OhioEPA

State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149

RECEIVED
JAN 1 1991
OFFICE OF RCRA
Waste Management Division
U.S. EPA, REGION V

Richard F. Celeste
Governor

December 31, 1990

RE: Grady McCauley Creative Graphics, Inc.
OHD000468609
Stark County

Mr. Dennis Grady
Grady McCauley Creative Graphics, Inc.
7584 Whipple Avenue
North Canton, Ohio 44720

Dear Mr. Grady:

Enclosed is the final report for the Comprehensive Ground Water Monitoring Evaluation (CME) that was conducted on October 25, 1990 at the Grady McCauley Creative Graphics, Inc. facility at 7390 Middlebranch Road, Middlebranch, Ohio.

The CME was conducted to determine Grady McCauley Creative Graphics, Inc.'s compliance with the interim status standards for owners and operators of hazardous waste treatment, storage, and disposal facilities, specifically rules 3745-65-90 through 3745-65-94 of the Ohio Administrative Code (OAC). The above noted regulations pertain to ground water monitoring. The CME was conducted by Diane Kurlich and Chris Khoureyof the Division of Ground Water, Northeast District Office. Mark Bergman of the Division of Solid and Hazardous Waste Management, Northeast District Office and Lisa Koenig of the Division of Ground Water, Central Office were also present.

The CME report consists of several sections including background information and data on the facility's history and operation, a discussion of the hydrogeology, a description of the ground water monitoring activities at the facility and various checklists and comments developed from these checklists.

A review of the CME revealed violations and deficiencies that are occurring or have occurred at the facility which are explained in the Compliance Status Summary section on pages 27 through 30 of the enclosed report, respectively.

Compliance with the ground water monitoring requirements outlined in the December 8, 1986 Consent Agreement and Final Orderbetween Grady McCauley Creative Graphics, Inc. and U.S. EPA should address the above-noted ground water monitoring violations occurring at the facility. Please submit written documentation demonstrating what actions Grady McCauley has taken of intends to take to abate these violations and deficiencies within a thirty (30) days of receipt of this letter to both me and Mark Bergman of the Northeast District Office.

If you have any questions, please contact Jeff Mayhugh at (614) 644-2934. Questions of a technical nature should be directed to Diane Kurlich of the Division of Ground Water at (216) 425-9171.

Sincerely,

Laurie Stevenson

Laurie Stevenson, Supervisor
Inspections and Information Management Unit
Hazardous Waste Enforcement Section
Division of Solid and Hazardous Waste Management

Reviewed by:

Pamela S. Allen

Pamela S. Allen, Manager
Hazardous Waste Enforcement Section
Division of Solid and Hazardous Waste Management

cc: Jan Carlson, DGW
Mark Bergman, NEDO, DSHWM
Diane Kurlich/Chris Khourey, NEDO, DGW
Jeff Mayhugh, DSHWM
Kevin Pierard, U.S. EPA, Region V

COMPREHENSIVE GROUND WATER MONITORING EVALUATION

OF

GRADY MCCAULEY CREATIVE GRAPHICS, INCORPORATED

STARK COUNTY

MIDDLEBRANCH, OHIO

OHD 004 468 609

OHIO ENVIRONMENTAL PROTECTION AGENCY

December 21, 1990

OhioEPA
State of Ohio Environmental Protection Agency
P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149
(614) 644-3020 **Fax** (614) 644-2329

Richard F. Celeste
Governor

December 22, 1990

Mr. Kevin Pierard, Chief
Ohio-Minnesota Technical Enforcement Section
Hazardous Waste Enforcement Branch, 5HS-12
U.S. EPA, Region V
230 South Dearborn Street
Chicago, IL 60604

Dear Mr. Pierard:

Please find enclosed the final CME for Grady McCauley Creative Graphics, Incorporated. This document, submitted in partial fulfillment of the 1991 RCRA grant commitment for the first quarter, is based on a site inspection conducted November 1, 1990. This document was prepared by Diane Kurlich of the Division of Ground Water, Northeast District Office with the assistance of Mark Bergman of the Division of Solid and Hazardous Waste, Northeast District Office.

If you have any questions, please contact me at (614) 644-2905.

Sincerely,

Janice A. Carlson

Janice A. Carlson, Manager
Technical Services Section
DIVISION OF GROUND WATER

JC/LK/vg
GRADY

pc: Joel Morbito, Project Officer, U.S. EPA, Region V
Carl A. Wilhelm, Chief, DGW (w/enclosure)
Tom Allen, Assistant Chief, DGW
Tim Krichbaum, Manager, DGW-CO
Pam Allen, Manager, DSHWM-CO (w/enclosure)
Tom Crepeau, Manager, DSHWM-CO (w/enclosure)
Laurie Stevenson, Supervisor, DSHWM-CO
Dave Wertz, Manager, DSHWM-NEDO (w/enclosure)
Chris Khourey, Supervisor, DGW-NEDO (w/enclosure)
Diane Kurlich, Hydrogeologist, DGW-NEDO
Mark Bergman, Environmental Engineer, DSHWM-NEDO
File

OhioEPA
State of Ohio Environmental Protection Agency
P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149
(614) 644-3020 **Fax** (614) 644-2329

Richard F. Celeste
Governor

December 22, 1990

Mr. Kevin Pierard, Chief
Ohio-Minnesota Technical Enforcement Section
Hazardous Waste Enforcement Branch, 5HS-12
U.S. EPA, Region V
230 South Dearborn Street
Chicago, IL 60604

Dear Mr. Pierard:

Please find enclosed the final CME for Grady McCauley Creative Graphics, Incorporated. This document, submitted in partial fulfillment of the 1991 RCRA grant commitment for the first quarter, is based on a site inspection conducted November 1, 1990. This document was prepared by Diane Kurlich of the Division of Ground Water, Northeast District Office with the assistance of Mark Bergman of the Division of Solid and Hazardous Waste, Northeast District Office.

If you have any questions, please contact me at (614) 644-2905.

Sincerely,

Janice A. Carlson, Manager
Technical Services Section
DIVISION OF GROUND WATER

JC/LK/vg
GRADY

pc: Joel Morbito, Project Officer, U.S. EPA, Region V
Carl A. Wilhelm, Chief, DGW (w/enclosure)
Tom Allen, Assistant Chief, DGW
Tim Krichbaum, Manager, DGW-CO
Pam Allen, Manager, DSHWM-CO (w/enclosure)
Tom Crepeau, Manager, DSHWM-CO (w/enclosure)
Laurie Stevenson, Supervisor, DSHWM-CO
Dave Wertz, Manager, DSHWM-NEDO (w/enclosure)
Chris Khourey, Supervisor, DGW-NEDO (w/enclosure)
Diane Kurlich, Hydrogeologist, DGW-NEDO
Mark Bergman, Environmental Engineer, DSHWM-NEDO
File

TABLE OF CONTENTS

I. INTRODUCTION 1
Field Evaluation 1
Sources of Information 1
Inspection Checklists 2

II. SITE HISTORY AND OPERATIONS. 3
Facility Location 3
Facility Description and History 3
Waste Materials and Disposal Practices. 5
Regulatory History. 8

III. REGIONAL AND SITE HYDROGEOLOGY 9
Regional Geology and Hydrogeology. 9
Site Geology and Hydrogeology 10

IV. GROUND WATER MONITORING WELL NETWORK 10
Ground Water Monitoring History 10
Monitoring Well Locations. 20
Monitoring Well Installation and Construction. 20
Adequacy of the Monitoring Well Network. 24

V. DETECTION AND ASSESSMENT MONITORING
Detection and Assessment Sampling Events. 25
Sampling and Analysis Procedures. 26
Analytical Results. 27

VI. COMPLIANCE STATUS SUMMARY. 27
Violations 27
Deficiencies. 30
VII. APPENDIX A--Checklists. 32
Appendix A 33
Appendix A-2 58
Comments. 62

VIII. APPENDIX B--U. S. EPA Consent Agreement and Final Order. 64

IX. APPENDIX C--Well Logs 72

LIST OF FIGURES

Figure 1. Facility Location Map. 4

Figure 2. Bedrock Topography Map. 11

Figure 3. Geologic Cross-section Along A-A'. 12

Figure 4. Geologic Cross-section Along B-B'. 13

Figure 5. Potentiometric Surface Map 11/1/90. 14

Figure 6. Potentiometric Surface Map 10/23/87. 15

Figure 7. Potentiometric Surface Map 6/11/87. 16

Figure 8. Potentiometric Surface Map 2/23/87. 17

Figure 9. Potentiometric Surface Map 5/5/85. 18

Figure 10. Construction Diagram for MW-1 through 3A. 22

Figure 11. Construction Diagram for MW-4, 5, and 9. 23

LIST OF TABLES

Table 1. Summary of Chemical Analysis of Wastes in Leach Well LW-4 and Septic Tank ST-5. 6

Table 2. Chemicals Used at Grady McCauley. 7

Table 3. Water Level Elevation Data. 19

Table 4. Monitoring Well Data. 21

Table 5. Parameters Detected During Monitoring. 28

I. INTRODUCTION

The purpose of this report is to document the results of a Comprehensive Ground Water Monitoring Evaluation (CME) conducted at Grady McCauley Creative Graphics Incorporated, in Middlebranch (Stark County), Ohio. A CME is a detailed evaluation of the adequacy of the design and operation of the ground water monitoring system at hazardous waste land disposal facilities. The objective of a CME is to determine whether the owner/operator has in-place a ground water monitoring system which is adequately designed, operated, and maintained to detect releases or to define the rate and extent of contaminant migration from a regulated unit as required under Ohio Administrative Code (OAC) Rules 3745-65-90 through 94. This facility also is operating under a 1986 U. S. EPA Consent Agreement and Final Order (Appendix B).

FIELD EVALUATION

A field evaluation was performed at the facility on November 1, 1990, as part of this CME. Present during this inspection were Mark Bergman, Environmental Scientist, Ohio EPA Northeast District Office (NEDO), Division of Solid and Hazardous Waste Management (DSHWM); Lisa Koenig, Hydrogeologist, Ohio EPA-Central Office, Division of Ground Water (DGW); Christopher Khourey, Supervisor, Ohio EPA-NEDO, DGW; and the author of this report, Diane Kurlich, Hydrogeologist, Ohio EPA-NEDO, DGW. No representatives of Grady McCauley were present during the site inspection, however, Ohio EPA representatives did meet with Dennis Grady and David McCauley in the company's present office on Whipple Avenue, North Canton, prior to the site inspection. The company's consultant was not present to perform any sampling activities. When contacted by Mark Bergman to schedule the on-site inspection, the owners indicated that they were no longer sampling and, therefore, they did not feel that it was necessary to contact their consultants to demonstrate sampling techniques.

SOURCES OF INFORMATION

Information used to complete this CME was gathered from both the field inspection and an extensive review of the files and documents at Ohio EPA-NEDO. The following documents were utilized in the preparation of this CME:

Correspondence and Facility Technical Documents:

1) Ohio EPA Regulatory/Correspondence files (1984-1990), Division of Solid and Hazardous Waste, NEDO, Grady McCauley.

2) Ground Water Assessment Proposal, Wadsworth Alert Testing Laboratories, Inc., December 26, 1984.

3) Ground Water Assessment, Grady McCauley Creative Graphics, Wadsworth Alert Testing Laboratories, Inc., August 6, 1985.

4) Ground Water and Subsurface Soil Sampling Plan, Grady McCauley Creative Graphics, Inc., Revision No. 1, Boinski Environmental Consultants, Inc., November 26, 1985.

5) Groundwater and Subsurface Soil Sampling Plan, Grady McCauley Creative Graphics, Inc., Middlebranch, Ohio Boinski Environmental Consultants, Inc., Final Revision, May 29, 1986.

6) Groundwater and Subsurface Soil Sampling for Grady McCauley Creative Graphics, Inc., Middlebranch, Ohio, The Ohio Drilling Company, February 23, 1987.

7) November 12, 1990 letter from John C. Lanigan, Jr. Woodward-Clyde Consultants to Diane Kurlich, Ohio EPA-NEDO.

General References:

7) United States Geological Survey 7-1/2 minute Quadrangle Topographic Map, Hartville, Ohio, Quadrangle.

8) Ground Water Resources of Stark County, Map, Alfred Walker, Ohio Department of Natural Resources.

9) Bedrock Geology of the Minerva Quadrangle, Stark, Columbiana, and Carroll Counties, Ohio, Richard M. DeLong, Ohio Department of Natural Resources Map, 1967.

10) Geology of Water in Ohio, W. Stout, K.V.Steg, and G.F. Lamb, Ohio Department of Natural Resources Bulletin 44, 1943.

11) Geology of Stark County, Richard M. DeLong and George M. White, Ohio Department of Natural Resources Bulletin 61, 1963.

12) An Inventory of Ohio Soils, Stark County, Ohio Department of Natural Resources, 1968.

13) Physical Geography, Stark County, Ohio Stark County Regional Planning Commission, Canton Office, 1960.

INSPECTION CHECK-LISTS

Attached to this report are several checklists from the Interim Status Ground Water Monitoring Evaluation (SW-954). The checklists deemed appropriate for this facility are:

APPENDIX A: CME Worksheet (March, 1988)
APPENDIX A-2: Inspection Compliance Form For a Facility Which Has Determined It May Be Affecting Ground Water Quality.

II. SITE HISTORY AND OPERATION

FACILITY LOCATION

The Grady McCauley Creative Graphics (OHD 004-468-609) facility is located at 7390 Middlebranch Road N.E., in Middlebranch, Stark County, Ohio. The facility lies approximately 400 feet west of the Middle Branch of the Nimishillen Creek, and north of the junction of Werner Church Road and Applegrove Street (Figure 1). The topography near the site is generally flat. The land beneath the facility has a gentle ten percent eastward slope decreasing to nearly zero percent towards the Nimishillen Creek.

FACILITY DESCRIPTION AND HISTORY

The Dice Decal Corporation in Middlebranch, Ohio, was renamed Grady McCauley Creative Graphics, Inc. (Grady McCauley), on September 1, 1984. The ownership of the corporation remained the same and there was no change in the corporate structure other than the change of name. The former company under the name of The Dice Decal Corporation had operated for approximately 36 years dating back to 1948. During this period the company employed from twenty to forty people.

The existing Grady McCauley structure was utilized for the manufacturing of decals. It is located in an area that is primarily residential with various light industry also present. Prior to 1948, the segment of the complex was reportedly used as a cheese house, retail operation, residential property and poultry cleaning operation. Segment A (Refer to Figure 2) of the complex is the original structure. Additions were reportedly added in the years 1969, 1972, 1979 and 1983.

Rinse waters generated from the company operation were released through company sewer drains into a "leaching" well/septic tank system. According to the Ohio Hazardous Waste Regulation OAC-3745-51-03 (a)(2)(IV), this rinse water was a hazardous waste which was being stored and disposed of improperly. Ground water monitor wells were installed and samples collected upon orders from the Ohio EPA dated August 12, 1984. The order was based upon a RCRA compliance inspection conducted February 9, 1984. Monitor well samples showed contamination from solvent wastes. Two of five neighboring domestic wells were shown to be contaminated with one ppb of methylene chloride.

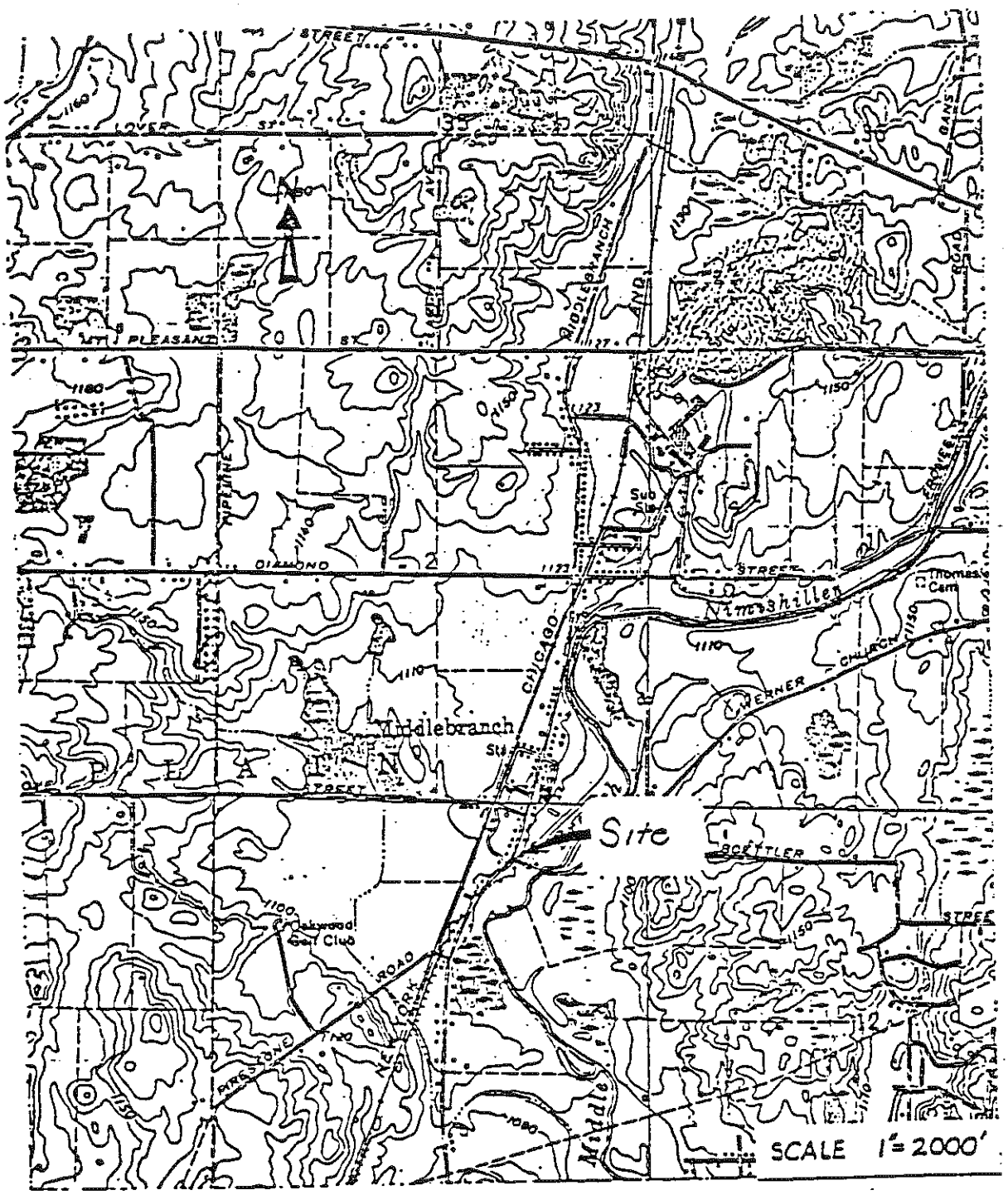


Figure 1. Facility location map.

WASTE MATERIALS AND DISPOSAL PRACTICES

Liquid wastes discharged from on-site activities have historically been directed to underground septic tanks and leaching ("dry") wells. Each leach well consists of a 2,000 gallon slotted underground tank designed to allow wastewaters to discharge into the ground. There are four leach wells and one septic tank at the facility. In 1983, two leaching wells, LW-1 and LW-2, were abandoned and replaced by two new leaching wells, LW-3 and LW-4. An area behind the facility where trash was open burned is also located on the Grady-McCauley property. This area is currently covered by a concrete drive and walkway behind Annex E of the Grady McCauley facility.

Leach well LW-2 reportedly received the overflow from leach well LW-1 and leach well LW-4 reportedly received overflow from leach well LW-3. A fifth subsurface point is a slotted septic tank which reportedly received all on-site liquid domestic and art room wastes.

The chemical characteristics of the waste contained in LW-4 and ST-5 are summarized in Table 1. The laboratory procedure used in the waste analysis was not included in the accompanying report and is unknown by this author.

Until 1984 about 450 to 1,200 gallons per year of methyl ethyl ketone (MEK) and other solvents were used at the facility to clean silkscreens and other equipment. The wastes from this process were drained through the company sewage system into the leaching wells. Apparently the original set of leaching wells, LW-1 and LW-2 did not function properly and filled with waste. This waste was removed by pumping and taken to a local sewage treatment facility for disposal. Total annual waste pumped amounted to 4,000 gallons per year. A percentage of the wastewater was printing ink. The extra ink which did not meet specifications was put into the trash dumpster for disposal by R. C. Miller, Inc. A plant filter process utilized a 60 percent Isophorone and 40 percent Xylol mixture. Approximately 50 percent of the screenings were cleaned by this process. The remaining 50 percent of the screenings were cleaned with 786 Ink Degradent or 757 (corrosive) manufactured by the Intercontinental Chemical Corporation of Cincinnati, Ohio. The washings from this process were then disposed of through the company sewage system. Methyl ethyl ketone (MEK) was used for one machine that had rubber rollers which the 60/40 mixture would destroy. Owners estimate that approximately 450 gallons of MEK was used per year.

Chemicals known to have been used at the facility are listed on Table 2.

Table 1

Summary of Chemical Analysis of
Wastes in Leach well LW-4
and Septic tank ST-5

Leach Well LW-4

VOC analysis

Chemical	Concentration	Det. Limits
Ethylbenzene	38 mg/l	10 mg/l
Xylenes	160 mg/l	10 mg/l

Base/Neutrals

Chemical	Concentration	Det. Limits
Isophorone	7,000 mg/l	5 mg/l

MS/DS Identified compounds

Chemical	Concentration	Det. Limits
Cyclohexahnone	500 mg/l	not given
1-methyl-2-Pyrrolidinone	25 mg/l	not given
2-cyclohexylidine Cyclohexanone	500 mg/l	not given

Metals

Chemicals	Concentration	Det. Limits
Cadmium	110 ug/l	not given
Chromium	470 ug/l	not given
Lead	1,600 ug/l	not given
Selenium	10 ug/l	not given
Silver	180 ug/l	not given

Septic Tank ST-5

VOC analysis

Chemical	Concentration	Det. Limits
Ethylbenzene	40 ug/l	10 ug/l
Acetone	69 ug/l	10 ug/l
Xylenes	180 ug/l	10 ug/l
Methyl Ethyl Ketone	83 ug/l	10 ug/l

BNA analysis shows nothing detected at 20 ug/l lower detection limit.

Table 2.

Chemicals used at Grady-McCauley

Chemical	Volumes	Disposal
methyl ethyl ketone	450-1,200 gal/yr	leaching wells
isophorone	unknown	leaching wells
xylene	unknown	leaching wells
naptha	unknown	leaching wells
paint wastes	unknown	dumpster
ink wastes	unknown	leaching wells
Solex Extender Base	unknown	unknown
FED-710 Alkyd	unknown	dumpster ?
LOV-120 gloss vinyl	unknown	dumpster ?
JRP-710 cellulose	unknown	dumpster ?
ICC-782 solvent base	unknown	unknown
ICC-786 solvent base	unknown	leaching wells ?
ICC-757 solvent/caustic	unknown	leaching wells ?

REGULATORY HISTORY

Grady McCauley did not operate the facility under a Part A Permit and has since relocated its operations to 584 Whipple Avenue, North Canton, Ohio. According to available information the facility was first inspected by the U.S. EPA as a potential hazardous waste site on November 20, 1980. The inspection report noted that the hazardous substances methyl ethyl ketone and paint wastes were present at the site. It was estimated at that time that approximately two drums per month of MEK were used at the site. This waste solvent was believed to have been discharged into underground storage tanks which were pumped twice a year by a waste hauler. Although the term "dry well" was used in the inspection report the US EPA Inspector mistakenly believed the tanks were fully contained/non-leaking storage tanks. Thus, no hazardous conditions were noted during that visit.

The site was inspected by Mark Bergman of the Ohio EPA on February 9, 1984. At that inspection, it was noted that hazardous waste was being stored and disposed of improperly in violation of Chapter 3734 of the Ohio Revised Code and the rules promalgated under it. The Dice Decal Corporation was notified of the violation at this time. Ground water monitor wells were installed and soil/water samples collected at the direction of the Ohio EPA on August 12, 1984. Results of this investigation showed low-level soil and ground water contamination at the site. On December 5, 1984 the company was ordered to conduct a more extensive investigation to fully delineate the extent of contamination at the site. On December 2, 1986, Grady McCauley entered into a Consent Agreement and Final Order (CAFO) with the U. S. EPA to settle issues arising from a June 28, 1985 Complaint and Compliance Order filed by the U. S. EPA. The June 28, 1985, Complaint concerned Grady McCauley's management of hazardous wastes at its facility at 7390 Middlebrance Road, Middlebranch, Ohio. Pursuant to orders 2 and 3 of the December 2, 1986, CAFO, Grady McCauley installed a ground water monitoring system and submitted the required status reports to the Ohio EPA and the U. S. EPA.

Grady McCauley Creative Graphics, Inc. moved their operation in 1986, from the Middlebranch property to 7584 Whipple Avenue in North Canton. They have maintained ownership of the Middlebranch property. Marshall Gash, an excavation/construction company, is currently leasing the building and property. They hope to purchase this property from Grady McCauley when the liabilities have been resolved. Marshall Gash has made numerous improvements to the building and property. Driveways were expanded without Mr. Grady or Mr. McCauley's knowledge. Resultant from this, leaching wells #3 and #4 were covered with a coarse slag material. The location of the wells is not specifically marked at this time. It is also unclear if surface soil around the top of these leaching wells was graded into surrounding locations.

If this occurred contamination may have been spread to adjacent areas. The upgradient ground water monitoring well (MW-2) is located in the front parking lot of this facility. The casing on this well extended above the surface of the gravel parking lot. On at least one occassion, this casing was struck by a vehicle and was bent noticeably. Grady McCauley was advised by the Ohio EPA that this casing needed to be better protected or modified. They contacted the Ohio Drilling Company and had them modify the casing. It was cut below the level of the parking lot and a small metal plate was placed over the well. Unfortunately, the metal plate rested directly on the inner plastic casing and as traffic drove over it, the casing plug was damaged. Surface water could possibly enter this monitor well and alter the ground water quality. A more substantial casing plug has recently been installed, however, it appears to have some damage occurring to it also.

III. REGIONAL AND SITE GEOLOGY AND HYDROGEOLOGY

REGIONAL GEOLOGY

Stark County has undergone glaciation during the Kansasian, Illinoian, and Wisconsian ages. The effects of the earliest glaciation is mainly reflected in drainage changes rather than in erosional and depositional features. Most of the glacial drift in the county is of Wisconsian Age and was deposited during the advances and retreats of ice sheets in the most recent glacial period. Much of the glacial drift is till or boulder clay, an unsorted, unstratified mixture of sand, silt, and clay containing pebbles, boulders and cobbles. The till occurs in up to four layers of different composition, each of which was deposited in a separate advance. Some of the sand and gravel drift occurs in small hills or knolls, called kames which were deposited by water from melting ice along the edge of, or in holes in the waning ice sheet. Other bodies of sand and gravel were deposited further away from the ice by melt-water streams flowing in the valleys of the Tuscarawas River and its tributaries. These deposits which completely or partly fill the valleys, form valley trains that extend far beyond the glaciated region.

Bedrock units underlying the glacial deposits include coals, shales, sandstones, clays and limestones of the Pottsville and Allegheny groups, Pennsylvanian Sytem (DeLong, 1963).

The Grady McCauley site is located on an alluvial terrace situated along the western edge of the Middlebranch Nimishillen Creek floodplain overlying a major valley fill aquifer. This valley fill aquifer comprises a major water bearing unit. It is interconnected with the Nimishillen Creek buried valley aquifer

system, from which the City of Canton draws a portion of its water supply. Wells in the Middlebranch area developed in the valley fill produce from 10 to 30 gallons per minute. Towards the City of Canton, the aquifer is much more productive with yields reaching 2,000 gallons per minute. Here the wells are developed in thick permeable sand and gravel deposits of the deep buried valley aquifer.

SITE GEOLOGY AND HYDROGEOLOGY

Drillers' logs for seven on-site borings and five private water wells were submitted by the consultant (Appendix C). These logs show a westward thickening wedge of unconsolidated sand and gravel deposits overlying a westward sloping shale bedrock topography (Figure 2). Two geologic sections from the 1987 CME are shown as Figures 3 and 4. These cross-sections show the general geometry of the deposits and the screened intervals of the monitor wells.

Data from on-site borings indicate glacial fill from 25 to 76 feet in thickness beneath the site. The fill is composed primarily of sand, gravel, and clay underlain by an unknown thickness of shale bedrock of the Pennsylvanian System. No laboratory analyses were performed to classify these sediments. The fill is interpreted to be post-Wisconsian glacial outwash deposits which grade upwards into alluvial sediments deposited by recent streams. It is within the valley fill that contaminants have been found.

Figures 5, 6, 7, 8, and 9 are water table surface maps of the valley fill aquifer showing water levels at different points in time. The direction of ground water flow appears to vary from a northeasterly direction to a southeasterly direction over time and may be seasonally influenced. In May, 1985, the pump for the well servicing the facility was turned off for 48 hours and the static water levels in the monitoring wells were measured. No change in the flow direction was noted. Water levels before and during pumpage of the Grady McCauley plant show only slight differences (Table 3). Water levels are fairly consistent over time and do not fluctuate by more than a few feet. During the CME site inspection, water level measurements were obtained from three wells. The flow direction determined from these measurements was consistant with the previously documented flow directions.

