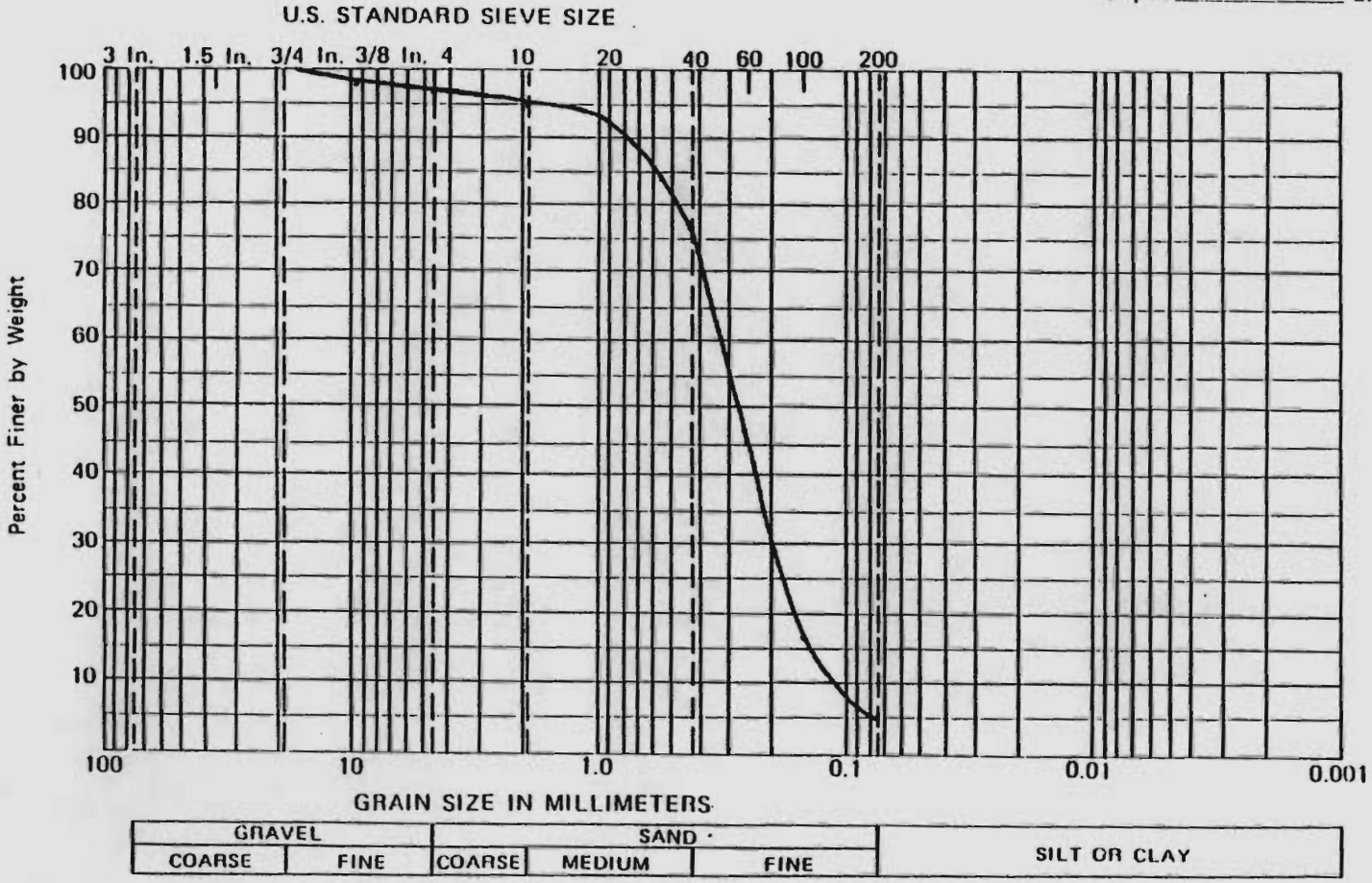


Figure 3-8

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-2 Sample No. 3

Depth 9.5-11.5 Elevation

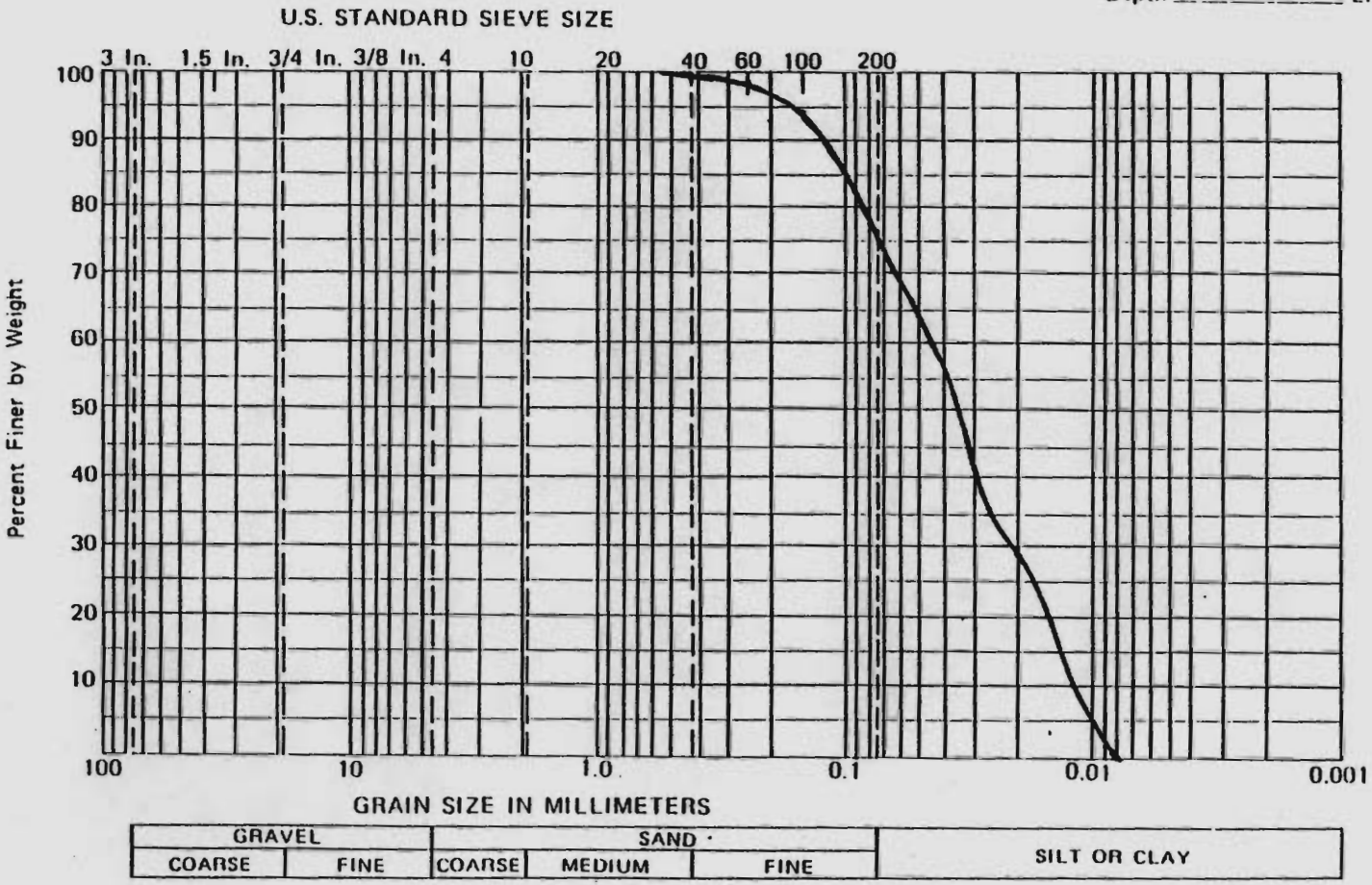


Figure 3-9

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-2 Sample No. 4

Depth 14.5-16.5 Elevation

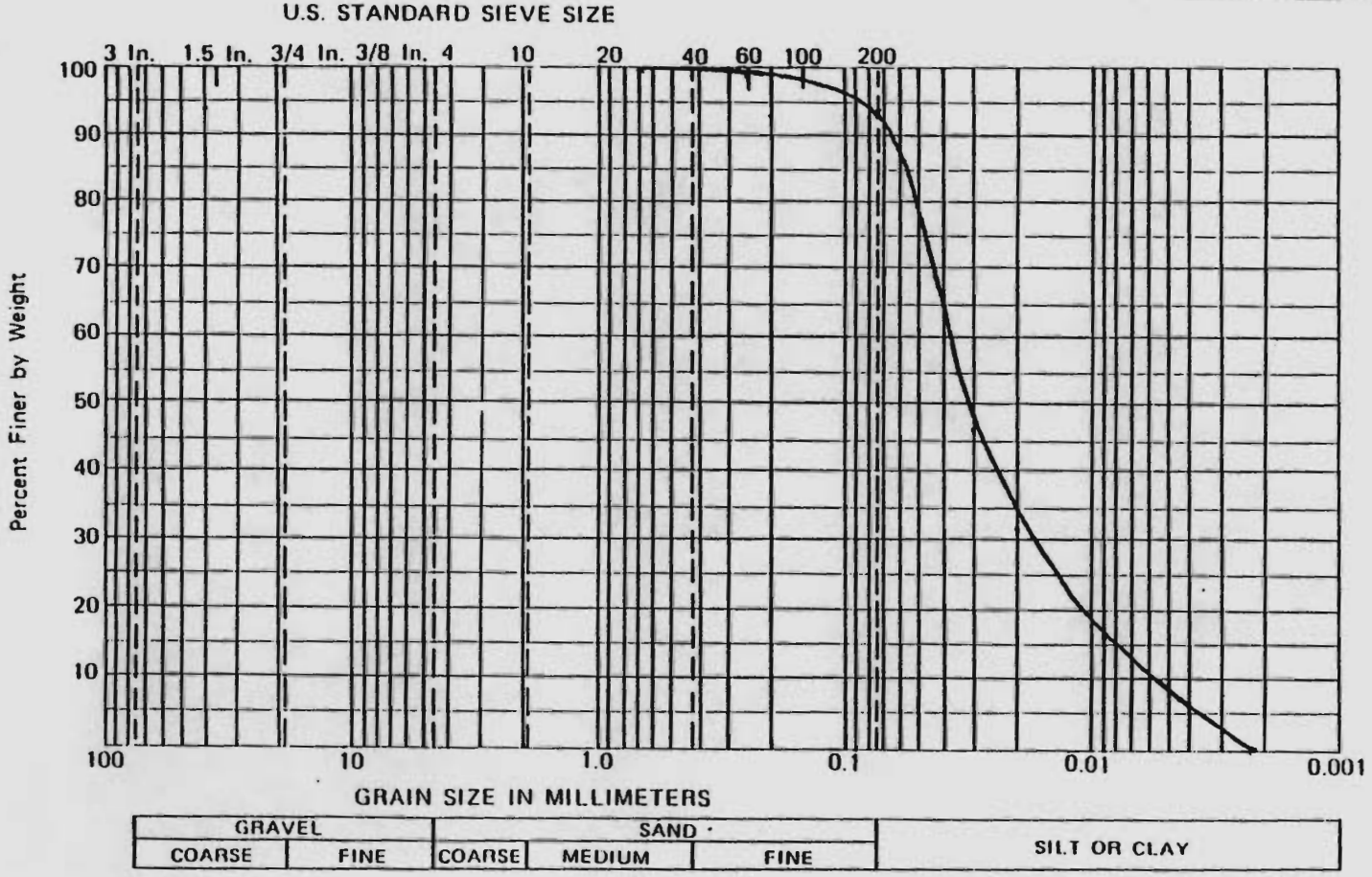


Figure 3-10

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-3 Sample No. 2

Depth 4.5-6.5 Elevation

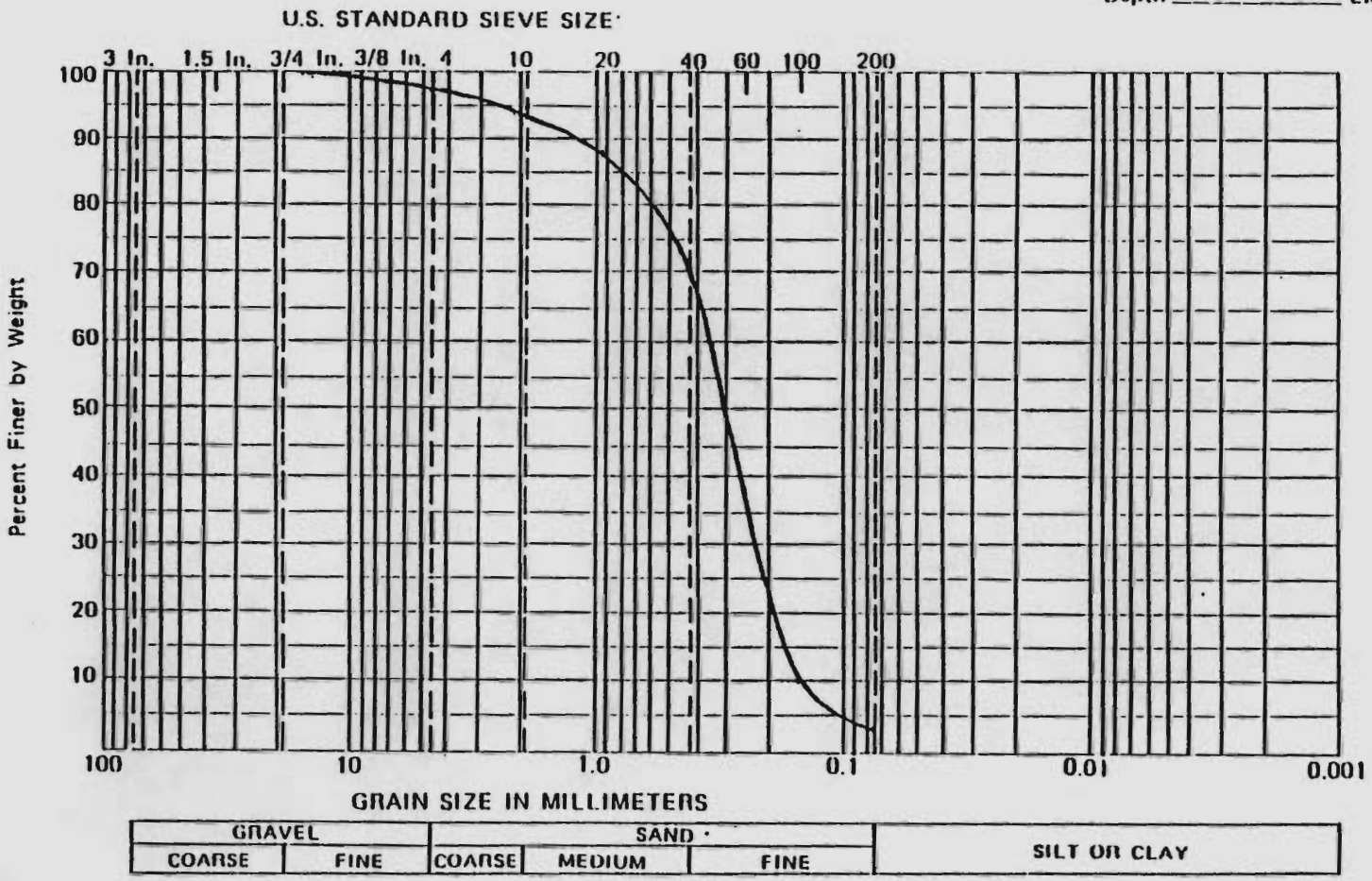


Figure 3-11

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-3 Sample No. 3

Depth 9.5-11.5 Elevation

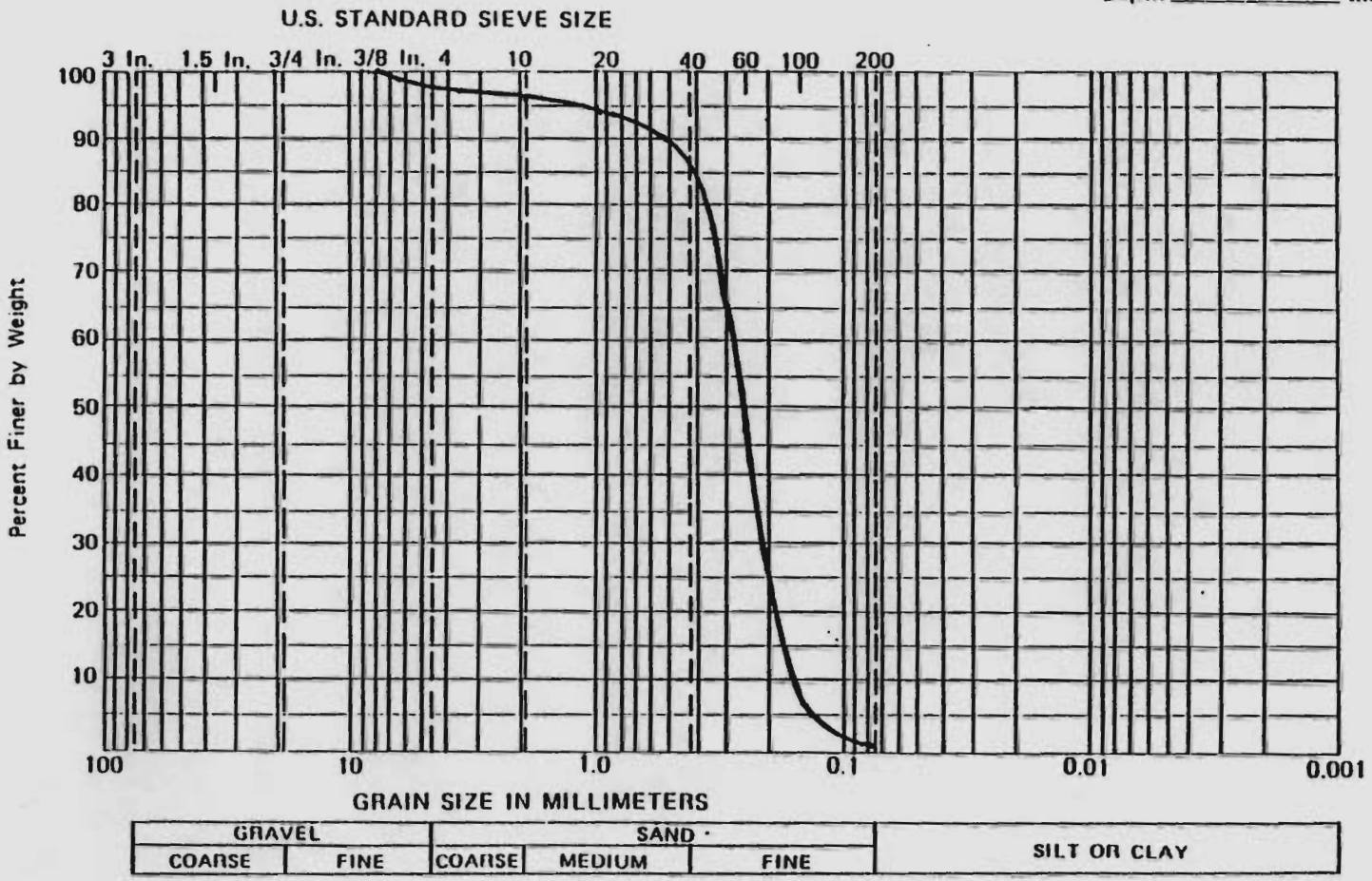


Figure 3-12

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Korkay

Boring No. K-3 Sample No. 4

Depth 14.5-16.5 Elevation _____

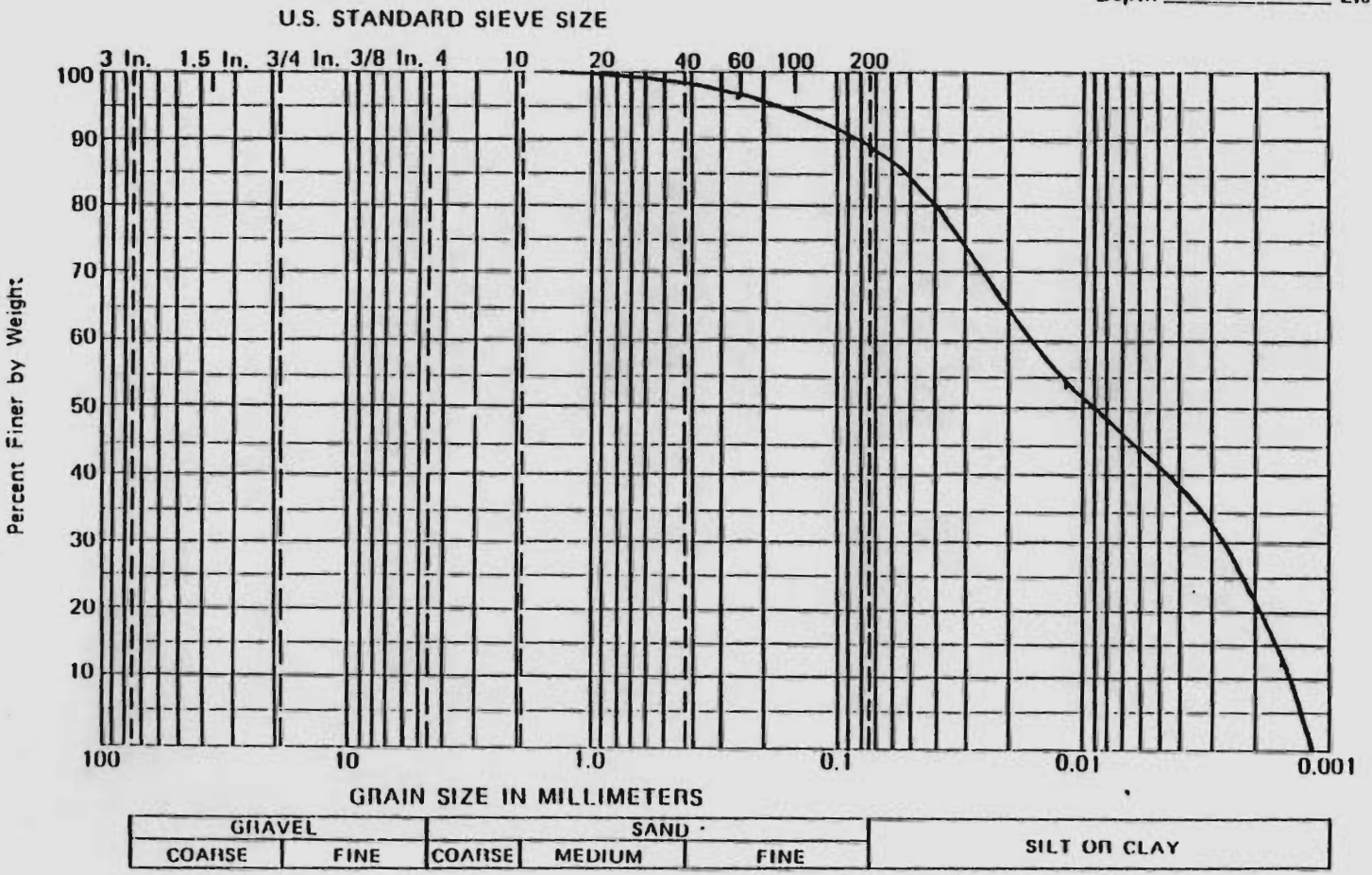
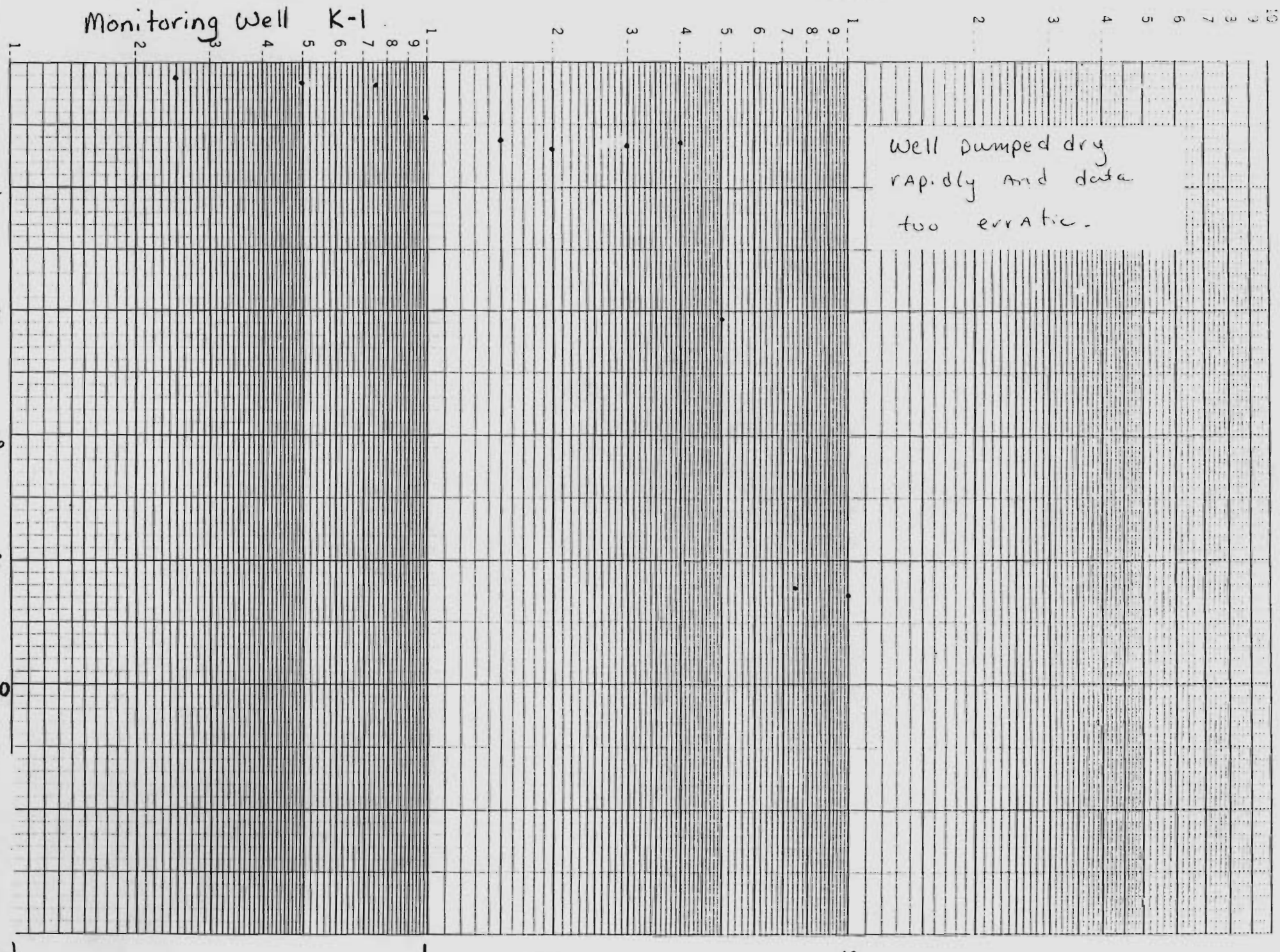


Figure 3-13

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

46 5490

Monitoring Well K-1



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

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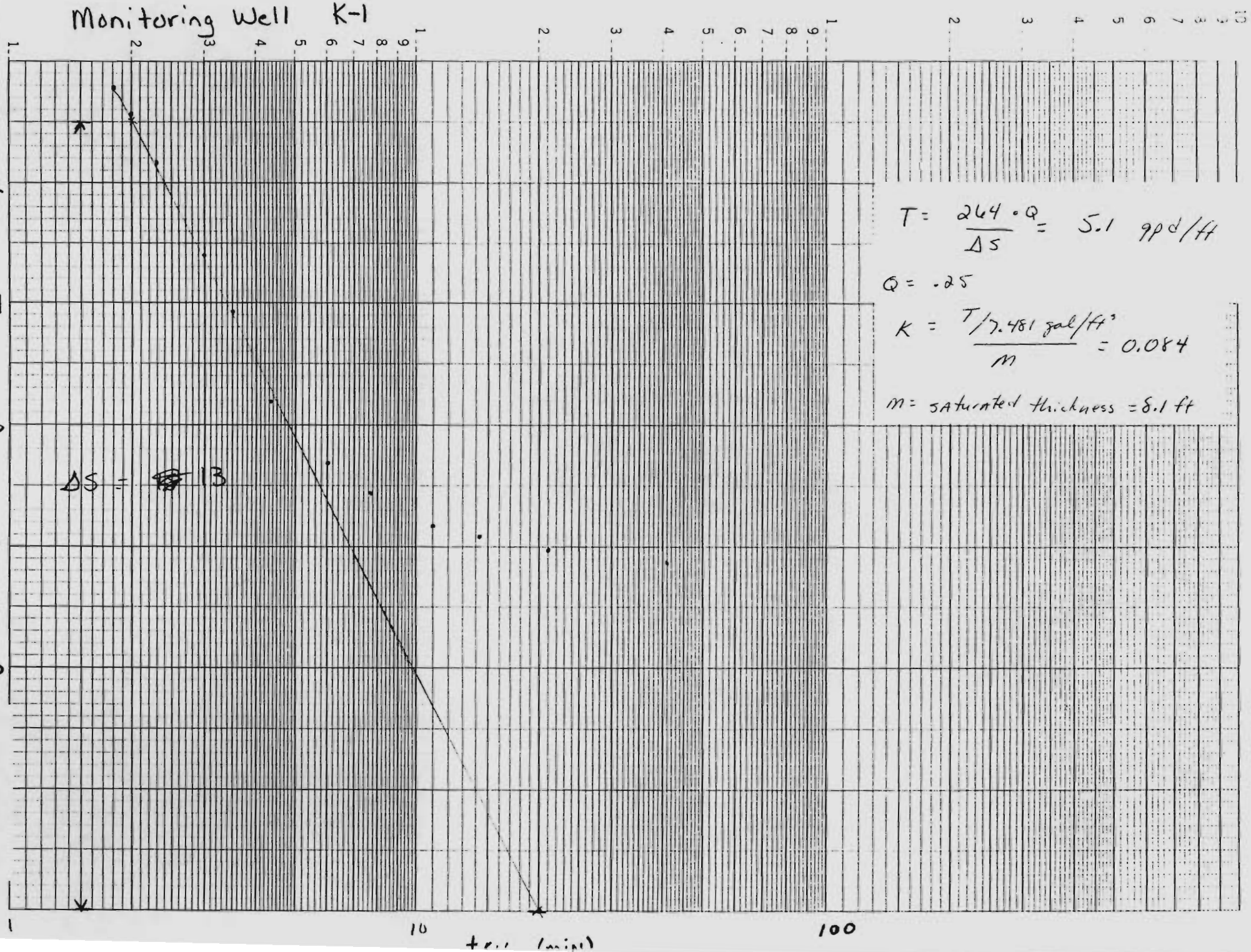
Monitoring Well K-1