IV. GROUND WATER MONITORING WELL NETWORK

GROUND WATER MONITORING HISTORY

Ground water monitoring at Grady McCauley began with the installation of wells MW-1, MW-1A, MW-2, MW-3, and MW-3A in March, 1985. Three additional wells, MW-4, MW-5, and MW-9 were

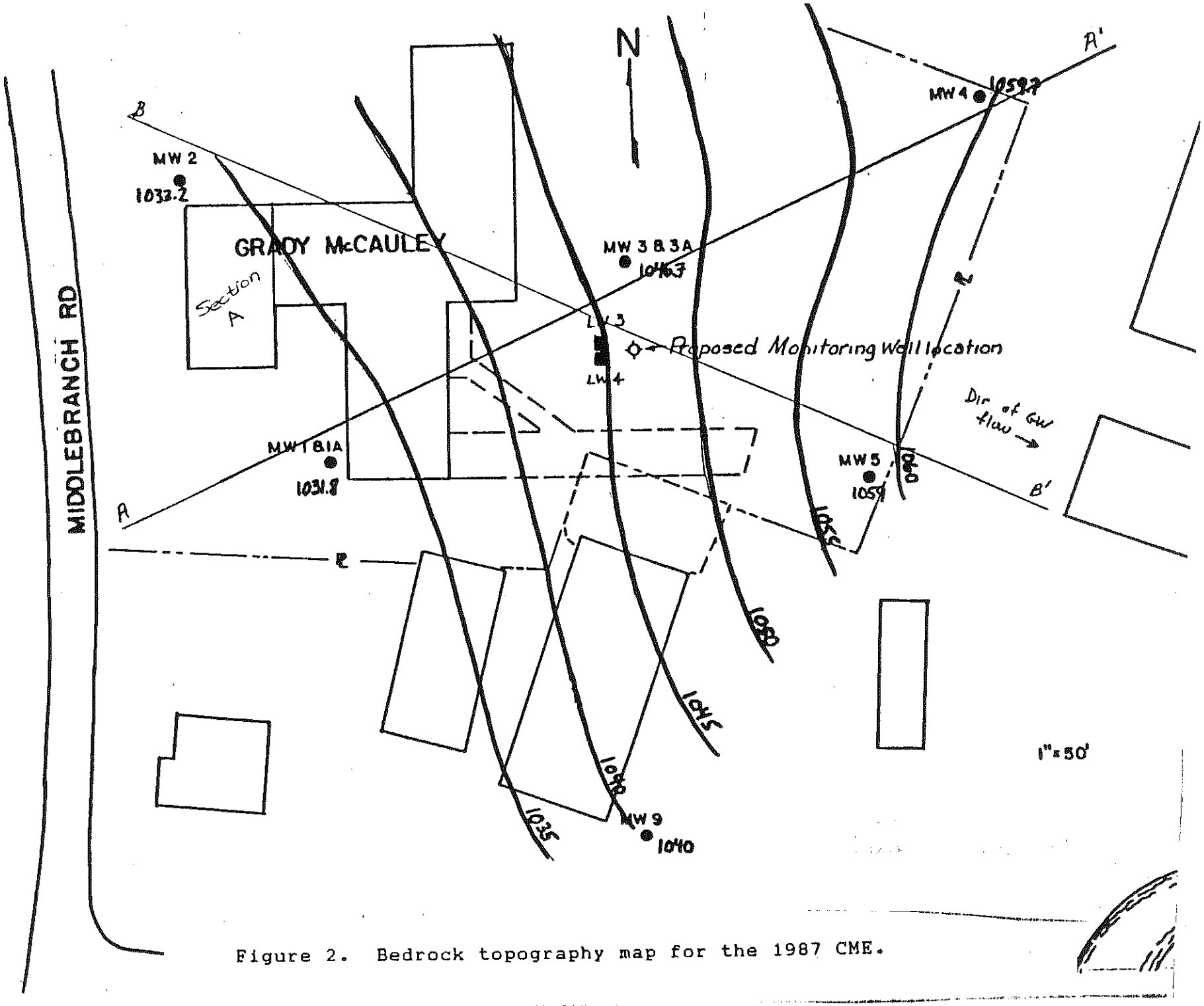


Figure 2. Bedrock topography map for the 1987 CME.

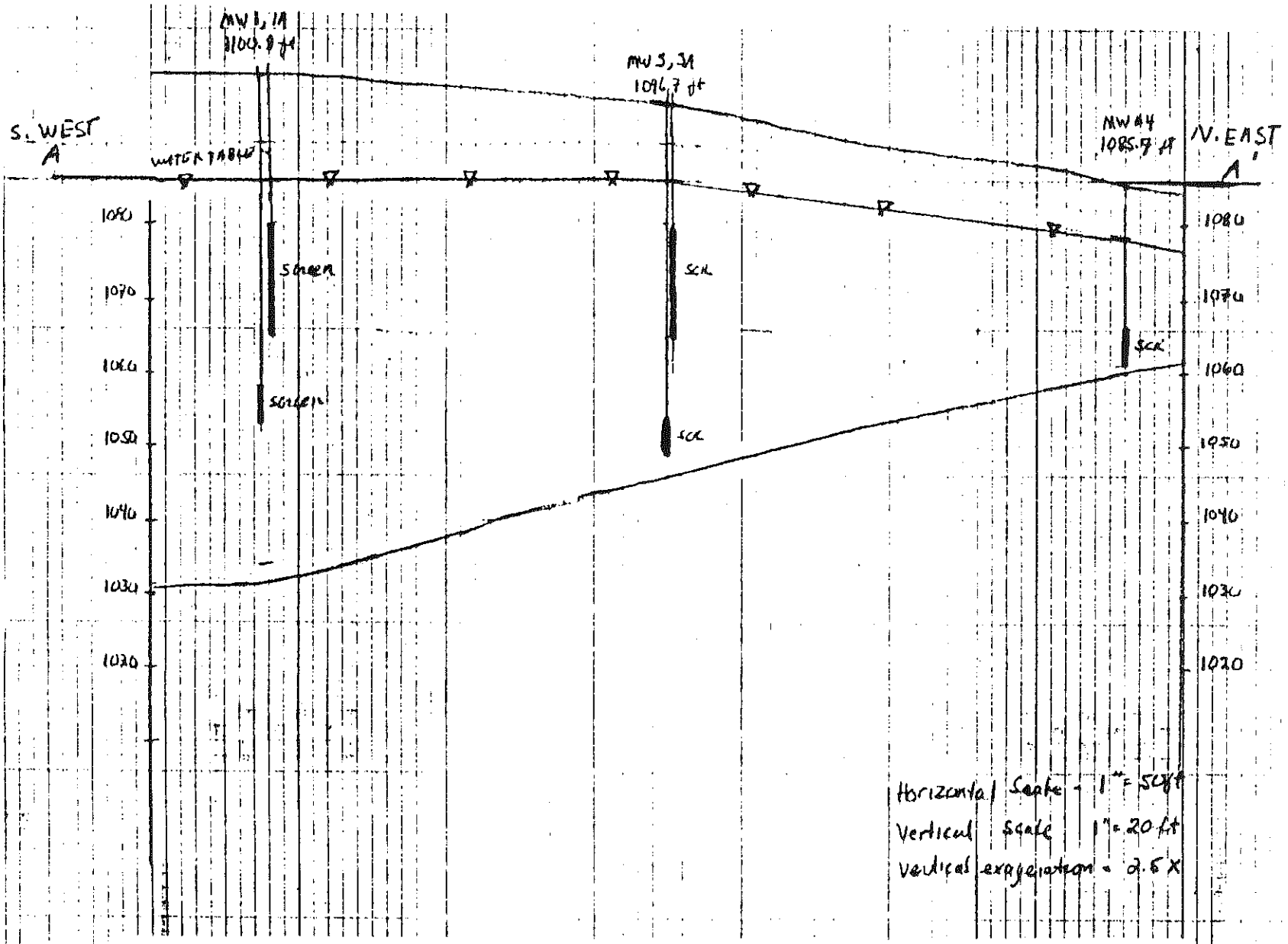


Figure 3. Geologic cross-section along A-A'. Figure 2 from 1987 CME.

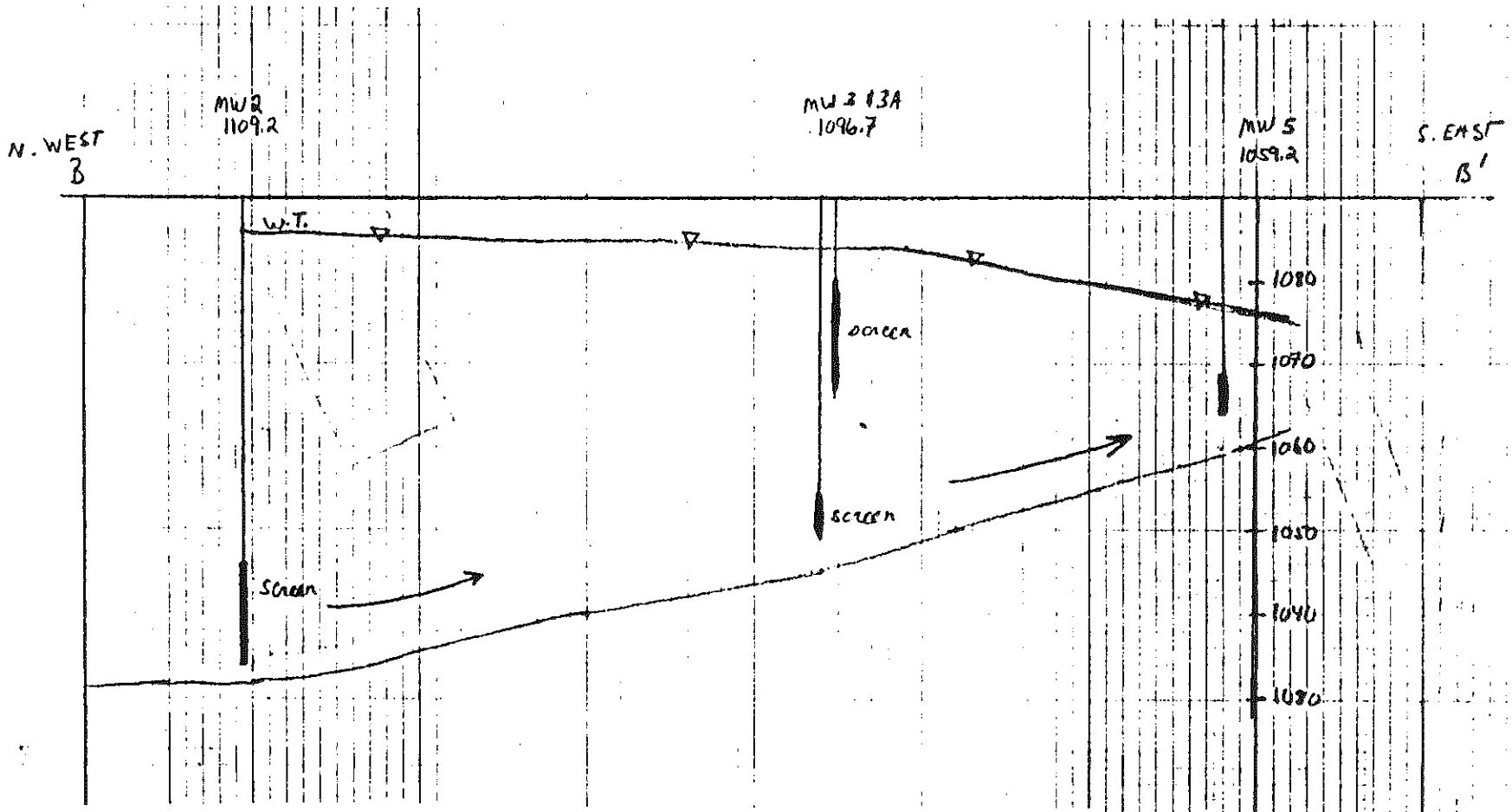


Figure 4. Geologic cross-section along B-B' Figure 2 from 1987 CME.

Horizontal scale 1 inch = 50ft
Vertical scale 1 inch = 20ft
Vert. exagg = 2.5 x

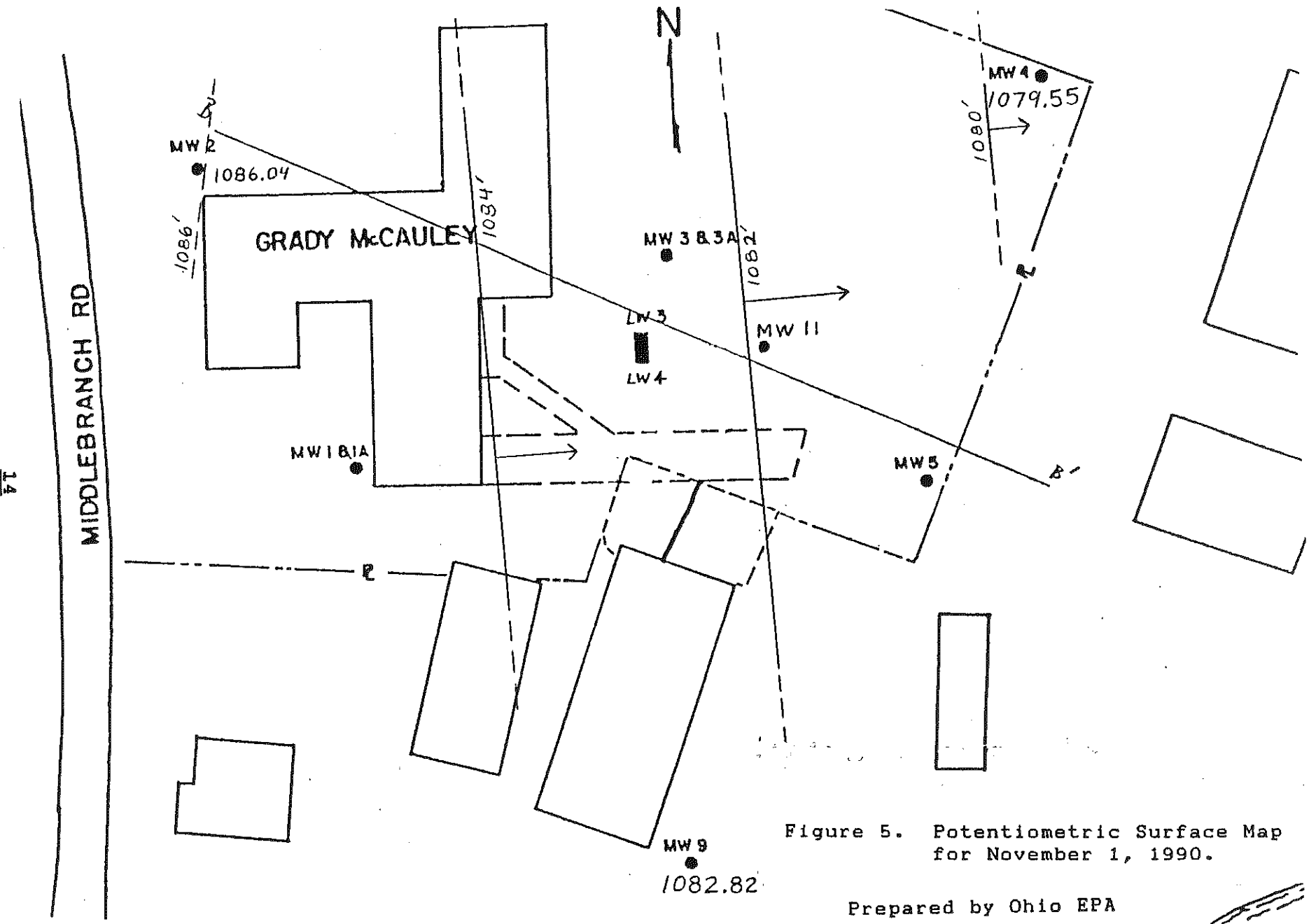


Figure 5. Potentiometric Surface Map for November 1, 1990.

Prepared by Ohio EPA

1" = 50'

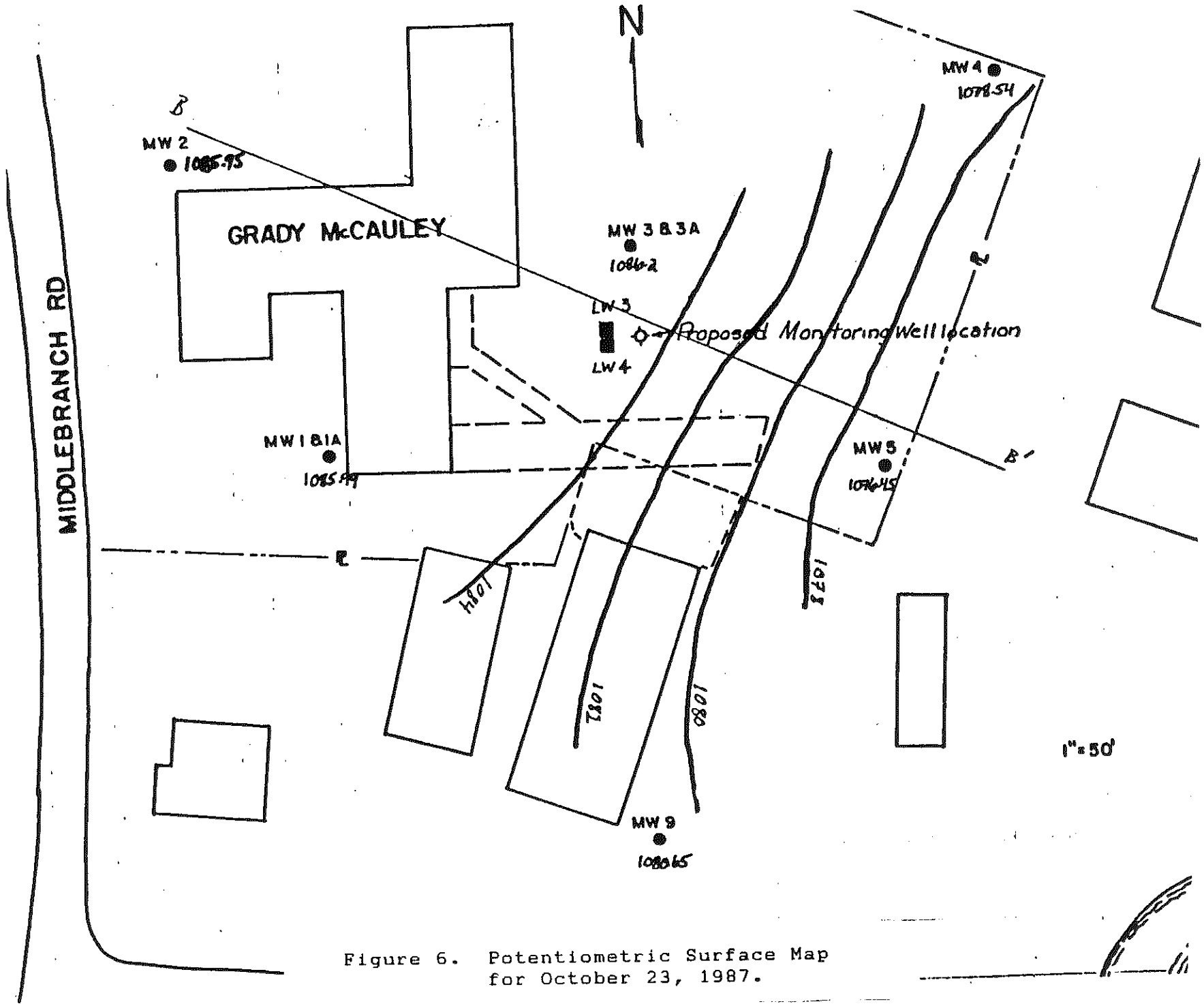


Figure 6. Potentiometric Surface Map for October 23, 1987.

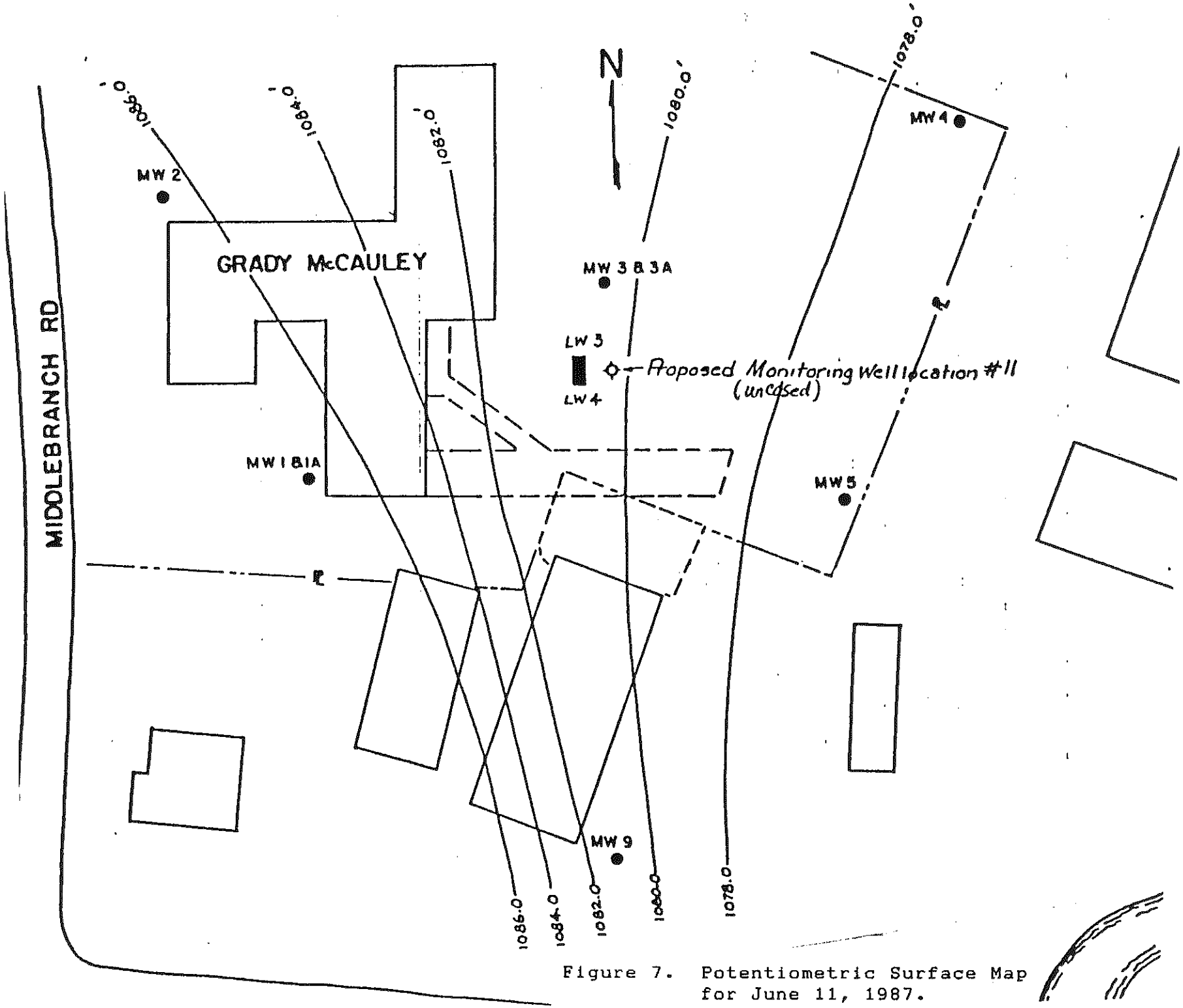


Figure 7. Potentiometric Surface Map for June 11, 1987.

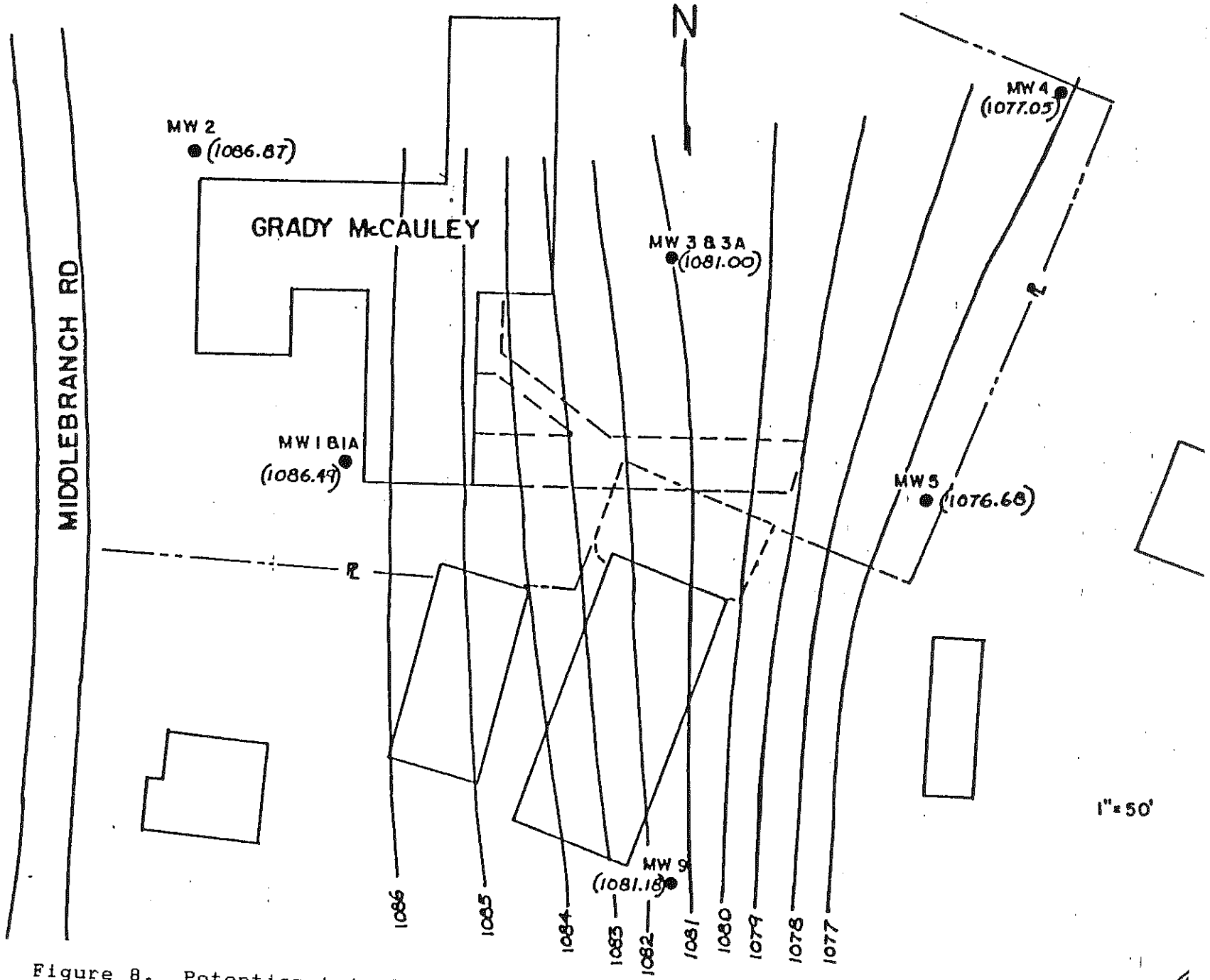


Figure 8. Potentiometric Surface Map for February 23, 1987.

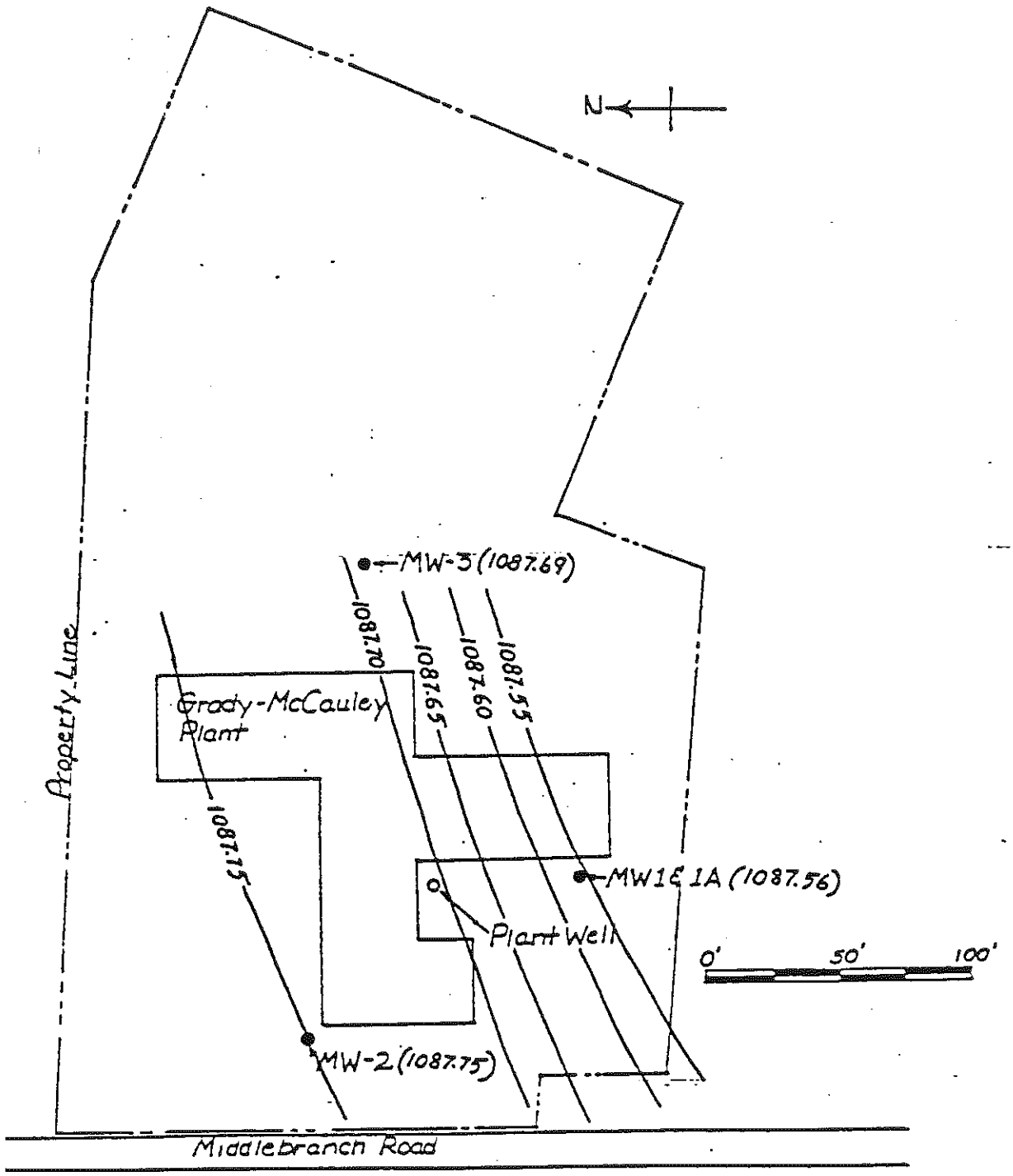


Figure 9. Potentiometric Surface Map for May 5, 1985.

TABLE 3
Water Level Elevation Data

Well	Date				
	5/5/85* Pump off	5/6/85 Pump on	6/11/87	10/23/87	10/3/89
MW-1	1087.56	1087.54	1086.49	1085.99	1086.50
MW-1A	1087.56	1087.70	NA	NA	1086.60
MW-2	1087.75	1087.57	1086.87	1085.95	1087.50
MW-3	1087.69	1087.54	1081.00	1086.2	1090.94
MW-3A	1087.95	1087.78	NA	NA	1091.02
MW-4	NA	NA	1077.05	1078.54	1078.74
MW-5	NA	NA	1076.68	1076.45	1077.26
MW-9	NA	NA	1081.18	1080.65	1081.19
MW-11	NA	NA	NA	NA	NA

Well	Date
	11/1/90
MW-1	NA
MW-1A	NA
MW-2	1086.04
MW-3	NA
MW-3A	NA
MW-4	1079.55
MW-5	NA
MW-9	1082.82
MW-11	NA

*The pump was turned off for 48 hours and water levels were measured. The pump then was turned on for 24 hours and the water levels were measured again.

installed in January and February of 1987. At the request of the U. S. EPA, one additional well, MW-11, was installed just downgradient of the leach wells in July, 1987.

MONITORING WELL LOCATIONS

The locations of the monitor wells at the site are shown in Figure 5. Table 4 summarizes the depths and screened intervals of each of these wells. The reasoning behind the locations of the wells has not been given by the facility. Screened intervals for wells 1 through 3A were determined by analysis of water samples during drilling of the wells. Intervals showing contaminants were screened. No reasoning was supplied for the screened intervals of monitor wells 4, 5, and 9. Monitoring well MW-11 was not screened.

MONITORING WELL INSTALLATION AND CONSTRUCTION

Monitor wells 1, 1A, 2, 3, and 3A are constructed of 2-inch diameter galvanized steel casing with 2-inch diameter 0.015 slot stainless steel screen. Figure 10 shows the typical construction of these wells. Monitor wells 4,5, and 9 are cased with 2-inch PVC flush joint casing with 2-inch, 20 slot PVC screen. These wells are finished flush with the ground surface. Figure 11 depicts the construction of these wells.

Monitoring wells 1, 1A, 2, 3, and 3A were drilled using the small hollow rod cable tool drilling method. The hole was advanced by driving a 4-inch diameter casing and then the soil materials inside of the casing was drilled out. A hollow tube sampling device was driven three to five feet ahead of the drilling operation to recover undisturbed soil samples for analysis. A 4-inch casing was then driven to the depth at which the soil sample was taken. No lubricants or fluids of any kind were used during drilling. A stainless steel screen was installed at the depth the soil sample was taken to allow pumping of that stratum for a water sample. This process was repeated until bedrock was encountered.

A 2-inch diameter pipe with the appropriate length of 2-inch diameter stainless steel screen was inserted inside the 4-inch casing. The 4-inch casing was pulled back to allow the natural formation to cave around the screen. When the screen was sufficiently exposed, the rest of the casing was pulled while backfilling with bentonite pellets to the surface to insure a good seal. The monitor well was finished as shown in Figure 10 and then developed by pumping. All casing, monitor well pipe, screen, and water contact equipment was steam cleaned prior to use where practical.

TABLE 4

Monitoring Well Data

Well#	Top-of-Casing Elevation (Ft)	Bedrock Elevation (Ft)	Screen Interval (Ft)
MW-1	1100.79	1031	1058-1053
MW-1A	1100.79	1031	1080-1065
MW-2	1109.23	1032	1044-1034
MW-3	1096.70	1046	1054-1049
MW-3A	1096.77	1046	1080-1065
MW-4	1085.70	1059.70	1066.70-1061.70
MW-5	1084.20	1059.20	1069.02-1064.02
MW-9	1086.67	1039.67	1056.67-1051.67

GRADY-McCAULEY MONITORING WELL INSTALLATION

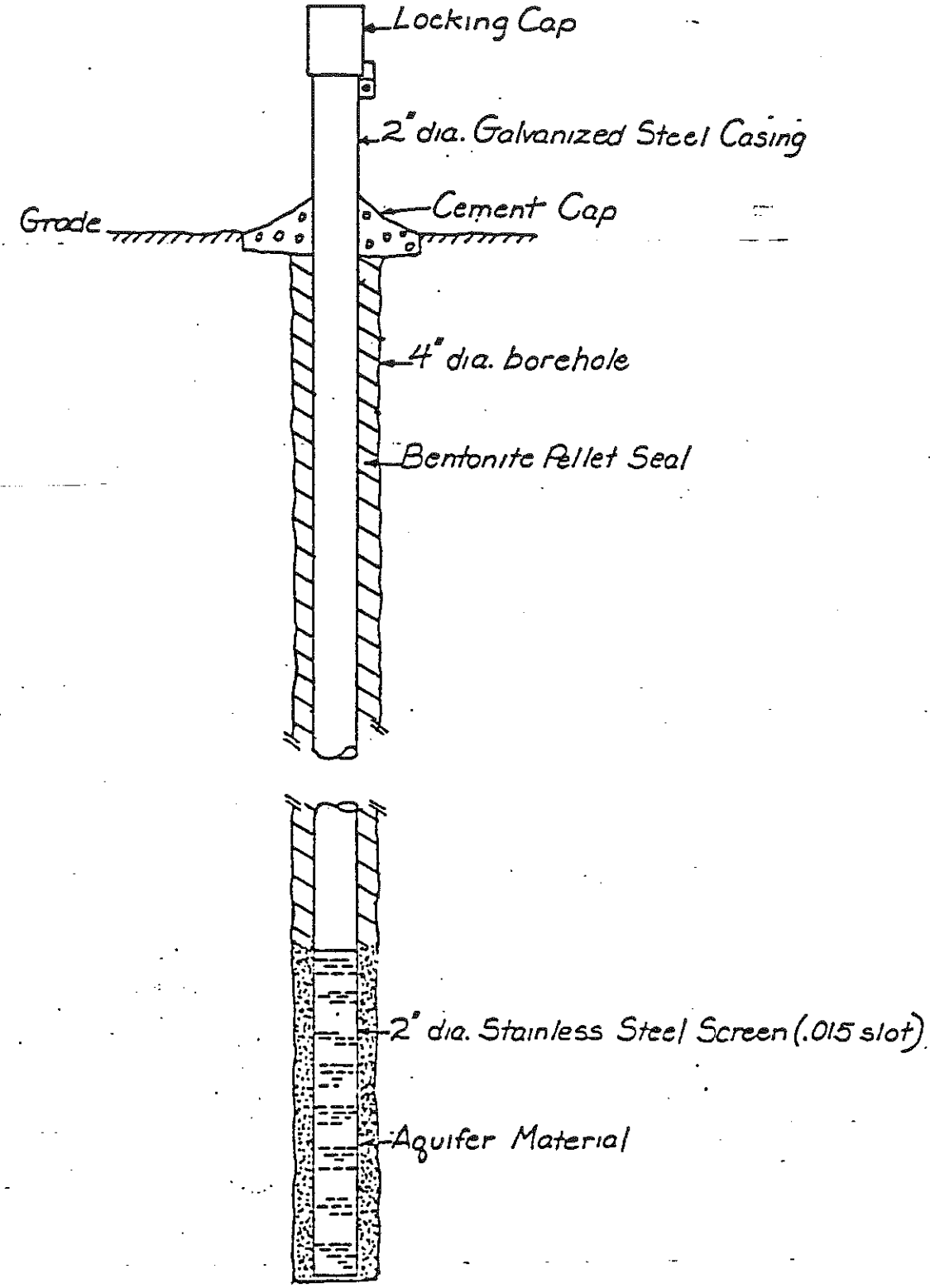


Figure 10. Construction diagram for monitor wells 1, 1A, 2, 3, and 3A.

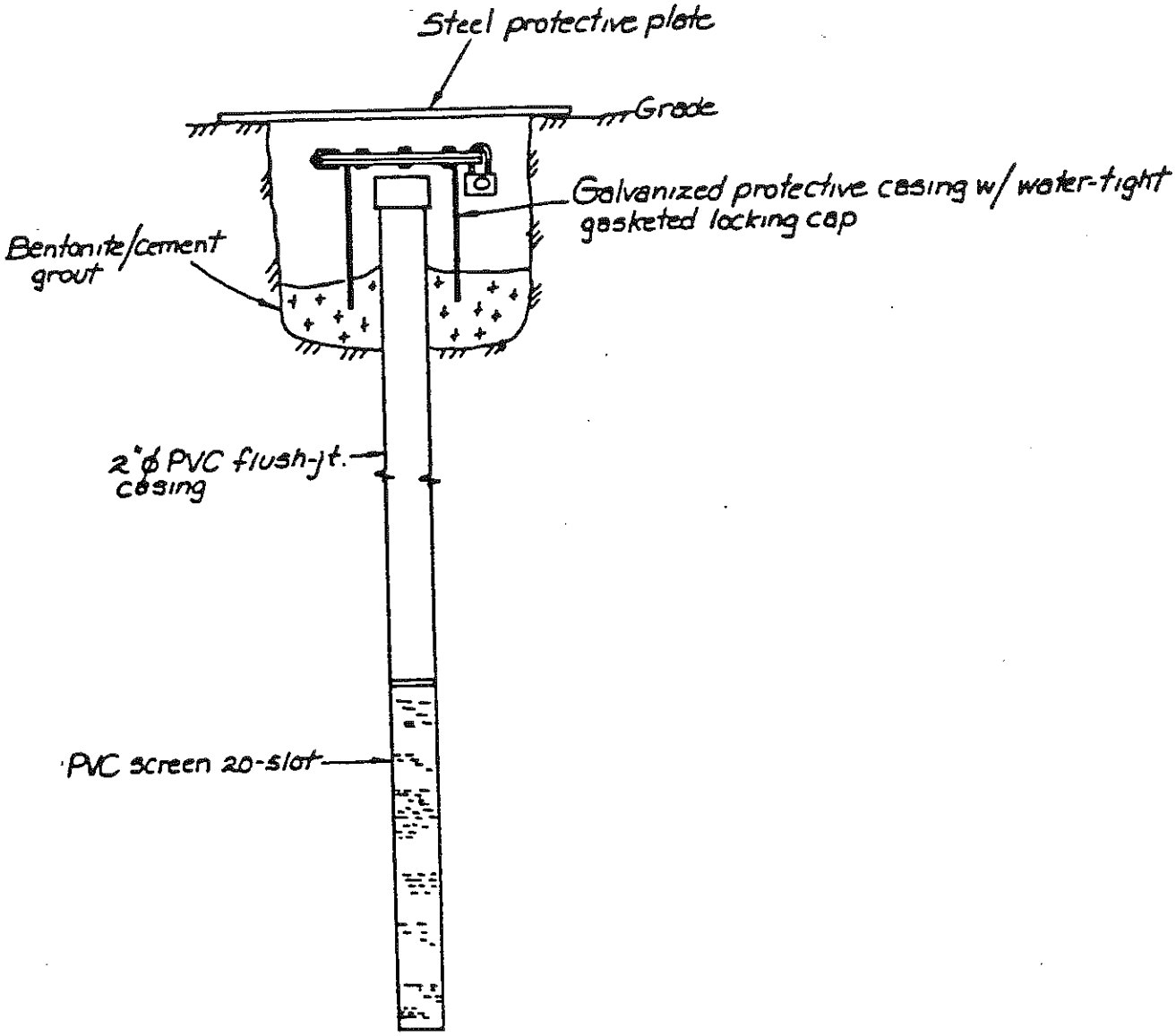


Figure 11. Construction diagram for monitor wells 4, 5, and 9.

Wells number 4, 5, and 9 were drilled by the hollow stem auger method. Each well was advanced by driving a casing and drilling out the encased materials. A hollow tube sampler was driven five feet ahead of the casing to collect undisturbed soil samples. The casing was then driven to the depth of the sampler. This sequential process was repeated until bedrock was encountered.

Subsequent to the selection of screening intervals, an appropriate length of PVC pipe was inserted into the casing. The casing was then extracted to allow adjacent sediments to cave-in around the screen. When the screen was sufficitnetly exposed, the remaining casing was removed and the hole backfilled with bentonite pellets to the surface. Monitor wells MW-4, MW-5, and MW-9 were cased with 2-inch, 20 slot PVC screen. These three wells are all completed flush with the ground surface. Figure 11 shows a construction diagram for these wells.

Monitor well MW-11 was constructed as an open hole with a temporary 3-inch steel casing.

ADEQUACY OF THE MONITORING WELL NETWORK

During the site inspection, all of the monitor wells at the facility were field located except for MW-5. Monitoring well MW-5 was installed flush to the ground and the area in which it was installed is now the parking lot of a neighboring company. Apparently MW-5 now is buried beneath the gravel of this parking lot. Monitor wells MW-1 and MW-1A were found to be in good repair. They were locked and because the company did not have keys for the wells, the interior of the wells could not be inspected. Both of these wells are installed above ground. Monitor well MW-2 which was originally completed above ground has had its riser cut off and now is finished flush with the ground surface. This was done because the well is located in a driveway and historically traffic had bumped and bent the riser (1987 CME) because bumper guards were never installed around the well. The well is covered by an unbolted metal plate. The top of the riser has a locking end cap with a rubberized seal, however, the end cap was not locked. The well is not finished properly for a flush to the ground surface well. It is not recessed and traffic driving over the end cap probably will in time damage the cap. The previous end cap had been worn through due to the flow of traffic over the well (Refer to the Regulatory History portion of this report). Monitor well MW-3 and MW-3A also are in a graveled parking lot. The wells are installed at ground level, but are not recessed. These wells were locked and the interior the the well could not be inspected. Monitor well MW-4 is recessed below the ground surface. A metal cover lies over a bolted metal lid. Under the bolted metal lid is a PVC riser and endcap. The well was not locked. Monitor well MW-9 also is

recessed with a metal cover covering a metal lid which could be bolted. The metal lid had a lock on one side, however, there were no bolts in the bolt holes around the circumference of the lid so access to the well was easily gained. There was standing water above the top of the riser endcap. Monitor well MW-11 has a galvanized riser, but no cement apron. The well was locked and the interior of the well could not be inspected. As mentioned previously, MW-11 has been left as an open hole with a temporary 3-inch steel casing.

V. DETECTION AND ASSESSMENT MONITORING

DETECTION AND ASSESSMENT SAMPLING EVENTS

Ground water samples first were collected for detection analysis on May 1, 1985 at which time MW-1, MW-1A, MW-2, MW-3, and MW-3A were sampled. Samples from MW-1, MW-1A, MW-2, and MW-3 were analyzed for HSL volatile compounds by Method 624. The sample from MW-3A was analyzed for base/neutral and acid extractable organics in addition to the HSL volatile organics compounds. Compounds detected during the 1985 sampling event included ethlybenzene, toluene, xylene, isophorone, lead, zinc, 1,1-dichloroethane, 1,1,1-trichloroethane, and 3,3,5-trimethlycyclohexane. On February 14, 1987 assessment monitoring began with the sampling of MW-1, MW-1A, MW-2, MW-3, MW-4, and MW-9 for ethlybenzene, xylene, isophorone, lead, and methylene chloride. In an additional round of assessment monitoring, MW-1A, MW-3A, MW-5, and MW-11 were sampled on July 30, 1987 for ethylbenzene, toluene, xylene, and isophorone. On September 18, 1987, MW-9 was sampled for ethylbenzene, xylene, and isophorone. Samples from monitoring wells MW-1, MW-1A, MW-2, MW-3A, MW-4, MW-5, and MW-9 were analyzed for lead on September 15, 1989. Detectable levels of lead were found in MW-2, MW-4, MW-1, MW-1A, and MW-2. Monitoring wells MW-2 and MW-4 were resampled for lead on October 3, 1989. Lead was not detected in the replicate samples. The samples were not analyzed for the parameters required by OAC 3745-65-92 (B)(1) through (B)(3). Before each sampling event the parameters to be analyzed were agreed upon by the U. S. EPA, Ohio EPA, and Grady McCauley (Refer to January 10, 1985 letter from Gary Gifford to David McCauley; Groundwater and Subsurface Soil Sampling Plan, May 29, 1986; and May 14, 1987, letter from William Muno to Kenneth Moore, counsel for the company)).

SAMPLING AND ANALYSIS PROCEDURES

The most recent sampling and analysis procedures are found in the report, Ground Water and Subsurface Soil Sampling Plan, May 29, 1986. Although this plan was approved by Ohio EPA on

November 18, 1986, it does not address the following issues required by OAC 3745-65-92 (A) as revised April 1, 1990.

1. No mention is made of determining ground water elevations as required by OAC 3745-65-92 (A)(1).

2. No provisions are made for the detection of immiscible layers as required by OAC 3745-65-92 (A)(2).

3. Additional information is needed concerning the procedures for sample withdrawal and the type of sampling equipment to be used as required by OAC 3745-65-92 (A)(3)(b) and (c).

4. Information regarding procedures and forms for recording raw data and the exact location, time and facility specific considerations associated with the data acquisitions, the calibration of field instruments, and procedures for sample filtration are not included in the sampling and analysis plan as required by OAC 3745-65-92 (A)(4)(a) through (c).

5. Details of equipment decontamination during sampling is not included in the sampling and analysis plan as required by OAC 3745-65-92 (A)(5).

6. No details of how purge water from the wells will be handled have been provided as required by OAC 3745-65-92 (A)(6).

7. Information concerning the detection limit for each analyte of interest and as well as the sample holding time has been omitted from the plan as required by OAC 3745-65-92 (A)(7)(b) and (c).

8. Details of the Quality Assurance/Quality Control procedures including the use of samples for field/lab/equipment blanks, duplicate samples, and potential interferences should be included in the sampling and analysis plan as required by OAC 3745-65-92 (A)(8)(a) through (c).

9. Chain of custody procedures including standardized field tracking reporting forms to establish sample custody for the field prior to and during shipping and sample labels containing all information necessary for effective sample tracking should be detailed in the sampling and analysis plan as required by OAC 3745-65-92 (A)(9)(a) and (b).

Field sampling procedures were not observed because the Grady McCauley consultants were not available during the inspection.

ANALYTICAL RESULTS

Results of the analyses are summarized in Table 5. As mentioned previously, the company did not analyze the ground water samples for the constituents required under OAC 3745-65-92 (B)(1) through (3). The constituents analyzed were agreed upon by the Ohio EPA, U. S. EPA and Grady McCauley prior to each sampling event. Constituents which were detected in one or more monitor wells include ethylbenzene; toluene; xylene; isophorone; lead; zinc; 1,1-dichloroethane; 1,1,1-dichloroethane; 1,1,,1-trichloroethane; 3,3,5-trimethylcyclohexane; and lead.

VI. COMPLIANCE STATUS SUMMARY

VIOLATIONS

As a result of this CME, several violations of Ohio interim status ground water monitoring regulations OAC 3745-65-90 through 94 have been identified. Each violation is listed below, and a brief corresponding explanation of the nature of the violation is given.

VIOLATION 1 3745-65-91 (C)

Grady McCauley has failed to case MW-11 in a manner that maintains the integrity of the monitoring well borehole as required by OAC 3745-65-91 (C). Monitor well MW-11 has been left as an open hole with a galvanized riser and no cement apron. The construction of the well should be upgraded to prevent inadvertant contamination of the ground water via the well.

VIOLATION 2 3745-65-92 (A)

Grady McCauley's Sampling and Analysis Plan does not include methods and/or procedures as required by the following specific rules. If further operation of the ground water monitoring system is necessary, the Sampling and Analysis Plan must be modified to address the following issues:

TABLE 5

Sample Date & Constituent	Well & Concentration (ug/l)					
5/1/85	1	1A	2	3	3A	
Ethylbenzene	1600	ND	ND	ND	49	
Toluene	640	ND	ND	ND	ND	
Xylene	4400	ND	ND	ND	85	
Isophorone	NA	NA	NA	NA	300000	
Lead	NA	NA	NA	NA	11	
Zinc	NA	NA	NA	NA	9.5	
1,1-Dichloroethane	ND	ND	ND	ND	55	
1,1,1-Trichloroethane	ND	ND	ND	ND	48	
3,3,5-Trimethylcyclohexane	NA	NA	NA	NA	5000	
Methylene Chloride	ND	ND	ND	ND	ND	
2/14/87*	1	1A	2	3A	4	9
Ethylbenzene	7	ND	ND	ND	ND	ND
	6	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND
Xylene	14	ND	ND	ND	ND	ND
	13	ND	ND	ND	ND	ND
	11	ND	ND	ND	ND	ND
	11	ND	ND	ND	ND	ND
Isophorone	ND	ND	ND	120	ND	ND
	ND	ND	ND	100	ND	ND
	ND	ND	ND	91	ND	ND
	ND	ND	ND	92	ND	ND
Lead	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND
	ND	ND	ND	ND	ND	ND

*Four replicate measurements taken.

TABLE 5 (Continued)

Sample Date & Constituent	Well & Concentration (ug/l)			
9/18/87	9			
Ethylbenzene	ND			
Xylene	ND			
Isophorone	97			
Lead	ND			
Methylene Chloride	ND			
7/30/87	1A	3A	5	11
Ethylbenzene	ND	ND	ND	ND
Xylene	1	ND	ND	ND
Isophorone	ND	ND	380	ND
Lead	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND

9/15/89	1	1A	2	3A	4	5	9
Lead (mg/L)	0.28	0.12	0.42	ND	0.16	ND	ND

10/3/89	2	4
Lead (mg/L)	ND	ND

OAC 3745-65-92 (A)(1). No reference is made of determining ground water elevations.

OAC 3745-65-92 (A)(2). No provisions are made for the detection of immiscible layers.

OAC 3745-65-92 (A)(3)(b) and (c). Additional information is needed concerning the procedures for sample withdrawal and the type of sampling equipment to be used.

OAC 3745-65-92 (A)(4)(a) through (c). Information regarding procedures and forms for recording raw data and the exact location, time and facility specific considerations associated with the data acquisitions, the calibration of field instruments, and procedures for sample filtration are not included in the sampling and analysis plan.

OAC 3745-65-92 (A)(5). Details of equipment decontamination during sampling is not included in the sampling and analysis plan.

OAC 3745-65-92 (A)(6). No details of how purge water from the wells will be handled have been provided.

OAC 3745-65-92 (A)(7)(b) and (c). Information concerning the detection limit for each analyte of interest and as well as the sample holding time has not been included in the plan.

OAC 3745-65-92 (A)(8)(a) through (c). Details of the Quality Assurance/Quality Control procedures including the use of samples for field/lab/equipment blanks, duplicate samples, and potential interferences should be included in the sampling and analysis plan.

OAC 3745-65-92 (A)(9)(a) and (b). Chain of custody procedures including standardized field tracking reporting forms to establish sample custody for the field prior to and during shipping and sample labels containing all information necessary for effective sample tracking should be detailed in the sampling and analysis plan.

<u>VIOLATION 3</u> OAC 3745-65-93 (D)(3)(e)

Grady McCauley has failed to include data evaluation procedures to be used in evaluating assessment monitoring data as required by OAC 3745-65-93 (D)(3)(e). Although the assessment plan was deficient in this respect, Grady McCauley has complied with Orders 2 and 3 of the December 2, 1986 CAFO.

VIOLATION 4 OAC 3745-65-93 (D)(4)

Grady McCauley has failed to determine the rate and extent of the migration of hazardous waste or hazardous waste constituents in the ground water. The monitoring system is insufficient to detect the occurrence of dense non-aqueous phase liquids (DNAPL) in the ground water. The rate of contaminant migration also has not been determined. The current monitor well system is not adequate to detect the presence of floating organic layers and should be screened near bedrock to detect sinking organic layers. Due to the westerly slope of the bedrock surface, additional top of bedrock wells may be needed for DNAPL detection.

VIOLATION 5 OAC 3745-65-93 (D)(7)

Grady McCauley has failed to determine the rate and extent of migration of the hazardous waste or hazardous waste constituents in the ground water or the concentrations of the hazardous wastes or hazardous waste constituents in the ground water on a quarterly basis as required by this rule. However, Grady McCauley has complied with Orders 2 and 3 of the December 2, 1986, CAFO.

VIOLATION 6 OAC 3745-65-94 (B)(2)

Grady McCauley has failed to submit annually, to the director, a report containing the results of the ground water quality assessment program which includes, but is not limited to, the calculated or measured rate of migration of hazardous waste or hazardous waste constituents in the ground water during the reporting period. This report should be submitted as part of the annual report required by OAC 3745-65-75. However, all reports required by the CAFO have been submitted.

Although the above violations of OAC 3745-65-90 through 94 have been noted during the completion of this CME, Grady McCauley has been in compliance with Orders 2 and 3 of the December 2, 1986 CAFO.

DEFICIENCIES

As a result of this CME, several deficiencies in the ground water monitoring program at Grady McCauley have been noted.

DEFICIENCY 1.

All the monitor wells should be locked at all times.

DEFICIENCY 2.

The physical condition of MW-2 must be upgraded so that the well is not damaged by traffic.

DEFICIENCY 3.

Galvanized steel casing should not be used in monitor well construction. This type of casing can contribute inorganic metal contamination to the water quality analyses.

APPENDIX A

APPENDIX A

COMPREHENSIVE GROUND-WATER MONITORING EVALUATION WORKSHEET

The following worksheets have been designed to assist the enforcement officer/ technical reviewer in evaluating theground-water monitoring system an owner/operator uses to collect and analyze samples of ground water. The focus of the worksheets is technical adequacy as it relates to obtaining and analyzing representative samples of ground water. The basis of the worksheets is the final RCRA Ground Water Monitoring Technical Enforcement Guidance Document which describes in detail the aspects of ground-water monitoring which EPA deems essential to meet the goals of RCRA. Appendix A is not a regulatory checklist. Specific technical deficiencies in the monitoring system can, however, be related to the regulations as illustrated in Figure 4.3 taken from the RCRA Ground-Water Monitoring Compliance Order Guide (COG) (included at the end of the appendix). The enforcement officer, in developing an enforcement order, should relate the technical assessment from the worksheets to the regulations using Figure 4.3 from the COG as a guide.