$T = \frac{264 \cdot Q}{\Delta s} = 5.1$ gpd/ft

$Q = .25$

$K = \frac{T / 7.481 \text{ gal/ft}^3}{m} = 0.084$

m = saturated thickness = 8.1 ft

$\Delta s = 1.3$

K·E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
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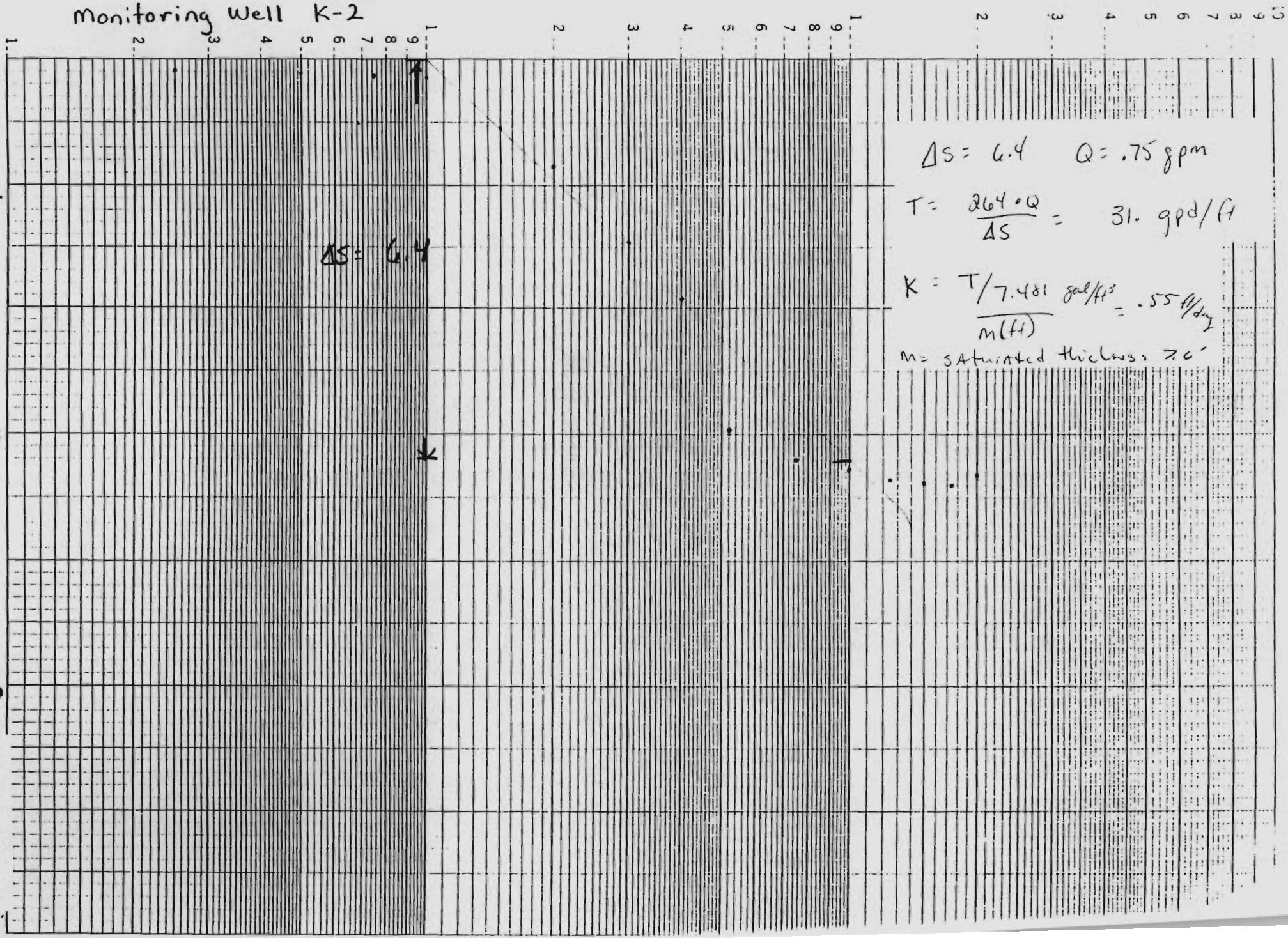
46 5490

Monitoring Well K-2



$\Delta S = 6.4$ $Q = .75$ gpm

$T = \frac{264 \cdot Q}{\Delta S} = 31.$ gpd/ft

$K = \frac{T / 7.481 \text{ gal/ft}^3}{m(ft)} = .55 \text{ ft/day}$

m = saturated thickness 7.0'

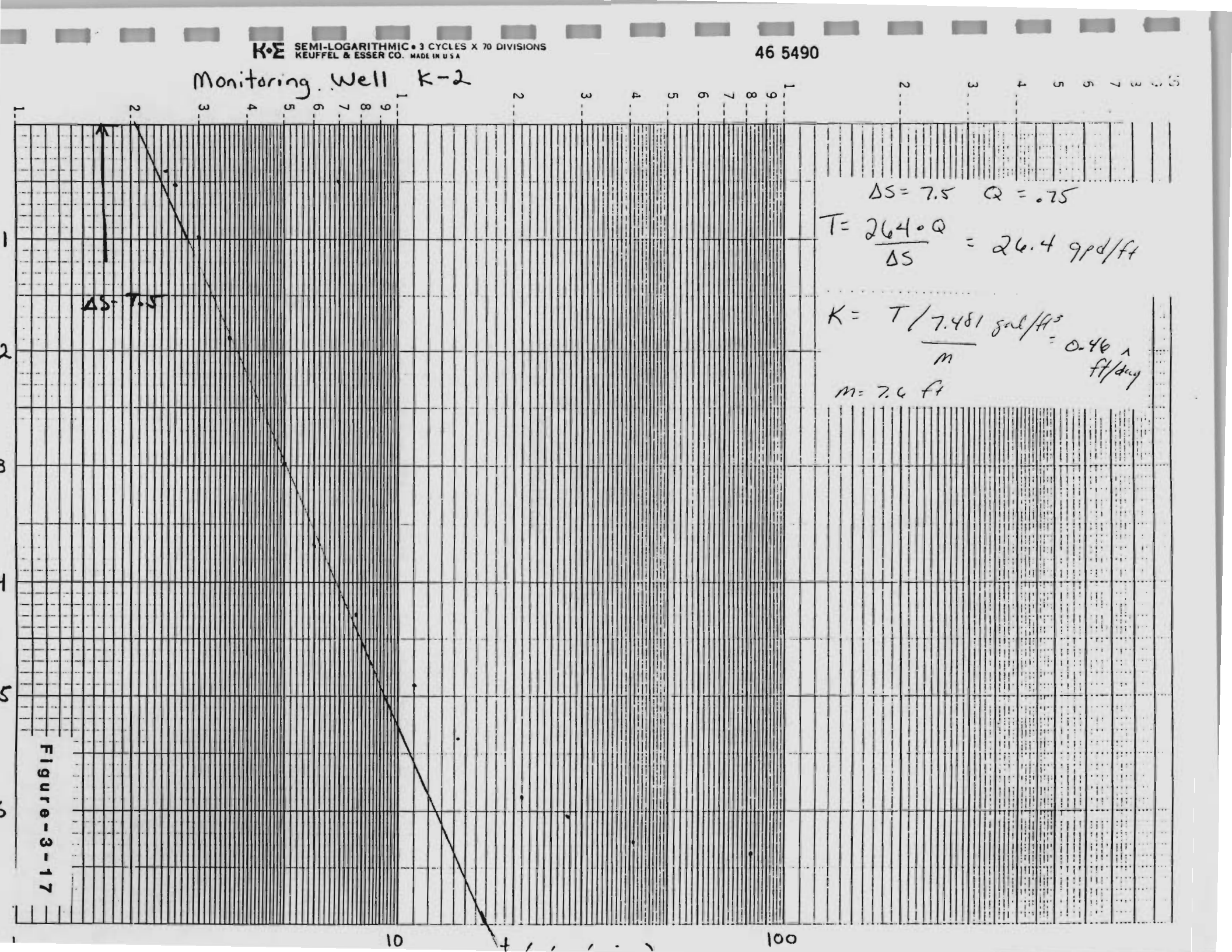

K•E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
Monitoring Well K-2
ΔS = 7.5
ΔS = 7.5 Q = .75
T = 264 • Q / ΔS = 26.4 gpd/ft
K = T / 7.481 gal/ft³ / m = 0.46 ft/day
m = 7.6 ft
10
100
t

Figure-3-17

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

46 5490

Monitoring Well K-3

Pumping data to erratic to evaluate!

0.1 1 10

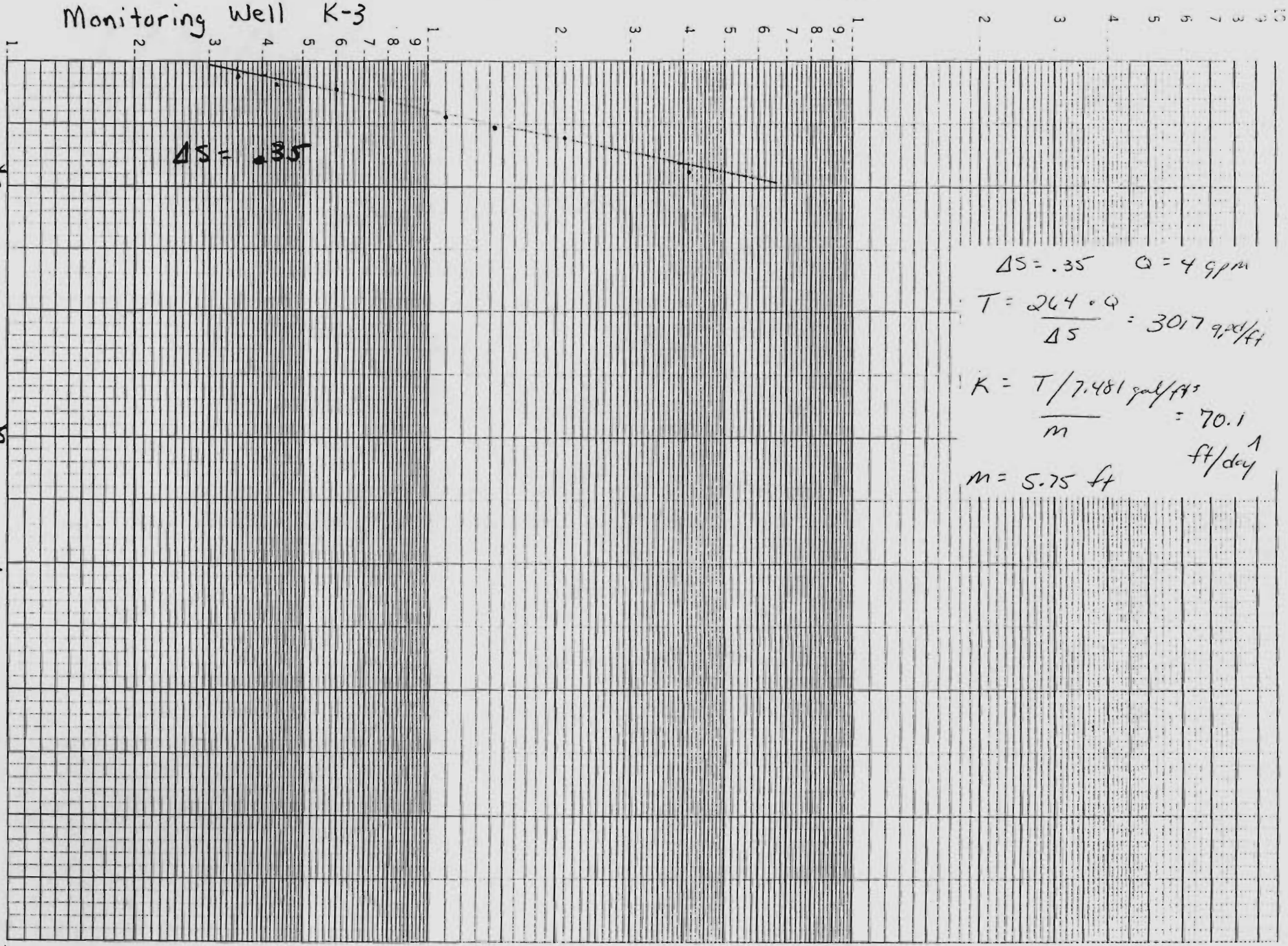
Time (min)

Figure 3-18

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

46 5490

Monitoring Well K-3



$\Delta s = .35$ $Q = 4$ gpm

$T = \frac{264 \cdot Q}{\Delta s} = 3017$ gal/ft

$K = \frac{T / 7.481 \text{ gal/ft}^3}{m} = 70.1$ ft/day

$m = 5.75$ ft

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Korkay

Well No: K-1 Gauge Date: 11/21/85 Time: 1000

Weather: Cloudy, cold 37°

Well Condition: Well locked, no evidence of tampering. Cement solid, no cracks

Well Diameter (inches): 2" pvc well, 7" bore hole

Odor (describe): None. HNU: background = .6, over well = .6

Sounding Method: — Measurement Reference: Top Pvc / Ground Sur

Well Depth (ft): 16.65/14.0' (1) Purge Date: 11/21 Time: 1025

Depth to Liquid (ft): 8.55/5.9 (2) Purge Method: Centrifugal Pump

Depth to Water (ft): 5.9 (3) w/ 1/2" poly tubing

Liquid Depth, (2)-(1): 8.1 (4) Purge Rate (gpm): 2 gpm

Liquid Volume, (4)xF (gal): 4 (5) Purge Volume (gal): 11

Did Well Pump Dry?, Describe: Well pumped dry after 5 gal. Waited 15 min then pumped out 6 more gal.

Samplers: T Porter / E. Bidwell

Sampling Date: 11/21/85 Time: 1245

Sample Type: G.(a) Split? No With Whom?

Comments and Observations: All bailers clear. Specific Conductance - 280

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Converstion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Kockay

Well No: K-2 Gauge Date: 11/21/85 Time: 1040

Weather: Cloudy, cold ~ 37°

Well Condition: No evidence of tampering, well locked, cement solid

Well Diameter (inches): 2" Dia / 7" bore hole

Odor (describe): Sweet chemical smell, HNU: b.g. = 1.8, over well = 2.8

Sounding Method: — Measurement Reference: Top of Protective Csg

Well Depth (ft): 16.31/14.5 (1) Purge Date: 11/21/85 Time: 1050

Depth to Liquid (ft): 7.76/5.95 (2) Purge Method: Centrifugal pump

Depth to Water (ft): 5.95 (3) —

Liquid Depth, (2)-(1): 8.55 (4) Purge Rate (gpm): 1.5

Liquid Volume, (4)xF (gal): 4.25 (5) Purge Volume (gal): 10.5

Did Well Pump Dry?, Describe: Well pumped dry after 7 gal whiked 15 minutes then pumped another 3.5 gal

Samplers: T. Poeree/ E. Bowell

Sampling Date: 11/21/85 Time: 1305

Sample Type: G.W Split? No With Whom? —

Comments and Observations: Probes were silt free, water has yellowish color. Spec Cond. 530

Stickup - 1.81

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Converstion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Koppers

Well No: K-3 Gauge Date: 11/21/85 Time: 1130

Weather: Cloudy, cold ~37°

Well Condition: Well locked, no evidence of tampering, Cement + grout solid. Blacktop surrounding well is stained with fuel oils

Well Diameter (inches): 2" PVC / 7" bore hole

Odor (describe): slight septic. HNU: BG = 2.6, over well = 5.2

Sounding Method: Measurement Reference: Top of PVC/G.S.

Well Depth (ft): 14.05/13.8 (1) Purge Date: 11/21/85 Time: 1125

Depth to Liquid (ft): 7.57/6.52 (2) Purge Method:

Depth to Water (ft): 6.52 (3)

Liquid Depth, (2)-(1): 7.28 (4) Purge Rate (gpm): 1.5

Liquid Volume, (4)xF (gal): 3.64 (5) Purge Volume (gal): 17 gal

Did Well Pump Dry?, Describe: Well did not pump dry. Pumped at ~1.5 gpm because pump was not pumping well.

Samplers: T. Poetzl / E. Bidwell

Sampling Date: 11/21/85 Time: 1330

Sample Type: E.W. Split? n/a With Whom?

Comments and Observations: Water was clear

Spec Cond. 410

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Converstion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: KleKay

Well No: KYU-1 Gauge Date: ___ Time: ___

Weather: Cool, cloudy ~37°

Well Condition: Town well; enclosed; North Second Ave.

Well Diameter (inches): 10" open hole in bedrock

Odor (describe): Sulfur

Sounding Method: — Measurement Reference: GS

Well Depth (ft): 300' (1) Purge Date: — Time: —

Depth to Liquid (ft): — (2) Purge Method: Let top run for a

Depth to Water (ft): — (3) few minutes

Liquid Depth, (2)-(1): — (4) Purge Rate (gpm): —

Liquid Volume, (4)xF (gal): — (5) Purge Volume (gal): —

Did Well Pump Dry?, Describe: —

Samplers: T. Porter / E. Bidwell

Sampling Date: 11/21/85 Time: 1420

Sample Type: G (1) Split? No With Whom? ___

Comments and Observations: Water clear. Spec Cond - 310

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Converstion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Korkay

Well No: K-2 Gauge Date: 4-20-87 Time: 1230 hrs.

Weather: Sunny ~70° F

Well Condition: Locked, secure

Well Diameter (inches): 2" PVC well

Odor (describe): None no HNu above background

Sounding Method: QED Measurement Reference: Top PVC

Stick up/down (ft): 1.81

(1) Well Depth (ft): 16.31 Purge Date: 4-20-87 Time: 1245

(2) Depth to Liquid (ft): 7.10 Purge Method: Centrifugal pump

(3) Depth to Water (ft): 7.10 Purge Rate (gpm): 2 gpm

(4) Liquid Depth [(1)-(2)]: 9.21 Purge Time (min): 6 min.

(5) 1 Borehole Liquid Volume [(4)xF] (gal): 5.70 Purge Volume (gal): 12 gal.

Did Well Pump Dry? Describe: Pumped dry after 6 gal.
waited 15 min. Pumped dry again

Samplers: Lori Rogers & Tom Porter

Sampling Date: 4-20-87 Time: 1322 hrs.

Sample Type: Grab Teflon Bailer Split? No With Whom:

Comments and Observations: All bailer clear, Spec. Cond. 480

FIGURE 3-24

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

* Multiply liquid depth by gallons/ft.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Kerkay

Well No: K-3 Gauge Date: 4-20-87 Time: 1330 hrs.

Weather: Sunny ~70°F

Well Condition: Not locked, cap broken

Well Diameter (inches): 2" well in 7" Borehole

Odor (describe): None

Sounding Method: OED Measurement Reference: Top of PVC

Stick up/down (ft): 1.05'

(1) Well Depth (ft): 14.05 Purge Date: 4-20-87 Time: 1340 hrs.

(2) Depth to Liquid (ft): 6.52 Purge Method: Centrifugal pump

(3) Depth to Water (ft): 6.52 Purge Rate (gpm): 2.5 gpm

(4) Liquid Depth [(1)-(2)]: 7.53 Purge Time (min): 10 m.n.

(5) ✓ Liquid Volume [(4)xF] (gal): 4.66 Purge Volume (gal): 25 gal.
1 Borehole

Did Well Pump Dry? Describe: Discharge clear, no HNu reading Above background.

Samplers: Lori Rogers / Tom Porter

Sampling Date: 4-20-87 Time: 1355 hrs.

Sample Type: Grab Split? No. With Whom:
Teflon Bailer

Comments and Observations: All bailers clear, spec. cond. 200.

FIGURE 3-25

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

* Multiply liquid depth by gallons/ft.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Korkay, Inc.

Well No: KTW-1 Gauge Date: 4-20-87 Time: _____

Weather: Sunny ~ 70° F.

Well Condition: Supply well, in locked house on N. Second Ave.

Well Diameter (inches): 10"

Odor (describe): _____

Sounding Method: – Measurement Reference: Ground Surface

Stick up/down (ft): _____

(1) Well Depth (ft): ~ 300' Purge Date: _____ Time: _____

(2) Depth to Liquid (ft): _____ Purge Method: _____

(3) Depth to Water (ft): _____ Purge Rate (gpm): _____

(4) Liquid Depth [(1)-(2)]: _____ Purge Time (min): _____

(5) Liquid Volume [(4)xF] (gal): _____ Purge Volume (gal): _____

Did Well Pump Dry? Describe: Tap was allowed to run for several min.

Samplers: Lori Rogers / Tom Porter

Sampling Date: 4-20-87 Time: 1445 hrs.

Sample Type: Grab. Split? _____ With Whom: _____

Comments and Observations: _____

FIGURE 3-26

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

* Multiply liquid depth by gallons/ft.

4. SITE ASSESSMENT - KORKAY, INC.

4.1 SITE HISTORY

The Korkay site is located at 70 West Main Street, Broadalbin, Fulton County, New York, on property owned by Perma Glaze Chemical Corp. The Korkay firm is a chemical supply company which buys and stores bulk chemicals from major chemical companies and blends or repackages these chemicals (detergents, solvents, etc.) into automotive products (Appendix 1.4.1-1). Korkay distributes automotive chemical products such as car waxes, spray cleaners, and hand cleaners (Appendixes 1.4.1-2 and 1.4.1-3). Barrels are used to distribute some of the final products.

Korkay obtains used barrels and stores them on site prior to sending them out to Frederickson-Cooperage of Waterford, New York to be washed (Appendix 1.4.1-4). Between 1969 and 1980, Korkay washed and relined the previously used barrels on site. In August 1979, personnel from the Regional New York State Department of Health (NYSDOH), and the Regional New York State Department of Environmental Conservation (NYSDEC) performed a site inspection at the Korkay site. They observed residue from the stored barrels leaking onto the ground, creating puddles (Appendixes 1.4.1-5 and 1.4.1-6). The barrel washwater, together with washwater from spill cleanup, and vat cleaning were discharged to the septic system. A neighbor indicated Korkay washed used barrels for a period of 8-9 years. The previous contents of the used barrels is unknown. Some of these barrels may have contained acetone, isopropyl alcohol, degreasers, perfumes, and other chemicals (Appendixes 1.4.1-5 through 1.4.1-7).

At the end of 1979, Korkay, Inc. installed a 4,000-gallon holding tank and no longer discharges wastewater to the septic tanks (Appendixes 1.4.1-8 and 1.4.1-9). The wastes from holding tanks are hauled away under manifest by EWS of Watervliet, New York to Connecticut (Appendix 1.4.1-4). Neighbors have complained of dying trees along their property which borders the barrel storage area (Appendix 1.4.1-5).

The site was a leather operation from 1887 to 1964. At the time Crosley Glove Company, of Gloversville, New York owned the property.

4.2 SITE TOPOGRAPHY

The Korkay site is situated on an approximately 1-acre parcel of property, of which about one-third is occupied by the plant building. The site is relatively flat with poor drainage. During wet periods of the year, there is standing water behind the building. To improve drainage, Korkay, Inc. constructed their own storm sewer consisting of cut-open 15-gallon drums placed end to end and filled with crushed stone in a backfilled 4-ft deep trench (Figure 1-2). The trench is located along portions of the perimeter of the property, starting midway on the west side and ending at the northeast corner in a dry well.

There are five septic tanks on the property, two of which are still active. The one in the southwest portion of the site has been replaced (Summer 1985) with a new 1,000-gallon tank. There were five buried tanks used for storing fuel oil and bulk chemicals, four are located on the west side and one under the south end of the building (Figure 1-2). During the Summer 1985, two of the

tanks (mineral spirits bulk storage) on the west side of the property were removed and a larger tank was installed above ground in the same general vicinity. The used and washed barrels are stored on site, mainly on the west and north sides of the property.

The nearest downgradient surface water is the Kennyetto Creek, located approximately 600 ft south of the site. Kennyetto Creek flows southwest past the site, then at Vail Mills it flows north-northeast and discharges into Sacandaga Reservoir. The nearest residence is adjacent and west of the site; a church is located adjacent and east of the site. The nearest commercial building is located about 100 ft north of the site. The nearest community wells are the Village of Broadalbin wells located on North Second Avenue and South Second Avenue, approximately 3,200 ft northwest and south of the site, respectively. The nearest private well is located approximately 1,700 ft west of the site on Route 155, outside the Village of Broadalbin corporate boundary (Appendix 1.4.2-1).

Three monitoring wells were installed during the Phase II investigation under EA's supervision. An offsite ambient monitoring well (K-1) is located northeast of the site on the Church property. The two onsite wells are located on the west side (K-2) and on the south side (K-3) (Figure 3-1, Locations).

4.3 SITE HYDROGEOLOGY

The site is located in the north-central part of the Mohawk Valley in a sunken block or graben consisting of Cambrian and Ordovician Age limestone and shale. The overburden in the area is glacial outwash and ground moraine till. The

overburden in the area appears to average 30-35 ft in thickness. The till is used as a source of domestic water supply while the outwash deposits are capable of supplying a much larger quantity of water. The Cambrian Age Little Falls Dolomite contains numerous joints and fractures enlarged by solution channels. This formation also supplies moderate to large quantities of water. The wells in the Little Falls Dolomite range in depth from 42 to 301 ft and average 124 ft in depth (Appendix 1.4.3-1).

The site vicinity is underlain by glaciolacustrine deposits of sand, silt, and clay (Appendix 1.4.3-2). Based upon the test borings/monitoring wells (Nos. K-1, K-2, and K-3) installed during the Phase II investigation (Figure 3-1, Locations), the site is directly underlain by unconsolidated sediment comprised of 7-12 ft of fine sand with some medium sand and silt, underlain by silt and clay. Each of the borings/wells were completed approximately 15 ft below ground surface in unconsolidated material in the first ground water encountered. Therefore, the specific composition and extent of the unconsolidated sediment below 15 ft is unknown at the site. Boring logs and grain size analysis curves for selected sediment samples from the borings are provided in Figures 3-2 to 3-13. Based upon the monitoring wells installed for this Phase II study, the depth to ground water at the site ranges from 5 to 7 ft below grade. Based upon the 9 October water level measurements in the three monitoring wells, the water table slopes slightly toward the south-southeast to southeast. However, water level measurements obtained on 14 and 21 November 1985 indicate that the water table slopes gently toward the east and northeast (Table 3-1, Summary of Well Data, and Figure 4-1). This could be caused by mounding of ground water at the site due to use of the septic system near Well K-2, however, this cannot be confirmed because of the small database. Prior to

sampling of the monitoring wells on 21 November 1985, Well K-1 was not in an upgradient position. The glacial deposits are underlain by dolomite bedrock of the Cambrian Age Little Falls Formations (Appendix 1.4.3-1). Several published logs of wells in the vicinity of the site indicate that the wells are completed in the Dolomite bedrock. Well No. 152, located approximately 1 mi northeast of the site, has a reported depth to bedrock of 35 ft and is completed to a depth of 300 ft. Well No. 121, located approximately 1 mi southwest of the site, has a reported depth to bedrock of 30 ft and is completed to a depth of 68 ft. The Town of Broadalbin well, located approximately 3,200 ft northwest of the site, has a depth to bedrock of 23 ft through sand and is completed to a depth of 310 ft (Appendixes 1.4.3-1 and 1.4.3-3).

The geophysical surveys conducted during the Phase II investigation indicate four zones of anomalous conductivity. However, the entire site could not be evaluated due to interference from above and below ground structures (Appendix 1.3.2-1).

A short-term, low-yield, pumping test was performed in each of the three borings/monitoring wells. The summary of the resultant estimates of the aquifer characteristics are provided in Table 4-1. Wells K-1 and K-2 screen mainly a fine sand and silt, while Well K-3 screens a medium to fine sand lens and only a small portion of the silt deposit. Calculations of transmissivity (T) and permeability (K) are based on Jacob's modification of the Theis equation (Appendix 1.4.3-6).

The Village of Broadalbin is on public water served by two supply wells, both of which are located within a 1-mi radius of the site. This water system serves 1,500 people (Appendix 1.4.3-4). One well is located about 3,200 ft northwest of the site and is completed in dolomite bedrock. The other well is located approximately 3,200 ft south of the site on the opposite side of Kennyetto Creek just south of the Village boundary, and is screened in a sand and gravel deposit just above dolomite bedrock. These wells are pumped alternately, the south well is pumped 14 hours during the day at 50 gpm, the north well is then pumped through the night at a rate of 250 gpm (Appendix 1.4.3-5). Outside of the village, within a 3-mi radius, are several reported community and domestic wells both in glacial deposits and dolomite bedrock. There are probably numerous unreported private domestic wells as well (Appendixes 1.4.3-1 and 1.4.3-4).

Based on available data, the glaciolacustrine unconsolidated sediment is apparently in hydraulic connection with the underlying bedrock within the 3-mi radius of the site (e.g., Appendix 1.4.3-5, 23 ft of sand overlying carbonate bedrock at the Village of Broadalbin North Second Avenue well). Therefore, for the purpose of HRS, the unconsolidated sediment and the carbonate bedrock are considered as the aquifer of concern. The overburden portion of the aquifer of concern is bounded by the Kennyetto Creek to the south and west, the Sacandaga Reservoir to the north, and the 3-mi radius to the east. The carbonate bedrock portion of the aquifer of concern is bounded by shale bedrock to the west, the Sacandaga Reservoir to the north, and the 3-mi radius south and east.

4.4 SITE CONTAMINATION

Waste Types and Quantities

Korkay, Inc. has discharged wastewater from a barrel washing operation, together with washwater from spills cleanup, and vat cleaning to the septic system and the ground at the site (Appendixes 1.4.1-4 through 1.4.1-6). The exact type and quantities are unknown, however, hazardous wastes are suspected.