Comprehensive Ground-Water Monitoring Evaluation	Y/N
I. Office Evaluation Technical Evaluation of the Design of the Ground-Water Monitoring System	
A. Review of Relevant Documents	
1. What documents were obtained prior to conducting the inspection:	
a. RCRA Part A permit application?	N
b. RCRA Part B permit application?	N
c. Correspondence between the owner/operator and appropriate agencies or citizen's groups?	Y
d. Previously conducted facility inspection reports?	Y
e. Facility's contractor reports?	Y
f. Regional hydrogeologic, geologic, or soil reports?	Y
g. The facility's Sampling and Analysis Plan?	Y
h. Ground-water Assessment Program Outline (or Plan, if the facility is in assessment monitoring)?	Y
i. Other (specify) _____	

NA = Not Applicable UNK = unknown

	Y/N
B. Evaluation of the Owner/Operator's Hydrogeologic Assessment	
1. Did the owner/operator use the following direct techniques in the hydrogeologic assessment:	
a. Logs of the soil borings/rock corings (documented by a professional geologist, soil scientist or geotechnical engineer)?	Y
b. Materials tests (e.g., grain size analyses, standard penetration tests, etc.)?	N
c. Piezometer installation for water level measurments at different depths?d. Slug tests?	N N
e. Pump tests?	N
f. Geochemical analyses of soil samples?	Y
g. Other (specify) (e.g., hydrochemical diagrams and wash analysis)	N
2. Did the owner/operator use the following indirect technique to supplement direct techniques data:	
a. Geophysical well logs?	N
b. Tracer studies?	N
c. Resistivity and/or electromagnetic conductance?	N
d. Seismic Survey?	N
e. Hydraulic conductivity measurements of cores?	N
f. Aerial photography?	N
g. Ground penetrating radar?	N
h. Other (specify)	N
3. Did the owner/operator document and present the raw data from the site hydrogeologic assessment?	Y
4. Did the owner/operator document methods (criteria) used to correlate and analyze the information?	N
5. The owner/operator prepare the following:	
a. Narrative description of geology?	Y
b. Geologic cross sections?	N
c. Geologic and soil maps?	N
d. Boring/coring logs?	Y
e. Structure contour maps of the differing water bearing zones and confining layer?	N
f. Narrative description and calculation of ground-water flows?	Y

	Y/N
g. Water table/potentiometric map?	Y
h. Hydrologic cross sections?	N
6. Did the owner/operator obtain a regional map of the area and delineate the facility?	Y
If yes, does this map illustrate: a. Surficial geology features?	N
b. Streams, rivers, lakes, or wetlands near the facility?	Y
c. Discharging or recharging wells near the facility?	N
7. Did the owner/operator obtain a regional hydrogeologic map?	UNK comment 1
If yes, does this hydrogeologic map indicate: a. Major areas of recharge/discharge?	NA
b. Regional ground-water flow direction?	NA
c. Potentiometric contours which are consistent with observed water level elevations?	NA
8. Did the owner/operator prepare a facility site map?	Y
If yes, does the site map show: a. Regulated units of the facility (e.g., landfill areas,impoundments)?	Y
b. Any seeps, springs, streams, ponds, or wetlands?	Y
c.Location of monitoring wells, soil borings, or test pits?	Y
d. How many regulated units does the facility have? 2	2
If more than one regulated unit then, • Does the waste management area encompass all regulated units?	Y
• Is a waste management area delineated for each regulated unit?	N
C. Characterization of Subsurface Geology of Site	
1. Soil boring/test pit program:	
a. Were the soil borings/test pits performed under the supervision of a qualified professional?	Y
b. Did the owner/operator provide documentation for selecting the spacing for borings?	Y
c. Were the borings drilled to the depth of the first confining unit below the uppermost zone of saturation or ten feet into bedrock?	Y
d. Indicate the method(s) of drilling:	

	Y/N
Auger (hollow or solid stem) X wells 4, 5, 9, 11 Mud rotary ___ Reverse rotary ___ Cable tool X wells 1, 1A, 2, 3, 3A Jetting ___ Other (specify) ___	
e. Were continuous sample corings taken?	Y
f. How were the samples obtained (checked method[s]) • Split spoon ___ • Shelby tube, or similar ✓ • Rock coring ___ • Ditch sampling ___ • Other (explain) Hollow Tube Sampler	Y
g. Were the continuous sample corings logged by a qualified professional in geology?	
h. Does the field boring log include the following information: • Hole name/number?	Y
• Date started and finished?	N
• Driller's name?	Y
• Hole location (i.e., map and elevation)?	N
• Drill rig type and bit/auger size?	N
• Gross petrography (e.g., rock type) of each geologic unit?	Y
• Gross mineralogy of each geologic unit?	N
• Gross structural interpretation of each geologic unit and structural features (e.g., fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)?	N
• Development of soil zones and vertical extent and description of soil type?	N
• Depth of water bearing unit(s) and vertical extent of each?	N
• Depth and reason for termination of borehole?	N
• Depth and location of any contaminant encountered in borehole?	Y
• Sample location/number?	Y
• Percent sample recovery?	N
• Narrative descriptions of: —Geologic observations?	N
—Drilling observations?	N
i. Were the following analytical tests performed on the core samples: • Mineralogy (e.g., microscopic tests and x-ray diffraction)?	N
• Petrographic analysis: —degree of crystallinity and cementation of matrix?	N
—degree of sorting, size fraction (i.e., sieving), textural variations?	N
—rock type(s)?	N

Comment 2

Comment 3

	Y/N	
—soil type?	N	
—approximate bulk geochemistry?	N	
—existence of microstructures that may effect or indicate fluid flow?	N	
• Falling head tests?	N	
• Static head tests?	N	
• Settling measurements?	N	
• Centrifuge tests?	N	
• Column drawings?	N	
D. Verification of Subsurface Geological Data		
1. Has the owner/operator used indirect geophysical methods to supplement geological conditions between borehole locations?	N	
2. Do the number of borings and analytical data indicate that the confining layer displays a low enough permeability to impede the migration of contaminants to any stratigraphically low water-bearing units?	N	Comment 4
3. Is the confining layer laterally continuous across the entire site?	Y	
4. Did the owner/operator consider the chemical compatibility of the site-specific waste types and the geologic materials of the confining layer?	N	
5. Did the geologic assessment address or provide means for resolution of any information gaps of geologic data?	Y	
6. Do the laboratory data corroborate the field data for petrography?	UNK	Comment 5
7. Do the laboratory data corroborate the field data for mineralogy and subsurface geochemistry?	UNK	Comment 6
E. Presentation of Geologic Data		
1. Did the owner/operator present geologic cross sections of the site?	N	
2. Do cross sections:		
a. identify the types and characteristics of the geologic materials present?	NA	Comment 7
b. define the contact zones between different geologic materials?	NA	
c. note the zones of high permeability or fracture?	NA	
d. give detailed borehole information including:	NA	

	Y/N	
• location of borehole?	NA	
• depth of termination?	NA	
• location of screen (if applicable)?	NA	
• depth of zone(s) of saturation?	NA	
• backfill procedure?	NA	
3. Did the owner/operator provide a topographic map which was constructed by a licensed surveyor?	UNK	Comment 8.
4. Does the topographic map provide:		
a. contours at a maximum interval of two-feet?	N	Comment 9
b. locations and illustrations of man-made features (e.g., parking lots, factory buildings, drainage ditches, storm drain, pipelines, etc.)?	Y	
c. descriptions of nearby water bodies?	Y	
d. descriptions of off-site wells?	Y	
e. site boundaries?	Y	
f. individual RCRA units?	Y	
g. delineation of the waste management area(s)?	N	
h. well and boring locations?	Y	Comment 10
5. Did the owner/operator provide an aerial photograph depicting the site and adjacent off-site features?	N	
6. Does the photograph clearly show surface water bodies, adjacent municipalities, and residences and are these clearly labelled?	NA	
F. Identification of Ground-Water Flowpaths		
1. Ground-water flow direction		
a. Was the well casing height measured by a licensed surveyor to the nearest 0.01 feet?	UNK	Comment 11
b. Were the well water level measurements taken within a 24 hour period?	Y	
c. Were the well water level measurements taken to the nearest 0.01 feet?	Y	
d. Were the well water levels allowed to stabilize after construction and development for a minimum of 24 hours prior to measurements?	Y	
e. Was the water level information obtained from (check appropriate one):		
• multiple piezometers placed in single borehole? ____		
• vertically nested piezometers in closely spaced separate ____		
• boreholes? ____		
• monitoring wells? ✓		

	Y/N	
f. Did the owner/operator provide construction details for the piezometers?	NA	Com 12
g. How were the static water levels measured (check method[s]). • Electric water sounder ✓ • Wetted tape ___ • Air line ___ • Other (explain) ___		
h. Was the well water level measured in wells with equivalent screened intervals at an equivalent depth below the saturated zone?	N	
i. Has the owner/operator provided a site water table (potentiometric) contour map?	Y	
If yes, • Do the potentiometric contours appear logical and accurate based on topography and presented data? (Consult water level data)	N	
• Are ground-water flow-lines indicated?	N	
• Are static water levels shown?	Y	
• Can hydraulic gradients be estimated?	Y	
j. Did the owner/operator develop hydrologic cross sections of the vertical flow component across the site using measurements from all wells?	N	
k. Do the owner/operator's flow nets include: • piezometer locations?	NA	Com 13
• depth of screening?	NA	
• width of screening?	NA	
• measurements of water levels from all wells and piezometers?	NA	
2. Seasonal and temporal fluctuations in ground-water a. Do fluctuations in static water levels occur? If yes, are the fluctuations caused by any of the following:	Y	
—Off-site well pumping	UNK	
—Tidal processes or other intermittent natural variations (e.g., river stage, etc.)	UNK	
—On-site well pumping	Y	
—Off-site, on-site construction or changing land use patterns	UNK	
—Deep well injection	UNK	
—Seasonal variations	yes	
—Other (specify) ___		
b. Has the owner/operator documented sources and patterns that contribute to or affect the ground-water patterns below the waste management?	Y	
c. Do water level fluctuations alter the general ground-water gradients and flow directions?	Y	Com 14
d. Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone?	Y	Com 15

	Y/N
e. Did the owner/operator implement means for gauging long term effects on water movement that may result from on-site or off-site construction or changes in land-use patterns?	N
3. Hydraulic conductivity	
a. How were hydraulic conductivities of the subsurface materials determined?	NA comment 16
• Single-well tests (slug tests)?	NA
• Multiple-well tests (pump tests)	NA
• Other (specify) _____	NA
b. If single-well tests were conducted, was it done by:	
• Adding or removing a known volume of water?	NA
• Pressurizing well casing?	NA
c. If single well tests were conducted in a highly permeable formation, were pressure transducers and high-speed recording equipment used to record the rapidly changing water levels?	NA
d. Since single well tests only measure hydraulic conductivity in a limited area, were enough tests run to ensure a representative measure of conductivity in each hydrogeologic unit?	NA
e. Is the owner/operator's slug test data (if applicable) consistent with existing geologic information (e.g., boring logs)?	NA
f. Were other hydraulic conductivity properties determined?	N
g. If yes, provide any of the following data, if available:	
• Transmissivity _____	
• Storage coefficient _____	
• Leakage _____	
• Permeability _____	
• Porosity _____	
• Specific capacity _____	
• Other (specify) _____	
4. Identification of the uppermost aquifer	
a. Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? If yes,	N
• Are soil boring/test pit logs included?	Y
• Are geologic cross-sections included?	N
b. Is there evidence of confining (competent, unfractured, continuous, and low permeability) layers beneath the site? If yes,	Y
• how was continuity demonstrated? 9 borings to 5ft bedrock + 6 private well logs 4 of which show no bedrock	
c. What is hydraulic conductivity of the confining unit (if present)? CM/Sec How was it determined?	NA comment 17

	Y/N
d. Does potential for other hydraulic communication exist (e.g., lateral incontinuity between geologic units, facies changes, fracture zones, cross cutting structures, or chemical corrosion/alteration of geologic units by leachage? If yes or no, what is the rationale? Hydraulic relationship between uppermost aquifer & bedrock not defined. Condition of shale bedrock not investigated.	Y
G. Office Evaluation of the Facility's Ground-Water Monitoring System—Monitoring Well Design and Construction: These questions should be answered for each different well design present at the facility. 1. Drilling Methods a. What drilling method was used for the well? • Hollow-stem auger ☑ mw 4, 5, 9 • Solid-stem auger ☐ • Mud rotary ☐ • Air rotary ☐ • Reverse rotary ☐ • Cable tool ☒ mw-1, 1A, 2, 3, 3A • Jetting ☐ • Air drill w/ casing hammer ☐ • Other (specify) _____	
b. Were any cutting fluids (including water) or additives used during drilling? If yes, specify: • Type of drilling fluid _____ • Source of water used _____ • Foam _____ • Polymers _____ • Other _____	N
c. Was the cutting fluid, or additive, identified?	NA
d. Was the drilling equipment steam-cleaned prior to drilling the well? • Other methods _____	Y
e. Was compressed air used during drilling? If yes, • was the air filtered to remove oil?	N
f. Did the owner/operator document procedure for establishing the potentiometric surface? If yes, • how was the location established? Surveyed top of casing & used water level indicator probe measurement	Y
g. Formation samples	

Comment 1B

	Y/N
• Were formation samples collected initially during drilling?	Y
• Were any cores taken continuous?	Y
• If not, at what interval were samples taken?	NA
• How were the samples obtained? —Split spoon X Shelby tube (Hollow tube sampler) —Core drill —Other (specify)	
• Identify if any physical and/or chemical tests were performed on the formation samples (specify) Chemical tests to determine nature of soil Contamination	
2. Monitoring Well Construction Materials a. Identify construction materials (by number) and diameters (ID/OD) Material / Diameter • Primary Casing: PVC 2 inch 4, 5, 9; Galvanized Steel 2 inch 1, 1A, 2, 3, 3A • Secondary or outside casing (double construction): NA / NA • Screen: PVC 2 inch 4, 5, 9; Stainless Steel 2 inch 1, 1A, 2, 3 4, 3	
b. How are the sections of casing and screen connected? • Pipe sections threaded Wells 1-3A	✓
• Couplings (friction) with adhesive or solvent	
• Couplings (friction) with retainer screws	
• Other (specify)	
c. Were the materials steam-cleaned prior to installation? • If no, how were the materials cleaned?	Y
3. Well Intake Design and Well Development a. Was a well intake screen installed?	Y
• What is the length of the screen for the well? 1, 3, 4, 5, 9 (5 ft); 2 (10'); 1A, 3A (15')	
• Is the screen manufactured?	Y
b. Was a filter pack installed?	N
• What kind of filter pack was employed? NONE	NA
• Is the filter pack compatible with formation materials?	NA
• How was the filter pack installed?	NA

	Y/N
• What are the dimensions of the filter pack? _____	NA
• Has a turbidity measurement of the well water ever been made?	N
• Have the filter pack and screen been designed for the insitu materials? _____	NA
c. Well development • Was the well developed?	Y
• What technique was used for well development? —Surge block —Bailer —Air surging X Water pumping MW-2 X Other (specify) Air lifting - All wells except #2	
4. Annular Space Seals a. What is the annular space in the saturated zone directly above the filter pack filled with: X Sodium bentonite (specify type and grit) Pellets wells 1, 1A, 2, 3, 3A —Cement (specify neat or concrete) X Other (specify) Bentonite-sand-portland cement mix wells 4, 5, 9	
b. Was the seal installed by: ✓ Dropping material down the hole and tamping wells 1, 1A, 2, 3, 3A —Dropping material down the inside of hollow-stem auger —Tremie pipe method ✓ Other (specify) pumped down side as casing withdrawn 4, 5, 9.	
c. Was a different seal used in the unsaturated zone? If yes,	N
• Was this seal made with? —Sodium bentonite (specify type and grit) —Cement (specify neat or concrete)- Other (specify)	NA
• Was this seal installed by? —Dropping material down the hole and tamping —Dropping material down the inside of hollow stem auger —Other (specify)	NA
d. Is the upper portion of the borehole sealed with a concrete cap to prevent infiltration from the surface? Except MW 11	Y
e. Is the well fitted with an above-ground protective device and bumper guards?	N
f. Has the protective cover been installed with locks to prevent tampering?	sometimes

Comm 19

	Y/N
H. Evaluation of the Facility's Detection Monitoring Program	
1. Placement of Downgradient Detection Monitoring Wells	
a. Are the ground-water monitoring wells or clusters located immediately adjacent to the waste management area?	Y
b. How far apart are the detection monitoring wells? 125-200'	
c. Does the owner/operator provide a rationale for the location of ea. monitoring well or cluster?	N
d. Does the owner/operator identified the well screenlengths of each monitoring well or clusters?	Y
e. Does the owner/operator provide an explanation for the well screen lengths of each monitoring well or cluster?	N comment 20
f. Do the actual locations of monitoring wells or clusters correspond to those identified by the owner/operator?	Y
2. Placement of Upgradient Monitoring Wells	
a. Has the owner/operator documented the location of each upgradient monitoring well or cluster?	Y
b. Does the owner/operator provide an explanation for the location(s) of the upgradient monitoring wells?	N
c. What length screen has the owner/operator employed in the background monitoring well(s)?	10 ft
d. Does the owner/operator provide an explanation for the screen length(s) chosen?	N
e. Does the actual location of each background monitoring well or cluster correspond to that identified by the owner/operator?	Y
I. Office Evaluation of the Facility's Assessment Monitoring Program Use Ground Water Assessment Proposal Dec 26, 1984 and Ground Water Assessment Aug 6, 1985	
1. Does the assessment plan specify:	
a. The number, location, and depth of wells?	N
b. The rationale for their placement and identify the basis that will be used to select subsequent sampling locations and depths in later assessment phases?	N
2. Does the list of monitoring parameters include all hazardous waste constituents from the facility?	N comment 21

	Y/N
a. Does the water quality parameter list include other important indicators not classified as hazardous waste constituents?	NA
b. Does the owner/operator provide documentation for he listed wastes which are not included?	NA
3. Does the owner/operator's assessment plan specify the procedures to be used to determine the rate of constituent migration in the ground-water?	N
4. Has the owner/operator specified a schedule of implementation in the assessment plan?	N
5. Have the assessment monitoring objectives been clearly defined in the assessment plan?	Y
a. Does the plan include analysis and/or re-evaluation to determine if significant contamination has occurred in any of the detection monitoring wells?	Y
b. Does the plan provide for a comprehensive program of investigation to fully characterize the rate and extent of contaminant migration from the facility?	Y
c. Does the plan call for determining the concentrations of hazardous wastes and hazardous waste constituents in the ground water?	Y
d. Does the plan employ a quarterly monitoring program?	N
6. Does the assessment plan identify the investigatory methods that will be used in the assessment phase?	Y
a. Is the role of each method in the evaluation fully described?	N
b. Does the plan provide sufficient descriptions of the direct methods to be used?	N
c. Does the plan provide sufficient descriptions of the indirect methods to be used?	N
d. Will the method contribute to the further characterization of the contaminant movement?	Y
7. Are the investigatory techniques utilized in the assessment program based on direct methods?	Y
a. Does the assessment approach incorporate indirect methods to further support direct methods?	N
b. Will the planned methods called for in the assessment approach ultimately meet performance standards for assessment monitoring?	N
c. Are the procedures well defined?	N
d. Does the approach provide for monitoring wells similar in design and construction as the detection monitoring wells?	N

comment 22

	Y/N
e. Does the approach employ taking samples during drilling or collecting core samples for further analysis?	Y
8. Are the indirect methods to be used based on reliable and accepted geophysical techniques?	NA Comment 2
a. Are they capable of detecting subsurface changes resulting from contaminant migration at the site?	NA
b. Is the measurement at an appropriate level of sensitivity to detect ground-water quality changes at the site?	NA
c. Is the method appropriate considering the nature of the subsurface materials?	NA
d. Does the approach consider the limitations of these methods?	NA
e. Will the extent of contamination and constituent concentration be based on direct methods and sound engineering judgment? (Using indirect methods to substantiate the findings.)	NA
9. Does the assessment approach incorporate any mathe-matical modeling to predict contaminant movement?	N
a. Will site specific measurements be utilized to accurately portray the subsurface?	NA
b. Will the derived data be reliable?	NA
c. Have the assumptions been identified?	NA
d. Have the physical and chemical properties of the site-specific wastes and hazardous waste constituentsbeen identified?	NA
J. Conclusions	
1. Subsurface geology	
a. Has sufficient data been collected to adequately define petrography and petrographic variation?	N
b. Has the subsurface geochemistry been adequately defined?	
c. Was the boring/coring program adequate to define subsurface geologic variation?	Y
d. Was the owner/operator's narrative description complete and accurate in its interpretation of the data?	N
e. Does the geologic assessment address or provide means to resolve any information gaps?	Y
2. Ground-water flowpaths	
a. Did the owner/operator adequately establish the hori-zontal and vertical components of ground-water flow?	N comment 24

	Y/N
b. Were appropriate methods used to establish ground-water flowpaths?	Y
c. Did the owner/operator provide accurate documentation?	N
d. Are the potentiometric surface measurements valid?	Y
e. Did the owner/operator adequately consider the seasonal and temporal effects on the ground-water?	N
f. Were sufficient hydraulic conductivity tests performed to document lateral and vertical variation in hydraulic conductivity in the entire hydrogeologic subsurface below the site?	N
3. Uppermost Aquifer a. Did the owner/operator adequately define the upper-most aquifer?	Y
4. Monitoring Well Construction and Design a. Do the design and construction of the owner/operator's ground-water monitoring wells permit depth discrete ground-water samples to be taken?	U
b. Are the samples representative of ground-water quality?	U
c. Are the ground-water monitoring wells structurally stable?	N
d. Does the ground-water monitoring well's design and construction permit an accurate assessment of aquifer characteristics?	N
5. Detection Monitoring a. Downgradient Wells • Do the location, and screen lengths of the ground-water monitoring wells or clusters in the detection monitoring system allow the immediate detection of a release of hazardous waste or constituents from the hazardous waste management area to the uppermost aquifer?	N
b. Upgradient Wells • Do the location and screen lengths of the upgradient (background) ground-water monitoring wells ensure the capability of collecting ground-water samples representative of upgradient (background) ground-water quality including any ambient heterogenous chemical characteristics?	N
6. Assessment Monitoring a. Has the owner/operator adequately characterized site hydrogeology to determine contaminant migration?	N
b. Is the detection monitoring system adequately designed and constructed to immediately detect any contaminant release?	N

Comment 25

Comment 26

	Y/N
c. Are the procedures used to make a first determination of contamination adequate?	Y
d. Is the assessment plan adequate to detect, characterize, and track contaminant migration?	Y
e. Will the assessment monitoring wells, given site hydrogeologic conditions, define the extent and concentration of contamination in the horizontal and vertical planes?	N
f. Are the assessment monitoring wells adequately designed and constructed?	N
g. Are the sampling and analysis procedures adequate to provide true measures of contamination?	N
h. Do the procedures used for evaluation of assessment monitoring data result in determinations of the rate of migration, extent of migration, and hazardous constituent composition of the contaminant plume?	N
i. Are the data collected at sufficient frequency and duration to adequately determine the rate of migration?	N
j. Is the schedule of implementation adequate?	N
k. Is the owner/operator's assessment monitoring plan adequate?	N
• If the owner/operator had to implement his assessment monitoring plan was it implemented satisfactorily?	N
II. Field Evaluation	
A. Ground-Water Monitoring System	
1. Are the numbers, depths, and locations of monitoring wells in agreement with those reported in the facility's monitoring plan? (See Section 3.2.3.)	Y
B. Monitoring Well Construction	
1. Identify construction material material diameter a. Primary Casing PVC 2" 4,5,9 b. Secondary or outside casing Galvanized Steel 2" 1, 1A, 2, 3, 3A Steel 3" Well #11	
2. Is the upper portion of the borehole sealed with concrete to prevent infiltration from the surface?	Y + N comment 27
3. Is the well fitted with an above-ground protective device?	N
4. Is the protective cover fitted with locks to prevent tampering? If a facility utilizes more than a single well design, answer the above questions for each well design?	Y + N comment 28

	Y/N
III. Review of Sample Collection Procedures	
A. Measurement of Well Depths /Elevation	
1. Are measurements of both depth to standing water and depth to the bottom of the well made?	N
2. Are measurements taken to the 0.01 feet?	Y
3. What device is used? electric probe	
4. Is there a reference point established by a licensed surveyor?	UNK comment 29
5. Is the measuring equipment properly cleaned between well locations to prevent cross contamination?	UNK comment 3
B. Detection of Immiscible Layers	
1. Are procedures used which will detect light phase immiscible layers?	UNK
2. Are procedures used which will detect heavy phase immiscible layers?	UNK
C. Sampling of Immiscible Layers	
1. Are the immiscible layers sampled separately prior to well evacuation?	UNK
2. Do the procedures used minimize mixing with water soluble phases?	UNK
D. Well Evacuation	
1. Are low yielding wells evacuated to dryness?	UNK
2. Are high yielding wells evacuated so that at least three casing volumes are removed?	UNK
3. What device is used to evacuate the wells?	UNK
4. If any problems are encountered (e.g., equipment malfunction) are they noted in a field logbook?	UNK

	Y/N
E. Sample Withdrawal	
1. For low yielding wells, are samples for volatiles, pH, and oxidation/reduction potential drawn first after the well recovers?	UNK
2. Are samples withdrawn with either flurocarbon/resins or stainless steel (316, 304 or 2205) sampling devices?	UNK
3. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps?	UNK
4. If bailers are used, is fluorocarbon/resin coated wire, single strand stainless steel wire, or monofilament used to raise and lower the bailer?	UNK
5. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample?	UNK
6. If bailers are used, are they lowered slowly to prevent degassing of the water?	UNK
7. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration?	UNK
8. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to insertion into the well?	UNK
9. If dedicated sampling equipment is not used, is equipment disassembled and thoroughly cleaned between samples?	UNK
10. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps: a. Dilute acid rinse (HNO_3 or HC1)?11. If samples are for organic analysis, does the cleaning procedure include the following sequential steps:	UNK
11. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps: a. Nonphosphate detergent wash?	UNK
b. Tap water rinse?	UNK
c. Distilled/deionized water rinse?	UNK
d. Acetone rinse?	UNK
e. Pesticide-grade hexane rinse?	UNK

	Y/N
12. Is sampling equipment thoroughly dry before use?	UNK
13. Are equipment blanks taken to ensure that sample cross-contamination has not occurred?	UNK
14. If volatile samples are taken with a positive gas displacement bladder pump, are pumping rates below 100 ml/min?	UNK
F. In-situ or Field Analyses	
1. Are the following labile (chemically unstable) parameters determined in the field:	
a. pH?	UNK
b. Temperature?	UNK
c. Specific conductivity?	UNK
d. Redox potential?	UNK
e. Chlorine?	UNK
f. Dissolved oxygen?	UNK
g. Turbidity?	UNK
h. Other (specify) _____	UNK
2. For in-situ determinations, are they made after well evacuation and sample removal?	UNK
3. If sample is withdrawn from the well, is parameter measured from a split portion?	UNK
4. Is monitoring equipment calibrated according to manufacturer's specifications and consistent with SW-846?	UNK
5. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook?	UNK
IV. Review of Sample Preservation and Handling Procedures	
A. Sample Containers	
1. Are samples transferred from the sampling device directly to their compatible containers?	UNK

	Y/N
2. Are sample containers for metals (inorganics) analyses polyethylene with polypropylene caps?	UNK
3. Are sample containers for organics analysis glass bottles with fluorocarbonresin-lined caps?	UNK
4. If glass bottles are used for metals samples are the caps fluorocarbonresin-lined?	UNK
5. Are the sample containers for metal analyses cleaned using these sequential steps:	
a. Nonphosphate detergent wash?	UNK
b. 1:1 nitric acid rinse?	UNK
c. Tap water rinse?	UNK
d. 1:1 hydrochloric acid rinse?	UNK
e. Tap water rinse?	UNK
f. Distilled/deionized water rinse?	UNK
6. Are the sample containers for organic analyses cleaned using these sequential steps:	
a. Nonphosphate detergent/hot water wash?	UNK
b. Tap water rinse?	UNK
c. Distilled/deionized water rinse?	UNK
d. Acetone rinse?	UNK
e. Pesticide-grade hexane rinse?	UNK
7. Are trip blanks used for each sample container type to verify cleanliness?	UNK
B. Sample Preservation Procedures	
1. Are samples for the following analyses cooled to 4°C:	
a. TOC?	UNK
b. TOX?	UNK
c. Chloride?	UNK
d. Phenols?	UNK
e. Sulfate?	UNK
f. Nitrate?	UNK
g. Coliform bacteria?	UNK
h. Cyanide?	UNK
i. Oil and grease?	UNK
j. Hazardous constituents (261, Appendix VIII)	UNK

	Y/N
2. Are samples for the following analyses field acidified to pH <2 with HNO_3:	
a. Iron?	UNK
b. Manganese?	UNK
c. Sodium?	UNK
d. Total metals?	UNK
e. Dissolved metals?	UNK
f. Fluoride?	UNK
g. Endrin?	UNK
h. Lindane?	UNK
i. Methoxychlor?	UNK
j. Toxaphene?	UNK
k. 2,4, D?	UNK
l. 2,4,5 TP Silvex?	UNK
m. Radium?	UNK
n. Gross alpha?	UNK
o. Gross beta?	UNK
3. Are samples for the following analyses field acidfied to pH <2 with H_2SO_4:	
a. Phenols?	UNK
b. Oil and grease?	UNK
4. Is the sample for TOC analyses field acified to pH <2 with HCl?	UNK
5. Is the sample for TOX analysis preserved with 1 ml of 1.1 M sodium sulfite?	UNK
6. Is the sample for cyanide analysis preserved with NaOH to pH >12?	UNK
C. Special Handling Considerations	
1. Are organic samples handled without filtering?	UNK
2. Are samples for volatile organics transfered to the appropriate vials to eliminate headspace over the sample?	UNK
3. Are samples for metal analysis split into two portions?	UNK
4. Is the sample for dissolved metals filtered through a 0.45 micron filter?	UNK
5. Is the second portion not filtered and analyzed for total metals?	UNK
6. Is one equipment blank prepared each day of ground-water sampling?	UNK

	Y/N
V. Review of Chain-of-Custody Procedures	
A. Sample Labels	
1. Are sample labels used?	UNK
2. Do they provide the following information:	
a. Sample identification number?	UNK
b. Name of collector?	UNK
c. Date and time of collection?	UNK
d. Place of collection?	UNK
e. Parameter(s) requested and preservatives used?	UNK
3. Do they remain legible even if wet?	UNK
B. Sample Seals	
1. Are sample seals placed on those containers to ensure samples are not altered?	UNK
C. Field Logbook	
1. Is a field logbook maintained?	UNK
2. Does it document the following:	
a. Purpose of sampling (e.g., detection or assessment)?	UNK
b. Location of well(s)?	UNK
c. Total depth of each well?	UNK
d. Static water level depth and measurement technique?	UNK
e. Presence of immiscible layers and detection method?	UNK
f. Collection method for immiscible layers and sample identification numbers?	UNK
g. Well evacuation procedures?	UNK
h. Sample withdrawal procedure?	UNK
i. Date and time of collection?	UNK
j. Well sampling sequence?	UNK
k. Types of sample containers and sample identification number(s)?	UNK
l. Preservative(s) used?	UNK
m. Parameters requested?	UNK
n. Field analysis data and method(s)?	UNK
o. Sample distribution and transporter?	UNK
p. Field observations?	UNK

	Y/N
—Unusual well recharge rates?	UNK
—Equipment malfunction(s)?	UNK
—Possible sample contamination?	UNK
—Sampling rate?	UNK
D. Chain-of-Custody Record 1. Is a chain-of-custody record included with each sample?	UNK
2. Does it document the following: a. Sample number?	UNK
b. Signature of collector?	UNK
c. Date and time of collection?	UNK
d. Sample type?	UNK
e. Station location?	UNK
f. Number of containers?	UNK
g. Parameters requested?	UNK
h. Signatures of persons involved in chain-of-custody?	UNK
i. Inclusive dates of custody?	UNK
E. Sample Analysis Request Sheet 1. Does a sample analysis request sheet accompany each sample?	UNK
2. Does the request sheet document the following: a. Name of person receiving the sample?	UNK
b. Date of sample receipt?	UNK
c. Duplicates?	UNK
d. Analysis to be performed?	UNK
IV. Review of Quality Assurance/Quality Control **A. Is the validity and reliability of the laboratory and field generated data ensured by a QA/QC program?**	UNK comment 31
B. Does the QA/QC program include: 1. Documentation of any deviation from approved procedures?	UNK

	Y/N
2. Documentation of analytical results for:	
a. Blanks?	UNK
b. Standards?	UNK
c. Duplicates?	UNK
d. Spiked samples?	UNK
e. Detectable limits for each parameter being analyzed?	UNK
C. Are approved statistical methods used?	N
D. Are QC samples used to correct data?	UNK
E. Are all data critically examined to ensure it has been properly calculated and reported?	UNK
VII. Surficial Well Inspection and Field Observation	
A. Are the wells adequately maintained?	N
B. Are the monitoring wells protected and secure?	N
C. Do the wells have surveyed casing elevations?	Y
D. Are the ground-water samples turbid?	UNK
E. Have all physical characteristics of the site been noted in the inspector's field notes (i.e., surface waters, topography, surface features)?	Y
F. Has a site sketch been prepared by the field inspector with scale, north arrow, location(s) of buildings, location(s) of regulated units, locations of monitoring wells, and a rough depiction of the site drainage pattern?	Y

	Y/N	
VIII. Conclusions		
A. Is the facility currently operating under the correct monitoring program according to the statistical analyses performed by the current operator?	Y	comment 32
B. Does the ground-water monitoring system, as designed and operated, allow for detection or assessment of any possible ground-water contamination caused by the facility?	N	comment 33
C. Does the sampling and analysis procedures permit the owner/operator to detect and, where possible, assess the nature and extent of a release of hazardous constituents to ground water from the monitored hazardous waste management facility?	UNK	comment 34

APPENDIX A-2

INSPECTION COMPLIANCE FORM FOR A FACILITY WHICH HAS DETERMINED IT MAY BE AFFECTING GROUND WATER QUALITY

Company Name: Grady McCauley Creative Graphics Inc. : EPA I.D. Number: 004-468-609

Company Address: 7584 Whipple Ave North Canton, OH

Inspector's Name: Diane Kurlich

Company Contact/Official: Dennis Grady Branch/Organization: Grady McCauley

Title: Owner / President : Date of Inspection: Nov. 1, 1990

	Yes	No	Unknown	Comments
Type of facility:(Check appropriately)				
a) surface impoundment		✓		
b) landfill	✓			
c) land treatment facility		✓		
d) storage facility		✓		
Ground-Water Monitoring Plan				
1. Has(Have) comparison(s) of ground water contamination indicator parameters for the upgradient well(s) 3745-65-93(B) shown a significant increase (or pH decrease) over initial background?			✓	✓ 1
a) If "Yes", has(have) the increase(s) been submitted to the Regional Administrator as part of the annual report? 3745-65-94(A)(2)	NA			
2. Have comparisons of indicator parameters for the downgradient wells 3745-65-93(B) shown a significant increase (or decrease) over initial background?			✓	✓ 2
a) If "Yes", were additional ground water samples taken for those downgradient wells where the significant difference was determined? 3745-65-93(C)(2)				
1) Were samples split in two?				
2) Was the significant difference due to laboratory error? (If "Yes", do not continue.)				

	Yes	No	Unknown	Comments
3. If significant differences were not due to laboratory error, was a written notice sent to the Regional Administrator within 7 days of (laboratory) confirmation? 3745-65-93(D)(1)			✓	
4. Within 15 days of notification of the Regional Administrator was a ground water quality assessment program submitted? 3745-65-93(D)(2)		✓		
a) Does the plan specify 3745-65-93(D)(3):				
1) Hydrogeologic Conditions at the facility?	✓			
2) The detection monitoring program implemented by the facility, including, but not limited to:				
a) The number, location, depth, and construction of detection monitoring wells with written documentation:	✓			
b) A summary of detection monitoring analytical data with written documentation of the results; and	✓			
c) A summary of statistical analyses applied to the data;		✓		✓ 3
3) The investigative approach to be followed during the assessment, including, but limited to:				
a) The proposed number, location, depth, installation method, and construction of monitoring wells;	✓			
b) The proposed methods for gathering additional hydrogeologic information;	✓			
c) The proposed use of supporting methodology (e.g., soil gas analysis, geophysics); and		✓		
d) The proposed methodology for determining contaminant migration rates;		✓		

	Yes	No	Unknown	Comments
4) Sampling and analysis procedures as specified under paragraph (A) of rule 3745-65-92 of the administrative code;		✓		
5) Proposed data evaluation procedures, including, but not limited to:				
a) Utilization of statistical data evaluation;		✓		
b) Utilization of computer models; and		✓		
c) Criteria that will be utilized to determine if additional assessment activities are warranted; and		✓		
6) A schedule of implementation.		✓		
b) Does the plan allow for determination of 3745-65-93(D)(4)				
1) Rate and extent of migration of hazardous waste or hazardous waste constituents?		✓		
2) Concentrations of the hazardous waste or hazardous waste constituents?	✓			
c) Is it indicated that the 1st determination was made as soon as technically feasible? 3745-65-93(D)(5)		✓		
1) Within 15 days after determination was a written report containing the assessment of ground water quality submitted to the Regional Administrator?		✓		
d) Was it determined that hazardous waste or hazardous waste constituents from the facility has entered the ground water?	✓			
1) If "No", was the original indication evaluation program, required by (3745-65-92) reinstated?				

	Yes	No	Unknown	Comments
a) Was the Regional Administrator notified of the reinstatement of program within 15 days of the determination? 3745-65-93(D)(7)		✓		
e) If it was determined that hazardous waste or hazardous waste constituents have entered the ground water 3745-65-93(D)(7)				
1) For facilities where the program was implemented prior to final closure, are determinations of hazardous waste or hazardous waste constituents continued on a quarterly basis? (If the program was implemented during the post-closure care period, determinations made in accordance with the ground water quality assessment plan may cease.)		✓		
2) Were(are) records kept of the analyses and evaluations, specified in the ground water quality assessment (throughout the active life of the facility)? 3745-65-94(B)(1)			✓	✓ comment 4
a) If a disposal facility, were (are) records kept throughout the post-closure period as well?	N/A			
f) Are annual reports submitted to the Regional Administrator containing the results of the ground water quality assessment program? 3745-65-94(B)(2)		✓		
Do the reports include the calculated or measured rate of migration of hazardous waste or hazardous waste constituents?	NA			

COMMENTS

Checklist A

Comment 1. Such a map was not included in the report.

Comment 2. Date started not included.

Comment 3. Depth and location of contaminants encountered in the bore hole is only included for MW 1-3A.

Comment 4. No analytical data have been provided.

Comment 5. No laboratory data have been provided.

Comment 6. No laboratory data have been provided.

Comment 7. Cross-sections were not provided by the company.

Comment 8. No information as to whether or not the map was constructed by a licensed surveyor.

Comment 9. Contours are at a 5' interval rather than a 2' interval.

Comment 10. Monitor well MW-11 is not shown on the map.

Comment 11. No information was provided to determine if a licensed surveyor did the surveying of casing heights.

Comment 12. No piezometers were installed.

Comment 13. Flow nets were not provided by the company.

Comment 14. Flow direction changes from SE to E to NE.

Comment 15. Monitor well cluster wells MW-3 and MW-3A show different static water levels on May 5, 1989, therefore, there may be a vertical component of flow.

Comment 16. Hydraulic conductivity was not determined.

Comment 17. Hydraulic conductivity was not determined.

Comment 18. No fluids used.

Comment 19. Monitor well MW-2 does not have a protective casing with locks. Monitor well MW-4 has a protective casing but it is not locked. Monitor well MW-9 has a locking protective casing, however, the locking cap is not bolted.

Comment 20. An explanation is not provided for the screen lengths.

Comment 21. A list of parameters is not provided. Parameters to be analyzed were determined on a per sampling event basis. A

Comment 22. No indirect methods were used or proposed.

Comment 23. No indirect methods were used or proposed.

Comment 24. Vertical components of flow have not been investigated.

Comment 25. Sampling and measurement of water levels has never been done on a regular quarterly basis; therefore, there is not a good data base for determination of seasonal and temporal effects on the ground water.

Comment 26. No provisions have been made for the determination of floating or sinking layers, therefore, it is unknown whether the samples are representative of ground water quality.

Comment 27. Monitor well MW-11 does not have a concrete seal.

Comment 28. See comment 19.

Comment 29. No information is provided to determine if the reference point was surveyed by a licensed surveyor.

Comment 30. Sampling was not observed, therefore, answers to the sampling collection procedures are unknown.

Comment 31. Laboratory QA/QC was not documented. Documentation of the field QA/QC is insufficient.

Comment 32. No statistical analyses were performed.

Comment 33. Provisions have not been made for the determination of floating of sinking layers.

Comment 34. Sampling and analysis procedures were not observed.

Comments Appendix A-2

Comment 1. Comparisons of ground water contamination indicator have not been analyzed, nor have any upgradient versus downgradient nor downgradient versus downgradient comparisons been made.

Comment 2. See comment 1.

Comment 3. Statistical analyses have not been applied to the data.

Comment 4. Records were unavailable during the inspection.

APPENDIX B

(ED K

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

DEC 4 - 1986

REPLY TO THE ATTENTION OF

RECEIVED '86 DEC -8 A9:52

RECEIVED OHIO EPA DEC 8 1986 DIV. of SOLID & HAZ. WASTE MGT.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Kenneth Moore, Esq.
Squire, Saunders & Dempsey
1800 Huntington Building
Cleveland, Ohio 44115

Re: Grady McCauley Creative Graphics, Inc.
RCRA Docket No. V-W-85-R-35

Dear Mr. Moore:

This letter acknowledges receipt of signed copies of a Consent Agreement and Final Order in the above-identified matter. Returned herewith is one fully executed copy containing the signatures of Mr. Constantelos and Mr. Adamkus. Another copy has been filed with the Regional Hearing Clerk. Payment of the $7,500 is due within thirty (30) days of the date that Mr. Adamkus signed the Order.

Your cooperation in resolving this matter is appreciated.

Very truly yours,

William H. Miner, Chief
Hazardous Waste Enforcement Branch

Enclosure

cc: Beverely Shorty
Regional Hearing Clerk

Honorable Spencer T. Nissen
Administrative Law Judge

Warren W. Tyler, Director
Ohio Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

IN THE MATTER OF:	)	
	)	DOCKET No.: V-W-85-P-35
GRADY McCAULEY CREATIVE GRAPHICS, INC.	)	
7930 MIDDLEBRANCH ROAD	)	CONSENT AGREEMENT AND
MIDDLEBRANCH, OHIO 45409	)	FINAL ORDER
	)	
EPA I.D. No.: OHD 004 468 609	)	

On June 28, 1985, a Complaint was filed in this matter pursuant to Section 3008 of the Resource Conservation and Recovery Act, as amended, (RCRA), 42 U.S.C. §6928, and the United States Environmental Protection Agency's Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation or Suspension of Permits, 40 CFR Part 22. The Complainant is the Director of the Waste Management Division, Region V, United States Environmental Protection Agency (U.S. EPA). The Respondent is Grady McCauley Creative Graphics, Inc.

The Parties to this action desiring to settle this action and believing that this settlement is in the public interest, enter into the following stipulations:

1. Respondent has been served a copy of the Complaint with the Notice of Opportunity for Hearing on this matter.

2. The Regional Administrator has jursidiction over this matter pursuant to Section 3008 of RCRA, 42 U.S.C. §6928.

3. Respondent is a corporation which carries on a screen printing business. The reusable screens employed in the business were washed at Respondent's facility at 7930 Middlebranch Road, Middlebranch, Ohio 44652. The solvent and ink residue in the wash which was not collected by the recycle system passed through floor drains to dry wells. In August 1985 the screen washing operation was moved to

Respondent's new replacement facility at 7584 Whipple Avenue, North Canton, Ohio 44720, which discharges its wastewater to a publicly owned treatment works.

4. On or about September 1, 1983, Mr. Dennis Grady and Mr. David McCauley assumed management and control of the facility at 7390 Middlebranch Road.

5. Respondent has ceased the generation and any subsequent treatment, storage or disposal of any hazardous waste at the facility at 7390 Middlebranch Road, Middlebranch, Ohio.

6. The parties have discussed settlement of this action in an informal conference held in the offices of U.S. EPA Region V in Chicago, Illinois on August 14, 1985 and on March 11, 1986.

7. Respondent explicity waives its rights to request a hearing on the allegations of the Complaint filed herein.

8. Settlement of the disputed issues arising from the Complaint without further administrative or judicial proceedings is in the public interest, and avoids the burden and expense of litigation for the parties. Entry of this Consent Agreement and Final Order is most appropriate means of resolving these issues. Accordingly, Respondent consents to the issuance of the Order hereinafter recited, and hereby consents to the payment of a civil penalty in the amount stipulated.

ORDER

Based on the foregoing stipulations, without the taking of any testimony, without the trial or adjudication of any issue of fact or law, without this Consent Agreement and Final Order constituting any evidence or admission by

Respondent with respect to any issue of fact or law, with the consent of the parties, and the Regional Administrator having considered the matter and being duly advised, IT IS HEREBY ORDERED as follows:

1. Respondent shall within forty-five (45) days of the effective date of this Order establish financial assurance for closure of the dry wells at 7930 Middlebranch Road pursuant to 40 CFR 265.143.

2. Respondent has submitted to the Ohio Environmental Protection Agency (OEPA) and U.S. EPA, and OEPA and U.S. EPA have approved, a Sampling Plan to identify the extent of soil and groundwater contamination at the facility. This plan includes but is not limited to the installation of a groundwater monitoring system and soil sampling.

3. Respondent shall, within 90 days of the effective date of this Order, complete the soil sampling, the initial rounds of groundwater monitoring for all wells specified in the Sampling Plan, and submit a status report indicating whether additional groundwater monitoring and/or sampling is required. If the status report indicates no additional monitoring and/or sampling is required, and OEPA and U.S. EPA concur with this determination, Respondent shall proceed to initiate the activites specified in Paragraphs 7 and 8 of this Order. If additional groundwater monitoring and/or soil sampling is required, an additional 90 days will be allowed to complete this activity.

4. Respondent shall, within 30 days of completion of the activities described in the Sampling Plan, prepare and submit to OEPA and U.S. EPA a Closure Plan for the dry wells which would meet the pertinent requirements of 40 CFR 265.110, 265.111, 265.112(a)(1), (3), and (4), 265.112(d), 265.114, and

265.115. Respondent at its option may elect to either remove and properly dispose of the existing dry wells or clean and decontaminate them.

5. OEPA and U.S. EPA will approve Grady McCauley's Closure Plan or specify in writing to Grady McCauley the modifications necessary for approval within 90 days of receipt of Grady McCauley's Closure Plan. Grady McCauley must modify its Closure Plan or submit a new Closure Plan within 30 days of receipt of OEPA's and U.S. EPA's specification of necessary modifications. Approval of Grady McCauley's initial, modified, or new Closure Plan shall not be unreasonably withheld. Grady McCauley shall perform all closure activities detailed in the Closure Plan submitted by it and finally approved.

6. Upon completion of the required closure activities, Respondent shall certify in writing to U.S. EPA and to OEPA that the facility has been closed in accordance with the specifications in the approved closure plan. Respondent shall also submit, or cause to have submitted to U.S. EPA and to OEPA, written certification of the same from the independent registered professional engineer that observed the closure activities.

7. Respondent shall within 60 days of the completion of activities described in Paragraph 3, prepare and submit to U.S. EPA and OEPA a Feasibility Study addressing the contaminated soil and groundwater at the facility. This study must clearly detail the activities which will be undertaken by Respondent to control, minimize, or eliminate to the extent necessary to protect human health and the environment, escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface water or to the atmosphere.

8. OEPA and U.S. EPA will approve Grady McCauley's Feasibility Study or specify in writing to Grady McCauley the modifications necessary for approval within 90 days of receipt of Grady McCauley's Feasibility Study. Grady McCauley must modify its feasibility study or submit a new Feasibility Study within 30 days of receipt of OEPA's and U.S. EPA's specification of necessary modifications. Grady McCauley shall perform all activities detailed in the Feasibiliity Study or modified Feasibility Study submitted by it and finally approved.

9. Within twenty-five (25) business days after completion of the requirements identified in paragraphs 3, 4, 5, and 6, and 7 above, Respondent shall notify U.S. EPA in writing. This notification shall be submitted no later than the times stipulated above to Mr. Paul Dimock, U.S. EPA, Region V, Waste Management Division, 230 South Dearborn Street, Chicago, Illinois 60604, Attention: RCRA Enforcement Section. A copy of these documents shall be submitte to Paula Cotter, Division of Solid and Hazardous Waste, Ohio Environmental Protection Agency, 361 East Broad Street, Columbus, Ohio 43216.

10. Respondent shall within 30 days of the effective date of this Order, pay a civil penalty in the amount of $7,500 (SEVEN THOUSAND FIVE HUNDRED DOLLARS), payable to the Treasurer of the United States. Said payment shall be mailed to U.S. EPA, Region V, P.O. Box 70753, Chicago, Illinois 60673. Copies of the transmittal of the payment shall be sent to both the Regional Hearing Clerk, Planning and Management Division and the Solid Waste and Emergency Response Branch Secretary, Office of Regional Counsel, U.S. EPA, 230 South Dearborn Street, Chicago, Illinois 60604.

11. If Respondent fails to take corrective action within the time specified in this Order, Respondent may be subject to a civil penalty of not

more than TWENTY-FIVE THOUSAND DOLLARS ($25,000) for each day of continued non-compliance with the Order. Such penalties are authorized pursuant to RCRA Section 3008(c).

12. The U.S. EPA may collect interest on any amounts overdue under the terms of this Consent Agreement and Final Order at the rate established by the Secretary of the Treasury pursuant to 31 U.S.C. §3717. A late payment handling charge of $20.00 will be imposed on any late payment, with an additional charge of $10.00 for each subsequent 30-day period over which an unpaid balance remains. In addition, a six percent per annum penalty will be applied on any principal amount not paid within ninety (90) days of the date on which each payment is due.

13. U.S. EPA expressly reserves all rights which it may have under RCRA Section 3008(a)(3) and RCRA Section 3008(h) should Respondent fail to comply with any requirements of the Order. Notwithstanding any other provision of the Order, an enforcement action may be brought pursuant to Section 7003 of RCRA or other statutory authority should the U.S. EPA find that the handling of solid waste or hazardous waste at the facility presents an imminent and substantial endangerment to human health or the environment.

14. This Consent Agreement and Final Order constitutes a settlement and final disposition of the complaint filed in this case and stipulations hereinbefore recited.

15. The above Consent Agreement and Final Order consisting of seven pages is hereby consented to by both of the parties to this proceeding.

Agreed this 17 day of NOV, 1986.

Grady McCauley Creative Graphics, Inc., Respondent

By: [signature] President

Agreed this 1st day of December, 1986.

[signature]
Basil G. Constantelos
Director, Waste Management Division
U.S. Environmental Protection Agency
Region V, Complainant

The above being agreed and consented to, it is so ORDERED this 2nd day of December, 1986.

[signature]
Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency

APPENDIX C

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady Mc Cauley - Middlebranch, Ohio HOLE NO. MW-1 3" Test Hole

DRILLED BY Glyn Davis DRILLER. COMPLETED March 15, 19 85

LOCATION 94 ft. east of Middlebranch Rd., 6 ft. west of building, 29 ft. north of south property line

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones,	5 ft.		
5 ft.	Sand, Clay & Stones	10 ft.		
5 ft.	Sand, Gravel & Little Clay			
	(dry)	15 ft.		
5 ft.	Fine Sand, Gravel & Little			
	Clay (stratified)	20 ft.		
22 ft.	Sand, Gravel & Little Clay	42 ft.		
7 ft.	Sand, Gravel & Clay	49 ft.	yes	
16 ft.	Sand, Gravel & Clay (dirty)	65 ft.		
4 ft.	Clay	69 ft.		
	Shale at	69 + ft.		
	Static water level = 12' 3"			
	Water encountered at 23 ft.			
	Pumped for water samples:	20' - 25'		
		35' - 40'		
		42' - 47'		
		48' - 53'		
		59' - 63'		

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-2
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 21, 19 85

LOCATION Approx. 40 ft. east of Middlebranch Rd., 8 ft. north of plant

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Sand, Clay & Large Stones	7 ft.		
7 ft.	Sand, Gravel & Clay	14 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	21 ft.		
7 ft.	Sand, Gravel & Clay	28 ft.		
7 ft.	Sand, Gravel & Little Clay			
	(Layer of stones 34 - 36 ft)	35 ft.		8' 6"
4 ft.	Sand, Larger Gravel &			
	Little Clay	39 ft.		
10 ft.	Fine Sand, Gravel & Clay	49 ft.		
7 ft.	Sand, Gravel & Clay	56 ft.		
7 ft.	Sand, Gravel & Little Clay	63 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	70 ft.		
4 ft.	Sand, Gravel & Little Clay	74 ft.		
2 ft.	Clay, Sand & Gravel	76 ft.		
	Shale at 76 feet			
	Pumped for water sample:			
	1. 28' - 31'			
	2. 35' - 38'			
	3. 42' - 45'			
	4. 49' - 52'			
	5. 56' - 59' (oily film on surface of water)			
	6. 63' - 66' (oily film on surface of water)			
	7. 70' - 73'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-3
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 28, 19 85

LOCATION Approx. 130 ft. north of south property line, 41 ft. east of building

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Clay, Sand & Stones	7 ft.		
3 ft.	Sand, Gravel & Clay	10 ft.		
4 ft.	Sand, Small Gravel & Clay	14 ft.		
7 ft.	Fine Sand, Small Gravel &			
	Clay (tight)	21 ft.		
7 ft.	Sand, Gravel & Little Clay			
	(tight)	28 ft.		
7 ft.	Fine Sand, Gravel & Clay			
	(tight)	35 ft.		
7 ft.	Fine Sand, Gravel & Little			
	Clay	42 ft.		
8 ft.	Sand, Larger Gravel &			
	Little Clay	50 ft.		
	Shale at 50 ft.			
	Pumped for water samples:			
	1. 14' - 17' (Foam present on water surface)			
	2. 21' - 24'			
	3. 28' - 31'			
	4. 35' - 38'			
	5. 42' - 45'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 4 - 2" Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Jan. 16, 19 87

LOCATION 166 ft. east of Grady-McCauley plant bldg., 354 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones	5 ft.		
5 ft.	Sand, Clay & Stones	10 ft.		
5 ft.	Brown Sand, Gravel & Clay	15 ft.		
7 ft.	Brown Sand, Gravel & Minor Clay	22 ft.		
2 ft.	Gray Sand, Gravel & Minor Clay	24 ft.		
2 ft.	Gray Clay	26 ft.		
	Shale at 26 feet			
	screen set 19 to 24 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 5 - 2"

Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Feb. 8, 19 87

LOCATION 49 ft. east of concrete walk edge, 204 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones	5 ft.		
5 ft.	Sand, Gravel & Clay	10 ft.		
5 ft.	Sand, Gravel & Little Clay	15 ft.		
5 ft.	Sand, Gravel & Little Clay	20 ft.	Water	
5 ft.	Fine Sand, Gravel & Clay	25 ft.	Made no water	
	screen set 15 to 20 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 9 - 2" Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Feb. 5, 19 87

LOCATION 15 ft. east of southeast corner of annex bldg., 55 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Brown Clay & Fill	5 ft.		
5 ft.	Brown Clay, Sand & Stones	10 ft.		
5 ft.	Brown Sand, Clay & Stones	15 ft.		
5 ft.	Brown sand, Gravel & Clay	20 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	25 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	30 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	35 ft.		
12 ft.	Gray Clay, Fine Sand & Gravel	47 ft.		
	screen set 30 to 35 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Gardy-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO 11 - 2"
Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED July 15, 19 87

LOCATION 20 ft. east of leach pit area

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Brown Clay, Sand & Stones	5 ft.		
5 ft.	Brown Sand, Clay & Gravel	10 ft.		
5 ft.	Brown Sand, Larger Gravel & Clay	15 ft.		
10 ft.	Gray Fine & Medium Sand, Gravel			
	& Clay	25 ft.		
5 ft.	Gray Fine & Medium Sand, Gravel			
	Little Clay	30 ft.		
10 ft.	Gray Sand, Gravel & Little Clay	40 ft.		
5 ft.	Sand, Clay & Stones (hardpan)	45 ft.		
	Shale below 45 feet			
	Water-bearing zone 6 ft. to 40 ft.			

PLEASE USE PENCIL
OR TYPEWRITER
DO NOT USE INK

DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

No. 255983

ounty Stark Township Plain Section of Township 11

Owner Glenn Boettler Address 2955 Werner Church Rd. Canton, O

Location of property Going north on Rt. 43, turn right onto Easton St., cont. approx. 2 miles, turn left onto Middlebrench Rd. Cont. 1/4 mile, turn right. House on

CONSTRUCTION DETAILS

Casing diameter 4 inch Length of casing 45 feet

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping rate 15 G.P.M. Duration of test hrs.

Drawdown 10 ft. Date

Developed capacity

Static level—depth to water 18 ft.

Pump installed by

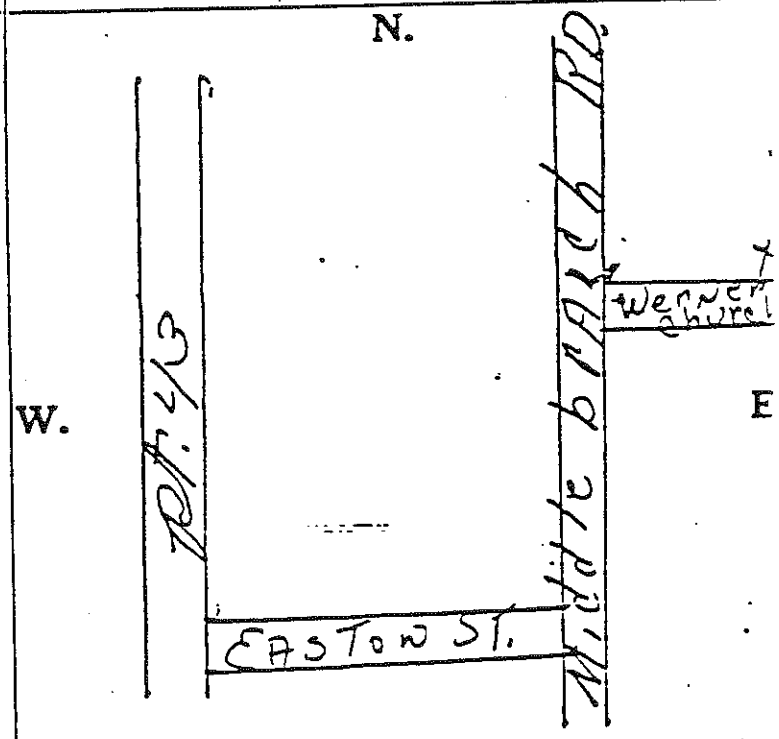
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
yellow clay stone	0 Feet	24 Ft.
[illegible]y clay stone	24	40
gray shale	40	50
lime layer	50	52
gray sandy shale	52	85

Total Depth 85 feet

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Parker Graham

Address 1174 Mt. Pleasant Rd. N.W.
North Canton 20, Ohio

Date June 25, 1961

Signed Parker Graham

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

591609

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP 14

OWNER Don Heater ADDRESS 7412 Middlebranch N.Canton

LOCATION OF PROPERTY same as above

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 95'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test 1 hr

Drawdown 0 ft Date 3/20/81

Static level (depth to water) 38

Quality (clear, cloudy, taste, odor) clear

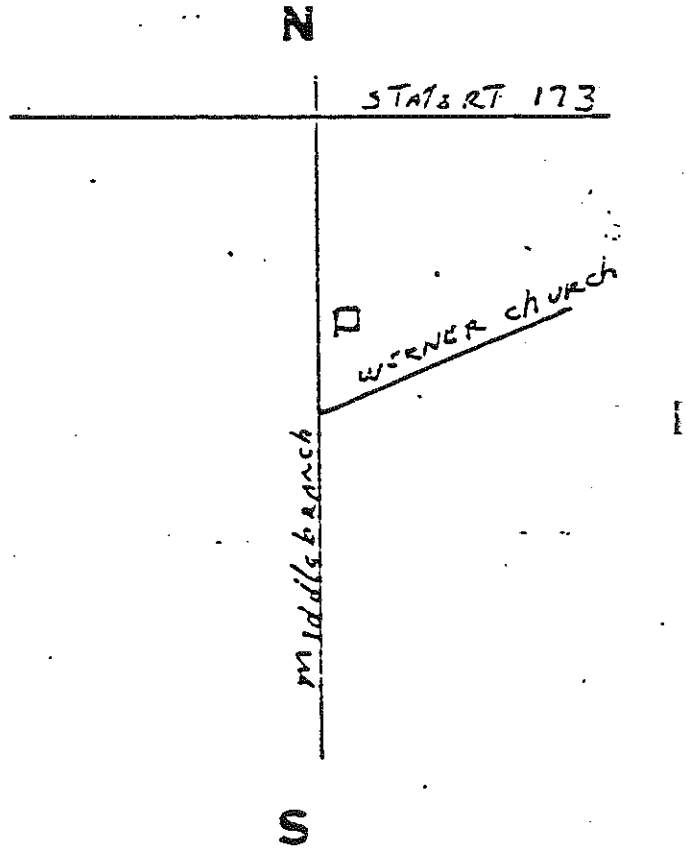
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
drift	0 ft	88 ft
shale	88	120

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ADAMS & SONS

ADDRESS 4310 - 25th St. N.W.

DATE 3/26/81

SIGNED R Dwayne Adams

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR, DIVISION OF WATER, FOUNTAIN SQ., COLS., OHIO 43224

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

№ 107099

County Stark Township Plain Section of Township or Lot Number 2

Owner Diamond Portland Cement Co. Address Middlebranch O.