Ground Water

A sample of ground water from the Village of Broadalbin on North Second Avenue was collected by the NYSDOH on 31 August 1981. The sample was analyzed for 40 organic volatile, and semi-volatile compounds, and 6 pesticide/PCBS. All the constituents analyzed were reported to be below the minimum detection levels (Appendix 1.4.4-1).

A sample of ground water from the three Phase II monitoring wells and the Village of Broadalbin, located on North Second Avenue approximately 3,500 ft northwest of the site, was initially collected by EA personnel on 21 November 1985. The analytical program for the four ground-water samples included the inorganic parameters and the organic compounds of the Hazardous Substance List. Due to missed holding times, the wells were resampled on 20 April 1987 and analyzed for Base Neutral/Acid Extractable Organics and Pesticides of the Hazardous Substance List. The upgradient Well K-1, located on the church property adjacent to the site at the edge of a parking area, no longer existed. The steel casing and PVC well stickup had apparently been

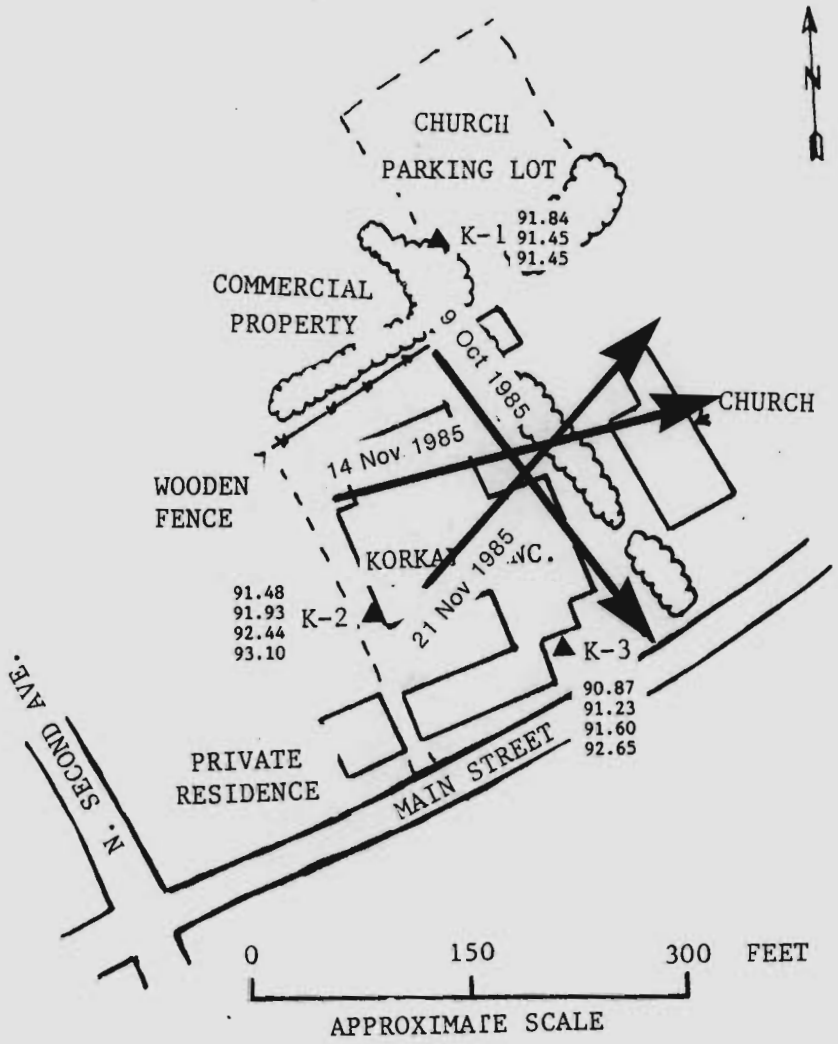
removed. The two wells (K-2 and K-3) onsite were still intact, however, the locking cap on Well K-3 was broken, apparently during snow removal over the winter and was no longer secure.

The following were detected in the samples collected 21 November 1985 from monitoring Well K-2: acetone (150 ppb); 1,1,1-trichloroethane (780 ppb); trichloroethene (130 ppb); and O&P-xylenes (94 ppb). Well K-2 is located within about 10 to 15 ft of two below ground mineral spirits storage tanks that have since been abandoned and removed by the owner. In the 21 November 1985 sample from monitoring Well K-3, tetrachloroethane (49 ppb) was detected. Acetone and 1,1,1-trichloroethane were detected in trace concentrations in the trip blank, however, the concentration for these compounds in Well K-2 sample was approximately 10 and 100 times higher, respectively. (Acetone was used for cleaning of sampling equipment as required by NYSDEC between wells.) No volatile organic compounds were detected in monitoring Well K-1 or Village of Broadalbin Well KTW-1 above the concentrations detected in the trip blank or method blank.

Chlordane (7.6 ppb) detected in the sample from Well K-2, collected during resampling on 20 April 1987, is above New York State Drinking Water Standards for ground water. No other semi-volatile organics, pesticides, or PCB's were detected in any of the samples. A sample from Well K-1 could not be collected during the 20 April 1987 resampling because the well no longer existed at the time. For metals, iron was detected in concentrations above drinking water standards in Wells K-1, K-2, and K-3, and manganese was detected above the standard in samples from Wells K-2 and K-3 (Appendix 1.4.4-2) (Table 4-2, Summary of Data for Samples Collected on 21 November 1985 and 20 April 1987).

Surface Water

Surface water samples were not collected from Kennyetto Creek during the Phase II investigation because there did not appear to be a direct route to surface water from the site. There was no data available on past sampling of surface water for the site.



Note: Map modified from 21 June 1984 aerial photo (enlarged).

LEGEND

Groundwater flow direction (date measured)

10/09/85
11/14/85
11/21/85
04/20/87
Dates of groundwater elevation measurements

Figure 4-1. Groundwater flow direction.

TABLE 4-1 KORKAY SITE: SUMMARY OF ESTIMATED AQUIFER CHARACTERISTICS

Well No.	Pump Rate (gpm)	Drawdown Phase		Residual Drawdown Phase	
		Transmissivity$^{(T)}$ (gpd/ft)	Permeability$^{(K)}$ (ft/day)	Transmissivity$^{(T)}$ (gpd/ft)	Permeability$^{(K)}$ (ft/day)
K-1	0.25	** Well pumped dry in 5 minutes		5.1	8.4×10^{-2}
K-2	0.75	31.0	5.5×10^{-1}	26.4	4.6×10^{-1}
K-3	4.0	*	*	3,017	70.1

* Pumping test data too erratic to evaluate.

** Data obtained appears to be directly related to the evacuation of the water in the well casing.

NOTE: Calculation of Transmissivity (T) and Permeability (K) are based on Jacob's modification of the Theis equation (Appendix 1.4.3-6).

TABLE 4-2 SUMMARY OF ANALYTICAL DATA FOR KORKAY SITE GROUND-WATER SAMPLES COLLECTED 21 NOVEMBER 1985 AND 20 APRIL 1987

Parameters	Trip Blank	KTW-1	K-1	K-2	K-3	New York State Potable Ground-Water Standards	Method Blank 11-25-85
Volatiles (ug/liter) (11-21-85)							
Methylene Chloride	9B	12B	BCRDL	BDL	BCRDL		BCRDL
Acetone	12	BCRDL	17	150	16		
2-Butane			BCRDL		BCRDL		BCRDL
1,1,1-Trichloroethane	8			780			
Trichloroethene				130	BCRDL		
Tetrachloroethane					49		
Toluene					BCRDL		
O&P-Xylenes				94	BCRDL		
1,1-Dichloroethane				BDL			
Trans-1,2-Dichloroethane				BDL	BCRDL		
Pesticides (ug/liter) (4-20-87)							
Chlordane			*	7.6		0.10	
Metals (mg/liter) (11-21-85)							
Aluminum			3.20	0.40			
Barium		0.20	0.04			1.00	
Calcium		33.0	30.0	42.0	42.0		
Chromium Total			.004	.012		0.05	
Copper			.008	.009		1.00	
Iron		0.18	2.00	6.60	7.40	0.30	
Magnesium		12.40	3.30	9.90	4.50		
Manganese		0.03	0.11	0.66	0.53	0.30	
Potassium		1.00	1.00	6.00	4.00		
Sodium		1.00	21.0	31.0	21.0		
Zinc		0.02		0.03		5.00	
Lead				.004		.025	

NOTE: 1. The analytical program included the full Hazardous Substance List (HSL); however, this summary includes only those parameters detected in at least one sample. Refer to Appendix 3 for the full CLP analytical (bound separately). 2. BCRDL = Detected below contract required detection limit. BDL = Detected below detection limit (affected by dilution). B = detected in the method blank.

* Not sampled. Well destroyed.

5. NARRATIVE SUMMARY

The Korkay site is one acre in size on property owned by Korkay, Inc. located in the Village of Broadalbin, Fulton County, New York. Korkay, Inc. is a chemical supply company which blends and repackages basic chemical products into products for the automotive trade. Korkay, Inc., of which Mr. Thomas Kline is President, began operations at the site in 1969. Crosley Glove Company, now located in Gloversville, New York, operated a leather operation at the site between 1887 and 1964.

Korkay, Inc. purchases used barrels in which to package some of their final products, and stores them on site. Between 1969 and 1980, the used barrels were washed on site. The barrel washwater, together with washwater from spills cleanup and vat cleaning, were discharged to the septic system. NYSDEC personnel noticed some leakage onto the ground as well. NYSDEC Region 5 required Korkay, Inc. to cease discharge of wastewater to the ground and septic system. In 1980 Korkay, Inc. installed a 4,000-gallon holding tank to contain vat cleaning and spill cleanup washwater, which is then removed by a liscensed hauler. Also in 1980, Korkay began sending the used barrels to be washed off site. Five buried tanks at the site were used for storing fuel oil and bulk chemicals. Korkay, Inc. replaced two tanks with an above ground tank in 1985.

Analysis of samples collected by EA from onsite monitoring wells, detected several organic compounds in the ground water. An estimated population of 4,078 is supplied by wells drawing from the aquifer of concern within a 3-mile radius of the site.

COORDINATES
LATITUDE: 43° 03' 28"
LONGITUDE: 74° 12' 02"

KORKAY SITE

BROADALBIN QUAD

7.5 MINUTE SERIES

Facility name: Korkay, Inc.

Location: 70 West Main, Broadalbin, Fulton County, New York

EPA Region:

Person(s) in charge of the facility: Mr. Thomas Kline, President

Name of Reviewer: Tom Porter Date: 15 April 1986

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Korkay, Inc. is a chemical blending and repackaging company which purchases used barrels and stores them on site. A barrel washing operation was performed at the site in the past and the wash water was discharged to the septic system with some leakage onto the ground. Ground-water contamination is of major concern.

Scores: S_M = 38.08 (S_{gw} = 65.62 S_{sw} = 5.84 S_a = 0)

S_{FE} = N/A

S_{DC} = 37.5

FIGURE 1
HRS COVER SHEET

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)	
1 Observed Release	(0) 45	1	0	45	3.1	
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 Route Characteristics					3.2	
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6		
Net Precipitation	0 1 2 (3)	1	3	3		
Permeability of the Unsaturated Zone	0 1 2 (3)	1	3	3		
Physical State	0 1 2 (3)	1	3	3		
Total Route Characteristics Score			15	15		
3 Containment	0 1 2 (3)	1	3	3	3.3	
4 Waste Characteristics					3.4	
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18		
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8		
Total Waste Characteristics Score			19	26		
5 Targets					3.5	
Ground Water Use	0 1 2 (3)	3	9	9		
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 (35) 40	1	35	40		
Total Targets Score			44	49		
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			37,620	57,330		
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 65.62			

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45		1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.						
2 Route Characteristics						4.2
Facility Slope and Intervening Terrain	0 (1) 2 3		1	1	3	
1-yr. 24-hr. Rainfall	0 (1) 2 3		1	1	3	
Distance to Nearest Surface Water	0 1 2 (3)		2	6	6	
Physical State	0 1 2 (3)		1	3	3	
Total Route Characteristics Score				11	15	
3 Containment	0 1 2 (3)		1	3	3	4.3
4 Waste Characteristics						4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)		1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8		1	1	8	
Total Waste Characteristics Score				19	26	
5 Targets						4.5
Surface Water Use	0 1 (2) 3		3	6	9	
Distance to a Sensitive Environment	0 1 2 3		2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40		1	0	40	
Total Targets Score				6	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				3,762	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{SW} =	5.85		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. Section)
[1] Observed Release	(0) 45	1	0	45	5.1
Date and Location:					
Sampling Protocol:					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a = 0			

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	65.62	4,306.0
Surface Water Route Score (S_{sw})	5.84	34.11
Air Route Score (S_a)	0.00	0.0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		4,340.1
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		65.88
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		38.08

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet N/A					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} = N/A			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 (3)	1	3	3	8.2
3 Containment	0 (15)	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 (3) 4 5	4	12	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			12	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			8,100	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 37.5		

FIGURE 12
DIRECT CONTACT WORK SHEET

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: As briefly as possible, summarize the information you used to assign the score for each factor (e.g., "waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

FACILITY NAME: Korkay, Inc.

LOCATION: 70 West Main Street, Broadalbin, Fulton County, New York

DATE SCORED: 15 April 1986

PERSON SCORING: Thomas Porter

PRIMARY SOURCE(S) OF INFORMATION (e.g., EPA region, state, FIT, etc.)

EA Science and Technology Phase II field activities.
New York State Department of Environmental Conservation files.
Site Owner.

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

Air.

COMMENTS OR QUALIFICATIONS:

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

1,1,1-Trichloroethene	Trichloroethene
Tetrachloroethane	O&P-Xylenes
Chlordane	

Rationale for attributing the contaminants to the facility:

None of these parameters were detected in Well k-1, but were detected in either the onsite Well K2 or K3. Well K-1 is in ambient location. However, there is a question whether a source is upgradient of the site.

Assigned value = 0.

References: 1 and 2.

***

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

The unconsolidated glacial outwash deposits and the underlying Little Falls dolomite.

Reference: 3.

Depth(s) from the ground surface to the highest seasonal level of the saturated zone (waste table[s]) of the aquifer of concern:

5-7 ft.

References: Table 3-1 and Section 4-3 of this report.

Depth from the ground surface to the lowest point of waste disposal/storage:

Ground surface. Depth to aquifer of concern = 5 ft.

Assigned value = 3.

Reference: 1.

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

45 in.

Reference: 4.

Mean annual lake or seasonal evaporation (list months for seasonal):

23 in.

Reference: 1.

Net precipitation (subtract the above figures):

22 in.

Assigned value = 3.

Reference: 1.

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Fine to medium sand.

Reference: Boring logs/well schematics, Figures 3-2 through 3-4 of this report.

Permeability associated with soil type:

$>10^{-3}$ cm/sec.

Assigned value = 3.

Reference: 1.

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Liquids.

Assigned value = 3.

Reference: 5.

***

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

In the past wastes were spilled on the ground surface and discharged to a septic system. No liner, or waste collection system.

References: 5 and 6.

Method with highest score:

No containment.

Assigned value = 3.

***

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Tetrachloroethane, Trichloroethene, Chlordane, O&P-Xylenes.

Reference: 2.

Compound with highest score:

Tetrachloroethane.

Assigned value = 18.

Reference: 7.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Exact quantity unknown.

Assigned value = 1.

Reference: 1.

Basis of estimating and/or computing waste quantity:

The quantity of hazardous waste discharged at the site is unknown. However, a release was observed in the ground water from the onsite wells, indicating some quantity of hazardous waste was discharged. The minimum quantity greater than zero was assumed.

Reference: 2.

***

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Both the glacial deposits and the carbonate bedrock in the 3-mi radius of the site are used as a domestic and public supply of drinking water.

References: 3 and 9.

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

A home is located on Route 155 approximately 1,700 ft west of the site, but not in the Village of Broadalbin.

Reference: 9.

Distance to above well or building:

1,700 ft.

Assigned value = 4.

Reference: 1.

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

	Population
Broadalbin Village Water Works	1,500
Artweld Trailer Park	75
Indian Village Trailer Court	145
Little Acres Mobile Homes	30
Murphy's Mobile Home Park, Inc.	54
Countryside Mobile Estates	48
Northway Mobile Home Park	250
Perth Center Mobile Court	75
Subtotal	2,177
520 private homes x 3.8 =	1,976
Total	4,153

Broadalbin Village well on North Second Avenue draws from a well completed in the carbonate bedrock. The chief source for domestic water supply in the area is from wells in glacial deposits. Homes were counted only in the overburden portion aquifer of concern. It was assumed community wells which supply larger quantities of water are in the bedrock aquifer.

References: 3, 9, and 10.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

No land irrigated within 3-mi radius of the site.

Reference: 11.

Total population served by ground water within a 3-mile radius:

Assigned value = 4.

Reference: 1.

SURFACE WATER ROUTE

1 OBSERVED RELEASE

None observed.

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

Not applicable.

Rationale for attributing contaminants to the facility:

Not applicable.

***

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

<1 percent.

Reference: 12.

Name/description of nearest downslope surface water:

Kennyetto Creek, tributary to Sacandaga Reservoir.

Reference: 9.

Average slope of terrain between facility and above-cited surface water body in percent:

3 percent.

Reference: 12.

Is the facility located either totally or partially in surface water?

No.

Reference: 9.

Is the facility completely surrounded by areas of higher elevation?

No.

Assigned value = 1.

References: 1, 9, and 12.

1-Year, 24-Hour Rainfall in Inches

2 in.

Assigned value = 1.

Reference: 1.

Distance to Nearest Downslope Surface Water

600 ft.

Assigned value = 3.

References: 9 and 1.

Physical State of Waste

Liquid.

Assigned value = 3.

References: 5 and 1.

***

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

There was no containment of the wastes. Wastes discharged to the ground surface and septic system.

References: 5 and 6.

Method with highest score:

No containment.

Assigned value = 3.

Reference: 1.

***

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

Korkay, Inc. used mineral spirits and Butyl cellosolve in the blending process to make products. Used barrels were stored and washed on site. These barrels could have contained acetone and other chemicals. Barrel washwater, together with washwater from spills cleanup and vat cleaning, were discharged in the septic system. Trichloroethane, O&P-Xylenes, Tetrachloroethane, Chlordane, and 1,1,1-Trichloroethene were detected in onsite monitoring wells.

References: 2, 5, and 12.

Compound with highest score:

Chlordane.

Assigned value = 18.

Reference: 1.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Exact quantity unknown.

Assigned value = 1.

Reference: 1.

Basis of estimating and/or computing waste quantity:

The quantity discharged at the site is unknown. However, a release was observed to ground water, indicating some quantity of hazardous waste was discharged. The minimum quantity greater than zero was assumed.

Reference: 2.

***

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Recreation.

Assigned value = 2.

Reference: 1.

Is there tidal influence?

No.

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Not applicable.

Distance to 5-acre (minimum) freshwater wetland, if 1 mile or less:

None.

References: 13 and 14.

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None.

Reference: 15.

Population Served by Surface Water

Location(s) of water supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static waterbodies) downstream of the hazardous substance and population served by each intake:

None.

Reference: 10.

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre).

Zero.

Reference: 11.

Total population served:

Zero.

Assigned value = 0.

Reference: 1.

Name/description of nearest of above waterbodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles.

Not applicable.

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

No available data.

Date and location of detection of contaminants

Not applicable.

Methods used to detect the contaminants:

Not applicable.

Rationale for attributing the contaminants to the site:

Not applicable.

***

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable.

Most incompatible pair of compounds:

Not applicable.

Toxicity

Most toxic compound:

Not applicable.

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

***

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

Not applicable.

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Not applicable.

Distance to 5-acre (minimum) freshwater wetland, if 1 mile or less:

Not applicable.

Distance to critical habitat of an endangered species, if 1 mile or less:

Not applicable.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Not applicable.

Distance to national or state park, forest, or wildlife reserve if 2 miles or less:

Not applicable.

Distance to residential area, if 2 miles or less:

Not applicable.

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Not applicable.

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Not applicable.

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

Not applicable.

FIRE AND EXPLOSION

Not applicable based on information provided. A state or local fire marshall has not certified that the site presents a significant fire or explosion threat and no threat has been demonstrated based on field observations (e.g., combustible gas indicator readings are not provided). Reference = 17.

1 CONTAINMENT

Hazardous substances present:

Not applicable.

Type of containment, if applicable:

Not applicable.

***

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable.

Ignitability

Compound used:

Not applicable.

Reactivity

Most reactive compound:

Not applicable.

Incompatibility

Most incompatible pair of compounds:

Not applicable.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

***

3 TARGETS

Distance to Nearest Population

Not applicable.

Distance to Nearest Building

Not applicable.

Distance to Sensitive Environment

Distance to wetlands:

Not applicable.

Distance to critical habitat:

Not applicable.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Not applicable.

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Not applicable.

Distance to residential area, if 2 miles or less:

Not applicable.

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Not applicable.

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Not applicable.

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

Not applicable.

Population Within 2-Mile Radius

Not applicable.

Buildings Within 2-Mile Radius

Not applicable.

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No documentation of an incident of direct contact.

***

2 ACCESSIBILITY

Describe type of barrier(s):

No barrier, site easily accessible.

Assigned value = 3.

References: 1 and 12.

***

3 CONTAINMENT

Type of containment, if applicable:

Waste was spilled on the ground and discharged to the septic system.

Assigned value = 15.

References: 1, 5, and 6.

***

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Chlordane	O&P-xylenes
1,1,1-Trichloroethene	Trichloroethene
Tetrachloroethane	

Reference: 2.

Compound with highest score:

Chlordane.

Assigned value = 3.

Reference: 1.

5 TARGETS

Population Within 1-Mile Radius

Village of Broadalbin =	1,415
Counted homes = 109 x 3.8 =	414
Total	1,829

Assigned value = 3.

References: 1, 9, and 16.

Distance to Critical Habitat (of Endangered Species)

None within 1 mi of site.

Reference: 15.

REFERENCES

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United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

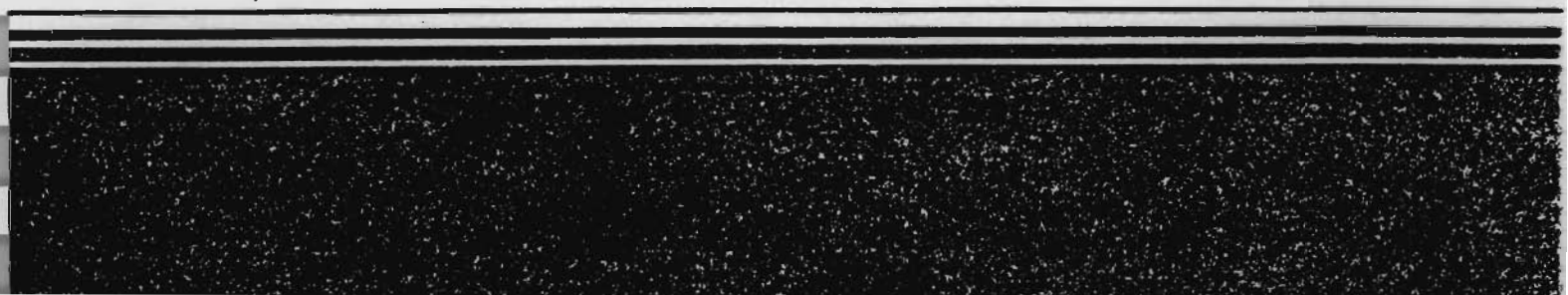
EPA Form 2070-13
July, 1981

Korkay Site

EPA

Potential Hazardous Waste Site

Site Inspection Report



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Korkay, Inc.	70 West Main Street				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Broadalbin	NY	12025	Fulton		

09 COORDINATES LATITUDE 43° 03' 28." | LONGITUDE 74° 12' 02."

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
05/03/85 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	1969 (BEGINNING YEAR) | Present (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR EA Science & Tech. (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jim Shultz	Geologist	EA Science & Technology	(914) 692-6706
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Thomas Porter	Geologist	EA Science & Technology	(914) 692-6706
Joyce Ferencz	Health and Safety Officer	EA Science & Technology	(301) 771-4950
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Thomas Kline	Vice President	Korkay, Inc.	(518) 883-3451
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1000 hours	Sunny, approximately 70°

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Jim Shultz	EA Science and Technology	914)692-6706

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Thomas Porter		EA Science & Technology	(914) 692-6706	03/24/86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS Unknown

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
(SOL)	SOLVENTS	Unknown		
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
(MES)	HEAVY METALS	Unknown		

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
			Detected in ground-		
	1,1,1,-Trichloroethane	25323-89-1	water sample from	780	ug/L
	Trichloroethene		onsite monitoring	130	ug/L
	Tetrachloroethane	127-18-4	wells.	49	ug/L
	Iron	7439-89-6		7.4	mg/L
	Manganese	7439-96-5		.66	mg/L
	P-xylene	106-42-3		94	ug/L

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	Mineral Spirits		FDS		
FDS	Butyl Cellosolve		FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

New York State Department of Environmental Conservation (NYSDEC) Files Region 5.
EA Site Inspection 3 May 1985.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 4,078
02 ☒ OBSERVED (DATE: 11/21/85) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

In samples of ground water from onsite monitoring wells, elevated levels of several volatile organic compounds were detected. Population within a 3-mile radius is served by drinking water from ground water.

01 ☒ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Kennyetto Creek, a tributary to Sacandaga Reservoir, is approximately 600 feet south of site. There are no surface water intakes for drinking water within a 3-mile radius of the site.

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No data.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No fire marshal has certified that the site is a threat.

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: 1,829
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Wastes have been discharged to the septic system and spilled on the ground.

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: _____ (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential exists.

01 ☒ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 4,078
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Aquifer of concern serves an estimated population of 4,078 in the 3-mile radius.

01 ☒ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential exists.

01 ☒ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential through direct contact.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: NY	02 SITE NUMBER: New

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential exists.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

None observed. Potential exists.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: 08/14/79) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

A barrel-washing operation discharged wastes to the septic system and leaked into the ground.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 5,907

IV. COMMENTS

Onsite barrel-washing operation ended in 1980.

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

NYSDEC File Region 5.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☒ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☒ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER (Specify) Discharge to septic system		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

06 AREA OF SITE

One _____ (Acres)

07 COMMENTS

Korkay, Inc. - Purchased used barrels of various previous content. The barrels were stored and washed on site. The wash water was discharged to the septic system with some leakage into the ground.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

To improve drainage, a 4-ft trench with 15-gallon drums filled with crushed stone was dug around the perimeter of the property. There are 5 septic tanks and 5 buried tanks for fuel oil and bulk chemicals. The used and washed barrels are stored on site mainly on the west and north sides of the property.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

No gates or fences prohibit entry.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EA Site Inspection 3 May 1985.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☒
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 3,000 ~~(mi)~~ (ft)
B. 1,700 ~~(mi)~~ (ft)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 4078

03 DISTANCE TO NEAREST DRINKING WATER WELL 1,700 ~~(mi)~~ (ft)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
6 (ft)	Southeast	6 (ft)	unknown (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

Town of Broadalbin well, approximately 0.6 mile from Korkay facility, was drilled in 1977. The well yields 200 gpm for 12 hours at night and water level is 28 feet from top. Another town well is south of the site and screened from 24-30 feet in unconsolidated sand and gravel. FU 152 well, approximately 1 mile northeast*

10 RECHARGE AREA		11 DISCHARGE AREA	
☒ YES ☐ NO	COMMENTS	☒ YES ☐ NO	COMMENTS: Kennyetto Creek 600 feet south of site.

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Kennyetto Creek	☐	0.1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 1,829 NO. OF PERSONS	B. 4,840 NO. OF PERSONS	C. 8,340 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

Adjacent-0 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

04 DISTANCE TO NEAREST OFF-SITE BUILDING

Adjacent-0 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The Village of Broadalbin surrounds the site, but the majority of the population in the vicinity is rural.

EPA FORM 2070-13 (7-81)

*of the site, and Well FU 121, approximately 1 mile southwest, have depth to bedrock of 35 feet and 30 feet, respectively.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

Unknown.

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
Approx. 35 (ft)	Unknown (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
14 (in)	2 (in)	1 %	South	<3 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. > 1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. Adjacent (mi)	B. Adjacent (mi)	C. _____ (mi)	D. .5 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site lies 1 mile from the Adirondack State Park, in the Village of Broadalbin. The site is in an area of both residential and commercial buildings. Kennyetto Creek is about 600 feet south with an intervening slope of less than 3 percent. The Village of Broadalbin North 2nd Avenue well is 0.6 miles north of the site.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EA Site Inspection.
NYSDOT Topographic Map. Broadalbin Quadrangle 1983 Edition.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	4	EA Engineering, Science, and Technology, Inc.	3/18/86
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNU	No significant HNU readings were recorded except over well K-2.
	(HNU reading 6.0 ppm above background.)
Site Slope	Suunto clinometer.
Well Elevation	Surveyed in feet below/above assumed elevation of 100 feet for PVC casing at K-1
Geophysical Survey	Conductivity and resistivity surveys.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF EA Science and Technology
(Name of organization or individual)

03 MAPS ☐ YES ☐ NO

04 LOCATION OF MAPS

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Short-term, low-yield pump tests on Phase II monitoring wells.
Grain size analysis for selected sediment samples from Phase II test borings.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EA Science and Technology Phase II Investigation.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II. CURRENT OWNER(S) / PARENT COMPANY (If applicable)

Current Owner			Parent Company		
01 NAME: PermaGlaze Chemical Corp.		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 70 West Main Street		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY: Broadalbin	06 STATE: NY	07 ZIP CODE: 12025	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:

III. PREVIOUS OWNER(S) (List most recent first) / IV. REALTY OWNER(S) (If applicable: list most recent first)

Previous Owner			Realty Owner		
01 NAME: Crosley Glove Company		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY: Gloversville	06 STATE: NY	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EA Site Inspection 3 May 1985.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	New

II. CURRENT OPERATOR *(Provide if different from owner)*

01 NAME	02 D+B NUMBER
Same as owner	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY *(If applicable)*

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) *(List most recent first; provide only if different from owner)*

01 NAME	02 D+B NUMBER
Same as previous owner	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES *(If applicable)*

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Files.
NYSDOH Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ G. WASTE DISPOSED ELSEWHERE — 02 DATE 1980 — 03 AGENCY _____
04 DESCRIPTION
Korkay, Inc. began sending used barrels off site to be washed.