Location of property Main office in Middlebranch

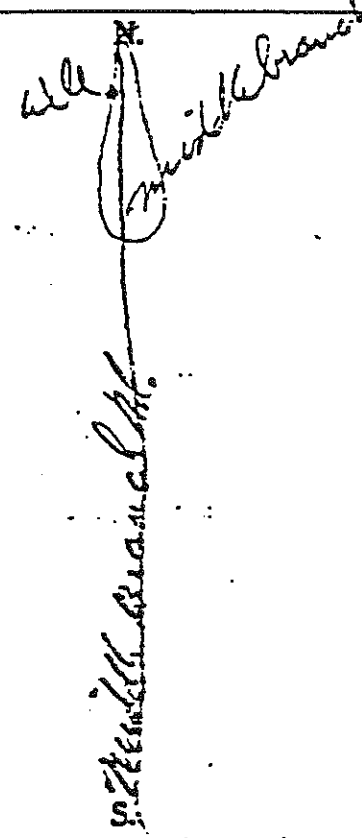
CONSTRUCTION DETAILS	PUMPING TEST
Casing diameter 8" Length of casing 191 ft.	Pumping rate 100 G.P.M. Duration of test 4
Type of screen Length of screen	Drawdown 17 ft. Date Jan 26 19
Type of pump	Developed capacity 100 gpm
Capacity of pump	Static level—depth to water 45'
Depth of pump setting	Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay sand + gravel	0 Feet	60 Ft.
shale	60	100
sand rock	100	178
shale	178	197
sand rock	197	218
shale	218	231
sand rock	231	254
shale	254	284
sand rock	284	316
shale	316	329
sand rock	329	357

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm W. J. Engel Drilling Co Date Jan 26 1954

Address R.D. #5 Massillon O. Signed W. J. Engel

PLEASE USE PENCIL
OR TYPEWRITER
DO NOT USE INK

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

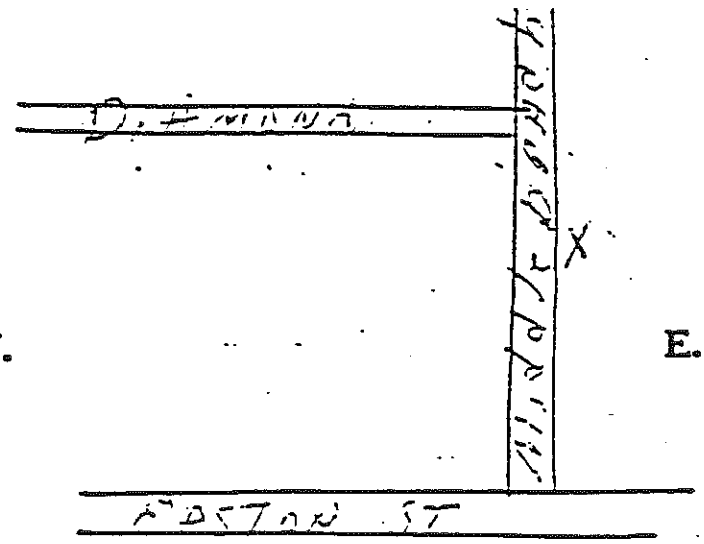
№ 277799

County Stark Township Plain Section of Township 11

Owner Maurice Griffith Address 165 of Mysticlibrand St.

Location of property Fairmount Ave, Canton, turn left 37. 1st. [illegible] 1st. [illegible] on right

CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 4 inch Length of casing 74 ft.	Pumping Rate 10 G.P.M. Duration of test ____ hrs.
Type of screen ____ Length of screen ____	Drawdown 20 ft. Date ____
Type of pump ____	Static level-depth to water 3 ft.
Capacity of pump ____	Quality (clear, cloudy, taste, odor)
Depth of pump setting ____	Cloudy
Date of completion ____	Pump installed by ____

WELL LOG			SKETCH SHOWING LOCATION
Formations Sandstone, shale, limestone, gravel and clay	From	To	Locate in reference to numbered State Highways, St. Intersections, County roads, etc.
	0 Feet	____ Ft.	N.
yellow clay & stone		40	
gray clay stone	40	68	
Coarse gravel	68	70	
Total depth 70 feet			W. E.
			S.

See reverse side for instructions

Drilling Firm [illegible] Date 7/16/62

Address 1174 Mt. Pleasant St. Canton 20, O. Signed [illegible]

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

495736

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Lee Zimmerman ADDRESS 7460 Panther Ave. N.E., N. Canton

LOCATION OF PROPERTY 7530/7532 Tyner Ave. N.E., North Canton 44721

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 71' 9"

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test ½ h

Drawdown 35 ft Date March 18, 1974

Static level (depth to water) 25

Quality (clear, cloudy, taste, odor) clear, no odor

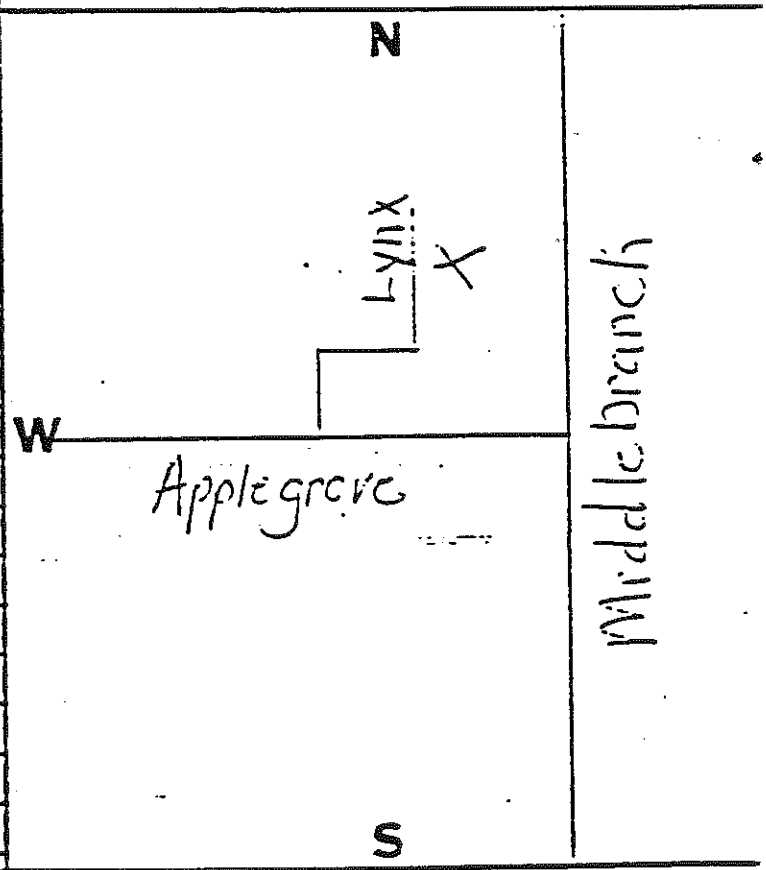
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
sand and gravel	0 ft	55 ft
soft gray shale	55	69
gray sandstone	69	83
gray shale	83	90
blue shale	90	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM A.B. Culp Drilling Co. DATE March 23, 1974

ADDRESS Louisville, Ohio 44641 SIGNED A.B. Culp

*If additional space is needed to complete well log, use next consecutive numbered form.

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

471099

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Dice Decal Corp. ADDRESS 7390 Middlebranch Rd., Middlet

LOCATION OF PROPERTY Same

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 40

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 30 gpm Duration of test 1

Drawdown -0- ft Date 8-21-74

Static level (depth to water) 12

Quality (clear, cloudy, taste, odor) good

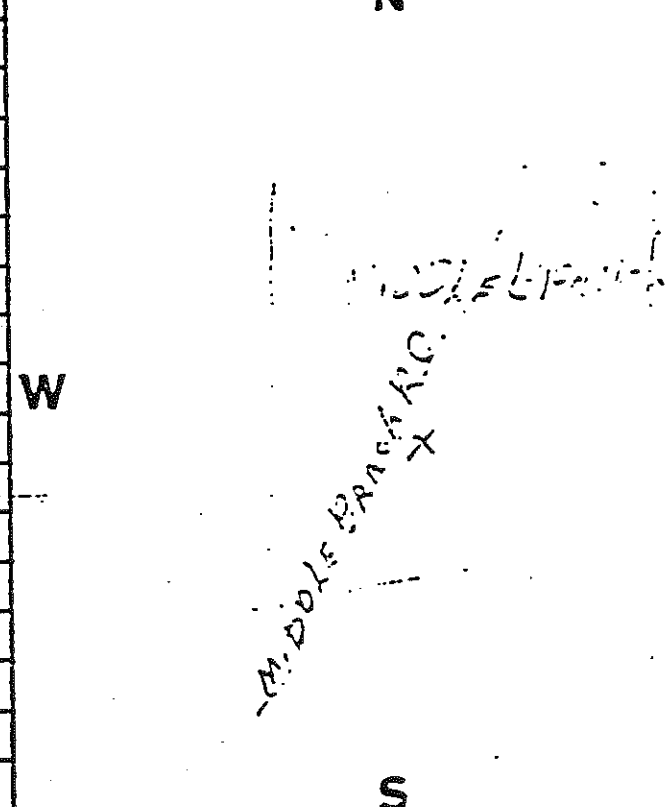
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Gravel	0 ft	38 ft

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM D.T. Waltz Drilling Co.

ADDRESS Route 1, Strasburg, Oh 44680

DATE August 22, 1974

SIGNED Paul V. Rale

*If additional space is needed to complete well log, use next consecutive numbered form.

O, N, ISS LDF

OhioEPA

State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149

C = vids being resolved thru 11-17-86 USEPA FCAFO
GW = 65-91, 93

Toward A Cleaner Environment
15 Year Anniversary 1972 - 1987

Richard F. Celeste
Governor

March 18, 1988

Mr. Dennis Grady
Grady McCauley, Inc.
7584 Whipple Avenue
North Canton OH 44720

Dear Mr. Grady:

The accompanying Comprehensive Groundwater Monitoring Evaluation (CME) report concerning Grady McCauley Creative Graphics, Inc. is the result of a comprehensive monitoring evaluation conducted at the facility on October 23, 1987 by Richard Freitas of the Northeast District Office of the Ohio Environmental Protection Agency (OEPA).

The purpose of the CME is to evaluate a facility's compliance with the interim status Resource Conservation and Recovery Act (RCRA) regulations found in the Code of Federal Regulations, 40 CFR, Subpart F and Ohio Administrative Code Rules 3745-65-90 through 3745-65-94.

The CME revealed the following violations:

1) The rate and extent of migration of the hazardous waste or hazardous waste consitutents in the groundwater have not been determined; 40 CFR 265.93(d)(4)(i) and OAC Rule 3745-65-93(D)(4)(a)

2) The construction of the monitoring wells is inadequate and needs to be upgraded; 40 CFR 265.91(c) and OAC 3745-65-91(C).

The following deficiencies were also noted:

1) The monitoring well system is not adequate to detect the presence of floating/sinking organic layers.

2) The sampling and analysis plan should have a more detailed explanation of sample collection techniques, decontamination procedures, well purging techniques, analytical methods and detection limits.

Since the groundwater monitoring plan is in substantial compliance with the Consent Agreement and Final Order, which Grady McCauley and U.S. EPA entered into on December 8, 1986, no action to correct the aforementioned violations and deficiencies are necessary at this time.

Sincerely,

Dave Sholtis, Supervisor
Compliance/Inspection Unit
Surveillance & Enforcement Section
DSHWM

Reviewed by:

Michael Savage, Manager
Surveillance & Enforcement Section
DSHWM

1945S(13-14)

DS/MS/drr

cc: Richard Freitas/Debby Berg, NEDO
Tim Krichbaum, DGW
Jeff Mayhugh, DSHWM
Jim Saric, U.S. EPA
Kenneth Moore, Esquire
1800 Huntington Bldg., Cleveland OH 44115

CALL JEFF MAYNUGH
OEPA
614-481-7236

COMPREHENSIVE MONITORING EVALUATION

OF

GRADY-McCAULEY CREATIVE GRAPHICS, INC.

MIDDLEBRANCH, OHIO.

A RPU FROM THE STATE WILL DISCUSS THE FACT THAT THE CAFO IS HANDLING CLOSURE AND G.W.M.

December 18, 1987

GENERAL BACKGROUND INFORMATION

The purpose of this report is to document the results of a Comprehensive Ground-Water Monitoring Evaluation (CME) conducted at Grady McCauley Creative Graphics Inc., in Middlebranch, Ohio. A CME is an intensive review of the ground water monitoring system at a facility. It is designed to evaluate compliance with the Resource Conservation and Recovery Act (RCRA) ground-water regulations outlined in 40 CFR 265, Subpart F of the Federal Code of Regulations. All operating, closed and closing land disposal facilities except certified closures by removal are subject to a CME.

SOURCES OF INFORMATION

This report is based upon an extensive review of files and documents available at the Northeast District Office of the Ohio Environmental Protection Agency. The following technical documents were especially useful in the preparation of this report:

1) US EPA Potential Hazardous Waste Report, August 15, 1983.

2) Volatile Organic Analysis, Soil Samples, Grady McCauley, Middlebranch Ohio, Wadsworth Testing Laboratories, October 18, 1984.

3) Volatile Compounds Analytical Report, (Grady McCauley plant well), Wadsworth Testing Laboratories, November 23, 1984.

4) Volatile Compounds Analytical Report, Grady McCauley, Middlebranch, Ohio, Wadsworth Laboratories (?), (Results of five water samples from local private wells) December 11, 1984.

5) Ground water Assessment Proposal, Wadsworth Laboratories Inc., December 26, 1984.

6) Piezometric surface map, Grady McCauley, The Ohio Drilling Company, May 20, 1985.

7) Ground water Assessment, Grady McCauley Creative Graphics, Wadsworth Testing Laboratories, August 6, 1985.

8) Ground water and Subsurface Soil Sampling Plan, Grady McCauley Creative Graphics Inc., Revision No. 1, Boinski Environmental Consultants Inc., November 26, 1985.

9) Acid Compound Analytical Report, MS/DS Identified Compounds, (Analytical data for monitor well # 3-A), Wadsworth Laboratories (August 6, 1985).

10) Groundwater and Subsurface Soil Sampling Plan, Grady McCauley Creative Graphics Inc., Middlebranch, Ohio, Boinski Environmental Consultants Inc., Final Revision, May 29, 1986.

11) Groundwater and Subsurface Soil Sampling for Grady McCauley Creative Graphics, Inc., Middlebranch, Ohio, The Ohio Drilling Company, February 23, 1987.

12) Piezometric Surface Map, Grady McCauley Creative Graphics, Inc., June 17, 1987.

13) Analytical Report, Grady McCauley, Wadsworth/Alert Laboratories Inc., August 5, 1987.

14) RCRA Interim Status Inspection Form, Grady McCauley Graphics, performed by Mark Bergman, OEPA, September 3, 1987.

15) Phase II Soil Sampling Plan, Grady McCauley Creative Graphics Inc., Middlebranch, Ohio, Boinski Environmental Consultants, September 11, 1987.

Additional technical references utilized that are available at the Northeast District Office of the Ohio EPA, Division of Ground water:

1) USGS topographic map, Hartville, Ohio.

2) Map: Ground-water Resources of Stark County, by Alfred Walker, Ohio Dept. of Natural Resources.

3) Bedrock Geology of the Minerva Quadrangle, Stark, Columbiana and Carroll Counties, Ohio, by Richard M. DeLong, Ohio Dept. of Natural Resources Map, 1967.

4) Geology of Water in Ohio, by Stout W., Steeg, K. V., and Lamb, G. F., Ohio Department of Natural Resources Bulletin 44, 1943.

5) Geology of Stark County, by Richard M. DeLong and George M. White, Ohio Dept. Natural Resources Bulletin 61, 1963.

6) An Inventory of Ohio Soils, Stark County, ODNR 1968.

7) Physical Geography, Stark County, Ohio, Stark County Regional Planning Commission, Canton Office, 1960.

8) Map of flood prone areas, USGS Hartville Ohio Quadrangle, 1973.

INSPECTION CHECK-LISTS

Attached to this report are three check lists from the Interim Status Ground water Monitoring Evaluation Document (SW-954). The check lists deemed appropriate for this facility are:

APPENDIX A: COMPREHENSIVE GROUND WATER MONITORING EVALUATION WORKSHEET.

APPENDIX A-1: FACILITY INSPECTION FORM FOR COMPLIANCE WITH INTERIM STATUS STANDARDS COVERING GROUND WATER MONITORING.

FACILITY NAME: Grady McCauley Creative Graphics, Inc., (formerly The Dice Decal Corporation) Middlebranch, Ohio.

EPA ID Number: OHD 004468609

FACILITY LOCATION

The Grady McCauley Creative Graphics facility is located at 7390 Middlebranch Road NE in Middlebranch, north of the City of Canton, Ohio. The facility may be located on the 7 minute USGS topograhpic map of Hartville, Ohio in the Plain Township of Stark County (NE sec. 11, T11N, R8W). It lies approximately 400 feet west of the Middle Branch of the Nimishillen Creek, north of the junction of Werner Church Road and Applegrove Street (Figure 1). The site latitude is 40 53'20.0" N and longitude is 081 19'48.0" W. The topography near the site is generally flat. The land beneath the facility has a gentle ten percent eastward slope decreasing to nearly zero percent towards the Nimishillen Creek.

FACILITY DESCRIPTION/HISTORY

The Dice Decal Corporation in Middlebranch, Ohio was renamed on September 1, 1984 to Grady McCauley Creative Graphics, Inc. The ownership of the corporation remained the same and there was no change in the corporate structure other than the change of name. The former company under the name of The Dice Decal Corporation had operated for approximately 40 years dating back to 1948. During this period the company employed from twenty to forty people.

Figure 1

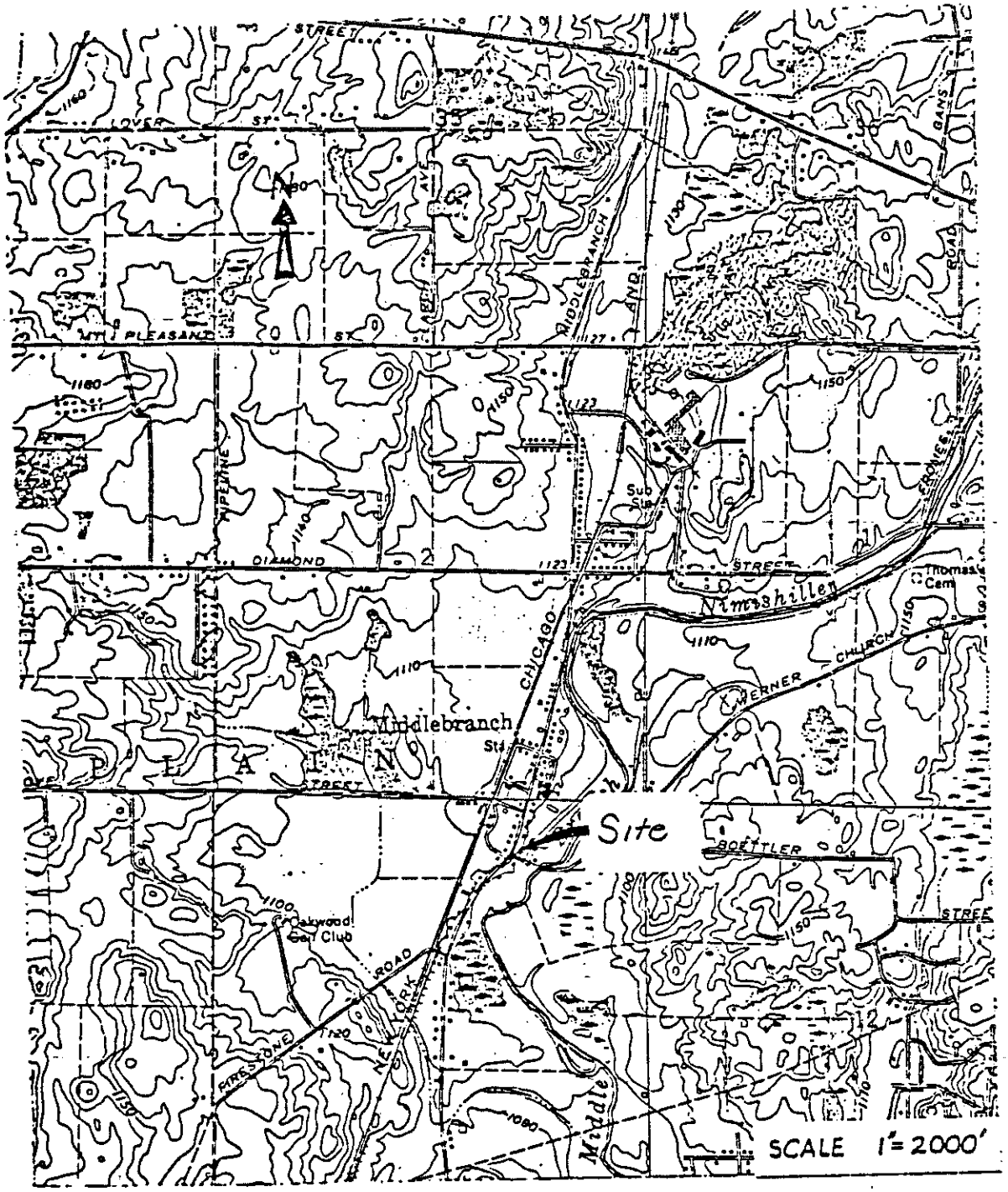


Figure 1 Facility Location MAP

The existing Grady-McCauley structure shown in Figure 2 was utilized for the manufacturing of decals. It is located in an area that is primarily residential with various light industry also present. Prior to 1948, the segment of the complex identified as "A" in Figure 2 was reportedly used as a cheese house, retail operation, residential property and poultry cleaning operation. Segment A of the complex is the original structure. Additions were reportedly added in the years 1969, 1972, 1979 and 1983. These additions are identified in Figure 2 as B, C, D, and E, respectively.

FIGURE 2

Rinse waters generated from the company operation were released through company sewer drains into a "leaching" well/septic tank system . According to the Ohio Hazardous Waste Regulation OAC-3745-51-03 (a)(2)(IV), this rinse water was a hazardous waste which was being stored and disposed of improperly. Ground water monitor wells were installed and samples collected upon orders from the Ohio EPA on August 12, 1984. The order was based upon a RCRA compliance inspection conducted February 9, 1984. Monitor well samples showed contamination from solvent wastes. Two of five neighboring domestic wells were shown to be contaminated with 1 ppb of methylene chloride. Grady-McCauley is currently under Consent Agreement and Final Orders from the US EPA to assess the degree of soil/water contamination at the facility and to provide for clean closure.

DISCUSS CAFO PROVISION

WASTE MATERIALS and DISPOSAL PRACTICES

Liquid wastes emanating from on-site activities have historically been directed to underground septic tanks and leaching ("dry") wells. Each leach well consists of a 2,000 gallon slotted underground tank designed to allow wastewaters to discharge into the ground. There are four leach wells and one septic tank at the facility. In 1983, two leaching wells, LW-1 and LW-2, were abandoned and replaced by two new leaching wells, LW-3 and LW-4. The locations of the wells and septic tanks are shown on Figure 2. An area behind the facility where trash was open burned is also located on the Grady-McCauley property. This area is currently covered by a concrete drive and walkway behind Annex E of the Grady-McCauley facility (Figure 2).

Leach well LW-2 reportedly received the overflow from leach well LW-1 and leach well LW-4 reportedly received overflow from leach well LW-3. A fifth subsurface point is a slotted septic tank, ST-5 on Figure 2, which reportedly received all on-site liquid domestic and art room wastes.

The chemical characteristics of the wastes contained in LW-4 and ST-5 are summarized in Table 1. Complete results are shown as Appendix B. The laboratory procedure used in

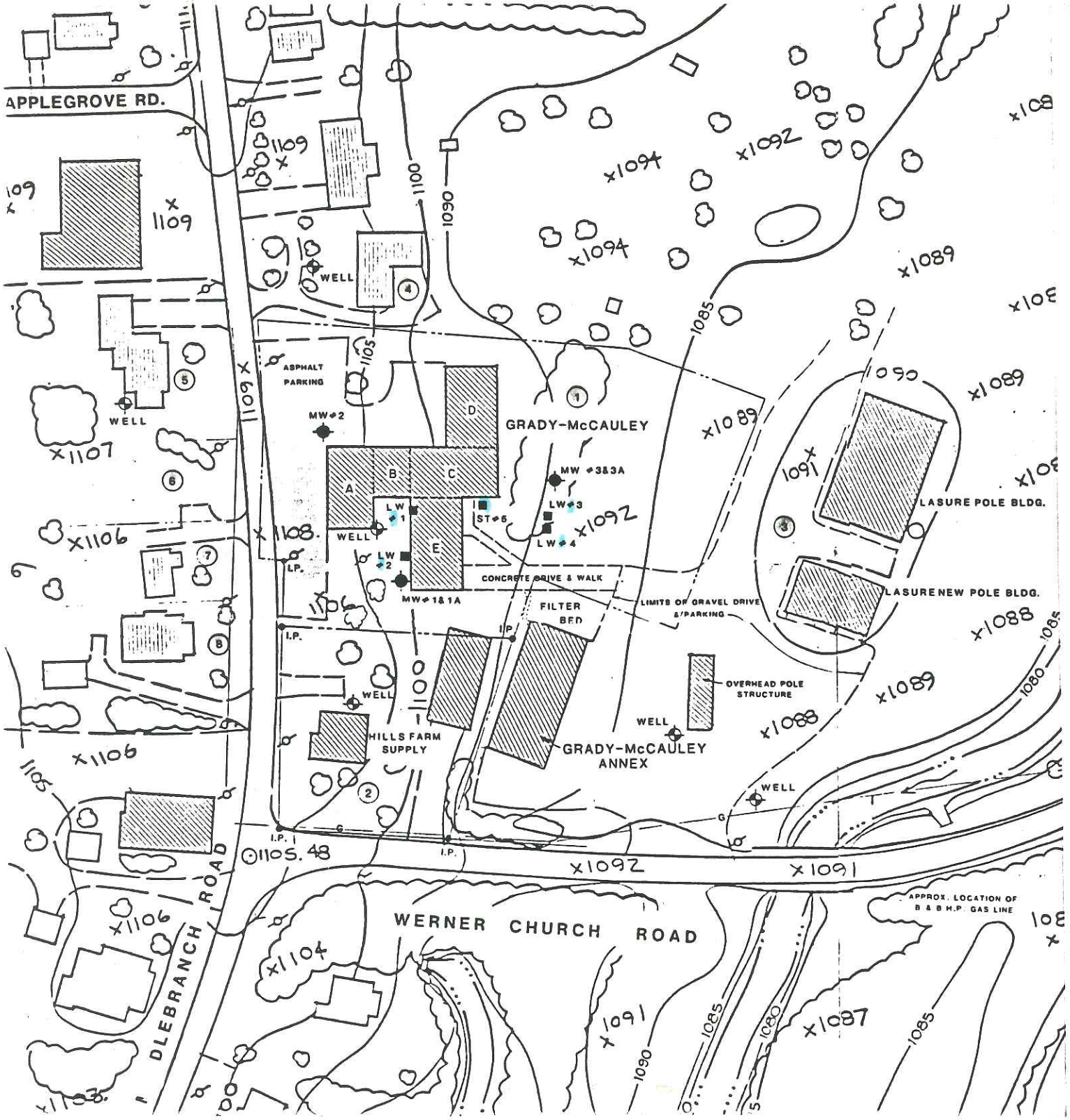


Figure 2: Facility map

the waste analysis was not included in the accompanying report and is unknown by this author.

Table 1

Summary of Chemical Analysis of Wastes in Leach well LW-4 and Septic tank ST-5.

Leach Well LW-4

VOC analysis

Chemical	Concentration	Det. Limits
Ethylbenzene	38 mg/l	10 mg/l
Xylenes	160 mg/l	10 mg/l

Base/Neutrals

Chemical	Concentration	Det. Limits
Isophorone	7,000 mg/l	5 mg/l

MS/DS Identified compounds

Chemical	Concentration	Det. Limits
Cyclohexahnone	500 ug/l	not given
1-methyl-2-Pyrrolidinone	25 ug/l	not given
2-cyclohexylidine Cyclohexanone	500 ug/l	not given

Metals

Chemical	Concentration	Det. Limits
Cadmium	110 ug/l	not given
Chromium	470 ug/l	not given
Lead	1600 ug/l	not given
Selenium	10 ug/l	not given
Silver	180 ug/l	not given

Septic Tank ST-5

VOC analysis

Chemical	Concentration	Det. Limits
Ethylbenzene	40 ug/l	10 ug/l
Acetone	69 ug/l	10 ug/l
Xylenes	180 ug/l	10 ug/l
Methyl Ethyl Ketone	83 ug/l	10 ug/l

BNA analysis shows nothing detected at 20 ug/l lower detection limit.

Until 1984 about 450 to 1,200 gallons per year of methyl ethyl ketone (MEK) and other solvents were used at the

facility to clean silkscreens and other equipment. The wastes from this process were drained through the company sewage system into the leaching wells. Apparently the original set of leaching wells, LW-1 and LW-2 did not function properly and filled with waste. This waste was removed by pumping and taken to a local sewage treatment facility for disposal. Total annual waste pumped amounted to 4,000 gallons per year. A percentage of the wastewater was printing ink. The extra ink which did not meet specifications was put into the trash dumpster for disposal by R. C. Miller, Inc. A plant filter process utilized a 60% Isophorone and 40% Xylol mixture. Approximately 50% of the screenings were cleaned by this process. The remaining 50% of the screenings were cleaned with 786 Ink Degradent or 757 (corrosive) manufactured by the Intercontinental Chemical Corporation of Cincinnati, Ohio. The washings from this process were then disposed of through the company sewage system. MEK was used for one machine that had rubber rollers which the 60/40 mixture would destroy. Owners estimate that approximately 450 gallons of MEK was used per year.

Chemicals known to have been used at the facility are shown as Table 2.

Table 2.
Chemicals used at Grady-McCauley

Chemical	Volumes	Disposal
methyl ethyl ketone	450-1,200 gal/yr	leaching wells
isophorone	unknown	leaching wells
xylene	unknown	leaching wells
naptha	unknown	leaching wells
paint wastes	unknown	dumpster
ink wastes	unknown	leaching wells
Solex Extender Base	unknown	unknown
FED-710 Alkyd	unknown	dumpster ?
LOV-120 gloss vinyl	unknown	dumpster ?
JRP-710 cellulose	unknown	dumpster ?
ICC-782 solvent base	unknown	unknown
ICC-786 solvent base	unknown	leaching wells ?
ICC-757 solvent/caustic	unknown	leaching wells ?

REGULATORY HISTORY

The facility did not operate under a Part A Permit and has since relocated to 7584 Whipple Avenue, North Canton, Ohio. According to available information the site was first inspected by the US EPA as a potential hazardous waste site on November 20, 1980. The inspection report noted that the hazardous substances methyl ethyl ketone and paint wastes were present at the site. It was estimated at that time that approximately 2 drums per month of MEK was used at the site. This waste solvent was believed to have been discharged into underground storage tanks which were pumped twice a year by a waste hauler. Although the term "dry well" was used in the inspection report the tanks were mistakenly believed to be fully contained/non-leaking storage tanks. Thus, no hazardous conditions were noted during that visit.