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	New

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

6. REMEDIAL COST ESTIMATE

6.1 SUMMARY OF PHASE II SAMPLING AND ANALYSIS

The following chemicals have been detected in samples of the ground water collected from Phase II onsite monitoring wells:

Acetone	Chlordane
1,1,1-Trichloroethane	Iron
Ortho and Para Xylenes	Trichloroethene
Manganese	

It should be noted that chlordane, othroxylene, and para-xylene were listed on the recommended maximum contaminant levels (RMCLs) published in the Federal Register, 13 November 1985.

For drinking water standards, iron and manganese concentrations exceed the New York State and Federal Government Drinking Water Standards. The iron and manganese standards set by the New York State and Federal Government are based on aesthetic quality.

The nearest dwelling that utilizes the ground water is a private home located approximately 1,700 ft west of the Korkay site.

Before any remedial option can be initiated it will be necessary to install additional monitoring wells to better define the ground-water flow direction and extent of the contaminated ground water. It is estimated that six additional wells or well pairs may be required. It is estimated that cost to

drill, install, test, and survey six 20-ft deep wells would be $14,300. However, if the monitoring wells must also be completed in bedrock; the installation, testing, and surveying of six bedrock wells (currently assumed to be 50 ft in depth) is estimated to cost $28,300. Sampling and full HSL analysis of a total of nine monitoring wells is estimated to cost $17,200, while the cost for 15 wells is estimated to be $28,000. If during monitoring well installation soils are observed to be contaminated, the NYSDEC will be contacted for approval to sample soil for a full HSL analysis on a case-by-case basis. Additionally, a sample of the sediment/sludge should be collected from the base of each of the five reported Dry Well/Septic Tanks for HSL Analysis for an estimated cost of $13,000.

6.2 RECOMMENDED REMEDIAL ALTERNATIVES

Based upon the results of the Phase II investigation, the following three alternatives are considered for remediation of the ground water at the Korkay site: pump contaminated water from the ground and treat with activated carbon, wall barrier cut-off, and bioreclamation. It must be noted that this assessment of remedial alternatives is preliminary and at best, gross estimates for program planning only.

6.2.1 Alternative 1- Pump & Treat[1]

The pump and treat option is based on the currently identified concentrations and types of chemical contamination detected in samples of ground water at the Korkay site. Since it is not known whether the detected contaminants have

reached the bedrock portion of the aquifer of concern (>35-ft below grade) supplying the town, this analysis assumes two conditions: (1) shallow aquifer (20-ft), and (2) deeper aquifer (>35-ft).

For the shallow well case, the availability of water is low with an average (K_2,K_3) of 2.3 gpm. For this estimate it was assumed that three wells would be pumped at 2.5 gpm.

The range of estimated costs for carbon treatment are as follows:

Own:

Daily Flow	-	0.011 mgd
Capital Costs	-	$165,000
O&M (413,000/mgd)	-	$5,000 - $7,000 /yr

Lease Basis:

Capital Costs	-	$400,000
O&M (14,000/mgd)	-	$200 - $500

If the deeper aquifer is contaminated, it is then assumed that the availability of water for treatment is greater (100 gpm).

Capital Costs	-	$165,000/mgd	
O & M	-	$413,00/mgd	(based on 0.144 mgd)

The effluent from this system might be fed into the main leading to the water treatment plant.

The range of estimated costs for carbon treatment are:

Capital Cost - $165,000

O & M - $5,000 - $7,000 small aquifer

- $413,000 large aquifer

6.2.2 Alternative II - Wall Barrier[1]

The second remedial option includes a cutoff wall constructed downgradient of the site. Because the shallow aquifer water table slopes only very slightly toward the south and the contaminant plume extent has not been defined, it is recommended at this time that a perimeter wall be placed around the site. Such a wall may actually have to surround a larger area depending upon the the actual extent of ground-water contamination.

For this analyses, it is assumed that 1,200 ft of wall will be required, and that the contamination has not yet penetrated to the bedrock.

Slurry Wall:

A slurry wall 3-ft thick x 1,200-ft long x 35-ft deep has (1200 x 35) = 42,000-ft^2.

Estimates of such work include total installation (excavation, material, installation, backfilling) of bentonite mixtures. The estimated unit costs range from \$7.50/ft^2 to \$16.00/ft^2. This spread is due to variance in soil

conditions that result in difficulty of achieving required depths, confined spaces where progress is slow, extensive site evaluation, and personnel protection is required.

For this case the estimated total costs range = $315,000 to $675,000.

Sheet piling, a continuous physical barrier, as installed to 35 ft results in estimated unit costs of $11.00/ft^2 to $20/ft^2. For this application (42,000-ft^2), an estimated range of $450,000 to $830,000 could be achieved. The variation is due to types of steel sheet and gauge.

6.2.3 Alternative III - Bioreclamation[2]

The use of biological systems for waste destruction has a history in municipal and industrial contained systems. Of particular interest to hazardous waste treatment is the use of selected bacteria in surface soils and shallow aquifers.

Either naturally occurring bacteria or special cultivated groups (hydrocarbon degraders) are introduced into an aquifer and circulated by way of injection wells and recovery wells. This closed loop approach provides good mixing for biological contact and degredation, and allows for the selective introduction of nutrients. Most nutrients include oxygen, nitrogen, and phosphorus. A typical program is outlined below.

Phase I: Site assessment including lab analyses of soils, bacterial, and waste types.

$6,000 to $17,000

Range due to complexity of wastes

Phase II: Process design including biological agent, chemical nutrients, equipment type, circulation rate.

$12,000 to $116,000

Range due to volume to be treated and complexity of wastes to be treated.

Phase III: Final design and Operation includes selection of equipment, procurement, installation, and operation.

Design + Installation + Equipment = $60,000 to $175,000

Operating & Maintenance Costs (including nutrients) = $6,000 to $23,000

Variations are due to size of pumps, chemical feed systems, and chemicals.

The estimated costs associated with the recommended remedial alternatives for Korkay are summarized below:

Investigation (wells, sampling, and analysis)	$ 43,500 - $ 83,600

Pump/Treat (small) Capital	$165,000 - $140,000
O & M	200 - 7,000
(large) Capital	165,000
O & M	413,000
Barriers: Slurry Walls	$315,000 - $675,000
Sheet Piling	450,000 - 830,000
Bioreclamation	$ 84,000 - $331,000

REFERENCES

1. Compendium of Costs of Remedial Technologies at Hazardous Waste Sites, Final Report, Hazardous Waste Engineering Research Laboratory, Office of Research & Development, U.S. EPA, Cinn., Ohio 45268, September 1985 (Appendix 1.6-1).

2. FMC Aquifer Remediation Systems, Bio XLSM Enhanced Bioreclamation Program Reports (Appendix 1.6-2).

APPENDIX 1.3.1-1

Contact	Information Received
Mr. Thomas Kline, President Korkay, Incorporated Broadalbin, New York 12025 (518) 883-3451	Site interview Material safety data sheets Korkay products list
Mr. Roger Dewel, Employee Village of Broadalbin Broadalbin, New York 12025 (518) 843-3520	Water supply information
Mr. Marsden Chen, P.E./Mr. Jim Tofflemire New York State Department of Environmental Conservation Bureau of Site Control 50 Wolf Road Albany, New York 12233-0001 (518) 457-0639	No information since 1983 Phase I Report
Mr. Bud Colton New York State Department of Health District Office Amsterdam, New York 12010 (518) 623-3671	No information since 1983 Phase I Report
Mr. Craig Hammer, P.E. New York State Department of Health District Office Amsterdam, New York 12010 (518) 843-3520	Village of Broadalbin North Second Avenue Well 1984 Sampling Results
Mr. Jim Mraz Fulton County Planning Board Johnstown, New York 12095 (518) 762-4832	Fulton County Comprehensive Public Water Supply Study CPWS - 66
Ms. Mildred Provost, Vice President Provost Brothers, Incorporated Well Drillers Sloansville, New York 12160 (518) 868-2126	Village of Broadalbin North Second Avenue well information
Mr. Kevin Walter, P.E. New York State Department of Environmental Conservation Division of Hazardous Waste Enforcement 50 Wolf Road Albany, New York 12233-0001 (518) 457-5637	No information since 1983 Phase I Report

Contact	Information Received
Mr. John Iannotti, P.E. New York State Department of Environmental Conservation Bureau of Remedial Action 50 Wolf Road Albany, New York 12233-0001 (518) 457-5637	No information since 1983 Phase I Report
Mr. Earl Barcomb, P.E. New York State Department of Environmental Conservation Landfill Operations Vatrano Road Albany, New York 12205 (518) 457-2051	No information since 1983 Phase I Report
Mr. Peter Skinner, P.E. New York State Attorney General's Office Room 221 Justice Building Albany, New York 12224 (518) 474-2432	No information since 1983 Phase I Report
Mr. Ron Tramontano/Mr. Charlie Hudson Bureau of Toxic Substance Assessment New York State Department of Health Tower Building 84 Holland Avenue Albany, New York 12237 (518) 473-8427	No information since 1983 Phase I Report
Mr. Perry Katz U.S. Environmental Protection Agency Region II Room 757 26 Federal Plaza New York, New York 10278 (212) 264-4595	No information since 1983 Phase I Report
Ms. Diana Messina U.S. Environmental Protection Agency Region II Surveillance and Monitoring Branch Woodbridge Avenue Edison, New Jersey 08837 (201) 321-6776	No information since 1983 Phase I Report

APPENDIX 1.3.2-1

GEOPHYSICAL FIELD EQUIPMENT AND GENERAL METHODOLOGY

Two geophysical instruments were used at the site to evaluate general subsurface conditions (geology, depth to ground water, location of ferrous material, and contamination). The following provides a description of the equipment used.

Terrain Conductivity

EM-31

The Geonics, Ltd. EM-31 terrain conductivity meter has an approximate penetration depth of 20 feet. The EM-31 is portable, and the method is rapid and non-destructive. It has a fixed transmitter and receiver boom so handling and data gathering is a relatively simple matter.

Resistivity

Resistivity soundings were performed using a Bison 2350B earth resistivity meter. The 2350B earth resistivity meter measures the nature of subsurface materials in ohm-feet. This technique employs four electrodes (two outer and two inner) along a straight line (for the Wenner and Schlumberger arrays). The instrument induces a DC current into the ground through the outer electrodes, and the potential difference may be affected by differences in geology, porosity, dissolved ions, soil moisture, and/or water quality. As the electrode positions are moved, specific potential differences are recorded. For each potential difference, apparent resistivity can be calculated. When the apparent resistivity values are plotted, the nature of subsurface conditions (locations of voids, sand and gravel, water quality, etc.) can be inferred both quantitatively and qualitatively.

The following three pages provide the Korkay site geophysical report prepared by Delta Geophysical Services.

KORKAY, INC. SITE

CONDUCTIVITY

Terrain conductivity survey lines were made with an EM-31 which allowed us to measure subsurface conductance (mmhos/m) for an effective depth of 20 feet. Twelve survey lines were run and conductivity data collected at 20-foot stations along each line. The survey lines were located relative to known geologic and/or hydrogeologic information, "noise" from external interferences (power lines, underground pipes, etc.) and limited accessibility (structures, etc.). The data recorded were used to locate anomalous zones which may indicate buried metal (pipes, drums, etc.) and or subsurface contamination (plumes).

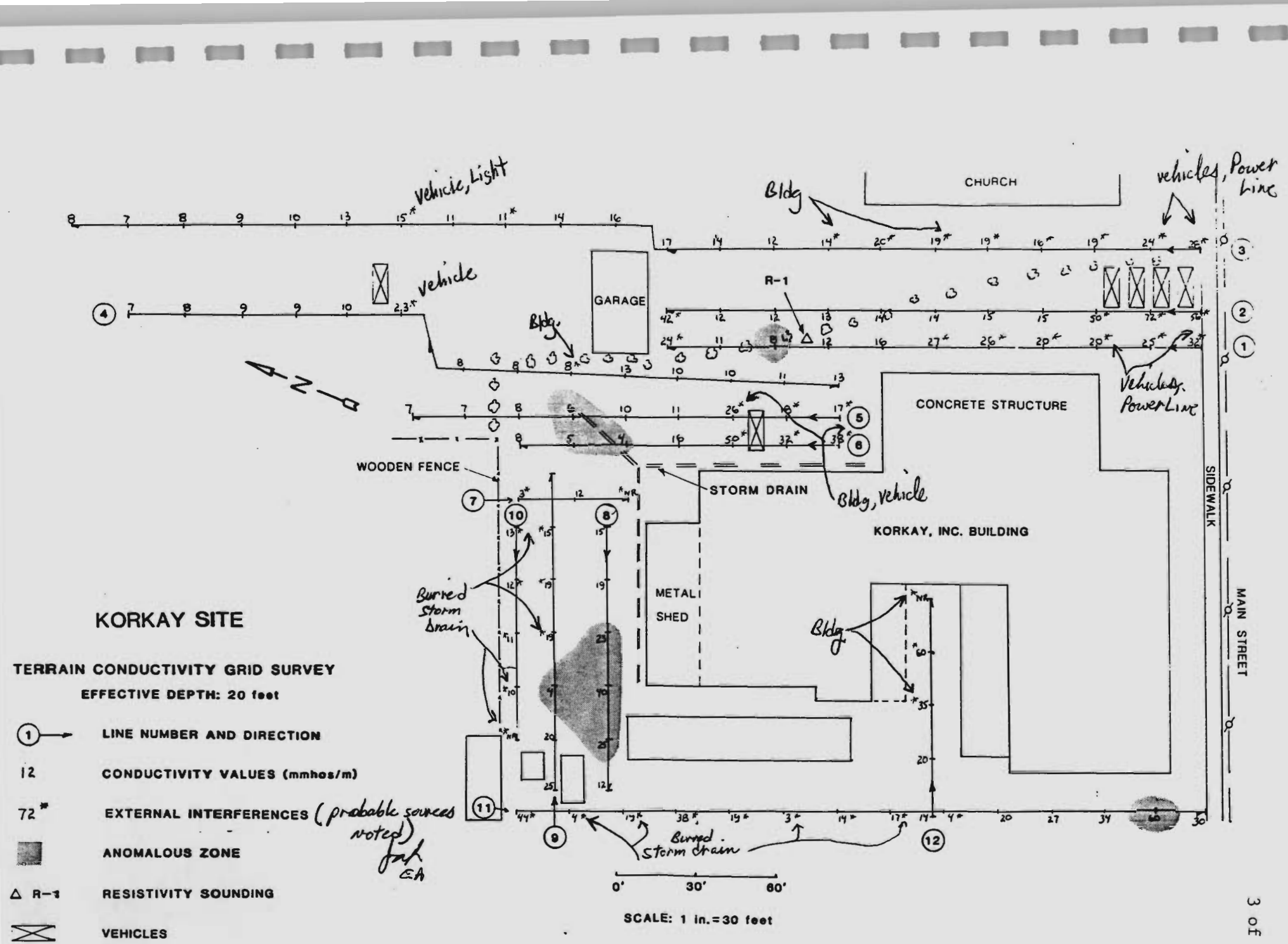
The conductivity lines are shown on the map with corresponding conductivity values (mmhos/m). Four anomalous zones are shown on the map. A long-time employee of Korkay, Inc. indicated that a storm drain, similiar to the one which runs along the north and west sides of the property, exists. Its location is along the east and north sides of the building, as shown on the map. The employee believed that a short section of the drain extends to the dry well in the north corner of the property. This seems to be validated by the anomalous zone in that area.

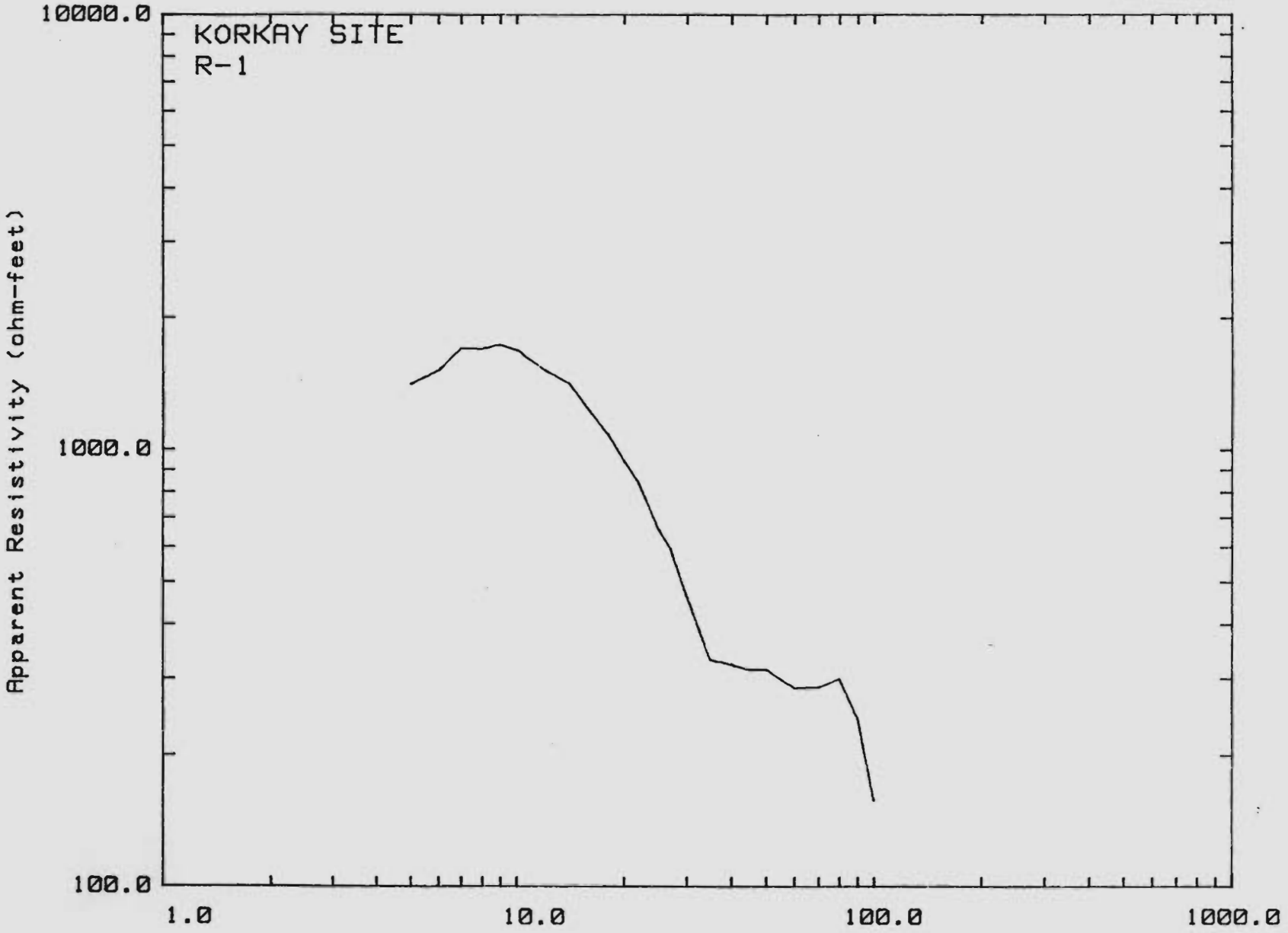
RESISTIVITY

One Schlumberger resistivity sounding was run to an electrode spacing of 100 feet and is located on the map.

The resistivity sounding was analyzed using computer and conventional techniques to best interpret the data.

Resistivity Sounding 1 reflects three general layers (see computer curve plot in Appendix). The upper layer (0-2) feet has been interpreted to be unsaturated soils. The intermediate layer (2-8) feet is interpreted to be unsaturated glacial till, and the third layer (greater than 8 feet) has been interpreted to be saturated glacial till. The depth to water is interpreted to be approximately 8 feet.


KORKAY SITE
TERRAIN CONDUCTIVITY GRID SURVEY
EFFECTIVE DEPTH: 20 feet
LINE NUMBER AND DIRECTION
CONDUCTIVITY VALUES (mmhos/m)
EXTERNAL INTERFERENCES (probable sources noted) JAH EA
ANOMALOUS ZONE
RESISTIVITY SOUNDING
VEHICLES
SCALE: 1 in.=30 feet
CHURCH
GARAGE
CONCRETE STRUCTURE
KORKAY, INC. BUILDING
METAL SHED
WOODEN FENCE
STORM DRAIN
SIDEWALK
MAIN STREET
R-1
Vehicle, Light
Vehicle
Bldg.
Bldg, vehicle
vehicles, Power Line
Vehicles, Power Line
Buried Storm Drain
Buried Storm Drain
0'
30'
60'
DELTA GEOPHYSICAL SERVICES


KORKAY SITE
R-1
10000.0
1000.0
100.0
Apparent Resistivity (ohm-feet)
1.0
10.0
100.0
1000.0
Electrode spacing (feet)
Type: SCHLUMBERGER

APPENDIX 1.3.2-2

MONITORING WELL INSTALLATION AND TESTING PROCEDURES

Observation Well Drilling and Sediment Sampling

A truck-mounted CME-55 drill rig was used. A hollow-stem auger drilling method was used in unconsolidated sediments, using a 4-1/4-in. I.D. auger.

Prior to the drilling of each boring/well, and at the completion of the last boring/well, the drilling equipment which came in contact with subsurface materials was pressure washed with hot potable water. Soil sampling of the unconsolidated sediments was performed using a split spoon sampler, at approximately 5-ft intervals and at detected major stratigraphic changes. The split spoon sampler was pressure washed with hot potable water before and after each sample. A HNU was used to monitor the potential organic vapors emitted during drilling operations and from each soil sample. Samples of the major soil/unconsolidated sediment types encountered during drilling were collected and grain size analysis was performed on selected representative samples. Unless otherwise instructed, all drill cuttings, fluids, and development/purging water were left on, or discharged to, the ground surface in the immediate area of the activity. An HNU reading of at least 5 ppm above ambient readings was established by NYSDEC as the criteria above which fluids and cuttings were to be collected and drummed for future appropriate disposal by NYSDEC.

Well Construction

Immediately prior to installation, the well pipe and screen were cleaned with a hot potable water pressure washer. Standard well construction for wells completed in unconsolidated sediments consisted of a 1-ft layer of sand placed at the bottom of the borehole below 10 feet of 2-in. diameter threaded-joint PVC well screen and an appropriate length of 2-in. diameter PVC riser with a bottom plug/cap. A sand pack of appropriate grain size was placed around the well screen up to 2 feet above the top of the screen, followed by a bentonite seal approximately 2 feet in thickness. A grout-bentonite mixture was then added to fill the annular space from the top of the bentonite seal up to grade. For the PVC wells installed, the filter sand and bentonite pellets were carefully placed by hand down the annular space between the hollow-stem auger and the PVC well pipe as the augers were slowly withdrawn. The depth to the top of the filter sand or bentonite pellets was constantly monitored with a clean, weighted-tape and compared to the depth of the base of the hollow-stem auger. The volume of filter sand and bentonite pellets needed was estimated and compared with the actual volume used. Because the PVC wells are screened the uppermost few feet of the first saturated zone encountered, the bentonite seal was generally close to ground surface and allowed for careful placement of the grout from ground surface.

the site, individual bottom-fill Teflon bailers were prepared in the laboratory for each well to be sampled. The preparation procedures were comprised of washing with hot water and Alkanox soap followed by a hot water rinse, acetone and hexane rinses, and air dried.

APPENDIX 1.3.2-3

SAMPLING PROCEDURES

A variety of sample types were collected. These included ground water from production and monitoring wells. All sampling was conducted by experienced personnel under supervision of the project manager. All sampling was accomplished under a rigorous chain-of-custody protocol. All samples were placed in containers of appropriate composition containing appropriate preservatives as presented in Table 7-1 of the Work/QA Project Plan for the current Amendment to Perform Phase II Work dated 16 January 1985. All sampling included trip blanks to further validate the data generated (refer also to Section 13, Sample Custody Procedures, of the Work QA/Project Plan).

Municipal Well Ground-Water Sampling

Permission for municipal well sampling was gained prior to initiation. A sample of raw ground water was collected from a tap near the well head and prior to any treatment, at a low flow rate, being especially careful not to aerate the sample.

Monitoring Well Ground-Water Sampling

One set of ground-water, grab-type samples were obtained for chemical analysis from PVC monitoring wells installed for this project.

The purging and sampling of each well was performed at least one week after completion of well development. Each well was purged by a centrifugal pump to remove potentially stagnant water in the well and allow for the recharge of the fresh ground water to the well for sampling. Each sampled well was purged to dryness, or up to approximately four times the volume of the water column in the borehole, depending upon the well yield.

To ensure that all stagnant water was purged from the well, the suction line was lowered to the bottom of the well, at which time the pump was started. After the required volume of water had been nearly evacuated, the suction line was raised slowly to the water surface and allowed to pump for a short time. The volume of water to be purged was determined as follows: for wells completed in unconsolidated material, a sand-packed 2-in. diameter PVC well was installed in a 7-in. diameter borehole; assuming 25 percent porosity of the sand pack, there is approximately a 0.50-gallon/linear foot of water in the borehole. a new, clean length of polyethylene flexible pipe was used in each well as the suction line.

upon completion of the purging operation at each well, a sample of the ground water was obtained by using individual bottom-fill teflon bailers lowered into each well with new polypropylene rope for each well. For each well sampled, the bailer was handled with a new pair of disposable plastic surgical gloves. The bailer was lowered into each well slowly to minimize the potential for aeration of the water sample. Water samples were carefully transferred from the bailer to the sample containers to further minimize the potential for aeration of water samples, especially those for VOA. No "head space" was allowed in filled VOA water sample containers. Prior to arrival at

Well Development

The development of the monitoring wells was performed by pumping as soon as practical after well installation. When developed by pumping, a centrifugal pump was used when the depth to water is less than 20 feet below ground surface.

For development using a centrifugal pump, a new, unused length of polyethylene flexible pipe was used in each well as a suction line. The pipe was fitted approximately 6 inches from its lower end with a steel washer large enough to fit over the polyethylene pipe but small enough to fit into the well, held in place by hose clamps on either side of the washer. New, unused washers and clamps were used for each well. The washer acts as a plunger (surge block) when raised and lowered in the screen interval. The well was simultaneously pumped and surged throughout the screen interval until the discharge water appeared to be clear.

Pump Tests of Monitoring Wells

A short-term, low-yield pumping test was performed in each well. Each test was comprised of: (1) a continuous discharge, pumped (drawdown) phase, and (2) a recovery phase. For such a test, pumping and water level measurement occurred in the same well.

In performing the short-term pumping test, first the static water level was measured and recorded prior to setting the pump. The pump was then started at a discharge rate set compatible to the estimated amount of ground water yielded by the well, simultaneously a stop-watch was started. Accurate depth to water measurements during the drawdown phase were obtained and recorded at regular intervals. The discharge rate was also measured (using a calibrated bucket and a stop watch) at different times during the pumping phase. When little or no further drawdown occurred, the pump was stopped. Time and water level measurements of the recovery phase instantly began. Accurate depth to water measurements were recorded at regular intervals until 90 percent recovery to the static (pre-pumping) water level was achieved.

The short-term pumping tests were performed using a centrifugal pump for depth to water less than 20 feet below ground surface. The centrifugal pump provided a wide range of discharge rates, from approximately 50 gpm to <5 gpm, which was controlled by a ball-valve attached to the discharge line. A new, unused length of polyethylene flexible pipe was used as a suction line for each well.

A Q.E.D. water level indicator was used to measure depth to water in the wells; this instrument has depth markers at 0.05-ft intervals. The Q.E.D. probe was decontaminated between wells by washing with Alkanox detergent, then rinsed with deionized water, acetone, and hexane.

Appendix 1.4.1-1

KORKAY, INC.

70 W. MAIN STREET, BROADALBIN, NEW YORK 12025
PHONE (518) 883-3451

SPECIALTY CHEMICALS

AUTOMOTIVE - INDUSTRIAL - HOUSEHOLD

THE KORKAY SYSTEM

June 22, 1979

Village Board
Incorporated Village of Broadalbin
Broadalbin, NY 12025

Attn: Sprague L. Jennings, Village Clerk

Dear Mr. Jennings:

As I have told you on the phone and told Mr. Pickering in person, Korkay, Inc. does not dump chemical waste in your landfill. We have no by- products to dispose of as a result of any of our processes.

We are not a chemical producer! We are blenders. We buy basic products from many of the major chemical companies in the United States and blend these basic products together into products for the automotive trade. There are no reactions which take place producing by-products. Everything produced goes into drums or bottles and is delivered to our salesmen for sale.

~~As for the items we take to your~~ landfill, they are: Cardboard, junk barrels, empty plastic bottles, broken pallets, empty bags, computer waste, lunch leftovers, broken truck parts from our garage, floor sweepings, etc. Occasionally we have some spoiled car wax to dispose of in 15 to 30 gallon quantities consisting of wax, petroleum solvents, silicones and dye, but only on occasion.

Korkay is trying very hard to be a good citizen of "The Friendly Village". The Village has never asked for and not received our co-operation as far as I can remember, and I assure you of our cooperation on everything you may require in the future.

Sincerely,

KORKAY, INC.

Thomas J. Kline

Thomas J. Kline
Vice President
TJK/ds

Appendix 1.4.1-2

Region 5 - Environmental Quality
Hudson Street, Warrensburg, N. Y. 12885
Area Code 518 623-3671

Robert F. Flacke
xxxxxxxxxxxxxxx

May 22, 1979

Village of Broadalbin
Broad Street
Broadalbin, New York 12025

RE: Your Letter of May 12, 1979

Dear Mayor Olmstead:

Your letter concerning industrial wastes from the Korkay Company has been referred to me for reply.

A check of our files indicates that Korkay manufactures products such as automotive chemicals, spray cleaners, and hand cleaners. We do not have a list of process chemicals or waste by-products, so it is not possible at this point in time to make a determination concerning the toxicity of those wastes.

As operator of the Broadalbin landfill, it is the responsibility of the Village of Broadalbin to monitor the waste products that go into the landfill. As such, the Village has the authority to require Korkay and any other industry to provide them with a list of the chemicals in their waste products. This list should include a statement concerning volume of waste generated

When the Village has obtained this list, we would be glad to review same and make a determination on the proper method of disposal of the wastes. Let me reemphasize that the Village has the authority to request such a list, and furthermore has the authority to refuse to accept these industrial wastes should Korkay refuse to provide the chemical list.

We will await your reply, and thank you for your concern for the environment.

Sincerely yours,

William C. Colden, P.E.
Regional Solid Waste Engineer

REC:brd

by: Ray E. Cowen, III, P.E.
Senior Sanitary Engineer

cc: Bruce Knapp

KORKAY, INC.
70 W. MAIN STREET, BROADALBIN, NEW YORK 12025
PHONE (518) 883-3451

SPECIALTY CHEMICALS

AUTOMOTIVE · INDUSTRIAL - HOUSEHOLD

THE KORKAY SYSTEM

9/21/81

P R O D U C T S

E Q U I P M E N T

A C C E S S O R I E S

K O R K A Y P R O D U C T S .....

OFTEN COPIED,

NEVER EQUALED.

I VINYL, HARD SURFACE AND GLASS CLEANERS

Kork Rub, MP Cleaner, All Purpose Cleaner, Spray Cleaner, Whitewall Cleaner, Kork Kleer, Aerosol Glass Cleaner, Spare & Strike

II UPHOLSTERY CLEANERS, CARPET SHAMPOO, TINTS & DYES

Kork Kleen, UPH Shampoo Conct., Carpet Shampoo, Kleen Scent, Tints & Dyes

III ENGINE CLEANERS AND DEGREASING PRODUCTS

Kork Buster, Degreaser, Motor Wash, Steam Cleaner, Grease Chaser, Cosmoline Remover, Tar Remover, Carburetor & Parts Cleaner

IV CAR AND TRUCK WASHING PRODUCTS

Pressure Wash, Pressure Wax, Kork Wash, Wash & Wax, Purple Concentrate, Truck & Bus Wash

V WAXES, POLISHES, COMPOUNDS

Perma Glaze, Poly Perma Glaze, Kork Kwik, Kwik Shine, Kork Buff, Kaldarize, Lustre Wax #1 & #2, Compounds

VI SPECIALIZED PRODUCTS

Super Hand Cleaner, Waterless Hand Cleaner, Vinyl Finish, Floor Finish, Diesel Dry Gas, Ezee Tap, Metal Cleaner

VII AEROSOL PRODUCTS

Motor Paint, Trunk Paint, Undercoating, Flat Fixer, Penetrant, Silicone

VIII ACCESSORIES

Two Gallon Sprayers, Drum Pumps, Drum Spouts, Brushes, Sponges, Chamois, Wash Mitts, Hydro Air Gun, Applicator Bottle, Buffer Pads, Hand Cleaner Pumps, Hand Cleaner Brackets

IX HI PRESSURE VEHICLE WASHING EQUIPMENT

Stationery and mobile units with manual or remote control operation for sale or lease. Coin operated units. Custom built units for sale

I VINYL, HARD SURFACES AND GLASS CLEANERS

KORK RUB

The original sanitizer* for cleaning vinyl and any hard surface including whitewalls on used cars. May also be used for institutional cleaning where a germ killing,* fast acting cleaner is needed. Safe for contact with normal skin when used as directed.* EPA #6943-1 registered germicide packaged ready for use in 1,5,15,30,55 gal sizes.

MP CLEANER

Fast acting concentrated cleaner made to be diluted with water for cleaning hard surfaces. Mix with water 3:1. Packaged in 1,5,15,30,55 gal sizes.

ALL PURPOSE CLEANER

Ready-for-use product for vinyl and hard surface cleaning. Excellent wetting action for penetrating surface soils. Formulated for maximum cleaning power at the lowest possible cost. Packaged in 5,55 gal sizes.

SPRAY CLEANER

This special formula, with a "lemon fresh" odor is the modern foaming cleaner that dissolves most greasy soil and stubborn stains on vinyl and hard surfaces. Safe for normal skin contact when used as directed. Packaged in handy 32oz. bottle with spray applicator for resale, and in 1,5,15,30,55 gal sizes.

WHITEWALL CLEANER

Potent ready-to-use liquid cleaner designed to clean even the dirtiest whitewall tire with minimun of effort and brushing. Avoid prolonged skin contact. Use protective eyewear. Packaged in 1,5,15 gal sizes.

KORK KLEER

Bulk glass cleaner that drys quickly and completely to leave a sparkling haze-free surface. Lightly ammoniated for fast cutting of any greasy film. Use as is or dilute with water 1:1. Packaged in 1,5,15,55 gal sizes.

AEROSOL GLASS CLEANER

Cuts smokey grime fast without streaks or hazing. Big 19oz. aerosol can for no mess clean up of glass, plastic, chrome, vinyl and tile surfaces.

I SPARE & STRIKE

Highly concentrated liquid alkaline cleaner designed for tough industrial cleaning operation:

- Removes resin build-up on paper mill rollers
- Cuts through baked on grease and carbon compounds.
- Dissolves most films and oxidized organic materials.
- Excellent heavy duty floor cleaner.

Flushes completely with water. Avoid skin contact. For best results use as is. Packaged in 5,55 gal sizes.

II UPHOLSTERY CLEANERS, CARPET SHAMPOO, TINTS & DYES

KORK KLEEN

Kork Kleen fabric cleaner is a rich sudsing compound with heavy flash foam that suspends all surface and embedded soils. Special detergents limit over wetting of seat fabric avoiding penetration of the underlying cushions. Safe for use on any fabric. Protects against resoiling. Neutralizes odors and leaves interiors with a fresh spicy scent. Apply as is with 2 gal. sprayer. Packaged in 1,5,15,30,55 gal sizes.

UPHOLSTERY SHAMPOO CONCENTRATE

Dilutable cloth cleaner offering good performance at an economy price. Mix with water 1:1. Packaged in 1,5,15,30, 55 gal sizes.

CARPET SHAMPOO

Rich long lasting suds penetrate deeply into carpet pile bringing up and suspending dirt and grit for easy removal. Foam dries to a crystalline state easily removed by vaccuming. Restores lustre and protects against resoiling. Now available in two formulations for use in regular shampooer and for new steam systems. Follow label directions for mixing. Packaged in 32oz, resale size and 1,1,5,15 gal sizes.

KLEEN SCENT

Deodorizer with a fresh spicy scent that overpowers and neutralizes musty, stale and smokey odors that build up in a car's interior. Use to remove odors from upholstered furniture and drawers as well. Applied sparingly as is with a spray applicator, 32oz. bottle goes a long way.

TINT & DYE

Professional rug tinting concentrate designed for use with Kork Kleen rug and upholstery cleaner. Brightens and restores dull and faded rugs. Available in red, blue, green, turquoise,

III ENGINE CLEANERS AND DEGREASING PRODUCTS

KORK BUSTER

Concentrated solvent type degreaser which penetrates greasy soils for easy removal. Will not harm painted surfaces, metallic parts or engine wiring. Flushes easily with cold water and inhibits rust on the areas that have been cleaned. Non-corrosive. Mix with kerosene 6:1 and apply with 2 gal sprayer. Packaged in 1,5,15,30,55 gal sizes.

DEGREASER

Ready-to-use engine cleaner that quickly dissolves both greasy soil and dirt. Heavy bodied liquid stays longer on vertical surfaces requiring less material to do the job. Will not harm painted surfaces, metallic parts or engine wiring. Excellent for removing undercoating overspray. Flushes completely with cold water and inhibits rust on areas that have been cleaned. Non-corrosive. Apply as is with 2 gal sprayer. Packaged in 1,5,15,30,55 gal sizes.

MOTOR WASH

Ready-to-use motor cleaner that can be wiped, brushed or sprayed on the area to be cleaned. Formulated with a special blend of solvents for quick and thorough removal of greasy soil accumulations from engines and small parts. Safe for painted surfaces and rubber parts. Flushes completely with cold water. Apply as is with 2 gal sprayer or pour into soak tank for small parts cleaning. Packaged in 5,15,30,55 gal sizes.

GREASE CHASER

Heavy-bodied biodegradeable water based degreaser for removing grease and soil from engines and other surfaces. An environmentally safe low cost alternative to solvent degreasers. Good results under normal conditions. Apply as is with a 2 gal sprayer. Packaged in 1,5,15,30,55 gal sizes.

STEAM CLEANER

Concentrated highly active cleaning compound designed specifically for use in steam cleaning machines. Inhibits the formation of hard water scale build-up in the coils of steam machines. Mix with water 15:1 for most cleaning jobs. Packaged in 5,15, 30,55 gal sizes.

III COSMOLINE REMOVER

Strongest blend of solvents available for effective removal of cosmoline without harm to automotive enamel and lacquer finishes. For best results follow the easy step-by-step instruction sheet provided with each drum of Cosmoline Remover. Apply as is with 2 gallon sprayer. Packaged in 5,15,30,55 gal sizes.

TAR REMOVER

For removing road tar and other oily film from body panels of vehicles. Will not harm painted surfaces. Flammable, do not use near open flame. Spray or wipe as is on surface to be cleaned. Allow time for tar to soften and dissolve. Wipe and rinse surface until clean. Packaged in 1,5,15 gal sizes.

CARBURETOR & PARTS CLEANER

Two phase dip-type metal cleaner, designed to remove heavy carbon and rust deposits from carburetors and small parts. Contains a special inhibitor to protect parts from corrosion during the cleaning process. Non-flammable. Wear protective clothing and eyewear when using product. Use full strength as a dip bath to soak parts and equipment. Flush parts with water after soaking. Packaged in 5 gal size.

IV CAR AND TRUCK WASHING PRODUCTS

PRESSURE WASH

Highly concentrated premimum car wash soap formulated for use with Korkay Pressure Washers. Removes normal soil and rinses free without spotting or streaking. Will not clog internal parts of pressure washer. Mix with water 16:1 (four gallons to a 55 gal drum). Final dilution through pressure washer is 700:1. Packaged in 5,15 gal sizes.

PRESSURE WAX

Use with Korkay Pressure Washers for special "hot wax" effect when washing cars. Beads water. Helps speed drying time. Eliminates water spots. Mix with water 15:1 and apply to car after rinsing. Packaged in 5 gal size.
Note: Pressure washer should be run on rinse cycle to clean it out after Pressure Wax has been used in the machine.

KORK WASH

Highly concentrated biodegradeable detergent developed specifically for hand-washing cars. Use as directed for best economy and results. Measure one ounce into Korkay Wash Mitt and apply to car that has been wet down. One ounce can also be added to two gallons of cool water in a bucket and this solution used to wash the car as well. Packaged in 1,5,15,30,

IV WASH & WAX

Same time proven Kork Wash formula with the addition of a wax to bead water and to reduce drying time. Apply in the same manner as Kork Wash. Packaged in 1,5,15,30,55 gal sizes.

PURPLE CONCENTRATE

A low cost yet balanced detergent concentrate with high sudsing and cleaning action for pressure washing or hand washing of cars. Mix 4 gals with water into a 55 gallon drum for use with a pressure washer. For hand washing add 1 ounce to two gallons of water in a bucket and apply with a Korkay Wash Mitt. Packaged in 1,5,15,30,55 gal sizes.

TRUCK & BUS WASH

Formulated for use with Korkay pressure wash equipment. For heavy duty cleaning of painted and unpainted steel and aluminum truck and bus bodies. Cleans without scrubbing. Wear protective clothing and eyewear. Use as is in pressure washer. Final dilution 16:1. Packaged in 55 gal size.

V WAXES, POLISHES, COMPOUNDS

PERMA GLAZE

Contains the finest blend of hard waxes and silicones for producing a detergent resistent long-lasting showroom shine. Seals out ice, salt, rain and snow while reducing dirt and dust accumulation. Time-tested "easy on-easy off" application makes Perma Glaze a must for new car make ready and used car maintenance. Apply with a clean soft cloth or damp sponge. Let dry to a white haze and wipe off. Packaged in 16oz., 1 gal sizes.

POLY PERMA GLAZE

New generation polish combining superior cleaning agents with a durable longer lasting wax. Stays bright longer. Resists weather and repeated washing. Same "easy on-easy off" properties as regular Perma Glaze. Poly Perma Glaze is the polish you will want to use on your own car. Follow label directions for best results. Packaged in 16oz. size.

KORK KWIK

New car prep for removing factory protective finish from new cars. Leaves a wax shine suitable for delivery. Mild solvent and abresive cleaning system removes tar and undercoating overspray and cleans and shines bumpers and chrome parts. Follow label directions and apply Kork Kwik with a soft cloth or cello sponge. When dry wipe with a clean cloth to a brilliant hard luster. Packaged in 1 gal size.

V

KWIK SHINE

Recommended for fiberglass boats, snow machines, motorcycles, trailers and recreational vehicles. Spray it on with a Korkey applicator bottle, allow 30 seconds for drying, wipe off with a clean cloth or towel. Leaves a hard finish in one third the time of regular waxes. Not for use on automobile finishes. Packaged in 1 gal size.

KORK BUFF

New heavy-duty auto cleaner for fast and easy reconditioning of all types of automotive paints. Formulated to give longer buff time and yield a higher gloss. Apply with a power buffer and follow up with a hand or machine application of Perma Glaze to protect the high luster developed by using Kork Buff. Packaged in 32oz. size.

KALDARIZE

Fast cutting cleaner for removing slightly oxidized paint and road soil from older car finishes. Fills small nicks and scratches and restores the rich color and beauty of older paints while leaving a clean lustrous wax finish. Follow label directions and apply Kaldarize to a clean surface away from sunlight. Packaged in 16oz. size.

LUSTRE WAX #1

Hand or machine applied for removing light oxidation from late model used car finishes. Gentle controlled cutting action is safe for the acrylic lacquer finishes. Never scratches, leaves a hard weatherproof gloss. Cleans and waxes in one step. Same "easy on-easy off" characteristics as Perma Glaze. Packaged in 64 oz. size.

LUSTRE WAX #2

Machine applied for cleaning and polishing badly oxidized finishes. Cuts like a compound and at the same time it machine glazes the finish, yielding a truly weather-proof surface. Leaves a deeper longer lasting gloss in half the time. Follow label directions and apply with a buffing machine for best results. Packaged in 64oz. size.

BUFFING COMPOUND

Fine White - For hand or machine use. Synthetic polishing compound has mild cleansing action. Leaves a high shine on all paints. Recommended for body shops and new car prep departments.

Medium Red - General purpose polishing compound for body shop paint finishing and used car clean-up. Works quickly

V Fast-Cut Compound - Super coarse compound recommended for heavy fast removal. Designed for cutting new paint and for eliminating orange peel.
All compounds packaged in 1 gal cans.

VI SPECIALIZED PRODUCTS

SUPER HAND CLEANER

Special formula combines grease and dirt cutting solvents, the scrubbing action of pure refined pumice and lanolin for skin protection. Super Hand Cleaner never needs to be shaken - will not settle out on the shelf. Out cleans the national brands and costs much less. Ask for a free demonstration. Packaged in 22oz., 1 gal sizes.

WATERLESS HAND CLEANER

Heavy duty cream type formula cleans with or without water. Contains lanolin and mineral oil to condition hands and prevent chapping. Wipes off or rinses easily and will not clog plumbing. Packaged in 22oz., 1 gal sizes.

PERMA-CURE TIRE REPAIR KIT

Easy to use kit for plugging holes in tires. Makes a permanent repair you can depend on. Kit includes material for 100 repairs, tools to make repair and complete instructions.

VINYL TOP AND INTERIOR FINISH

Tough acrylic polymer formula restores the sheen and life to interior or exterior vinyl. Spreads and levels freely drying to a clear gloss film that will not peel, fade or discolor. Dries hard, protecting vinyl from all types of weather and repeated washings. Follow label!directions for best results. Apply to clean surfaces with a damp cloth or sponge, spreading a wet even film. Packaged in 22oz., 1 gal sizes.

ACRYLIC FLOOR FINISH

For asphalt tile, vinyl, rubber, linoleum, terrazzo and sealed wood floors. Tough polymer coating drys clear and bright without buffing. Detergent washable. Excellent resistance to dirt pick up and black heel marking. Ammonia sensitive for easy removal. Apply evenly to a clean surface with a clean cloth or wax applicator. Packaged in 1 gal, 5 gal sizes.

DIESEL DRY GAS

Mixes directly with diesel fuel to prevent freezing and help eliminate moisture build-up in fuel tank. Add 1 gal dry gas to 100 gallon diesel fuel. Packaged in 1, 15 gal sizes.

VI EZEE TAP

Specialty cooling solvent for drilling and tapping operations. Non-flammable, fast drying formula leaves no film. Contains no water, eliminating corrosion and rusting problems. Avoid prolonged skin contact. Use only with adequate ventilation. Do not spray on hot parts or near open flame. Packaged in 1 gal size.

METAL CLEANER

Originally designed for removing the factory applied protective coating on domestic car bumpers. Excellent for cleaning and brightening unpainted metal trim. Use for heavy duty vinyl cleaning. Non-corrosive. Apply as is to surface to be cleaned. Rinse with water. Packaged in 5,15 gal sizes.

VII AEROSOL PRODUCTS

Korkay stocks a quality brand of aerosol motor paints and accessory products. The products are top quality and if the can doesn't spray, it will be replaced at no charge.

MOTOR PAINT	TRUNK SPATTER PAINT	OTHER AEROSOL PRODUCTS
Clear Gloss	Gray/White	Undercoating
Gloss Black	Green/Aqua	Flat Fixer
Flat Black	Brown/White	Penetrant
Ford Blue		Silicone
Chevy Orange		Carb. & Choke Cleaner

VIII ACCESSORIES

Korkay stocks a complete line of tools and accessories for dispensing and applying Korkay products. Each item has been selected with quality, durability and economy in mind and carries the guarantee of satisfaction.

CHAPIN COMPRESSED AIR 2 GALLON SPRAYER - For applying bulk chemicals. Heavy duty polyethylene plastic tank. Adjustable brass nozzle.

REPAIR KIT FOR CHAPIN SPRAYER - Contains all the replacement parts needed to recondition Chapin Sprayer.

DRUM PUMP - Metal construction, adjustable for various size drums. Draws out and dispenses a full quart with each cycle.

DRUM SPOUTS - Sturdy polyethylene spout threads easily into all Korkay drums.

HAND CLEANER PUMP - Measures out just the right amount of hand cleaner to do the job. Threads into 1 gallon container.

VIII PISTOL GRIP SPRAYERS AND APPLICATOR - Pistol grip sprayer with adjustable nozzle fitted to 32oz. plastic bottle. Sprayer and bottle available separately too.

DETAIL BRUSH - For cleaning hard to reach areas on trim and name plates. ½" nylon bristle.

DAIRY BRUSH - For cleaning rugs, upholstery and vinyl tops. Stiff 1½" nylon bristle. Has square end and rounded end for extra versatility.

WHITEWALL BRUSH - Long wearing 5/8" brass bristles with a durable hardwood handle.

CAR WASH BRUSH - 8" rectangular brush with nylon bristles. Accomodates threaded or unthreaded handle.

BRUSH HANDLE - 60" wooden brush handle for car wash brush.

SEA WOOL SPONGE - Genuine natural ocean sponge, dried and cleaned. Sealed in a plastic bag until you are ready to use it.

CELLO SPONGE - Two small sponges per package. Great for quick clean ups and for streakless applying of vinyl top finish.

CHAMOIS - Generous size extra thick chamois at an unusually low cost.

WASH MITTS - Quality wash mitt made with dynel fiber to last longer.

BUFFER PADS - Sturdy round-up pads with 1¼" pile.

HYDRO AIR GUN - All metal gun has fitting to accept water hose and compressed air hose. Makes your air compressor a power washer.

HAND CLEANER BRACKET - Stronge metal wall bracket for 1 gallon size hand cleaner. Vinyl coated for extra durability.

IX HIGH PRESSURE VEHICLE WASHING EQUIPMENT

Korksy manfactures several models of Pressure Washers using the highest quality parts and materials. Standard models are available for sale or lease. Coin-operated and custom built models are available for sale only. Whether you buy or lease, you can depend on your Korksy Representative to provide parts and prompt service to keep downtime to a minimum.

IX MODEL #352 PRESSURE WASHER - SALE/LEASE

500 P.S.I. working pressure
Output, 2 gallons per minute
Positive metered soap pick-up
35 ft. hose
Manually operated at the front of the machine

MODEL #152 PRESSURE WASHER - SALE/LEASE

500 P.S.I. working pressure
Output, 2 gallon per minute
35 ft. hose
Remote switch at the end of hose or manually operated at the front of the machine.

MODEL #552 PRESSURE WASHER - SALE ONLY

1000 P.S.I. working pressure
Output, 2 gallons per minute
35 ft. hose
Remote switch at the end of hose or manually operated at the front of the machine.

* Above models available with 50ft. or 75ft. hoses

COIN OPERATED PRESSURE WASHER - SALE ONLY

For single or multiple bay installation
Includes: 25¢ coin box, wall boom or overhead swivel boom and all necessary electrical connections.
500 P.S.I. working pressure
Output, 2 gallon per minute
25 ft. hose

CUSTOM BUILT PRESSURE WASHER - SALE ONLY

Units custom manfactured to your specfications. Call or send your requirements in for a price quotation.

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

Appendix 1.4.1-4

COMMUNICATIONS RECORD FORM

Distribution: ( ) File, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Mr. Thomas Kline Date: 4/15/88

Phone Number: (518) 883-3451 Title: Pres. Dent

Affiliation: Korkay, Inc. Type of Contact: Phone

Address: _____ Person Making Contact: Tom Porter

_____

Communications Summary: RE: Where wastes from 4,000 gal. tank is disposed and where used barrels are washed.

- Wastes from 4,000 gal tank are hauled away by EWS of Watervliet under manifest to Connecticut.

- USED barrels are sent to Fredrickson - Cooperage of Waterford, NY. However, don't take many barrels back anymore they don't do it that often.

(see over for additional space)

Signature: Thomas Porter

Appendix 1.4.1-5
1 of 2

STATE OF NEW YORK
DEPARTMENT OF HEALTH

MEMORANDUM

September 11, 1979

Mr. John T. Eadie
Area Director
Northern Regional Office
SEP 14 1979
ENVIRONMENTAL
WARRENSBURG

To: Mr. Decker - Northern Regional Office

From: Mr. Lupe - Northern Regional Office

Subject: Possible In-Place Toxic Problem
Korkay, Inc.
Broadalbin (V), Fulton County

On August 14, 1979, I met with Mr. Bud Colden of the New York State Department of Environmental Conservation, to investigate a complaint from Mr. Ed Tanner regarding Korkay, Inc. of Broadalbin, New York.. Mr. Colden had arrived at the Village prior to me and had photographed a barrel storage and chemical leachate problem in back of Korkay, Inc. Mr. Tanner had informed Mr. Colden that poor barrel washing waste disposal practices and barrel storage had gone on for years and it was now affecting trees on his property and had affected a neighbor's garden.

Mr. Colden showed me the barrel storage area at Korkay. Approximately 200-300 barrels were stored outdoors and residue from the barrels was leaking onto the ground. Several streams and puddles of pink and white leachate were on the ground. We did not immediately speak with the Korkay Officials, as Mr. Colden wanted to evaluate this problem further with his forestry people and toxic wastes people. I indicated that I would tell Mr. Cunnan and have him visit the site to see the problem.

Mr. Cunnan arrived on the scene after Mr. Colden left. While waiting for Mr. Cunnan, I advised Mr. Pickering, Board Trustee of the complaint and asked him to accompany us to the plant. We met with Mr. Anthony Kline, Korkay, Inc. and checked the plant for cross connections and to inspect the barrel storage area. Several potential cross connections were found and he was informally informed of the need for correction.

Mr. Kline explained that Korkay buys used barrels, washes them out, relines them and uses them to distribute products. A variety of used barrels formerly containing degreasers, acetone, isopropyl alcohol, perfumes, and other chemicals and food stuffs were present. We pointed out the leachate problems and the sloppiness of the barrel washing operation. We advised him that DEC would formally advise him of corrective action and indicated that until then, better control of barrel washing was needed.

Because the company has been operating the barrel washing operation for several years and the variety of chemical residues which have been spilled or washed into the ground, a potentially serious in-place toxic problem may exist. Recently, Mr. Colden and several members of New York State Department of Environmental Conservation staff have revisited the site and ordered corrective action (see attachments). As you will note more details are to be obtained on the chemicals at the plant. I will keep you advised on this matter.

If you have any questions on this matter, please discuss with me directly.

CC: Mr. Gunnan - Johnstown D.O.
Mr. Golden - DEC, Harrisburg
Mr. Eadie - Northern Regional Office
Mr. Tramontano - Toxic Substances Management Unit
Dr. Richard Wagner - Local Health Officer

AUG 16 19
N.Y. STATE DEPT. OF
JOHNSTOWN DISTRICT

D. A. Corliss, P.E., Regional Engineer - Ray Brook
William C. Colden, P.E. Regional Solid Waste Engineer - Warrensburg
Industrial Waste Discharge and Inplace Toxics, Korkay Incorporated
Broadalbin (V), Fulton (Co.)
August (V), Fulton (Co.)

On August 14, 1979, I met with Ed Tanner, owner of Tanner's Lumber Yard in Broadalbin. He showed me a number of dead trees in his back yard which he believed to be caused by an industrial waste discharge from the Korkay plant. The trees had been looked at by John English of the Northville office and he believes that the trees are not being killed by pests or disease and suggested to Mr. Tanner that the discharge from Korkay is the likely cause.

Mr. Tanner and I walked around the back fence and on to the Korkay property where I observed the presence of approximately 100 to 200 barrels. A bright red liquid was flowing from the barrel storage area. Mr. Tanner informed me that has been common practice for the past 8 or 9 years for the company to wash out these barrels and discharge the washwater to the ground surface. I am not aware at this time as to all of the various chemicals which Korkay uses, however, a number of barrels were labeled degreaser, acétone and isopropyl alcohol.

Photographs are attached showing the discharge, the barrel area and the dying trees. Please return the photographs when you are finished with them. A site sketch is also attached. The problem is definitely a significant one deserving prompt action. The actions which I believe should be taken are as follows:

1. Korkay should be contacted by a representative of the Pure Waters staff regarding cessation of this industrial waste discharge.

2. An industrial chemical survey of Korkay should be scheduled as soon as possible. Ray Cowen's July 23, 1979, letter to the Village of Broadalbin indicated that the survey would be scheduled around mid-August.

3. The area in and around the Korkay plant should be treated as a suspected hazardous waste site and appropriately investigated. The chemicals used by this company need to be determined and if the waste material turns out to be hazardous as expected, then a sampling program should be initiated to determine the extent of contamination in the area.

4. A program for remedial action should be established through the appropriate legal documentation and consent order.

Unless instructed otherwise, this is the action that we will be taking.

William C. Colden, P.E.
Regional Solid Waste Engineer

WCC/isb

cc: T. Monroe
C. Goddard
Jack Cannan ✓
D. Fleury
B. Davis

Appendix 14.1.-7
1 of 2

qc

Region 5 - Environmental Quality
Hudson Street, Warrensburg, N. Y. 12885
Area Code 518 623-3671

Robert F. Flacke
xxxxxxxxxxxxxxx

August 24, 1979

Korkay, Incorporated
70 West Main Street
Broadalbin, N. Y. 12025

Attn: Mr. Thomas Klein
Vice President

RECEIVED
AUG 27 1979
N. Y. STATE DEPT. OF HEALTH
JOHNSTOWN DISTRICT OFFICE

RE: Permit Requirements for Industrial Waste
Korkay, Incorporated
Broadalbin (T), Fulton (Co.)

Dear Mr. Klein:

This letter is intended to serve as a summary of our meeting at your office on August 17, 1979. At that meeting, this Department was represented by Stephen Wood, Environmental Conservation Officer, William Colden, Regional Solid Waste Engineer, David Werner, Engineering Aide, and William Lamy, pure waters office. We met with you to discuss your waste discharge to groundwaters at the rear of your plant.

As we understand, you are receiving barrels from various sources and you rinse the barrels before filling them with the various chemicals which you then, in turn, market. The wastewater then is discharged to an old tile field system adjacent to your building. In addition, any of your raw materials that are spilled or are washed out are disposed of, through this same system via a floor drain. Article 17 of the Environmental Conservation Law stipulates that for any industrial wastewater you must have a State Pollutant Discharge Elimination System (SPDES) Permit. It appears that your discharge contains some toxic substances and therefore a discharge to groundwater from your tile field would contravene the groundwater standards. In order for you to comply with the groundwater standards you should cease your wastewater discharge to the ground, until such time as it is properly treated. You have been given a permit application and should you decide to discharge to either ground or surface waters you must complete the application and return it.

We discussed several possible solutions to your problem. It would appear that to comply with the conditions of obtaining a SPDES permit and removing the

pollutants before discharging the effluent to either groundwater or surface water would be costly. You stated that you could obtain new barrels and abolish your rinse operation, then you could contain the wash operation of raw materials spills in the plant, as well as any rinse water from washing the barrels which contained the raw materials. You mentioned that this could be done in a couple of weeks. Another alternative would be to install a holding tank in the ground and contain all rinse waters and then contract with a licensed hauler for disposal of the wastewater.

In order to avoid direct enforcement action, it is recommended that you should cease your wastewater discharge by September 1, 1979. I would recommend that you institute one of the above mentioned plans to control your wastewater discharge, at least as a temporary solution to your problem. This would then allow you to compare costs and investigate the alternatives listed, or others that haven't been mentioned.

We will be contacting you to arrange for a time when we may perform a follow-up Industrial-Chemical survey which will allow us to determine exactly what waste materials you have been discharging to the ground. We also will be evaluating the site to determine what action may be necessary to eliminate the existing environmental hazard.

If I can be of any assistance to you in selecting a particular option, please feel free to contact me.

Sincerely yours,

David B. Fleury, P.E.
Regional Pure Waters Engineer

by: William E. Lamy, P.E.
Senior Sanitary Engineer

WEL:brd

cc: M. A. Coutant, Esq.
S. A. Wood, ECO
W. C. Colden, P.E.
J. Cunnan, P.E.