The site was inspected by Mark Bergman of the OEPA on February 9, 1984. At that inspection, it was noted that hazardous waste was being stored and disposed of improperly in violation of OAC-3745-51-03 (a)(2)(IV). The Dice Decal Corporation was notified of the violation at this time. Ground water monitor wells were installed and soil/water samples collected under orders from the Ohio EPA on August 12, 1984. Results of this investigation showed low-level soil and ground water contamination at the site. On December 5, 1984 the company was ordered to conduct a more extensive investigation to fully delineate the extent of contamination at the site. On June 28, 1985, the US EPA filed a Complaint and Compliance Order (CAFO) against the firm. Currently the facility is under a Consent Agreement and Final Order by the US EPA to assess the degree of soil/water contamination and to provide for clean closure.

A summary of events detailing the correspondence between the Ohio Environmental Protection agency and the United States Environmental Agency with The Dice Decal Corporation/Grady McCauley Creative Graphics, Inc. is included in Appendix C.

GEOLOGY

Introduction

Available geologic information submitted to date includes driller's logs of seven on-site borings and six private water wells in the vicinity of the site. Twenty-three soil borings also have also been performed at the site, however, no logs were given for these. Geologic/hydrogeologic cross-sections/fence diagrams and maps were not completed by the consultant. This author, however, did construct two sketch geologic sections.

Geologic setting

The site is located within the glaciated region of the Appalachian Plateau province in Stark County, Ohio. The county has undergone glaciation twice, once during Illinoian time and again in Wisconsin time. A third and previous glacier advanced into Ohio, however, its effect on Stark County is mainly reflected in drainage changes rather than erosional/depositional features. Underlying bedrock consists of the Pennsylvanian System. This sequence is characterized by numerous coal beds that are separated by shale, sandstones, clay and less commonly, limestone strata (Delong, 1963).

Most of the glacial drift in the county is of Wisconsin age and was deposited during the advances and retreats of ice sheets in the last glaciation. Much of the glacial drift is till or boulder clay, an unsorted, unstratified mixture of sand, silt and clay containing pebbles, boulders and cobbles. The till occurs in one to as many as four layers of different composition, each of which was deposited in a separate advance. Some of the sand and gravel drift occurs in small hills or knolls, called kames, which were deposited by water from melting ice along the edge of, or in holes in the waning ice sheet.

Other bodies of sand and gravel were deposited further away from the ice by melt-water streams flowing in the valleys of the Tuscarawas River and its tributaries. These deposits, which completely or partly fill the valleys, form valley trains that extend far beyond the glaciated region.

SITE HYDROGEOLOGY

The Grady-McCauley site is located upon an alluvial terrace situated along the western edge of the Middlebranch Nimishillen Creek floodplain overlying a major valley fill aquifer. This valley fill aquifer comprises a major water bearing unit. It is interconnected with the Nimishillen Creek buried valley aquifer system from which the City of

Canton to the south draws a portion of its water supply from a large municipal well field (Figure 3).

Wells in the Middlebranch area developed in the valley fill produce from 10 to 30 gallons per minute. Towards the City of Canton, the aquifer is much more productive with yields reaching 2,000 gallons per minute (Figure 3). Here the wells are developed in thick permeable sand and gravel deposits of a deep buried valley aquifer.

Driller's logs for seven on-site borings and five private water wells were submitted by the consultant (Appendix D). These logs show a westward thickening wedge of unconsolidated sand and gravel deposits overlying a westward sloping shale bedrock topography. This westward thickening wedge may be seen from the basement topography map constructed by this author (Figure 4). Two sketch geologic sections constructed by this author are shown as Figures 5 and 6. These sections show the general geometry of the deposits and the screen intervals of the monitor wells.

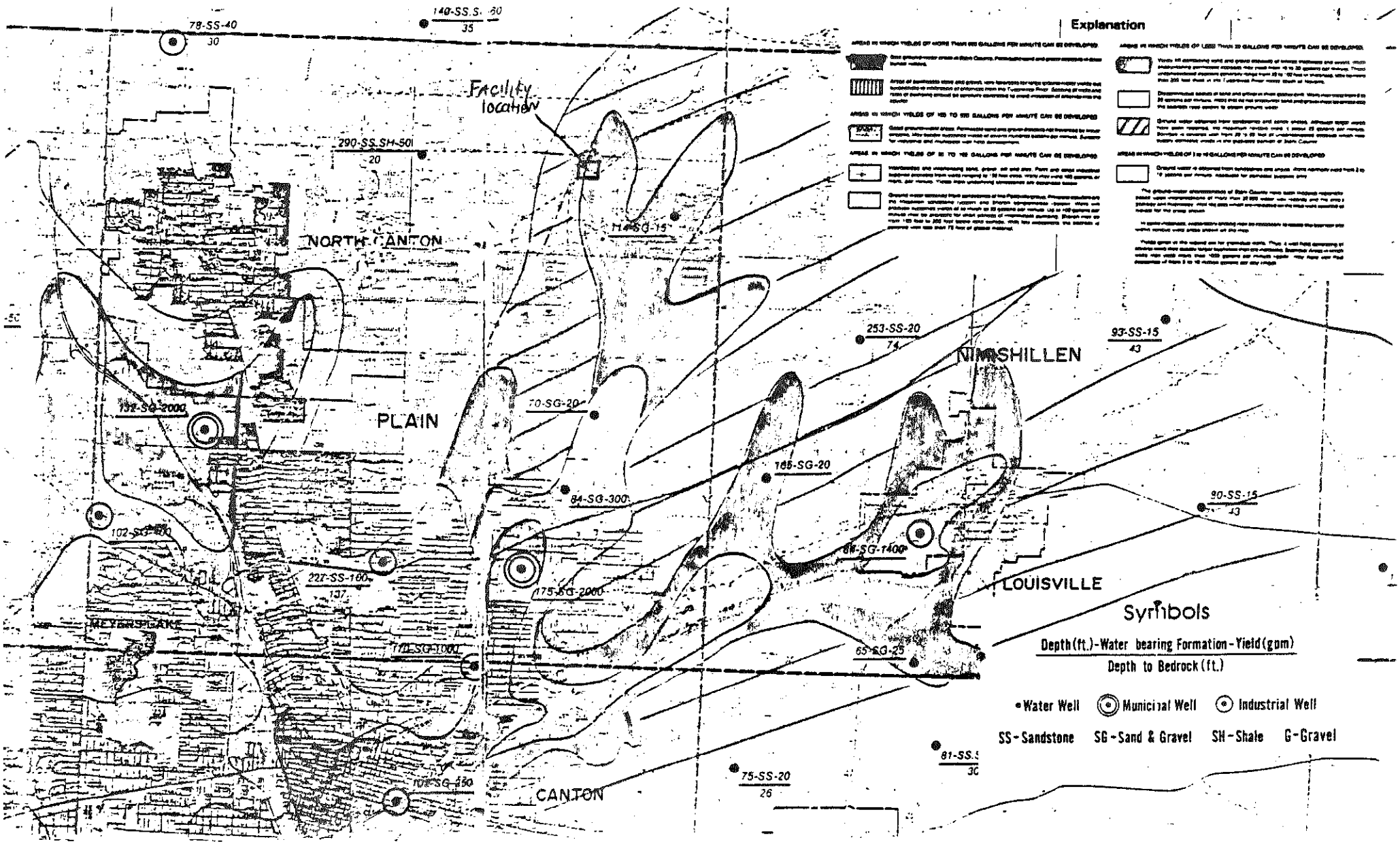
Data from on-site borings indicates fill from 25 to 76 feet in thickness beneath the site. It is composed primarily of sand, gravel, and clay underlain by an unknown thickness of shale bedrock of the Pennsylvanian System. No laboratory analysis' were performed in order to classify these sediments. The fill is interpreted to represent post-Wisconsin glacial outwash deposits which grade upwards into alluvial sediments deposited by recent streams. It is within the valley fill that contaminants have been found. To date eight monitor wells have been installed within this aquifer at the Grady-McCauley facility. Four of these wells, #1, 1A, and #3, 3A are cluster wells. Locations of these wells may be found in Figure 4. Table 3 gives the depths and screened intervals of each of these wells. The reasoning behind the location of each of these wells was not given. Screen intervals for wells #1 to #3A were determined by analysis of water samples during the drilling of the wells. Those intervals showing contaminants were screened and monitored. No reasoning was given for the screen intervals of monitor wells 4, 5, and 9. The locations and screened intervals of each well will need to be reviewed.

REVIEW!

Figures 7, 8, 9, and 10 are water table surface maps of the valley fill aquifer showing water levels at different points in time. The direction of groundwater flow appears to vary from northeast to southeast over time and may be seasonally influenced. Apparently little change in direction of flow may be attributed to local well pumpage. Water levels before and during pumpage of the Grady-McCauley plant well show only slight differences (Table 4). Water levels are fairly consistent over time and do not flunctuate by more than a few feet.

NOT TRUE EARLIER WORK COVERAGE WAS INADEQUATE

Figure 3: (and Water Resource Map Stark County, Ohio



F4

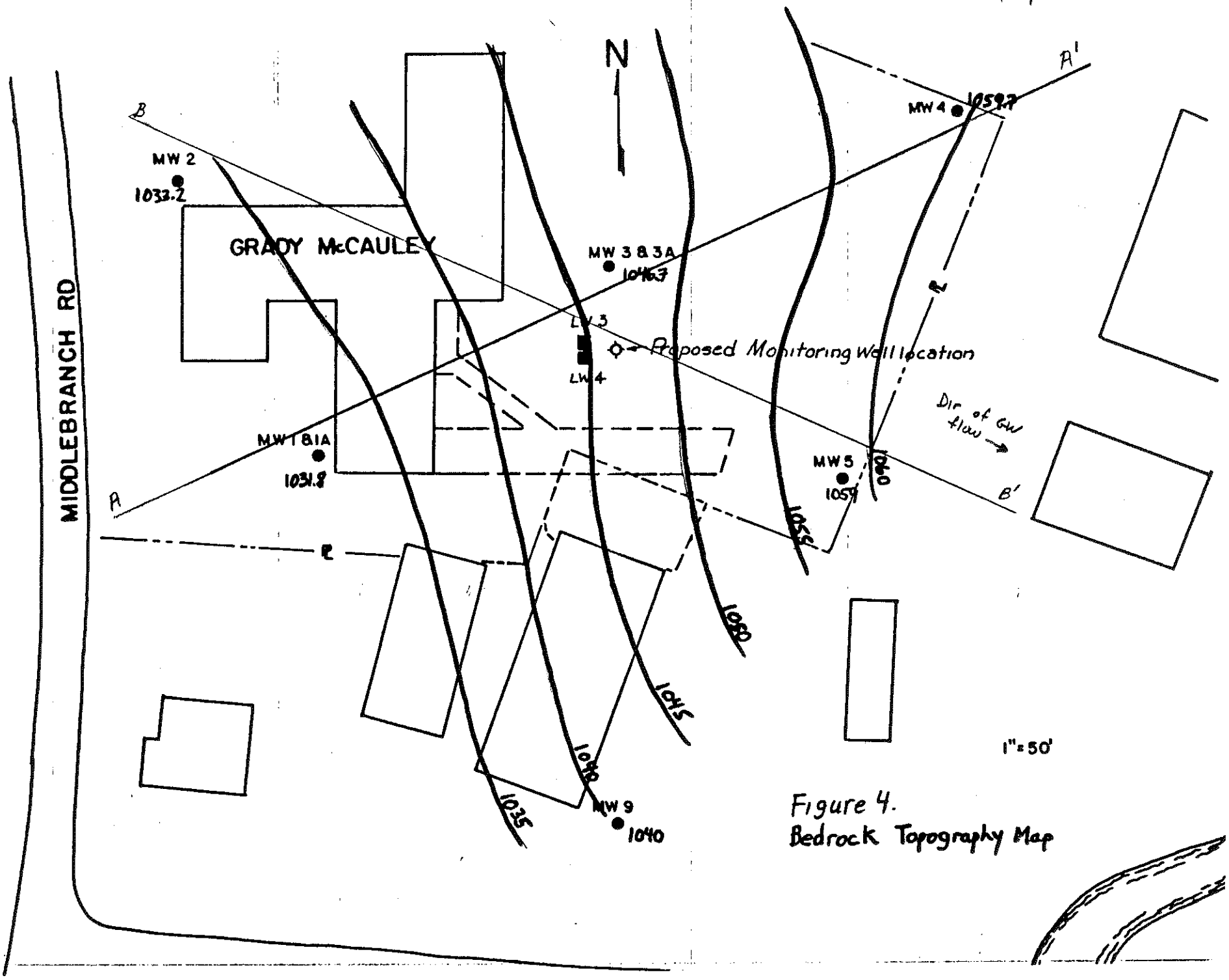


Figure 4.
Bedrock Topography Map

Figure 5
Geologic Section Along Line A-A'

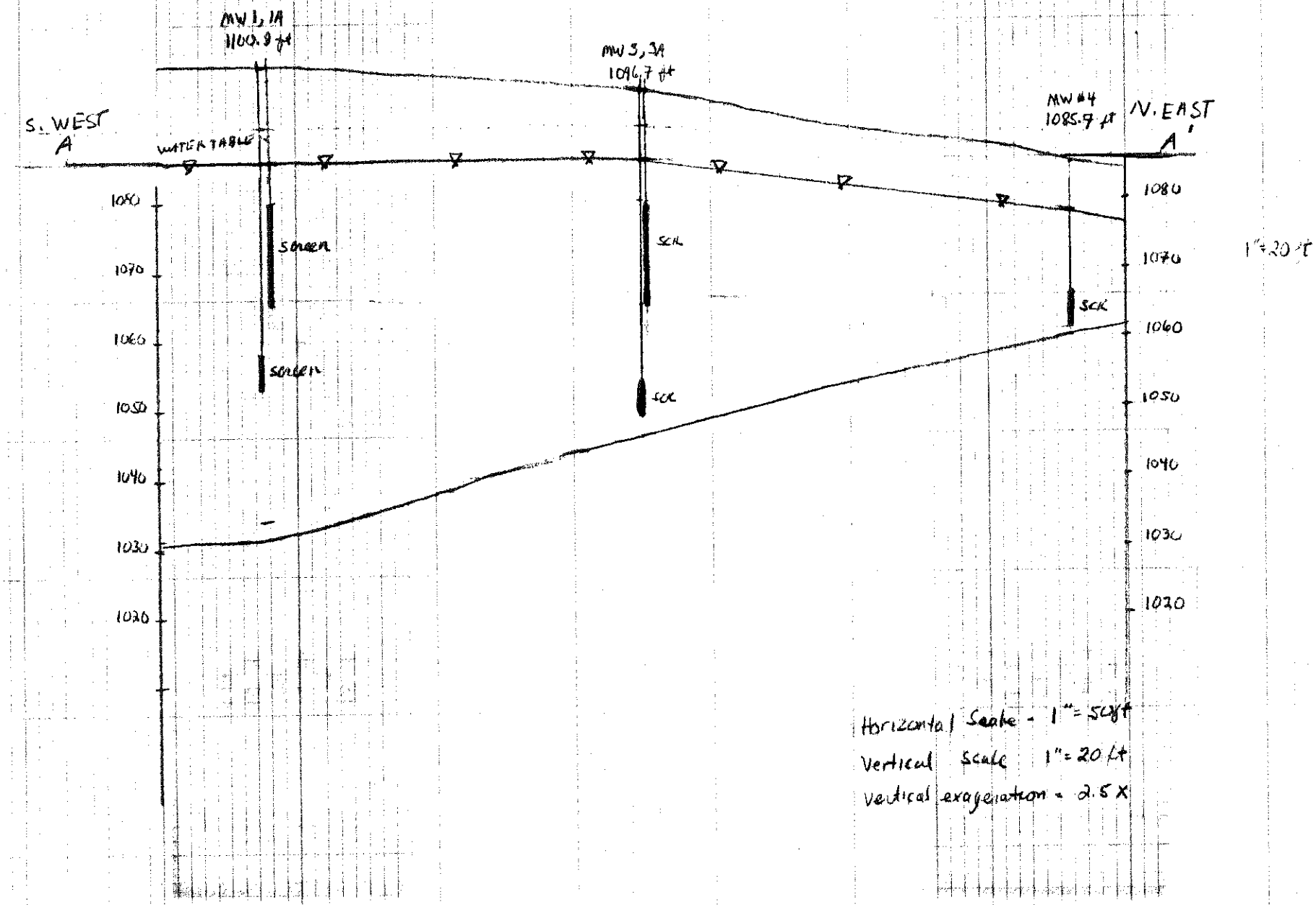
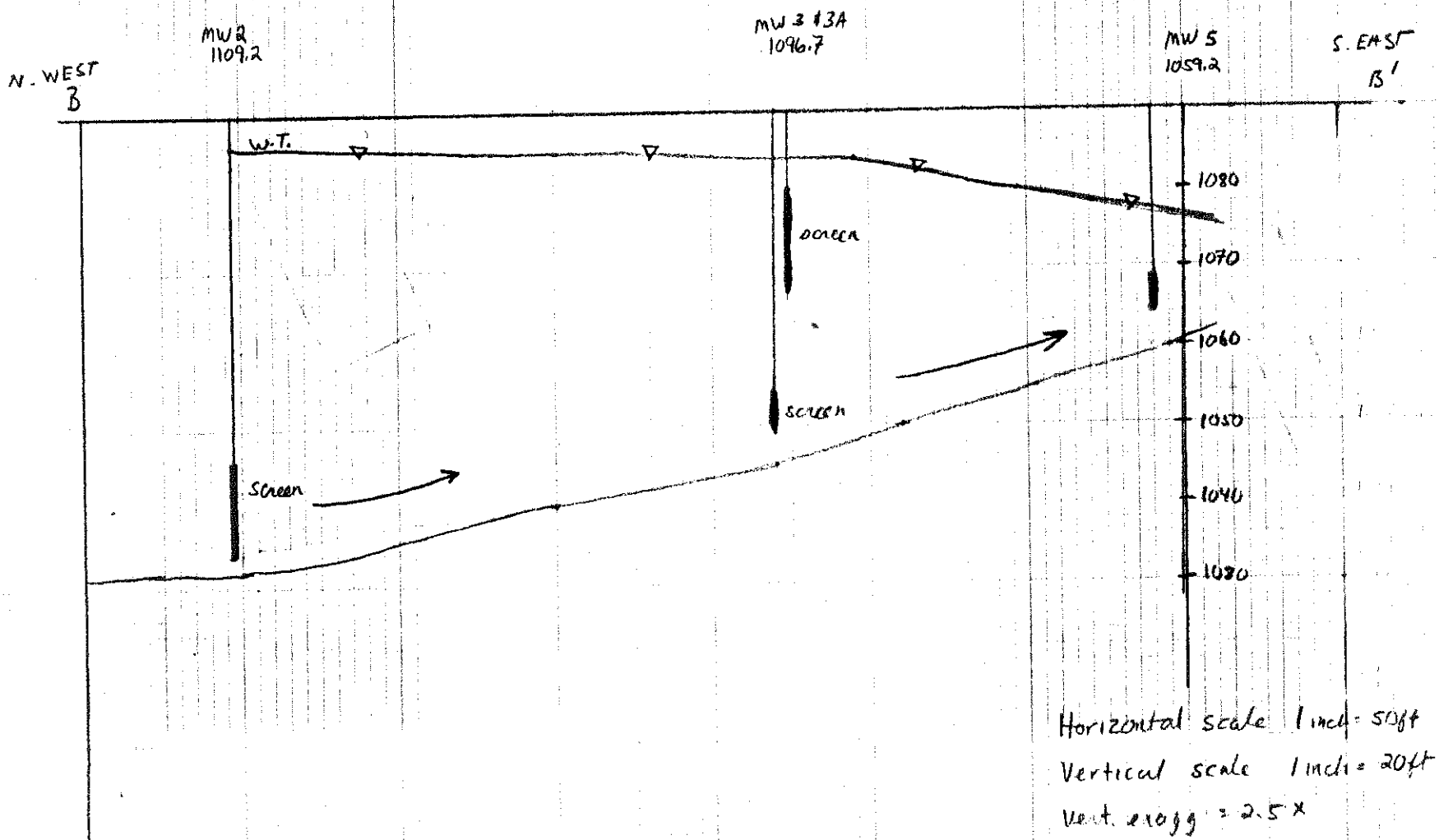


Figure 6
Geologic Section Along Line B-B' Figure



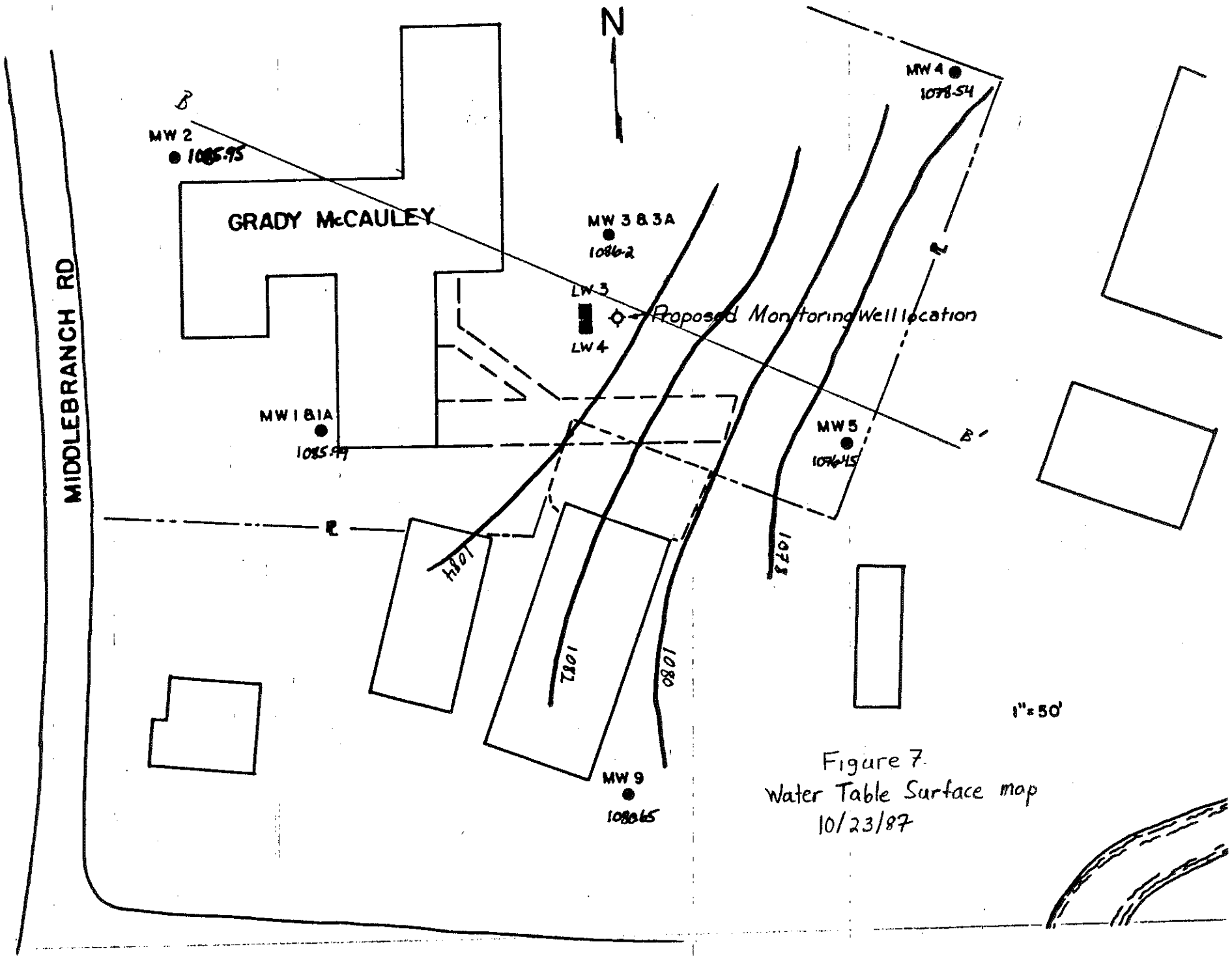


Figure 7
Water Table Surface map
10/23/87

RECEIVED JUN 1 5 1987

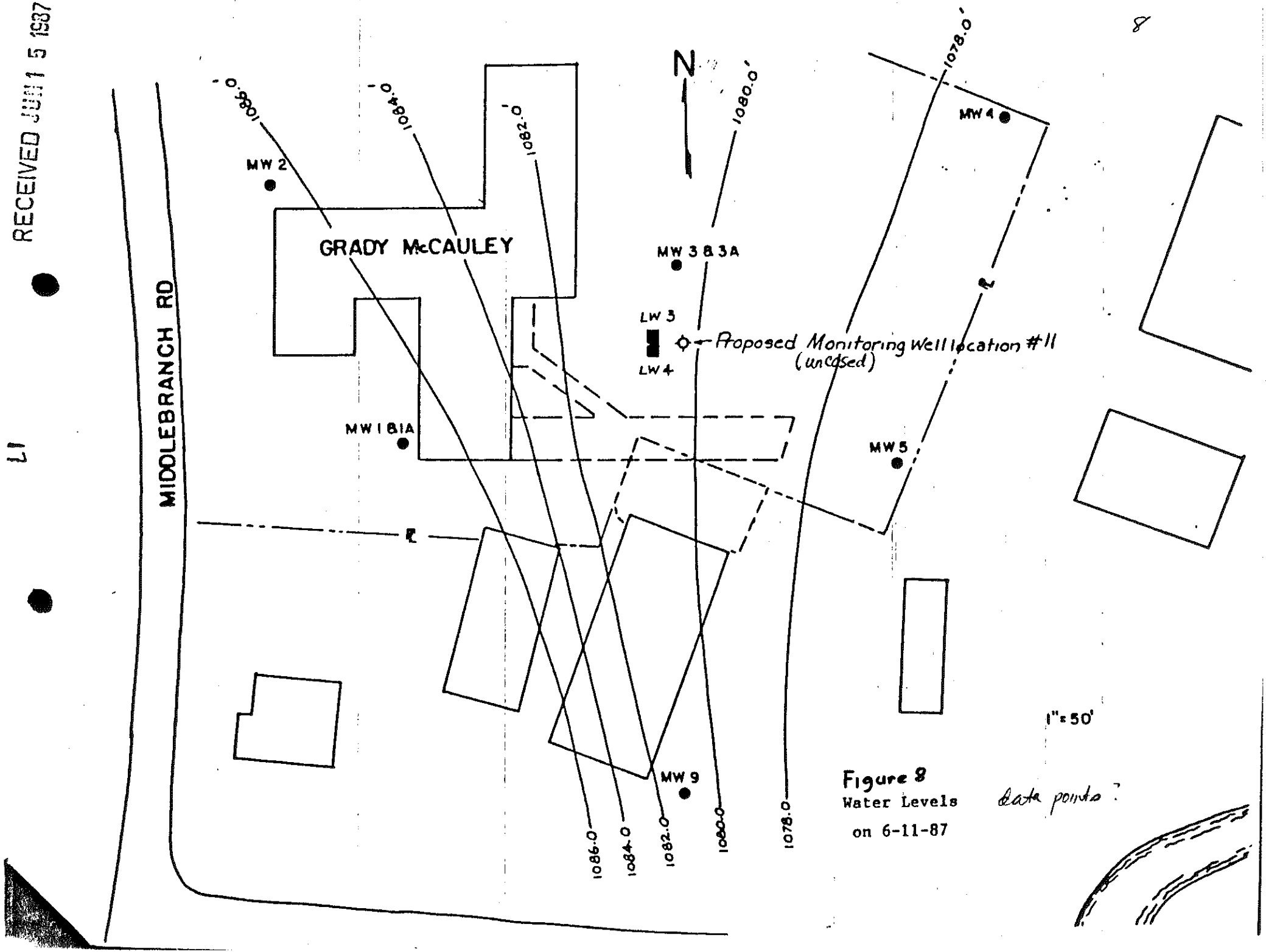


Figure 8
Water Levels
on 6-11-87

data points?

8

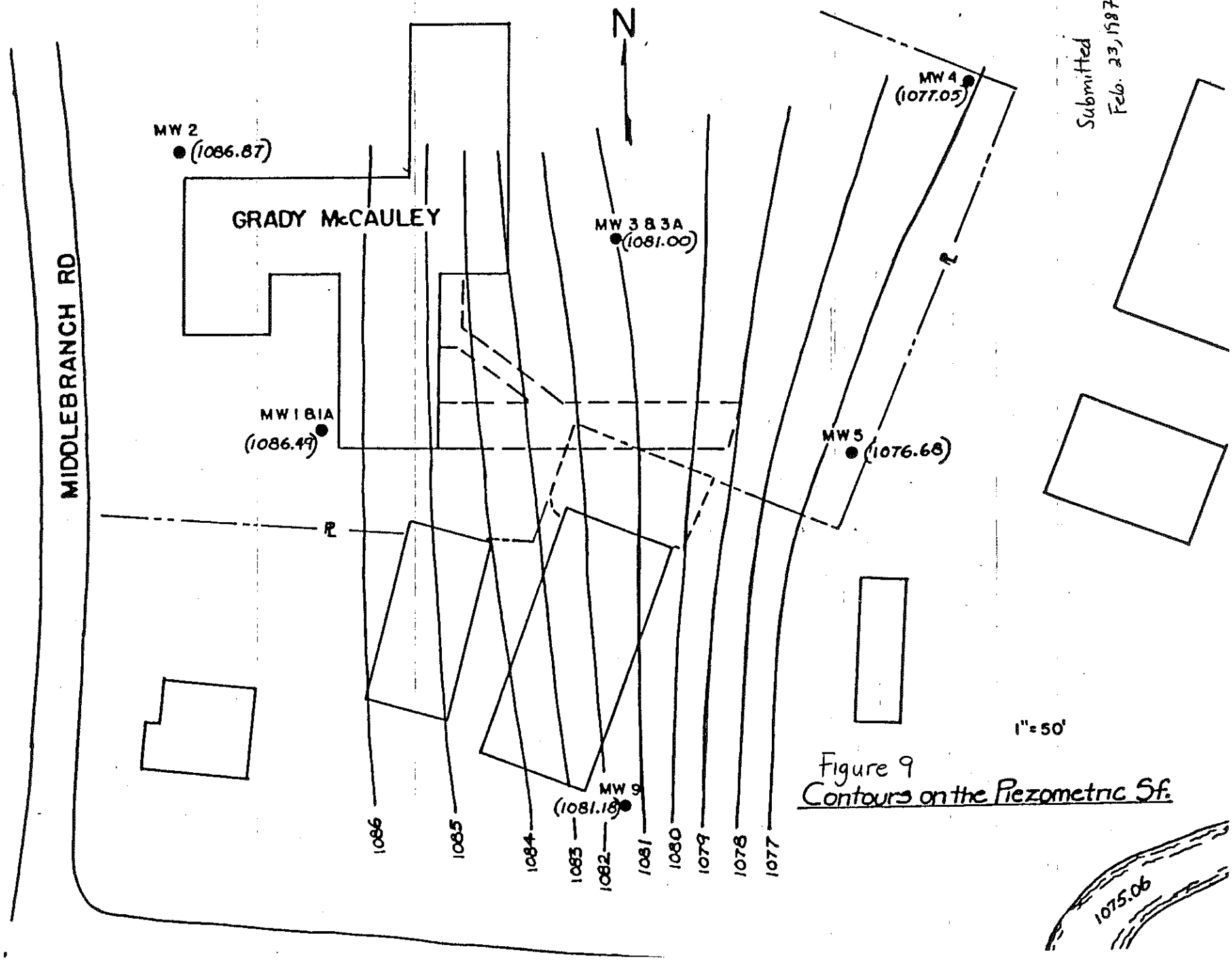


Figure 9
Contours on the Piezometric Sf.