Appendix 1.4.1-8

1 of 1

Region 5 - Environmental Quality
Hudson Street, Warrensburg, New York 12885
(518) 623-3671 or 668-5441

December 18, 1979

Korkay, Incorporated
70 West Main Street
Broadalbin, New York 12025

Attention: Mr. Thomas Klein
Vice President

Dear Mr. Klein:

The enclosed forms are for your use in securing a permit to haul industrial waste. I telephoned your office last Thursday and spoke with Arthur Schrum. He indicated that your company wants to haul its own waste that is generated by the barrel wash operation.

Mr. Schrum told me that your efforts to move the barrel wash operation to Amsterdam have not been successful. As I understand it, you are now discharging this waste to a 4,000 gallon holding tank, with subsequent removal by a registered waste hauler. Mr. Schrum could not recall the name of the hauler, but he is required by law to amend his registration to include your wastes. I would appreciate it if you would so notify the hauler, or provide me with his name so that I may do so.

In regard to your application, please pay particular attention to the section pertaining to the physical and chemical character of the waste. If you need further help in filling out the application, please don't hesitate to call.

Sincerely yours,

William C. Colden, P.E.
Regional Solid Waste Engineer

By: Ray E. Cowen, III, P.E.
Senior Sanitary Engineer

REC:isb
Encl.
cc: Ray Lupe, P.E.
Norm Drapeau, P.E.

Telecon w/Schrum 1/22/80 3pm.
Korkay has not purchased a truck yet. Application will be submitted when and if truck is purchased. Currently, Patrick Septic Service is pumping tank. I called Bruce Knapp to alert him about Patrick as he is not currently registered to haul these wastes.

David B. Fleury, P.E., Regional Pure Waters Engineer - Ray Brook
Robert E. Davis, P.E., Senior Sanitary Engineer - Warrensburg
Korkay, Incorporated, Broadalbin (V), Fulton (Co.)

September 10, 1979

On September 5, 1979, Walter Haynes and I made an inspection of the subject plant grounds to determine what, if any, steps the firm had taken to abate their pollution problems. I met with Tom Klein to discuss the situation.

At present, the following has been accomplished:

1. The road around the building has been paved with crushed stone.

2. The barrel wash operation has ceased. The firm has plans to move this phase of the process to Amsterdam pending approval by the City to use the sewers.

3. The process vat discharge is no longer being discharged to the septic system. The discharge is being contained in empty drums that will be trucked to Amsterdam as per item 2.

4. The firm is planning to install a 4,000 gallon holding tank to contain the process vat discharge in lieu of using the empty barrels. They plan on registering their own truck to haul this wastewater to Amsterdam.

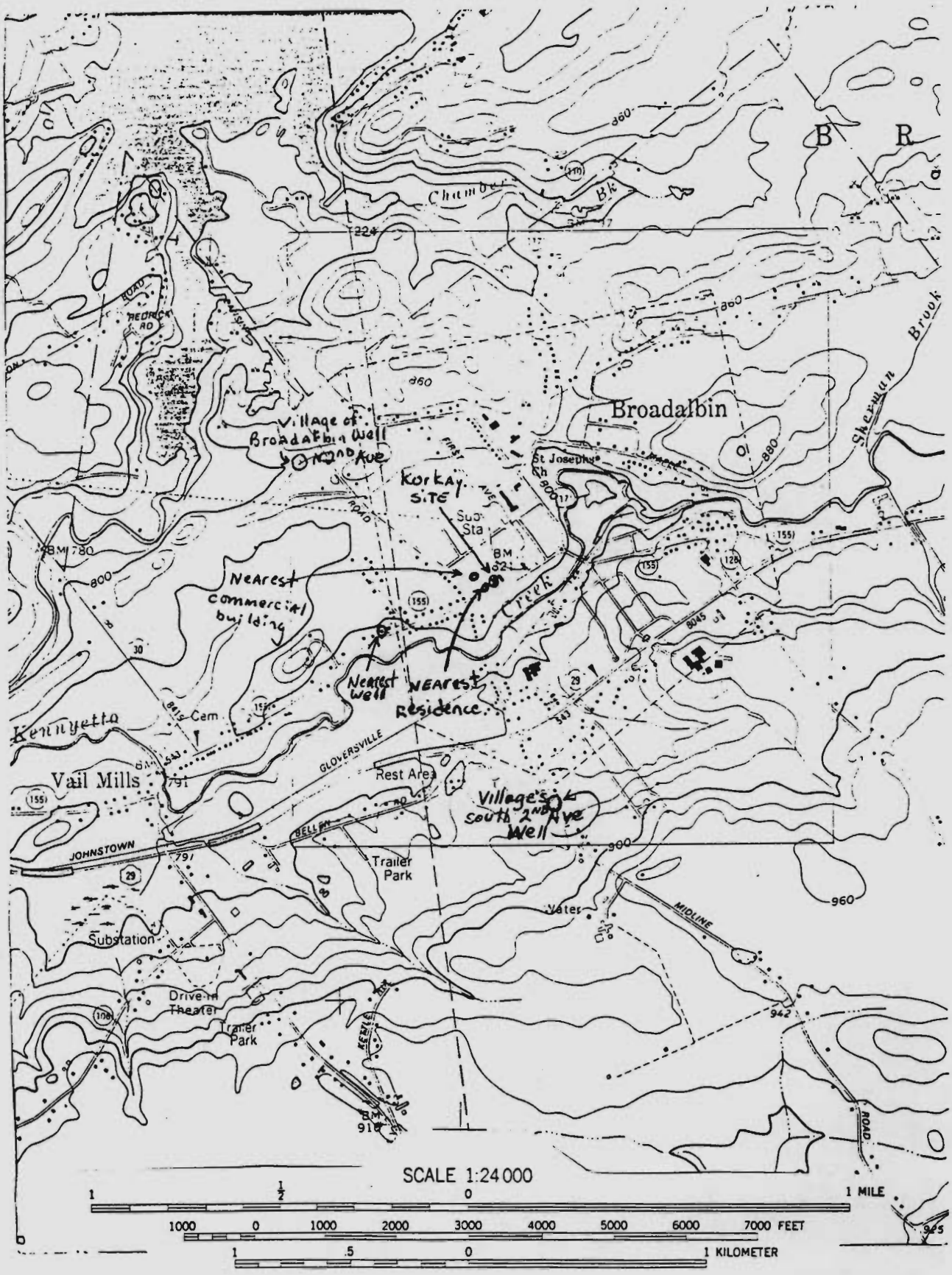
I asked Mr. Klein to keep us informed regarding their progress to date in eliminating the problem. In light of the firm's past practices, I feel that some follow up soil sampling may be in order to determine if there is a significant toxics problem at the site.

Robert E. Davis, P.E.
Senior Sanitary Engineer

RED:isb

cc: William C. Colden, P.E.

Appendix 1.4.2-1



7.5 Minute Series
Broadalbin Quadrangle

Appendix 1.4.3-1
P. 1 of 18

STATE OF NEW YORK
DEPARTMENT OF CONSERVATION
WATER POWER AND CONTROL COMMISSION

PERRY B. DURYEA.....*Conservation Commissioner, Chairman*
B. D. TALLAMY.....*Superintendent of Public Works*
NATHANIEL GOLDSTEIN.....*Attorney General*
JOHN C. THOMPSON, *Executive Engineer*

UNITED STATES DEPARTMENT OF THE INTERIOR

OSCAR L. CHAPMAN, *Secretary*

GEOLOGICAL SURVEY

WILLIAM E. WRATHER.....*Director*
C. G. PAULSEN.....*Chief Hydraulic Engineer*
A. N. SAYRE.....*Chief, Ground Water Branch*
M. L. BRASHEARS, JR.....*District Geologist*

2 of 18

CONTENTS

3 of 10

CONTENTS — (Continued)

4/11

GROUND-WATER RESOURCES OF FULTON COUNTY, N. Y.

By THEODORE ARNOW

ABSTRACT

This report was prepared as part of a State-wide survey of the ground-water resources of New York being made by the United States Geological Survey in cooperation with the New York Water Power and Control Commission. Most of the field work was done during 1946, but some additional work was done during the succeeding four years. Records were obtained for 219 wells and springs, and 22 water samples were collected for chemical analysis.

Fulton County is in the east-central part of the State of New York. The northern half of Fulton County lies in the southernmost extension of the Adirondack Mountains and the southern half lies in the north-central part of the Mohawk Valley. Most of the population and industry is concentrated in the southern flat-lying area. The northern area constitutes part of the Adirondack Forest Preserve and is sparsely populated. Manufacturing is the chief means of livelihood, and the main industry is glovemaking. Drainage in Fulton County is divided into south-flowing streams tributary to the Mohawk River and northeast-flowing streams entering the Sacandaga River or the Sacandaga Reservoir, which covers a large area in the northeastern part of the County. The climate is temperate. The mean annual temperature is 45° F., and the average annual precipitation is 44 inches.

The geologic structure of Fulton County is characterized by at least 10 major normal faults which are part of the great Mohawk Valley fault series. The bedrocks range from pre-Cambrian to Ordovician in age, and in most areas they are mantled by unconsolidated Pleistocene glacial deposits or Recent alluvial deposits.

Precipitation within the County is the source of essentially all ground water in Fulton County. Glacial deposits constitute the major aquifers and the water is recovered from these beds mainly by means of dug wells and springs. Where glacial deposits are thin or otherwise unproductive, water is recovered from the bedrock by means of drilled wells. The glacial deposits, however, are the only potential source of large supplies of ground water. Geophysical exploration east of Gloversville indicates the existence of a buried preglacial valley of the Sacandaga River.

Ground water is used in Fulton County chiefly for domestic and farm purposes and the small supply of water obtained from dug wells generally is satisfactory. Industrial development is primarily in the urban areas, and water used for manufacturing processes is obtained from municipal water systems, which, in two out of seven communities, supply ground water. The quality of the ground water in Fulton County in general is good, and there are few reports of waters having a high mineral content or being excessively hard.

GEOLOGY AND WATER-BEARING PROPERTIES OF THE FORMATIONS

Most of Fulton County lies within the boundaries shown on three U. S. Geological Survey topographic maps, the Broadalbin, Gloversville, and Lasselsville quadrangles. The remaining area is shown on the Canajoharie, Fonda, Amsterdam, Little Falls, and Stony Creek quadrangles. The geology of the Broadalbin and Little Falls quadrangles has been published in detail (Miller, 1911; Cushing, 1905) and the Broadalbin report has been used as a basis for many of the stratigraphic data given in this report. The stratigraphic column for Fulton County is shown in table 1 and the bedrock geology is shown on plate 2.

GEOLOGIC HISTORY

The recorded geologic history of Fulton County begins in pre-Cambrian time when the area was covered by ocean waters. The Grenville series, consisting of several thousand feet of sand, shale, and limestone was deposited in the sea. After deposition of the sediments, igneous activity began on a major scale, and large bodies of syenite and granite were intruded into the Grenville. During or after the period of igneous activity the region was subjected to great forces, which resulted in the metamorphism of both the igneous and sedimentary rocks and the consequent formation of gneiss and schist. Because of later diastrophism the beds now dip at angles ranging from vertical to nearly horizontal. The dip, however, generally is about 25° toward the south.

The next noteworthy geologic event was the elevation of the entire region above sea level and the commencement of a long period of erosion. Minor igneous activity resulted in the intrusion of a series of fine-grained gabbro and diabase dikes into the older rocks. Erosion continued and at the dawn of the Paleozoic era, a fairly flat surface existed approximately at sea level.

Early in the Cambrian period the ocean encroached upon the land again and deposition of Paleozoic sediments began. The sea invaded the Mohawk Valley from the east and did not reach Fulton County until Upper Cambrian time, when the Potsdam sandstone was deposited. The Potsdam was followed by the series of alternating sandstone and dolomite that comprises the Theresa dolomite; and finally, was followed by the Little Falls dolomite. Owing to the irregularity of the old depositional surface and the uneven rise of the Paleozoic seas, the Theresa or Little Falls was deposited directly on the pre-Cambrian surface in certain localities. After deposition of the Little Falls dolomite the land once again was elevated above sea level and subjected to erosion. This marked the end of the Cambrian period and the resultant unconformity separates the beds of the Cambrian and Ordovician systems.

Then followed an oscillation of the land surface. The Tribes Hill limestone was deposited in a shallow sea and during the ensuing period of erosion was nearly or completely removed from Fulton County.

After erosion of the Tribes Hill limestone, the Lowville and Amsterdam limestones, commonly called the Black River beds, were deposited. The Black River beds are thin in Fulton County and are separated from the overlying Glens Falls limestone by a slight disconformity, thus indicating that a period of uplift and erosion separated the deposition of the two (Megathlin, 1938, p. 91). After the Glens Falls limestone was deposited, an influx of fine muddy sediment resulted in the deposition of the Canajoharie shale. This is the youngest consolidated sedimentary formation now present in Fulton County. Although no post-Canajoharie sedimentary rocks are present in the area, it is believed that deposition continued through the Silurian (Miller, 1929, p. 59) and possibly into the Devonian (Goldring, 1931, p. 367). This opinion is based on outcrops of Silurian and Devonian strata south of Fulton County, which if projected, would extend as far north as the southern slopes of the Adirondacks.

The dip of the Paleozoic rocks ranges from southeast to southwest and from horizontal to 6°. In general, however, the dip is about 2° toward the southwest. Locally the shales dip as much as 50°; but the steep dips are always associated with faults and result from the dragging action involved in the faulting.

During the Appalachian Revolution at the close of the Paleozoic era the region was uplifted. It is believed that at this time the bedrock was sheared by the series of north-trending faults which have so greatly influenced the present-day topography. The faults are nearly all vertical and in the majority of places the upthrow is on the west side. In addition to the Noses and Batchellerville faults previously described, at least eight major faults are present in Fulton County. The general relationships of these faults are shown on figure 2 and plate 2. It is interesting to note that the

furnishes only one-quarter g. p. m. from 45 feet of rock, and well Fu 140 is reported to furnish only 1 g. p. m. from 121 feet of the pre-Cambrian. Six wells in the pre-Cambrian rocks range from 40 to 125 feet in total depth and have an average depth of 78 feet. The joints tend to pinch out or close up with increased depth, and generally it has been observed that below a depth of 150 to 200 feet further drilling produces little additional water.

Cambrian formations

Potsdam sandstone and Theresa dolomite.—The Potsdam sandstone and Theresa dolomite underlie a very small area in Fulton County. Because of this and because neither is very porous nor has an extensive joint system, wells tapping these formations have small yields. Well Fu 141, the only well in the Potsdam for which a record was obtained, has a yield of 3 g. p. m. The type of pump used at wells Fu 169 and 170, both of which end in the Theresa, indicates that no more than 3 to 4 g. p. m. is obtained. This, of course, does not preclude the possibility of the dolomite yielding more to a pump of larger capacity, but in general, yields from the Potsdam and Theresa may be expected to be small.

Little Falls dolomite.—The Little Falls dolomite is a compact, dense rock containing few pore spaces. It is broken by numerous joints, however, that have been enlarged by solution of the dolomite along the joint and bedding planes. The solution channels form excellent paths for movement of water, but like the joint systems of the pre-Cambrian rocks, the existence of the channels is difficult to predict. The yields of the wells tapping the dolomite, therefore, range considerably. In all, 13 wells are reported to obtain water from the Little Falls dolomite and the yields range from about 2 to 40 g. p. m. and average 9 g. p. m. The wells range in depth from 42 to 301 feet and average 124 feet in depth. Most wells in the Little Falls dolomite will probably furnish a sufficient supply for household use, but obtaining a more ample supply depends largely on the chance that the well intersects several solution channels.

Ordovician formations

Limestones.—The Lowville, Amsterdam, and Glens Falls limestones are all compact, dense rocks having little pore space but as in the Little Falls dolomite, solution channels and cavities are formed by the dissolving action of circulating waters. Only nine wells have been reported that tap the limestones, seven in the Glens Falls, and one each in the Amsterdam and Lowville. The average yield is about 5 g. p. m. Well Fu 137, for which a yield of 30 to 40 g. p. m. is reported, penetrates 146 feet of rock, and as the total thickness of limestone in the area is approximately 50 feet, this well probably obtains most of its water from the underlying Little Falls dolomite. Well Fu 155, a dug well 15 feet deep, penetrates 1 foot into the Amsterdam limestone. The well is cased loosely in the overlying drift, however, and the water probably is obtained largely from the 14 feet of overburden.

Canajoharie shale.—The Canajoharie shale is a dense impermeable rock which in some areas prevents the surface waters from percolating farther downward. In Fulton County, however, the shale has many joints that provide excellent passageways for the movement of ground water. The joints are similar to those in the other rocks in the area, however, and it is not possible to predict accurately their position beneath the land surface. The yields obtained from wells in the Canajoharie, therefore, range considerably and depend on the number of joints intersected. Reported yields range from 2 to 22 g. p. m. and the average yield for the 34 wells listed in this report is 5 g. p. m. The wells range in depth from 13 to 365 feet and average 135 feet in depth. Yields from the Canajoharie generally decrease with depth as the joints tend to become tighter and pinch out, and it generally is inadvisable to continue drilling to depths much more than 150 feet in the shale if sufficient water has not already been obtained.

Quaternary deposits

Glacial deposits.—Brigham (1929, p. 48) estimates that the glacial deposits in Fulton County have an average thickness of 30 feet. Glacial deposits yield water to 128 of the 191 wells for which information has been obtained. Of these 128, 6 are driven wells, 41 are drilled wells, and 81 are dug wells.

Till, in one form or another, serves as the aquifer for about 80 percent of the wells tapping the glacial deposits. Although largely unsorted and relatively impervious, the till is unconsolidated and comparatively easy to excavate. Therefore, by means of the dug well, which possesses a large infiltration area and a large storage capacity, the till has become the source of water supply for many of the farms and households in the area. The average yield from dug wells in till is less than 3 g. p. m. The depths of 52 wells in the till range from 5 to 265 feet and average 26 feet.

Intermingled with the till are lens-shaped outwash deposits that differ greatly in lithologic properties and are difficult to trace for any distance. Drilled wells, which can penetrate a greater thickness of drift than the dug wells, may encounter these lenses and obtain larger yields from them than wells obtain from tapping the till. Records of 20 wells penetrating outwash deposits show yields that range widely but average more than 10 g. p. m. Many of the yields, however, reflect the maximum capacity of the pump at the well, and the outwash probably is capable of supplying much larger quantities of water than is indicated. The municipal well at Broadalbin (Fu 131) yields 125 g. p. m. from a gravel layer. Depths of 61 wells penetrating outwash deposits range from 7 to 223 feet and average 67 feet. Outwash deposits constitute the most productive aquifers in the County and if modern methods of well completion were employed (see section "Recovery") the deposits could be a source of large industrial and municipal supplies.

Alluvial deposits.—Deposition of silt, sand, and gravel in Recent time has built up a series of stratified alluvial deposits in some of the river valleys of the area. The exact areal extent and thickness of these deposits is not known accurately, but most of the deposits are believed to be small and thin. Only one well definitely is known to obtain water from the alluvium. Well Fu 89, a dug well 14 feet square and 14 feet deep, obtains water from alluvial deposits of Cayadutta Creek. During pumping test at the well, 400 g. p. m. were obtained with a drawdown of about 11 feet after pumping 8 hours. After approximately a 2-hour recovery period the water had returned nearly to its original level. On the basis of this one well, it may be said that alluvial deposits in the County which are subject to surface-water recharge, may constitute a good source of ground water capable of meeting small industrial demands.

RECOVERY[3]

Ground water in Fulton County primarily is recovered from wells. Of these, the majority are shallow dug wells of large diameter that obtain water from unconsolidated materials. Nearly all of the remainder are drilled wells that obtain water from the bedrock or the overburden. In addition to the dug wells and drilled wells, a few small-diameter driven wells obtain water from the overburden.

Dug wells

The percentage of dug wells in Fulton County is comparatively high compared to that of other areas in the State. This is due to several factors. Most of the County, particularly the western and northern parts, is sparsely populated. The inhabitants live primarily on farms that are not equipped with many modern water-consuming devices or facilities, and consequently the dug well, with its modest yield and low cost, generally has sufficed. Another factor is that until recently no full time well driller resided in the area. Anyone wishing to have a well drilled had to bring in a driller from another county, and the additional cost of moving the drilling equipment over long distances was often a deterring factor. In addition, as drillers generally are paid according to footage drilled, they often hesitate to work in strange areas because of fear of obstacles that would materially slow down operations and thus decrease profits. Sixty percent of Fulton County is underlain by very hard pre-Cambrian rocks through which drilling is always very slow, and this also has tended to discourage extensive drilling operations. Within recent years, however, overflow of the urban population beyond the area served by municipal water supplies has created a large demand for private supplies, and this, coupled with the location of a well drilling company in Gloversville, has resulted in a sharp increase in the number of the new wells being drilled.

Dug wells are found mainly in the rural areas and are used primarily for domestic and farm purposes. Most are 2 to 3 feet in diameter and 10 to 20 feet in depth, but some are as much as 5 feet in diameter and 46 feet in depth. The large infiltration area provided by a dug well enables it to obtain water from relatively poor water-bearing materials. This factor, coupled with the large reservoir facilities provided, makes the dug well satisfactory for many homes and farms. This type of well, however, may yield no water during protracted dry periods when the water table falls below the shallow-well bottom. In addition, most wells of this type have a dry-laid stone or brick casing that has innumerable openings that may permit the inflow of polluted surface and shallow-soil waters. Construction of a satisfactory dug well requires careful sealing against pollution from surface sources as well as adequate depth to assure an unfailing water supply during drought periods.

Drilled wells

The drilled wells in Fulton County are almost all 6 inches in diameter and supply water for farm, domestic, and commercial purposes. Those obtaining water from rock generally are cased down to the rock, and left open below. If the casing is properly seated in the rock, all surface water and any water in the overlying unconsolidated materials are kept out and water enters only from

[3] For a complete discussion of wells, well-drilling equipment, and drilling techniques see the section "Recovery" in GW-20 or 21 listed in table 7 at the end of this report.

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SUMMARY OF GROUND-WATER CONDITIONS

The rain and snow that falls on Fulton County is the source of the region's ground-water supply. No extensive subterranean flow of ground water into the County from adjacent areas is indicated.

Ground water in Fulton County is recovered chiefly by means of dug and drilled wells. Of the total of 219 wells for which records were obtained, 104 were drilled, 81 were dug, and 6 were driven. The dug well, having a large infiltration area, is used chiefly on farms to obtain a water supply from the glacial deposits. Yields usually are small, averaging less than 3 g. p. m.; generally this meets all needs. Drilled wells also are used primarily for domestic and farm supplies but generally only where the glacial covering is thin or otherwise unproductive or where there is a likelihood of contamination or an uncertainty of supply during dry periods. There is little industrial demand for ground water in Fulton County. Most industry is in urban areas that have municipal surface-water supplies capable of supplying water at so low a price rate that the risk and cost of establishing a private individual ground-water system generally is not warranted. It is expected in the future, however, that several plants will install wells in order to take advantage of the constant low-temperature feature of ground water.

Ground water generally occurs throughout the County under water-table conditions. Several flowing wells have been reported, but probably they are caused by local conditions; no extensive artesian aquifers are known.

The chief water-bearing rocks of the area are the pre-Cambrian rocks, the Little Falls dolomite, and the Canajoharie shale. All are dense, compact, impervious rocks that yield water only from joints, bedding planes, or solution channels. Openings of this nature are difficult to predict and generally tend to pinch out with depth. The yields obtained from the rock wells, therefore, range considerably. Yields ranging from less than 1 to 40 g. p. m. have been reported. The Little Falls dolomite has an average yield of 9 g. p. m. and is the most productive consolidated aquifer. The quality of water depends upon the source formation. Water from the well-cemented insoluble pre-Cambrian rocks is softer and lower in dissolved solids than water obtained from the dolomite. The water obtained from the soft calcareous Canajoharie shale is the hardest and possesses the highest total of dissolved solids of the three.

The unconsolidated glacial deposits are the chief water-bearing sediments of the area. They range from unsorted till through well-sorted outwash deposits, and accordingly yields range considerably. The till yields less than 3 g. p. m. to dug wells, whereas outwash deposits yield an average of more than 10 g. p. m. to drilled wells. The latter figure, however, would be considerably higher if modern methods of well drilling and well developing were employed. Under such conditions the glacial deposits could be expected to yield supplies large enough for industrial and municipal use. One of the most promising areas for future development in the County is in the vicinity of Gloversville, in what may be a buried preglacial valley of the Sacandaga River.

The quality of the water obtained from the glacial deposits also varies considerably and in many places reflects the character of the underlying bedrock. Glacial deposits overlying the hard dense pre-Cambrian rocks yield softer water than do deposits overlying the shales and dolomites, which consist of calcareous minerals easily taken into solution.

The unconsolidated deposits are the most productive aquifers in the County and constitute the only source from which future demands for large quantities of water can be satisfied.

USGS Bulletin GW-24

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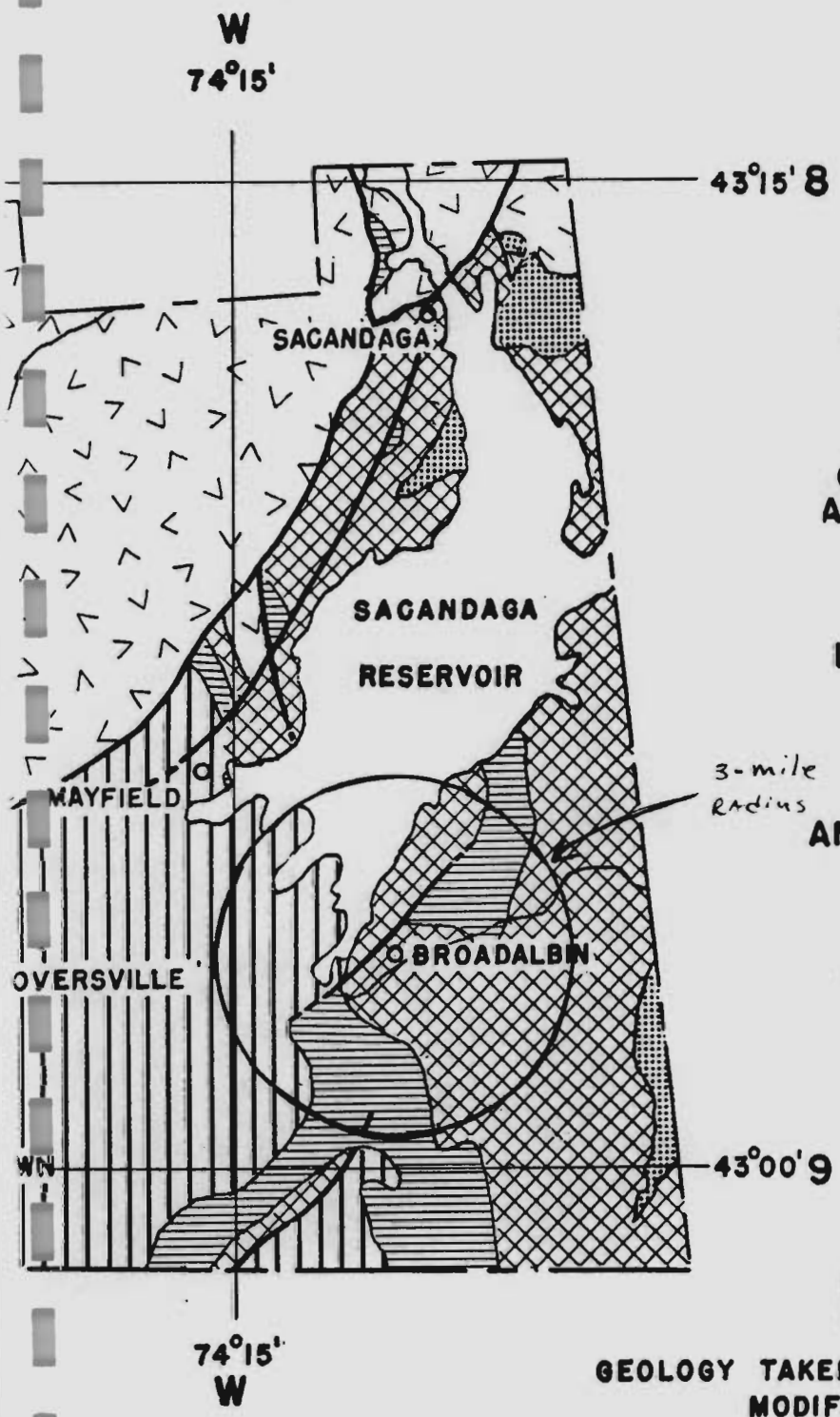
NEW YORK WATER POWER AND CONTROL COMMISSION PLATE 2

FULTON COUNTY, NEW YORK



EXPLANATION

CANAJOHARIE SHALE

GLENS FALLS, AMSTERDAM AND LOWVILLE LIMESTONES

ORDOVICIAN

LITTLE FALLS DOLOMITE

THERESA DOLOMITE AND POTSDAM SANDSTONE

CAMBRIAN

PRE-CAMBRIAN ROCKS

FAULT

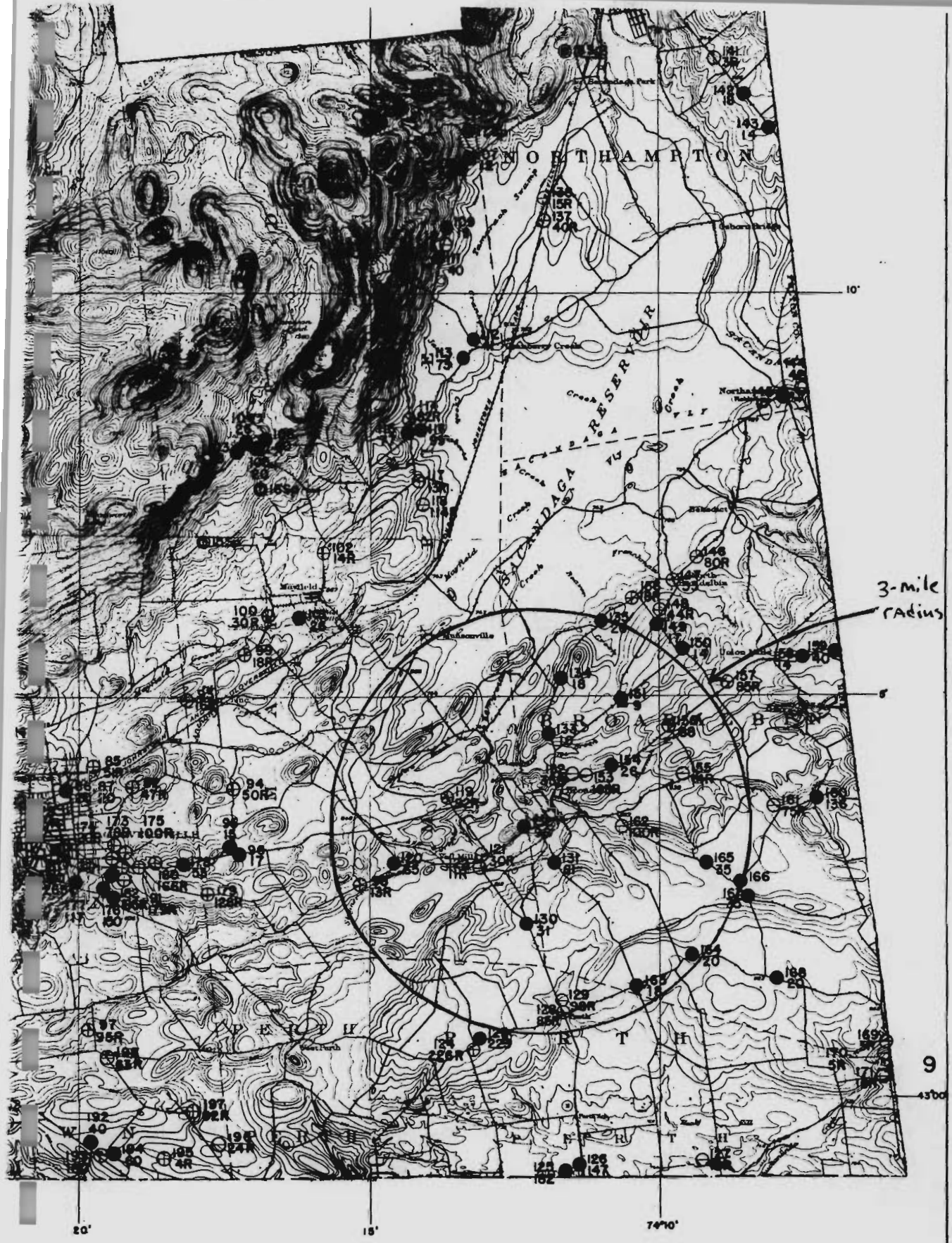
SCALE

2 0 2 4 MILES

GEOLOGY TAKEN FROM MAP BY F. J. H. MERRILL, MODIFIED BY THE WRITER

10 of 11

GW-24



W

SCALE

1 1/2 0 1 2 MILES

CONTOUR INTERVAL 20 FEET

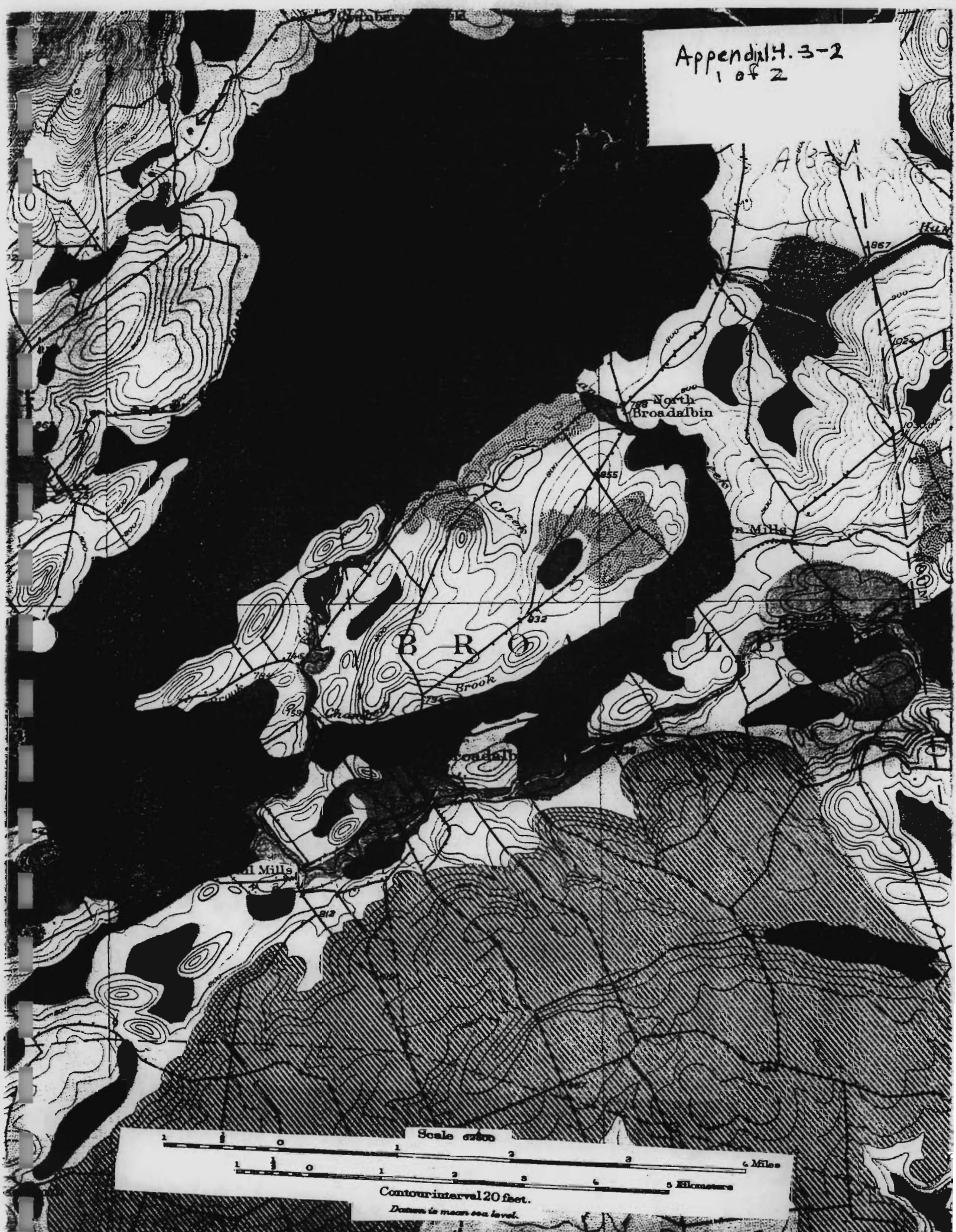
DATUM IS MEAN SEA LEVEL

Appendix 1.4.3-4

USGS Bulletin GW-24

Table 6.—Records of selected wells in Fulton County, New York (Continued)

Well number	Location	Owner	Altitude above sea level (feet)	Type of well	Depth (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic subdivision	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
Fu 120	8W, 14.1S, 0.3E	E. L. Coons	820	Drl	65	6	...	Pleistocene gravel	..	Jet	..	Farm	
Fu 121	8W, 13.9S, 1.6E	Chris Hults	780	Drl	68	6	30	Little Falls dolomite	4	Suction	30	Dom	Reported drawdown is 31 feet when pumped at 30 gallons per minute.
Fu 150	8W, 11.0S, 4.6E	Emma Kuns	865	Dug	14	48	...	Pleistocene till	9	Force	..	Dom	
Fu 151	8W, 11.7S, 3.7E	William Pyristy	840	Dug	9	48	...	do.	5	Bucket	..	Dom	
Fu 152	8W, 12.8S, 3.0E	C. S. Husted	820	Drl	300	6	35	Little Falls dolomite	..	..	1.5	Dom	Flowing well. Record was obtained from U. S. Geol. Survey Water-Supply Paper 102, p. 181.
Fu 153	8W, 12.8S, 3.1E	M. K. Husted	820	Drl	301	6	165	do.	..	..	2	Dom	Do.
Fu 154	8W, 12.7S, 3.5E	J. Konikiewcs	830	Dug	26	34	...	Pleistocene till	23	Force	..	Dom	
Fu 155	8W, 12.8S, 4.6E	G. Kiriluk	830	Dug	15	42	14	Amsterdam limestone	13	do.	3	Dom	Temperature 48° F.[a]
Fu 156	8W, 12.1S, 4.4E	Charles Beletsky	910	Drl	88	6	...	..	..	do.	..	Dom	
Fu 130	8W, 14.9S, 2.3E	Thomas Koslowski	915	Dug	31	36	...	Pleistocene sand	..	..	..	Farm	
Fu 131	8W, 14.1S, 2.7E	Town of Broadalbin	840	Drl	81	6	...	Pleistocene gravel	12	Force	125	PWS	Reported drawdown is 15 feet when pumped at 125 gallons per minute.[a]
Fu 132	8W, 13.5S, 2.3E	Jacob Zuckerwar	800	Drl	96	6	...	Pleistocene deposits	18	..	2	Dom	(b)
Fu 133	8W, 12.2S, 2.6E	R. W. Brauns	840	Dug	10	36	...	Pleistocene till	2	Suction	..	Farm	
Fu 134	8W, 11.4S, 2.8E	N. H. Lasher	820	Dug	18	36	...	do.	8	..	..	Dom	
Fu 161	8W, 13.3S, 5.9E	George G. Wood	970	Drl	100	6	75	Little Falls dolomite	..	..	1.5	Dom	Temperature 54° F.[a]
Fu 162	8W, 13.5S, 3.7E	M. Opalka	850	Drl	124	6	100	do.	25	Force	4.5	Dom	Reported drawdown is 6 feet when pumped at 4.5 gallons per minute. Temperature 50° F.[a]
Fu 163	8W, 15.2S, 3.9E	A. S. Blood	887	Dug	18	36	...	Pleistocene sand	12	Suction	..	Farm	
Fu 164	8W, 15.4S, 4.7E	Orlie Philips	900	Dug	22	48	...	do.	11	Force	..	Dom	
Fu 165	8W, 14.1S, 4.9E	Lawrence Opalka	950	Dug	35	48	...	Pleistocene till	17	do.	..	Dom	(b)


Appendix H. 3-2
1 of 2
North
Broadalbin
Mills
Brook
Mills
Scale 62500
1 0 1 2 3 4 Miles
1 0 1 2 3 4 5 Kilometers
Contour interval 20 feet.
Datum is mean sea level.

BULLETIN NO. 280.
GLOVERSVILLE, BROADALBIN, FONDA
AND AMSTERDAM QUADRANGLES

LEGEND

- Ground Moraine unmodified till
- Bouldery till with or without Moraimic Contours
- Drumlins
- Water-swept till in the Mohawk Valley
- Perth-Broadalbin till plain
- Water-laid drift deposited in standing waters of glacial age
- Kames
- Glacial Spillways and other abandoned channels, mostly of glacial age
- Iroquois gravels
- Landslips
- Alluvial plains

Appendix 1.4.3-3

RECEIVED NOV 29 1985

Provost Bros., Inc.

FREE ESTIMATES

DRILLED WATER WELLS SINCE 1912

CODE 518 868-2126

GOULDS PUMPS
Sales and Service
SLOANSVILLE, NEW YORK

Nov. 26, 1985

To whom it may concern;

In june, 1977, we drilled a water well for the Village of Broadalbin, it was located on Second Avenue. The formation was 1' - 23' sand; 23' - 310' limestone. The yield was 200+ g.p.m. and the water level was 28' from the top.

Respectfully,

Mildred A. Provost
Exec. Vice-President

Mildred A. Provost

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

Appendix 1.4.3-4
p. 1 of 3

FULTON and MONTGOMERY C

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SCALE 1:250,000

FULTON COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Broadalbin Village Water Works. . . .	1500. . .	Wells
2	Canajoharie Village (Montgomery Co).		Sprite Creek Reservoir
3	Fort Plain Village (Montgomery Co).		North Creek Reservoir
4	Gloversville City Water Works. . . .	19000. . .	Rice, Jackson Summit, and Cameron Reservoirs
5	Hyde Park Water Works.	25. . .	Wells
6	Johnstown City Water Works.	9360. . .	Cork Center & Cold Brook Reservoirs
7	Kingsboro Water Works.	200. . .	Reservoirs
8	Mayfield Village Water Works.	911. . .	Wells
9	Northville Village.	1300. . .	Hunters Creek
10	Sacandaga Park Water Works.	1000. . .	Mountain Road Reservoir
11	St. Johnsville Village (Montgomery Co). . . .		Spring
Non-Municipal Community			
12	Artweld Trailer Ranch.	75. . .	Wells
13	Countryside Mobile Estates.	48. . .	Wells
14	Field Point Mobile Home Park.	21. . .	Wells
15	Flyin Y Trailer Park.	NA. . .	Wells
16	Fulton County Infirmary.	375. . .	Ponds
17	Goodspeed Farm.	35. . .	Wells
18	Indian Village Trailer Court.	145. . .	Wells
19	Ko-Z Mobile Home Park 2.	60. . .	Wells
20	Lakeside Mobile Estates.	NA. . .	Wells
21	Little Acres Mobile Homes.	30. . .	Wells
22	Murphy's Mobile Home Park Inc.	54. . .	Wells
23	Northway Mobile Home Park.	250. . .	Wells, Well (Springs)
24	Perth Center Mobile Court.	75. . .	Wells
25	Pine Hill Trailer Court.	36. . .	Wells
26	Red Carpet Housing Corp.	78. . .	Wells
27	Tryon School.	195. . .	Wells (Infiltration Gallery)
28	Valle Mobile Homes.	66. . .	Wells
29	Woodland Estates.	48. . .	Wells

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science and Technology Inc

Appendix 1.4.3-5

COMMUNICATIONS RECORD FORM

Distribution: ( ) Korkay file, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Roger Deuel Date: 11-14-85

Phone Number: (518) 883-3353 Title: DPW Employee

Affiliation: Village of Broadalbin Type of Contact: in person

Address: _____ Person Making Contact: Tom Porter

_____

Communications Summary: N. Second Ave Village well installed 1970 depth to rock 35', well depth ~300'. 10" casing, pump is set at ~260'. Pumps 250 gpm

S. Second Ave well screens overburden. Well was drill into bedrock but screen was set just above rock in a sand and gravel deposit, 6' well screen. Well is pump at 50 gpm. The two wells are pumped Alternately S. 2nd Ave. well pumps 14 hrs during day. Then N. 2nd Ave well is pumped at 0 night.

3/19/86 Pine St. ¼ mile
3rd Ave whole
N. Main 1 House

(see over for additional space)

Signature: Tom Porter

Appendix 1.4.3-6
p. 1 of 6

Groundwater and Wells

Second Edition

Fletcher G. Driscoll, Ph.D.
Principal Author and Editor

Published by Johnson Division, St. Paul, Minnesota 55112

255– 257, 259

p 2 of 6

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in gpd/ft
t = time since pumping started, in days

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in m^2/day
t = time since pumping started, in days

The well function of u [$W(u)$] originated as a term to represent the heat distribution in a flat plate with a heating element at its center. Theis recognized that this same concept could be applied to the regular distribution of the groundwater head around a pumping well even though water flows toward the point source rather than away from it. The mathematical principles remain the same.

Analysis of pumping test data* using the Theis equation can yield transmissivity and storage coefficients for all nonequilibrium situations. In actual practice, however, the Theis method is often avoided because it requires curve-matching interpretation and is somewhat laborious. In fact, the work of applying the Theis method can be avoided in most cases. For example, if the pumping test is sufficiently long or the distance from the well to where the drawdown is measured is sufficiently small, the $W(u)$ function can be replaced by a simpler mathematical function which makes the analysis easier. The Theis method is developed at the end of this chapter, but at this point the simplified version is examined because it serves well in most cases.

MODIFIED NONEQUILIBRIUM EQUATION

In working with the Theis equation, Cooper and Jacob (1946) point out that when u is sufficiently small, the nonequilibrium equation can be modified to the following form without significant error:

$$s = \frac{264Q}{T} \log \frac{0.3\ Tt}{r^2S} \qquad s = \frac{0.183Q}{T} \log \frac{2.25\ Tt}{r^2S} \qquad (9.6)$$

where the symbols represent the same terms as in Equation 9.5 and 9.5a.

For values of u less than about 0.05, Equation 9.6 gives essentially the same results as Equation 9.5. The value of u becomes smaller as t increases and r decreases. Thus, Equation 9.6 is valid when t is sufficiently large and r is sufficiently small. Equation 9.6 is similar in form to the Theis equation except that the exponential integral function, $W(u)$, has been replaced by a logarithmic term which is easier to work with in practical applications of well hydraulics.

For a particular situation where the pumping rate is held constant, Q, T, and S are all constants. Equation 9.6 shows, therefore, that the drawdown, s, varies with $\log t/r^2$ when u is less than 0.05. From this relationship, two important relationships can be stated:

1. For a particular aquifer at any specific point (where r is constant), the terms s and t are the only variables in Equation 9.6. Thus, s varies as $\log C_1 t$, where C_1 represents all the constant terms in the equation.
2. For a particular formation and at a given value of t, the terms s and r are the

*The performance of newly completed wells is often checked by pumping tests. During the test, the drawdown in the pumping well and observation wells is measured at a constant discharge rate. When properly conducted, these tests yield information on transmissivity and storage capability. See Chapter 16 for a detailed analysis of pumping test procedures.

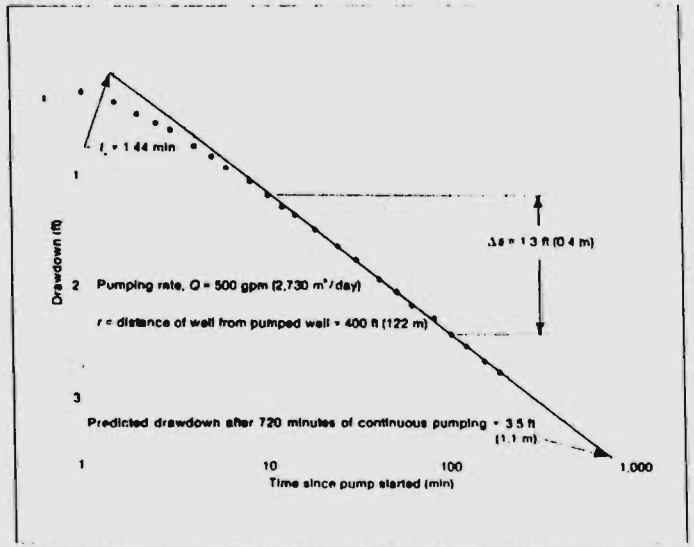

Figure 9.13. When data from Table 9.1 are plotted on semilogarithmic graph paper, most of the plotted points fall on a straight line. The reason for determining Δs and *t*₀ are explained in the text.

only variables in Equation 9.6. In this case, s varies as $\log C/r^2$, where C represents all the constant terms in the equation, including the specific value of t.

By using these simplified relationships based on Equation 9.6, it is possible to derive information on the hydraulic characteristics of the aquifer by plotting drawdown and time data taken during a pumping test. The data are plotted on semilogarithmic paper* as shown in Figure 9.13. Applying the first of the relationships developed above, time, t, is plotted horizontally on the logarithmic scale; drawdown, s, is plotted vertically on the arithmetic scale. Figure 9.13 shows the data from Table 9.1 plotted as a semilog diagram, where most of the points fall on a straight line.

All the points except those representing measurements made during the first 10 minutes of pumping fit the line. During the first 10 minutes, the value of u is larger than 0.05 and so the modified nonequilibrium equation is not applicable within that phase of the test.

Transmissivity

The coefficient of transmissivity is calculated from the pumping rate and the slope of the time-drawdown graph by using the following relationship developed from Equation 9.6:

*Semilogarithmic graph paper is constructed so that one scale is arithmetic and the other is based on the logarithm of the number being plotted. Thus, a straight-line relationship can be shown to exist between two variables whose relationship is actually changing in time.

$$T = \frac{264\,Q}{\Delta s} \qquad T = \frac{2.3}{4\pi}\,\frac{Q}{\Delta s} = \frac{0.183\,Q}{\Delta s} \qquad (9.7)$$

where
T = coefficient of transmissivity, in gpd/ft
Q = pumping rate, in gpm
Δs = (read "delta s") slope of the time-drawdown graph expressed as the change in drawdown between any two times on the log scale whose ratio is 10 (one log cycle)

where
T = coefficient of transmissivity, in m²/day
Q = pumping rate, in m³/day
Δs = (read "delta s") slope of the time-drawdown graph expressed as the change in drawdown between any two times on the log scale whose ratio is 10 (one log cycle)

In the example, Δs is 1.3 ft (0.4 m), which is the change in drawdown between 10 minutes and 100 minutes after the start of the pumping test, and Q equals 500 gpm (2,730 m³/day); so:

$$T = \frac{264 \cdot 500}{1.3} = 102{,}000 \text{ gpd/ft} \qquad T = \frac{0.183 \cdot 2{,}730}{0.4} = 1{,}250 \text{ m}^2\text{/day}$$

Table 9.1. Drawdown Measurements in an Observation Well 400 ft (122 m) from Pumped Well

Time since pump started, in min	Drawdown, s ft	Drawdown, s m	Time since pump started, in min	Drawdown, s ft	Drawdown, s m
1	0.16	0.05	24	1.58	0.48
1.5	0.27	0.08	30	1.70	0.52
2	0.38	0.12	40	1.88	0.57
2.5	0.46	0.14	50	2.00	0.61
3	0.53	0.16	60	2.11	0.64
4	0.67	0.20	80	2.24	0.68
5	0.77	0.23	100	2.38	0.73
6	0.87	0.27	120	2.49	0.76
8	0.99	0.30	150	2.62	0.80
10	1.12	0.34	180	2.72	0.83
12	1.21	0.37	210	2.81	0.86
14	1.30	0.40	240	2.88	0.88
18	1.43	0.44			

Coefficient of Storage

The coefficient of storage is also readily calculated from the time-drawdown graph by using the zero-drawdown intercept of the straight line as one of the terms in the equation. The following equation is derived from Equation 9.6:

$$S = \frac{0.3\,Tt_0}{r^2} \qquad S = \frac{2.25\,Tt_0}{r^2} \qquad (9.8)$$

where
S = storage coefficient

where
S = storage coefficient

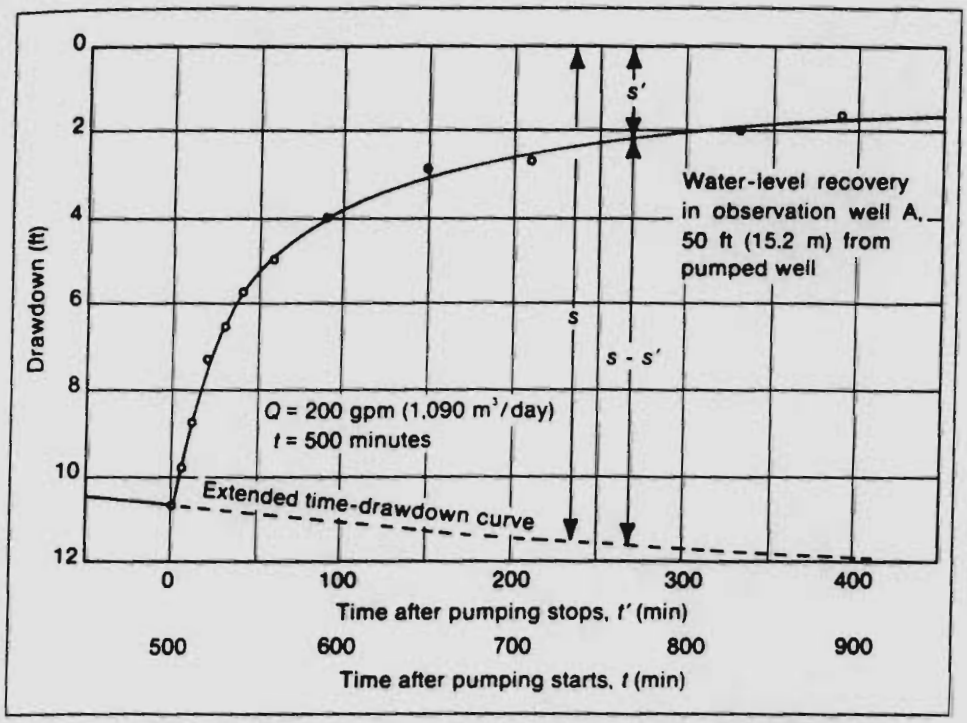

Figure 9.39. Residual-drawdown curve from observation well, with extended time-drawdown curve (on arithmetic scales) showing how calculated recovery is determined at any instant during the recovery period. Producing well pumped 200 gpm (1,090 m³/day) for 500 minutes.

retically, the drawdown and recovery plots should be identical if the aquifer conditions conform to the basic assumptions of the Theis concept.

The time-recovery data from the pumped well can also be plotted by using the method applied to the observation well. The time-recovery plot for the pumped well is more accurate than its time-drawdown plot because the residual-drawdown measurements are more accurate. During the recovery period, water-level measurements can be made without being affected by pump vibrations and momentary variations in the pumping rate.

In analyzing the time-recovery plot, its slope is of primary interest. Two factors determine the slope of the straight line in Figure 9.40. One is the average pumping rate during the preceding pumping period, the other is the aquifer transmissivity.

In Figure 9.40, the slope of the straight line is expressed numerically as the change in the water-level recovery per logarithmic cycle. It is designated by $\Delta(s - s')$. Its value in Figure 9.40 is 5.2 ft (1.6 m), which is the recovery during the period from 10 minutes to 100 minutes after pumping stopped.

The next step is to calculate the transmissivity of the aquifer from the following equation:

$$T = \frac{264\,Q}{\Delta\,(s - s')} \qquad T = \frac{0.183\,Q}{\Delta\,(s - s')} \qquad (9.14)$$

Note that this equation is similar to Equation 9.7. Figure 9.40 shows the value of T to

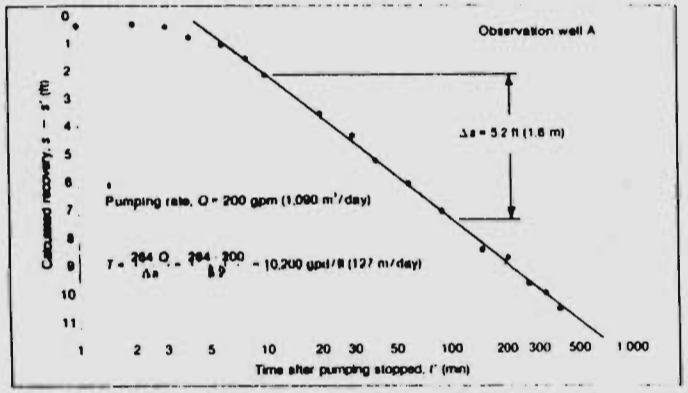

Figure 9.40. Time-recovery plot for observation well becomes a straight line when plotted on a semilog diagram, similar to the time-drawdown diagram for the preceding pumping period.

be about 10,200 gpd/ft (127 m²/day), which may be compared with T as calculated from the time-drawdown data plotted in Figure 9.25. If test conditions meet the required standards and measurements are taken carefully, the two results should agree reasonably well.

A second method of plotting the data permits direct use of the residual drawdown without calculating the recovery from an extension of the time-drawdown plot. It can be shown that the residual drawdown is related to the logarithm of the ratio t/t' as follows:

$$s' = \frac{264\,Q}{T} \log t/t' \qquad s' = \frac{0.183\,Q}{T} \log t/t' \qquad (9.15)$$

Mathematical development of this relationship is given in Appendix 9.D.

This equation shows that when values of s' are plotted against corresponding values of t/t' on semilogarithmic graph paper, a straight line can be drawn through the plotted points. Figure 9.41 shows the data from Table 9.4 plotted on a semilog diagram, with s' indicated on the vertical arithmetic scale and t/t' on the horizontal logarithmic scale. The transmissivity is then calculated from the following equation:

$$T = \frac{264\,Q}{\Delta s'} \qquad T = \frac{0.183\,Q}{\Delta s'} \qquad (9.16)$$

Note from Figure 9.41 that time during the recovery period increases toward the left in this method of plotting, whereas on the time-drawdown and time-recovery plots time increases toward the right.

The residual-drawdown plot as shown in Figure 9.41 is preferred over the recovery plot, Figure 9.40, for calculating transmissivity. The method shown in Figure 9.41 provides a more independent check on the results calculated from the pumping period.

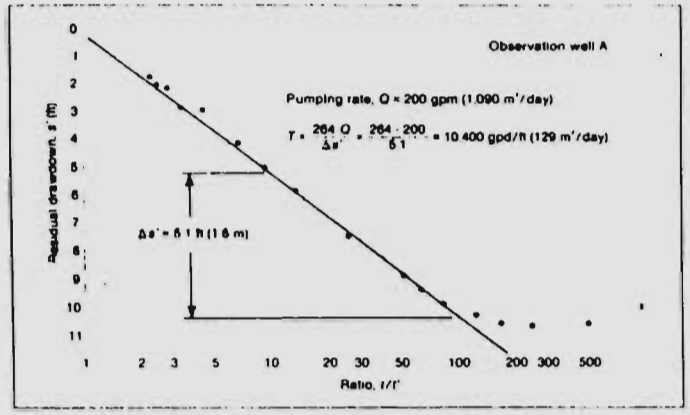

Figure 9.41. Residual drawdown plotted against the ratio t/t' becomes a straight line on semilog graph and permits calculation of transmissivity as shown. Time during recovery period increases toward the left in this diagram.

The method used in Figure 9.40 depends upon extension of the time-drawdown plot through the recovery period; thus, the drawdown plot itself determines the values used in the recovery plot, and any inaccuracies in the drawdown plot are projected into the recovery plot.

If no observation well is available, the recovery data from the pumped well usually provide the best basis for calculating the transmissivity of the aquifer. The residual-drawdown plot, as shown in Figure 9.41, should always be used in such a case.

Determining Storage Coefficient Using Recovery Data

If measurements are made in at least one observation well during the recovery period, the storage coefficient can be calculated from portions of these data. The data must be plotted as shown in Figure 9.40. The residual-drawdown plot cannot be used for determining the storage coefficient, even though that plot is valid for calculating the transmissivity.

Figures 9.42 and 9.43 show the similarity in calculations of the storage coefficient from time-drawdown and time-recovery diagrams. Using Equations 9.7 and 9.8, the time-drawdown data for an observation well, shown in Figure 9.42, give values of T = 13,000 gpd/ft (161 m²/day) and $S = 5.7 \times 10^{-4}$, respectively. Parallel calculations from Figure 9.43 using $\Delta(s - s')$ in place of Δs and t'_w in place of t_w give values of T = 13,700 gpd/ft (170 m²/day) and $S = 4.4 \times 10^{-4}$, respectively. These two sets of results are considered to be in reasonable agreement.

It is apparent from the residual-drawdown curve in Figure 9.41 that t'_w cannot be obtained from that diagram. The horizontal scale represents a ratio without units. The intercept of this curve at zero drawdown has an entirely different significance on this graph. It is necessary to review the basic assumptions listed on page 218 that were used in developing the equations for both the pumping period and the recovery period

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A study of residual-drawdown curves from actual aquifer tests reveals that the curve does not always pass through this point, called the origin of the diagram. When the curve fails to pass through the origin, it is concluded that the aquifer conditions do not conform to the assumed idealized conditions.

Three ways in which the conditions differ from the theoretical aquifer may be indicated by the residual-drawdown plot. If the graph indicates zero drawdown at a t/t' value of 2 or more, it is concluded that some recharge water reached the aquifer during the pumping period. The result of the recharge is to bring about full recovery to the original static level during a relatively short recovery period, long before t/t' approaches 1. The upper plot in Figure 9.44 might be obtained for such a situation.

A different condition is indicated when the plot extended to the left shows a residual drawdown of several inches or more as t/t' approaches 1. This situation would occur in an aquifer of limited extent with no recharge, when pumping permanently lowers the static water level. The lowest plot in Figure 9.44 illustrates this type of result.

The third condition that can account for minor displacement of the residual drawdown plot results from a variation in the storage coefficient, S. In theory, the storage coefficient is assumed to be constant during both the pumping period and the recovery period of the test. In practice, however, S probably varies and is apt to be greater during the pumping period than during the subsequent recovery (Jacob, 1963).

The value of S for a confined aquifer depends upon the elastic properties of the formation. If the aquifer is not perfectly elastic, it does not rebound vertically during recovery of water levels (recovery of pressure) at the same rate that it is compressed as a result of the drawdown during the preceding pumping.

During pumping from an unconfined aquifer, air occupies the voids in the sands within the cone of depression, because that part of the formation is actually dewatered. The volume of water drained per cubic foot of the formation is the value of S. When pumping is stopped, the rising water table may trap some of the air as bubbles in the

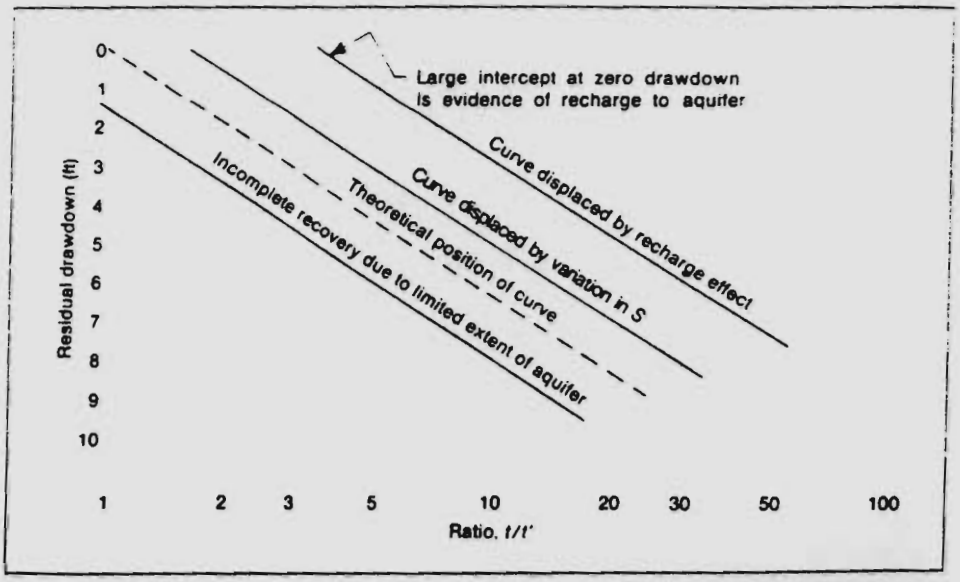

Figure 9.44. When real aquifer conditions differ from theoretical conditions, the residual-drawdown plot may be displaced in any of the three ways shown in this diagram.

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NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

INAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 4 OF 4)

LAB ACCESSION NO: 12511 YR/MO/DAY/HR SAMPLE REC'D: 81/08/31/14

REPORTING LAB: 17 EHC ALBANY
PROGRAM: 100 PUBLIC WATER SUPPLIES
STATION (SOURCE) NO: 00129000
DRAINAGE BASIN: 11 NY GAZETTEER NO: 1723 COUNTY: FULTON
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: BROADALBIN V

EXACT SAMPLING POINT: 80 SITE SURVEY-NORTH 2ND AVE WELL SAMPLE TAP
TYPE OF SAMPLE: 02 PWS, CHLORIN.
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/31/10
REPORT SENT TO: CO (2) RO (1) LPHE (2) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
361109	2-CHLOROETHYLVINYL ETHER	MCG/L	1.	LT
342109	BROMOFORM	MCG/L	1.	LT
51809	1,1,2,2-TETRACHLOROETHANE	MCG/L	1.	LT
341209	TETRACHLOROETHENE	MCG/L	1.	LT
340909	CHLOROBENZENE	MCG/L	1.	LT
349709	1,3-DICHLOROBENZENE	MCG/L	1.	LT
344109	1,2-DICHLOROBENZENE	MCG/L	1.	LT
344209	1,4-DICHLOROBENZENE	MCG/L	1.	LT
052409	ALDICARB	MCG/L	1.0	LT

DATE PRINTED: 9/30/81

INTER AGENCY

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NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 3 OF 4)

LAB ACCESSION NO: 12511 YR/MO/DAY/HR SAMPLE REC'D: 81/08/31/14

REPORTING LAB: 17 EHC ALBANY
PROGRAM: 100 PUBLIC WATER SUPPLIES
STATION (SOURCE) NO: 00129000
DRAINAGE BASIN: 11 NY GAZETTEER NO: 1723 COUNTY: FULTON
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: BROADALBIN V

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TYPE OF SAMPLE: 02 PWS, CHLORIN.
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/31/10
REPORT SENT TO: CO (2) RO (1) LPHE (2) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
351909	1,1-DICHLOROETHANE	MCG/L	1.	LT
361209	TRANS 1,2-DICHLOROETHENE	MCG/L	1.	LT
339009	CHLOROFORM	MCG/L	1.	LT
350809	1,2-DICHLOROETHANE	MCG/L	1.	LT
323609	1,1,1-TRICHLOROETHANE	MCG/L	1.	LT
336609	CARBON TETRACHLORIDE	MCG/L	1.	LT
338909	BROMODICHLOROMETHANE	MCG/L	1.	LT
361309	1,2-DICHLOROPROPANE	MCG/L	1.	LT
361509	TRANS 1,3-DICHLOROPROPENE	MCG/L	1.	LT
361609	TRICHLOROETHENE	MCG/L	1.	LT
344909	DIBROMOCHLOROMETHANE	MCG/L	1.	LT
361409	CIS 1,3-DICHLOROPROPENE	MCG/L	1.	LT
351709	1,1,2-TRICHLOROETHANE	MCG/L	1.	LT

DATE PRINTED: 9/30/81

INTER AGENCY
NYSDH WATER OPERATION SECTION
BUREAU OF PUBLIC WATER SUPPLY

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 2 OF 4)

LAB ACCESSION NO: 12511 YR/MO/DAY/HR SAMPLE REC'D: 81/08/31/14

REPORTING LAB: 17 EHC ALBANY
PROGRAM: 100 PUBLIC WATER SUPPLIES
STATION (SOURCE) NO: 00129000
DRAINAGE BASIN: 11 NY GAZETTEER NO: 1723 COUNTY: FULTON
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: BROADALBIN V

EXACT SAMPLING POINT: 80 SITE SURVEY-NORTH 2ND AVE WELL SAMPLE TAP
TYPE OF SAMPLE: 02 PWS, CHLORIN.
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/31/10
REPORT SENT TO: CO (2) RO (1) LPHE (2) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
038109	P.C.B., AROCLOR 1254	MCG/L	0.54	LT
041609	P.C.B., AROCLOR 1260	MCG/L	0.54	LT
039909	MIREX	MCG/L	0.54	LT
34209	ATRAZINE	MCG/L	0.4	LT
041409	CARBOFURAN	MCG/L	0.5	LT
362009	CHLOROMETHANE	MCG/L	1.	LT
361809	BROMOMETHANE	MCG/L	1.	LT
341009	VINYL CHLORIDE	MCG/L	1.	LT
370209	DICHLORODIFLUORMETHANE	MCG/L	1.	LT
361909	CHLOROETHANE	MCG/L	1.	LT
361709	TRICHLOROFLUROMETHANE	MCG/L	1.	LT
323809	DICHLOROMETHANE	MCG/L	1.	LT
350909	1,1-DICHLOROETHENE	MCG/L	1.	LT

DATE PRINTED: 9/30/81

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NYSDH WATER OPERATION SECTION
BUREAU OF PUBLIC WATER SUPPLY
EMPIRE STATE PLAZA, ALBANY N.Y.

SUBMITTED BY: SLADE

Site : Novkay Site
Fulton Co
4 of 4

0145

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 4)

LAB ACCESSION NO: 12511 YR/MO/DAY/HR SAMPLE REC'D: 81/08/31/14

REPORTING LAB: 17 EHC ALBANY
PROGRAM: 100 PUBLIC WATER SUPPLIES
STATION (SOURCE) NO: 00129000
DRAINAGE BASIN: 11 NY GAZETTEER NO: 1723 COUNTY: FULTON
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: BROADALBIN V

EXACT SAMPLING POINT: 80 SITE SURVEY-NORTH 2ND AVE WELL SAMPLE TAP
TYPE OF SAMPLE: 02 PWS, CHLORIN.
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/31/10
REPORT SENT TO: CO (2) RO (1) LPHE (2) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
334409	BENZENE	MCG/L	1.	LT
339209	TOLUENE	MCG/L	1.	LT
351009	ETHYLBENZENE	MCG/L	1.	LT
440909	CHLOROBENZENE	MCG/L	1.	LT
444209	1,4-DICHLOROBENZENE	MCG/L	1.	LT
449709	1,3-DICHLOROBENZENE	MCG/L	1.	LT
444109	1,2-DICHLOROBENZENE	MCG/L	1.	LT
070409	PARA XYLENE	MCG/L	1.	LT
070309	META XYLENE	MCG/L	1.	LT
151409	ORTHO XYLENE	MCG/L	1.	LT
039809	P.C.B., AROCLOR 1221	MCG/L	0.54	LT
038009	P.C.B., AROCLOR 1016/1242	MCG/L	0.54	LT

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BUREAU OF PUBLIC WATER SUPPLY
EMPIRE STATE PLAZA, ALBANY N.Y.

SUBMITTED BY: SLADE

RECEIVED MAR 20 1986

Appendix I.S.4-1
1 of 2

Dear Mr. Porter,

There is no land being irrigated within 3 miles of this site

Sincerely yours,

Paul Sabo

District Conservationist


2092
Beaver
Creek
GOODEMOTE
BM 829
840
860
880
900
960
B R O A
Broadalbin
Sherman Brook
Chamberg
Bk
BM 797
224
HUTCHINSON
ROAD
HEDRICK RD
FRENCHMAN
FIRST AVE
St Joseph's Church
Sub Sta
Kerkacy
Creek
BM 780
BM 821
Kennyetta
Cem
Vail Mills
BM 791
GLOVERSVILLE
Rest Area
JOHNSTOWN
BELLEN RD
Trailer Park
Water
MIDLINE
Substation
Drive-In Theater
Trailer Park
KENYETTA
BM 918
ROAD
RIDGE
945
942
Broadalbin QUAD MAP

Appendix 1.5.4.-2

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

COMMUNICATIONS RECORD FORM

Distribution: (✓) Korkay file, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Mr. Allen Koechlein **Date:** 4/25/88

Phone Number: (518) 623-3671 **Title:** Fish & Wildlife Dept Art

Affiliation: NYS DEC Region 5 **Type of Contact:** Phone

Address: Hudson St. Warrensburg, NY. **Person Making Contact:** Tom Porter

Communications Summary: Are there any CFR Part 230 Regulated wetland downgradient. There is a Regulated wetland in the Village of Broadalbin along the ~~Kpen~~ Kennyetto Creek, however it is located upgradient of the site. There are no other wetlands along Kennetto Creek to the Great Sacandaga lake.

(see over for additional space)

Signature: Thomas Porter

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

Appendix 1.5.4-3

COMMUNICATIONS RECORD FORM

Distribution: ( ) Kerkay File, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Russell Cole **Date:** 25 April

Phone Number: (518) 457-1937 **Title:** Senior Wildlife Biologist

Affiliation: Division of Fish & Wildlife **Type of Contact:** Phone

Address: NYSDEC 50 Wolf Road Albany, NY 12233-0001 **Person Making Contact:** Evan B. Metzger

Communications Summary: Russell pulled the ~~E~~ Broadalbin Quad Map of the Biological Inventory Maps and indicated that there are no regulated wetlands within 1 mile downstream along the Kennyetto Creek of the site.

He also said that to the best of his knowledge, the National Wetlands Inventory Map is not completed for the Broadalbin area, but gave me a number at Cornell University to check (607-255-0800)

(see over for additional space)

Signature: Evan B. Metzger

Appendix 1.5.4-7
1 of 2

New York State Department of Environmental Conservation
Wildlife Resources Center
Delmar, NY 12054

Henry G. Williams
Commissioner

RECEIVED APR 16 1986

April 10, 1986

Mr. Thomas Porter
EA Science and Technology
RD2 Box 91
Goshen Turnpike
Middletown, NY 10940

Dear Tom:

We have reviewed the hazardous waste sites enclosed with your letter of 21 March 1986 for potential affects on "Federally listed endangered species" and "critical habitats". There were not any Federally listed species identified in the vicinity of the sites; however, several sites are in close proximity to significant habitats, including State listed endangered and threatened species. We have drawn the approximate locations of these habitats on the enclosed maps and described them on the back of each map.

In addition, these sites were reviewed by the New York Natural Heritage Program for proximity to rare plants. Information from their files is also included on the back of each map. Please treat the rare plant information as "confidential" and review the enclosed disclaimer statement. If you have any questions concerning the rare plants please contact Dr. Steve Clemants, Botanist, New York Natural Heritage Program, at this address or (518) 439-7488.

If we can be of further assistance please do not hesitate to contact us.

Sincerely,

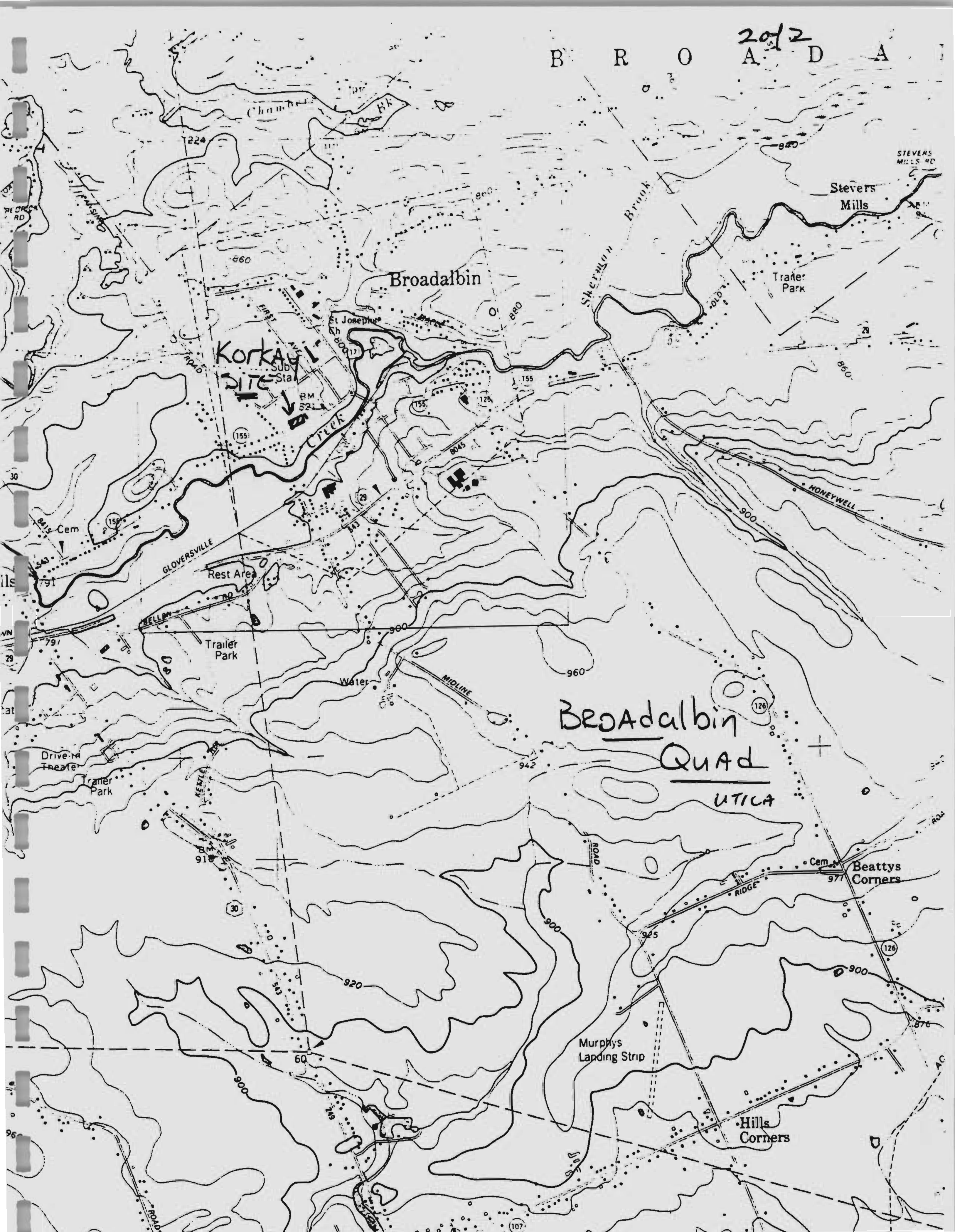
John W. Ozard

John W. Ozard
Senior Wildlife Biologist
Significant Habitat Unit

Enclosures

cc: NYNHP - S. Clemants

JWO:sjs


2012
B R O A D A
Chamber Bk
Broadalbin
St Joseph's Ch
Korkay Site
Sub Sta
BM 821
Creek
Sherman Brook
Stevers Mills
STEVERS MILLS RD
Trailer Park
HONEYWELL
GLOVERSVILLE
Rest Area
Cem
BELLEN RD
Trailer Park
Water
MIDLINE
Broadalbin Quad
UTICA
Drive-in Theater
Trailer Park
KESTLE
BM 910
ROAD
RIDGE
Cem
Beattys Corners
Murphys Landing Strip
Hills Corners
860
880
840
900
960
942
920
925
971
791
224
155
126
29
30
107

Appendix 1.5.7-2

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

COMMUNICATIONS RECORD FORM

Distribution: (✓) Korkay File, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Robert Ballinger Date: 3/31/86

Phone Number: (518) 883-3611 Title: Fire Department

Affiliation: Broadalbin Type of Contact: Phone

Address: Broadalbin, New York. Person Making Contact: Tom Porter

Communications Summary: I inquired if either a state or local fire marshal had certified Korkay, Inc. site as representing a significant fire or explosion threat to the public.

Mr. Ballinger stated there were no local fire marshal only a code inforcer (Mr. Harold Banta) and that Korkay, Inc. has not been certified as a fire or explosion threat.

(see over for additional space)

Signature: Thomas Porter

Appendix 1.6-1
1 of 5

163/250

September 1985

COMPENDIUM OF COSTS OF REMEDIAL TECHNOLOGIES AT HAZARDOUS WASTE SITES

FINAL REPORT

HAZARDOUS WASTE ENGINEERING RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

63940

TABLE 11
SLURRY WALL COST ESTIMATES

(1982 Dollars)

DATA SOURCE	LENGTH & DEPTH	THICKNESS	MATERIAL	UNIT COST
US EPA CH_2 M Hill 1983 New York	7,900 feet x 14 feet	over 2 feet	concrete	$10/sq.ft.
US EPA Weston 1982 New Hampshire	3,733 feet x 70 feet (1)	3 feet	soil- bentonite	$8.05/sq.ft.
US EPA Bids 1982 New Hampshire	3,500 feet x 60 feet	3 feet	soil- bentonite	$7.35/sq.ft.
US EPA JRB-RAM 1980	1,000 feet x 40 feet	3 feet	soil- bentonite	$7.08-13.86/sq.ft.

(1) Dimensions assumed for costing
(3,125 feet x 50 feet expected).

Ground-Water & Leachate Controls
Impermeable barrier
Sheet Piling

Among the estimate scenarios, the piling types varied both in composition and in thickness. Galvanized steel ($10.48/sq.ft. installed) which provides somewhat greater corrosion resistance, was slightly more expensive than black steel ($9.41/sq.ft. installed). The paucity of data on piling thicknesses precludes accurate quantification of their relationships to costs. However, this variable may often be dictated by the availability of local material and geological constraints. Piles are typically withdrawn and reused, and the thickness of the piles may affect the reusability. Hence the rebate value of piles is affected, since a pile which is too thin may buckle upon insertion. The effect of thickness and reusability on the cost may be significant since materials may be 80% of the total cost of a sheet piling cut-off wall. The cost estimates given Table 14 do not include cost credits for reuse of the piles, but do include varying pile types, as indicated. The cost of a geotechnical investigation as noted in Table 15 ($11,210-23,010) was included only in the SCS "impoundment" estimate. Additional costs for overhead (25%) and contingency allowances (25%) were included in this estimate and the SCS "landfill" estimate.

Estimates Sources

- JRB-RAM, 1980
- Radian, 1983
- SCS, 1980

TABLE 15

SHEET PILING COST ESTIMATES

(1982 Dollars)

Data Source	Lenth x depth	Weight	Piling	Unit Cost
US EPA JRB - RAM 1980	1,000 feet x 20 feet	186 tons	5 guage	$17.03/sq.ft.
US EPA Radian 1982	1,000 feet x 20 feet	Not given	black steel	$9.41/sq.ft.
			galvanized	$10.48/ sq.ft.
US EPA SCS (1, 2) "Impoundment" 1980	2,372 feet x 49 feet	487 tons	5 guage	$8.42-12.63/sq.ft.
US EPA SCS (2) "Landfill" 1980	2,373 feet x 49 feet	1,281 tons	PMP-22	$8.02-11.80/sq.ft.

(1) Includes geotechnical investigation ($11210 - 23,010)

(2) Includes overhead (25%) and contingency (25%) allowances

TABLE 33

CARBON TREATMENT COST ESTIMATES

(1982 Dollars)

Data Source	Design	Capacity	Operation & Maintenance	Capital
US EPA Radian	30 min. contact time;	0.14 Mgd (100 gpm)	$357,000/Mgd	$143,000/Mgd
1983	1 lb per 5,000 gal; off-site regeneration	1.4 Mgd (1,000 gpm)	$250,000/Mgd	$643,000/Mgd
US EPA/NJDEP CDM Feasibility Study (F.S) 1983 New Jersey	SO_2 for Fe ppt. air stripping neutralization (3) 1 lb per 1,000 gall.	2 Mgd (1,389 gpm) 7 Mgd (4861 gpm)	$1.5 million/ Mgd $1.3 million/ Mgd	$473,500/Mgd $471,429/Mgd (4) $138,000/Mgd (5)
US EPA CH_2 M Hill (vendor quote for F.S.) 1983 Illinois	sand filters carbon tanks rented system	0.28 Mgd (200 gpm) 2.16 Mgd (1,500 gpm)	$11,786/Mgd (2) $222,000/Mgd	$346,429/Mgd (1) $476,852/Mgd
US EPA SCS 1981 (mid 1978 dollars)	pressurized pretreated in situ regeneration	7.2 Mgd (5,000 gpm)	$883,200	$234,600

(1) Includes set-up and breakdown of all major equipment, piping, controls, utility, erection, transportation, carbon and sand. No purchase.

(2) System rental

(3) All costs included
(4) First 5 years
(5) After 5 years.

Appendix 1.6-2
1 of 2

Bio XL℠ Enhanced Bioreclamation Program

Project Description, Services and Costs

Aquifer Remediation Systems (ARS) Bio XL Program is custom designed to develop a cost effective strategy for in situ treatment of our client's subsurface contamination problems. Once a client has contracted with ARS for a Bio XL Program, a team of specialists is assigned to the project by the Project Coordinator. This Coordinator acts as the prime contact for the client and brings together the ARS resources necessary to meet the needs of the client.

The major elements of our Program and associated services and costs are detailed below.

Phase I: Site Assessment

Site Assessment provides a general understanding of the microbial activity at the contaminated site and confirms this activity can be accelerated by our Process to degrade the groundwater contaminant. In addition, key issues regarding site hydrology and chemistry are evaluated to determine if they may be significant knockout factors.

Activities include an on-site visit to collect groundwater samples for further laboratory evaluation, conduct on-site groundwater analysis and a review of site information which has already been generated.

Costs for Phase I, typically range from $5,000-10,000 for simple sites such as petroleum hydrocarbons and $10,000-15,000 for more complex sites.

Phase II: Process Design

Process Design identifies whether or not a Bio XL Program will reduce the groundwater contamination to acceptable levels and provides cost and time figures which will allow for an economic comparison to other treatment options.

Activities include an on-site visit to obtain core samples which will be analyzed to determine the amount of contaminant in the soil, compatibility of the subsurface environment to stimulation and a more specific microbial assessment of the relative rates of degradation of the contaminants. Since geotechnical site investigations have not typically evaluated the amount of contamination adsorbed in the soil, soil analysis has been included in this phase.

Costs for Phase II range from $10,000-30,000 for simple sites such as petroleum hydrocarbons and $20,000-100,000 for more complex sites.

Phase III: Program Implementation

Program Implementation provides execution of the Bio XL project which has been designed to achieve the desired remediation goals.

Activities for this phase are quite extensive but are performed under four major categories; final project engineering; installation of ARS application equipment and project start-up; operation and monitoring; and site closure.

Costs for Phase III are very site specific. The less contaminant to be degraded and the less complex the site, the lower the remediation costs. Costs range from $50,000-150,000 with a monthly charge of $5,000-20,000 for service and nutrients.

At the conclusion of Phase III, a final report will be prepared for the client which will contain full documentation of the project. Included will be one-day consultation with the ARS Project Coordinator to discuss and review the report.

*Bio XL is a service mark of FMC Corporation.

0840S30040Sec

(47-15-11 (10/83)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SOLID AND HAZARDOUS WASTE

INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

PRIORITY CODE: _____ SITE CODE: 518014

NAME OF SITE: Korkay, Inc. REGION: 5

STREET ADDRESS: 70 West Main Street

TOWN/CITY: Broadalbin COUNTY: Fulton

NAME OF CURRENT OWNER OF SITE: Korkay, Inc., President Thomas Kline

ADDRESS OF CURRENT OWNER OF SITE: Same as above

TYPE OF SITE: (spills to ground) OPEN DUMP [X] (septic system) STRUCTURE [X] LAGOON [ ]
LANDFILL [ ] TREATMENT POND [ ]

ESTIMATED SIZE: 1 ACRES

SITE DESCRIPTION:

Korkay, Inc. is a chemical blending and repackaging company which purchases used barrels and stores them on site. A barrel washing operation was performed on site in the past and the wash water was discharged to the septic system with some leakage onto the ground surface.

HAZARDOUS WASTE DISPOSED: CONFIRMED [X] SUSPECTED [ ]

TYPE AND QUANTITY OF HAZARDOUS WASTES DISPOSED:

TYPE	QUANTITY (POUNDS, DRUMS, TONS, GALLONS)
1,1,1-Trichloroethane	Unknown
Tetrachloethane	Unknown
Chlordane	Unknown
O&P-Xylene	Unknown
Trichloroethene	Unknown

TIME PERIOD SITE WAS USED FOR HAZARDOUS WASTE DISPOSAL:

_____, 19 69 TO _____, 19 80

OWNER(S) DURING PERIOD OF USE: Korkay, Inc.

SITE OPERATOR DURING PERIOD OF USE: Korkay, Inc.

ADDRESS OF SITE OPERATOR: 70 West Main Street, Broadalbin, New York 12025

ANALYTICAL DATA AVAILABLE: AIR ☐ SURFACE WATER ☐ GROUNDWATER ☒
SOIL ☐ SEDIMENT ☐ NONE ☐

CONTRAVENTION OF STANDARDS: GROUNDWATER ☒ DRINKING WATER ☐
SURFACE WATER ☐ AIR ☐

SOIL TYPE: Silty sand and silt

DEPTH TO GROUNDWATER TABLE: approximately 6 feet below grade.

LEGAL ACTION: TYPE: None known STATE ☐ FEDERAL ☐
STATUS: IN PROGRESS ☐ COMPLETED ☐
REMEDIAL ACTION: PROPOSED ☐ UNDER DESIGN ☐
IN PROGRESS ☐ COMPLETED ☐

NATURE OF ACTION: _____

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Ground water and potential soil contamination.

ASSESSMENT OF HEALTH PROBLEMS:

Ground water is used as a source of drinking water within a 3-mile radius of the site.

PERSON(S) COMPLETING THIS FORM:

FOR NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAME EA Science and Technology
TITLE _____
NAME _____
TITLE _____
DATE: 15 April 1986

NEW YORK STATE DEPARTMENT OF HEALTH

NAME _____
TITLE _____
NAME _____
TITLE _____
DATE: _____