Submitted
Feb. 23, 1987

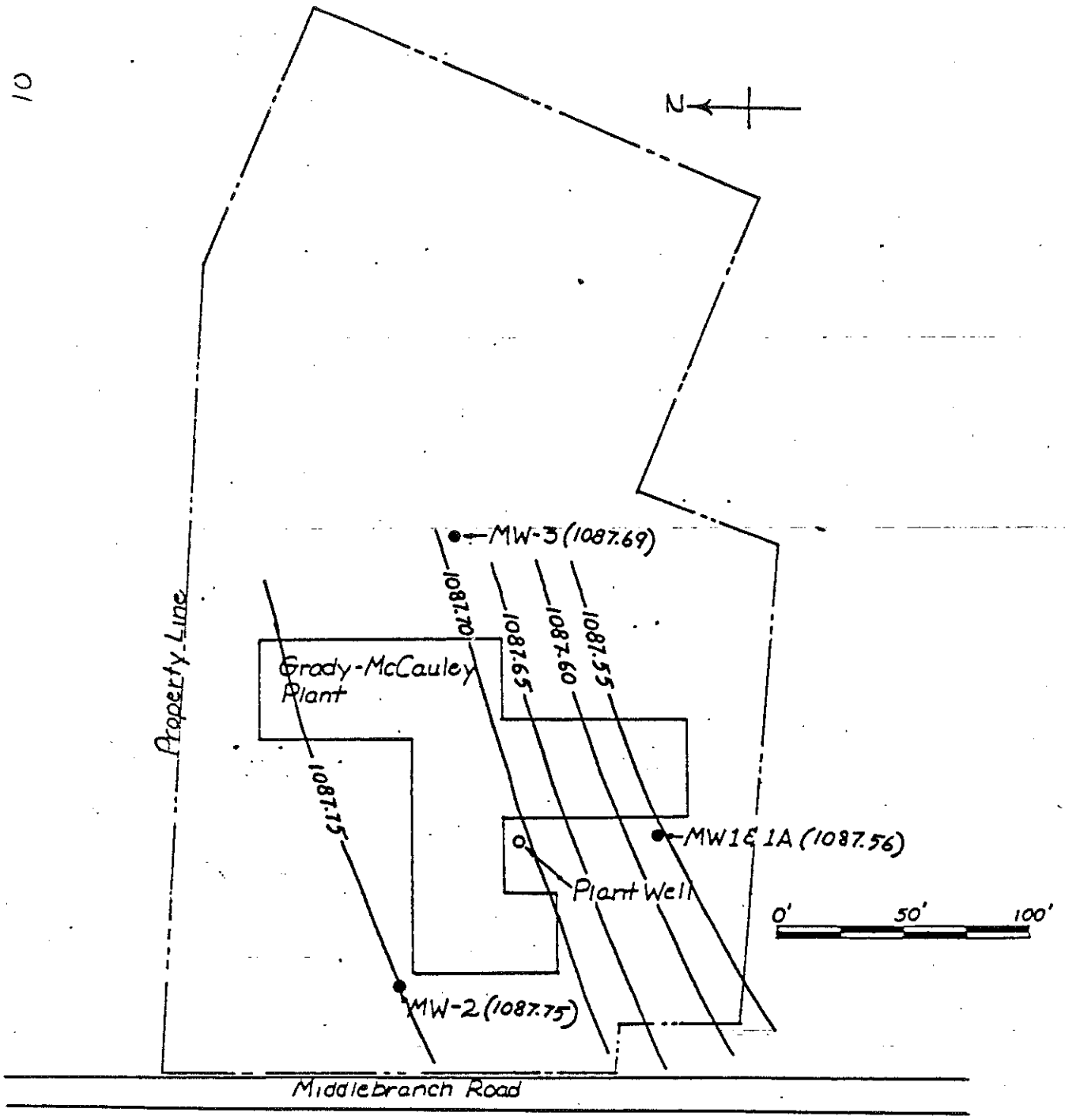


Figure 10.
Map of Site showing locations of test holes/monitoring wells and piezometric surface on 5-5-85 (plant well not pumping)

Table 3.
Grady-McCauley Monitoring Wells

Well#	Elev. top of casing (ft)	Elev. of bedrock (ft)	Screen setting (ft)
MW-1	1100.79	1031	1058 - 1053
MW-1A	1100.79	1031	1080 - 1065
MW-2	1087.75	1032	1044 - 1034
MW-3	1096.70	1046	1054 - 1049
MW-3A	1096.77	1046	1080 - 1065
MW-4	1085.70	1059.70	1066.70 - 1061.70
MW-5	1084.20	1059.20	1069.02 - 1064.02
MW-9	1086.67	1039.67	1056.67 - 1051.67

Table 4.

Water levels before and after pumping
Grady-McCauley plant well

Well#	Screen interval (ft)	water level 5/5/85 no pumping (ft)	water level 5/6/85 pump on (ft)
MW-1	1058 - 1053	1087.56	1087.54
MW-1A	1080 - 1065	1087.56	1087.70
MW-2	1044 - 1034	1087.75	1087.57
MW-3	1054 - 1049	1087.69	1087.54
MW-3A	1080 - 1065	1087.95	1087.78

Evaluation of Hydrogeologic Data

The rationale behind the location and screening intervals of the on-site monitor wells needs review. It does not appear that the proper intervals were screened to detect floating or sinking organic layers although dissolvers would probably be adequately detected by this system. No geologic/hydrogeologic cross-sections have been submitted and the lateral/vertical extent of the uppermost aquifer has not

?

been defined. The velocity and vertical components of ground water flow within the aquifer and the influence of the basement topography upon this flow has likewise not been discussed. Isoconcentration maps delineating the vertical/lateral extent of the contaminant plume have not been submitted and the rate and extent of migration of the hazardous waste constituents within the ground water has not been defined.

HAS BEEN DEMONSTRATED

EVALUATION OF THE MONITOR WELL SYSTEM

To date eight monitor wells have been completed at the site. Wells 1, 1A, 2, 3 and 3A were constructed of 2-inch diameter galvanized steel casing with 2-inch diameter 0.015 slot stainless steel screen. Figure 11 shows the typical construction of these type of wells. Monitor wells 4, 5, and 9 are of a different construction. These wells were cased with 2-inch PVC flush joint casing utilizing 2-inch, 20 slot PVC screen. These wells were finished beneath the ground surface. A diagram showing the construction of these wells is shown as Figure 12.

Drilling Methods

The first series of monitor wells, numbers 1, 1A, 2, 3, and 3A, were drilled by the small hollow rod cable tool drilling method. In this method, the hole is advanced by driving 4-inch diameter casing and drilling out the soil materials inside it. A hollow tube sampling device is driven three to five feet ahead of the drilling to recover undisturbed soil samples for analysis. The 4-inch casing is then driven to the depth to where the soil sample was taken. No lubricants or fluids of any kind were used during the drilling. A stainless steel screen is then installed at that depth to allow pumping of that stratum for a water sample. This process is repeated until bedrock is encountered.

A 2-inch diameter pipe with the appropriate length of 2-inch diameter stainless steel screen is inserted inside the 4-inch casing which is bumped back to allow the natural formation to cave around the screen. When the screen is sufficiently exposed, the rest of the casing is pulled out while backfilling with pelletized bentonite to the surface to assure a good seal. The monitor well is then pumped for development and finished as show in Figure. All casing, monitor well pipe, screen and water contact equipment is steam cleaned prior to use where practical.

? FIGURE 12?

Wells number 4, 5, 9 were drilled by the hollow stem auger method. Each well was advanced by driving a casing and drilling out the encased materials. A hollow tube sampler was driven five feet ahead of the casing to collect undisturbed samples. The casing is then driven to the depth of the sampler. This sequential process is repeated until

Figure 11.

GRADY-McCAULEY MONITORING WELL INSTALLATION

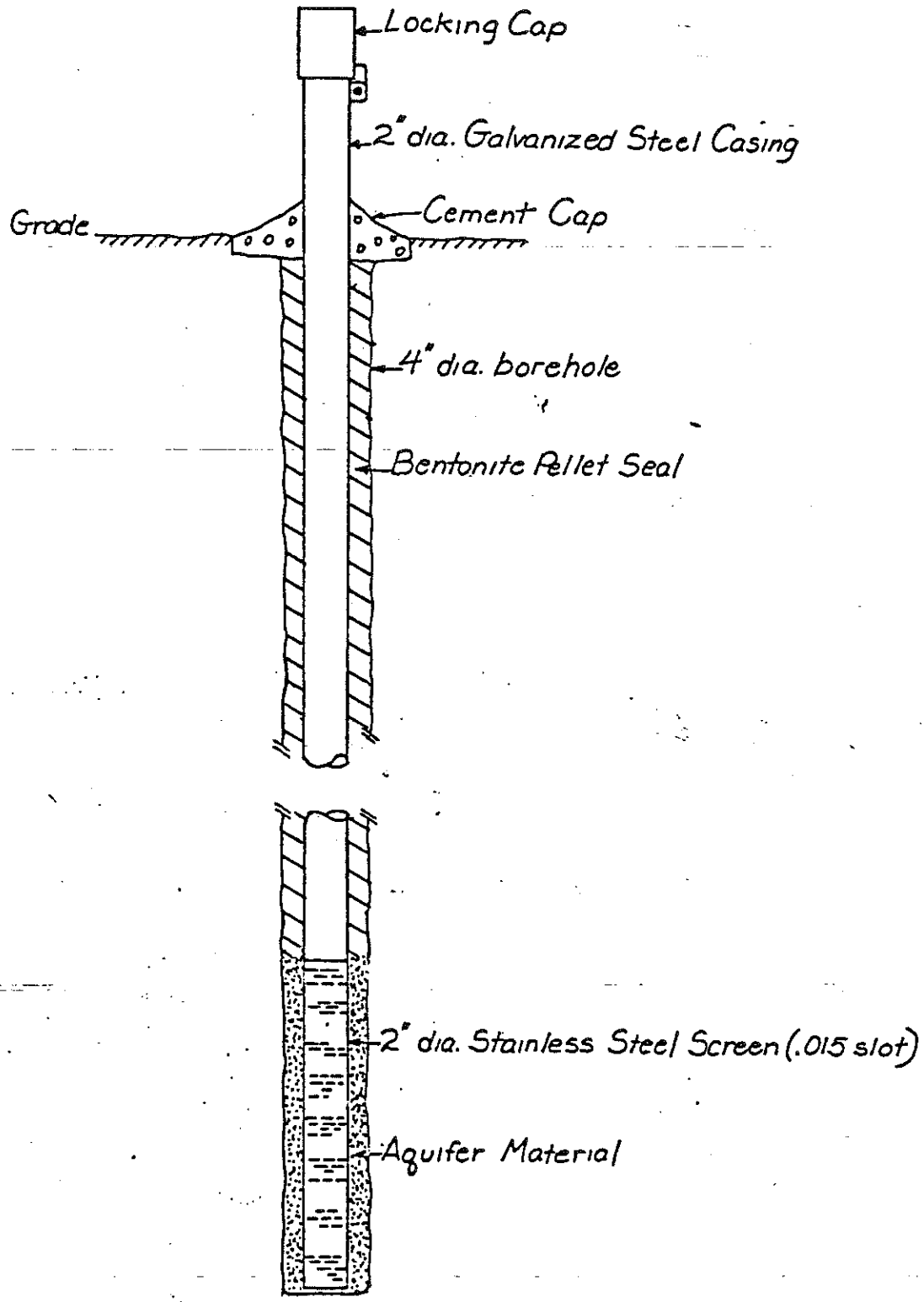
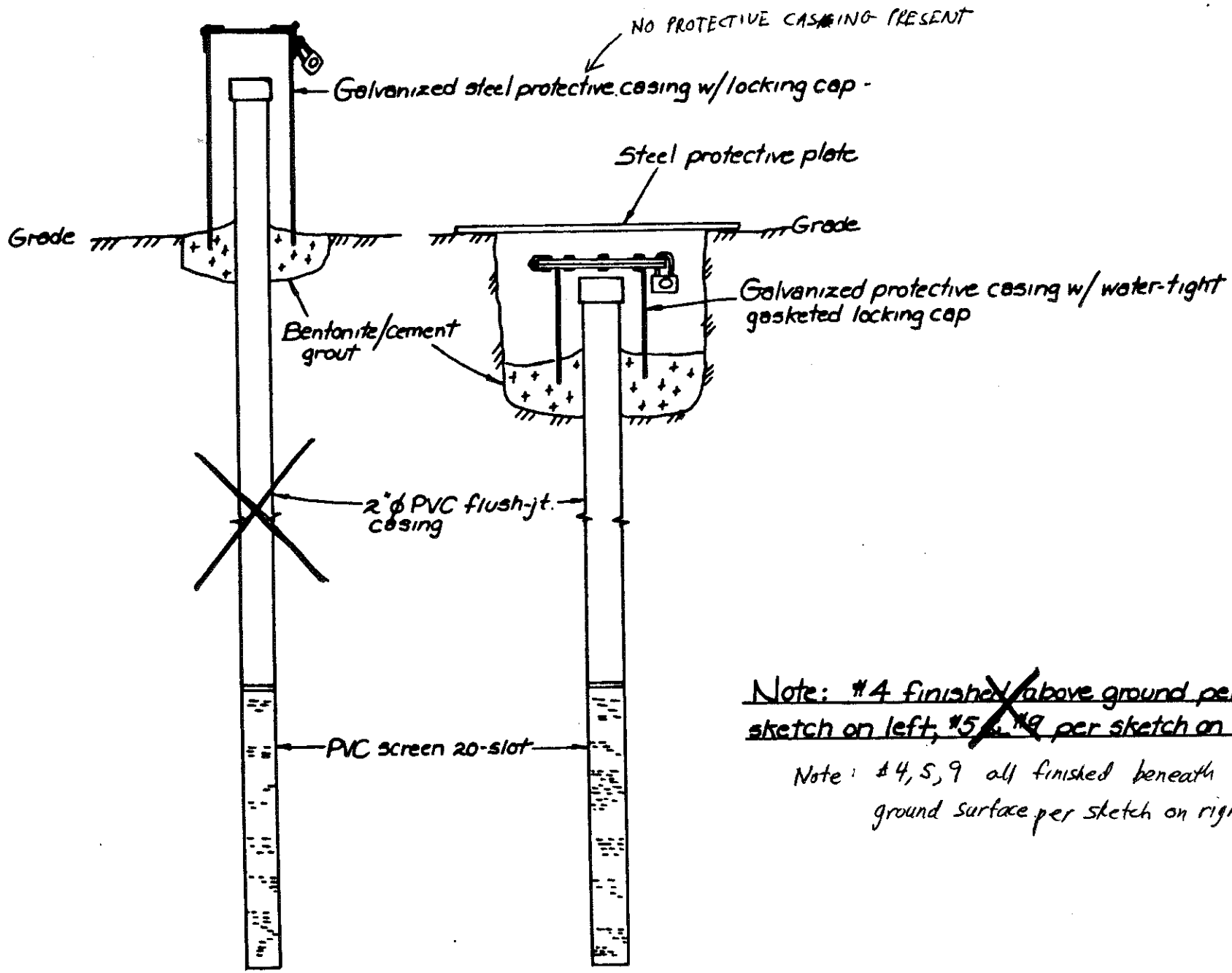


Figure 12.



Note: #4 finished above ground per sketch on left; #5, #9 per sketch on right.

Note: #4, 5, 9 all finished beneath ground surface per sketch on right

bedrock is encountered.

Subsequent to the selection of screening intervals, an appropriate length of PVC pipe is inserted into the casing. The casing is then extracted to allow adjacent sediments to cave-in around the screen. When the screen is sufficiently exposed, the remaining casing is removed and the hole backfilled with bentonite pellets to the surface.

MONITOR WELL CONSTRUCTION

The monitor well system was examined by this author during a site inspection on October 23, 1987. During this inspection, several problems were noted in the monitor well design:

1) The riser pipe from monitor well #2 was bent and the cement apron around the well was cracked and broken. This well is placed in the parking lot in front of the Grady-McCauley facility and possibly was struck by an automobile.

The well had a locking cap but did not have a protective cover or bumper guards. This well should be repaired and protected with both a bumper guard and a protective covering in addition to the locking cap.

2) Monitor wells #4, #5, and #9 are all finished beneath the ground surface. Apparently this was necessary because these wells are located near a drive-way and parking lot with extensive truck and automobile traffic. Upon observation of monitor well #5, it was noted that the top of the bolt-on cover to the well was caked with mud. Upon removal of the cover it became apparent that surface water had infiltrated and contaminated this well. The outer annulus between the protective casing and the well pipe was filled with water to the level of the top of the riser pipe allowing surface water to enter the well.

Monitor well #4 also showed evidence of surface water contamination. Standing water was noted inside the protective casing annulus near the well pipe. It is likely that surface water may have entered this well also. Monitor well #9, although finished beneath the surface, did not appear to be innundated by surface water and may not have been contaminated. The construction of these wells will need to be modified.

3) Monitor wells 1, 1A, 2, 3 and 3A, are all finished above the ground surface. All have locking caps but no protective covers. These wells should have protective covers to prevent damage to the wells.

4) A newly drilled well, monitor well #11, has been left as an open hole with a temporary 3 inch steel casing. The hole

has no cap or protective cover. This well should be converted into a properly constructed monitor well or be plugged. It may be allowing surface contaminants to enter the ground waters.

Other problems with the monitor well design are as follows:

1) The screens were not packed with filter material and the wells may not be properly developed.

2) The wells were not sealed according to proper procedure.

3) Galvanized steel casing should not have been used in the monitor well construction. This type of casing could contribute Zinc, Iron and other metals to the water quality analysis.

4) Reasons given for the location of the screen intervals do not appear to be adequate and needs to be re-evaluated.

5) Monitor wells 1A and 3A have 15 foot screens and monitor well #2 has a 10 foot screen. Screen lengths should probably not be more than five to ten feet in length for monitoring purposes.

6) Monitor well #2 may not be sufficiently upgradient to be repesentative of background water quality. Upon installation of this well, contaminants were detected in a water quality analysis.

SOIL/WATER SAMPLING ANALYSIS

Evaluation of ground water / soil sampling

The facility sampling and analysis plan appears incomplete. Complete details of the procedures followed in equipment decontamination, well evacuation, sample collection, preservation, shipment, chain-of-custody need to be included in this plan. The analytical methods and detection limits used in some of the water quality analysis unclear in some cases. Analytical methods and detection limits should be clearly stated for each water/soil analysis. Detection limits should be as low as possible and should not vary for each different round of sampling.

Monitor wells should be sampled at regular intervals using consistent detection limits and analytical methods. Water quality results should be tabulated in a manner suitable to determine water quality trends. Graphical displays of the data should be presented to show the areal distribution of the contaminanats and may be compared to determine changes in concentrations over time.

The following is a summary of water and soil sampling data accumulated to date.

The initial investigation at the facility consisted of two soil borings. One boring was located near leach wells 3 and 4, the other near leach wells 1 and 2 (Figure 13). Soil samples for each boring were taken at 5 feet and 8 feet depths. This was in accordance with an Ohio EPA request stated in a letter to The Dice Decal Corporation on August 24, 1984. Results of this initial investigation were forwarded to the Ohio EPA as a lab report dated October 18, 1984. These results indicated soil contamination with the following chemicals listed in Table 5.

TABLE 5
COMPOUNDS DETECTED BY
VOC ANALYSIS' OF INITIAL SOIL BORINGS

Soil boring #1-1 depth 5 feet

Chemical	Concentration	Detection limits
Ethylbenzene	360 mg/kg	50 mg/kg
Xylenes	1,600 mg/kg	50 mg/kg

Soil boring #1-2 depth 8 feet

Chemical	Concentration	Detection limits
Ethylbenzene	1,000 mg/kg	50 mg/kg
Xylenes	28,000 mg/kg	50 mg/kg
Acetone	340 mg/kg	50 mg/kg

Soil boring #2-1 depth 5 feet

Chemical	Concentration	Detection limits
Methylene chloride	18 mg/kg	1 mg/kg

Soil boring #2-2 depth 8 feet

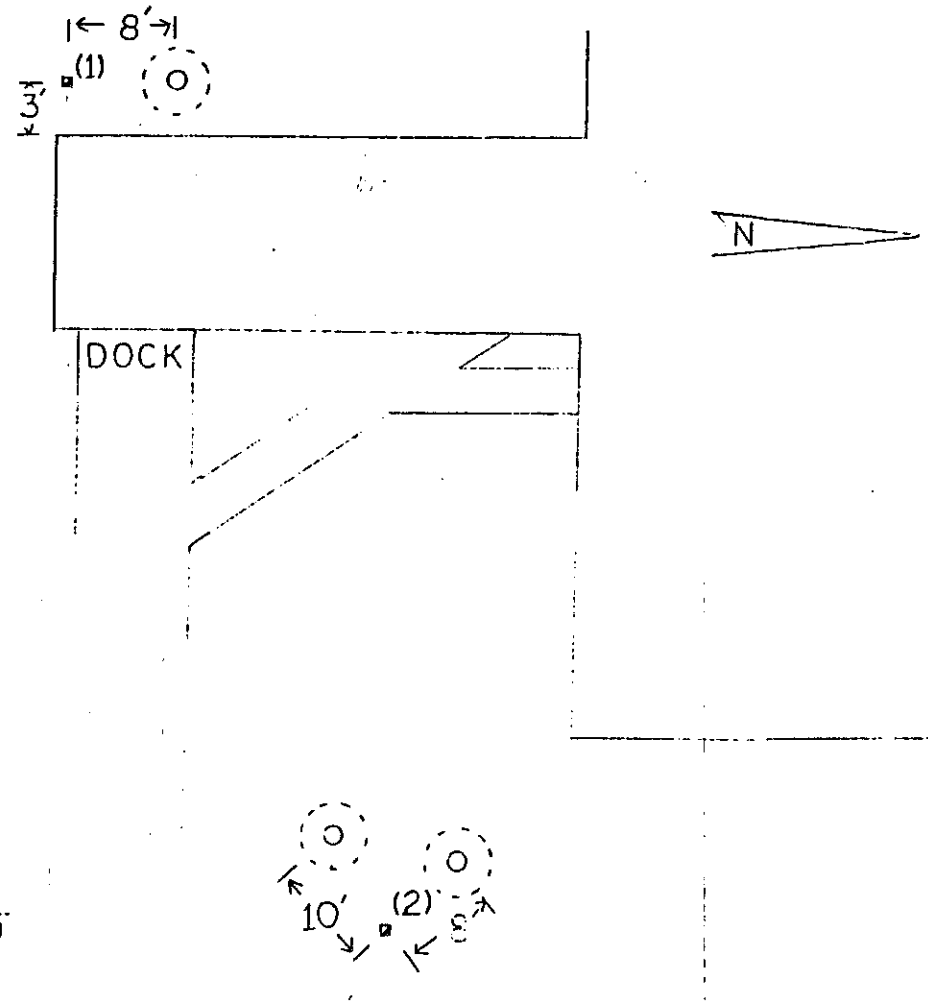
Chemical	Concentration	Detection limits
Ethylbenzene	1 mg/kg	1 mg/kg
Xylenes	6 mg/kg	1 mg/kg

* Note- Detection limits of samples #1-1 and #1-2 were much higher than those for samples #2-1 and #2-2. As a result, compounds of lower concentrations may not have been detected in those analysis' with the higher detection limits.

FIGURE 13.

INITIAL SOIL SAMPLING AREAS

GRADY McCAULEY



▫ - SAMPLE POINT
(5' & 8')

As a result of these findings, The Dice Decal Corporation was asked to sample nearby private water wells in the vicinity for possible contaminants. On November 29, 1984, the results of a water analysis of the Dice Decal water well dated August 21, 1984 were submitted to the Ohio EPA. Results of this analysis indicated the following contaminants in the company water well:

Table 6.
CONTAMINANTS DETECTED IN VOC ANALYSIS
OF WATER FROM THE DICE DECAL PLANT WELL
November, 1984

Chemical	Contaminant	Detection limit
Ethylbenzene	39 ug/l	* 10 ug/l
Xylenes	140 ug/l	* 10 ug/l

* Note- detection limits used were too high. A detection limit of 1 ug/l should have been used.

As a result of this finding, representatives of the Ohio EPA on November 11, 1984, recommended that the water for this well should not be ingested if concentrations of xylenes or ethylbenzenes are above 8 ug/l.

In addition to the sampling of the Dice Decal plant water well, the company tested five other area water wells (wells 1 through 5 on Figure 2). Well numbers 1 and 3 showed contamination with 1 ug/l of methylene chloride.

On August 16, 1985, a report entitled Ground Water Assessment of the Grady-McCauley Creative Graphic, Inc. was submitted in accordance with the Ground-water assessment proposal approved by both the United States EPA and the Ohio EPA. This report included analysis' of water and core samples collected during the drilling of test holes #1, #2, and #3 on March 21, 1985. Also included were analytical results for the first round of monitor well sampling on May 1, 1985 and private water supply well testing during August, 1985.

Appendix E shows the analytical results for the water and soil samples collected during the drilling of monitor wells 1, 2, and 3. Data from these analysis were used to determine which vertical intervals were to be screened and monitored. Those intervals showing contamination were screened and monitored. On May 1, 1985, the newly installed monitor wells were sampled. Contaminants detected are summarized in Table 7.

Table 7.
CHEMICALS DETECTED IN MONITOR WELLS
MAY 1, 1985

Monitor well #1 screen at 1058-1053

VOC analysis 5/13/85

Chemical	Concentration	Detection limit
Ethylbenzene	1,600 ug/l	10 ug/l
Toluene	640 ug/l	10 ug/l
Xylenes	4,400 ug/l	10 ug/l

Monitor well #3-A screen at 1080-1065

VOC analysis 5/10/85

Chemical	Concentration	Detection limit
1,1-Dichloromethane	55 ug/l	10 ug/l
Ethylbenzene	49 ug/l	10 ug/l
1,1,1-Trichloroethane	48 ug/l	10 ug/l
Xylenes	85 ug/l	10 ug/l

Base/Neutrals Analysis

Chemical	Concentration	Detection limit
Isophorone	300,000 ug/l	50 - 500 ug/l

Metals Analysis

Chemical	Concentration	Detection limit
Lead	0.11 mg/l	not given
Zinc	9.5 mg/l	not given

* Note - Detection limit should be 1ug/l.

In August, 1985, five water supply wells were resampled and analyzed for contaminants. Chemicals discovered are listed in the Table 8.

Table 8.

Location: Womens Wash Room Sink, NE
(Grady-McCauley facility?)

VOC analysis on 7/12/85

Chemical	Concentration	Detection limit
Methylene chloride	5.0 ug/l	1 ug/l
1,1,1-Trichloroethane	1.5 ug/l	1 ug/l

Base/Neutrals analysis on 7/15/85
No Base/Neutral compounds detected at detection limit of 10 to 50 ug/l.

Metals analysis

Chemical	Concentration	Detection limit
Barium	0.30 mg/l	?
Lead	0.14 mg/l	?

Location: Lasure New Pole Building Yard Hydrant

VOC analysis on 7/12/85
No compounds detected at detection limit of 1 ug/l.

Base/Neutrals analysis on 7/14/87
No compounds detected at detection limit of 10 to 50 ug/l.

Metals analysis

Chemical	Concentration	Detection limit
Barium	0.2 mg/l	?

Location: D. Heater Residence, 7412 Middlebranch Rd.

VOC analysis on 7/23/87
No compounds detected at detection limit of 1 ug/l.

Base/Neutrals analysis on 8/5/85
No Base/Neutral compounds detected at a detection limit ranging from 10 to 50 ug/l.

Location: L. Mancini Residence, 7401 Middlebranch Rd.

VOC analysis on 7/23/85
No compounds detected at a lower detectable limit of 1 ug/l.

Base/Neutrals analysis on 7/25/85
No Base/Neutral compounds detected at the lower detectable limit ranging from 10 to 50 ug/l.

Location: Hill's Farm Supply, 7376 Middlebranch Rd.

VOC analysis on 7/23/85
No compounds detected at a lower detection limit of 1 ug/l.

Base/Neutrals analysis on 7/25/85
No Base/Neutral compounds detected at a lower detection limit ranging from 10 to 50 ug/l.

Metals analysis
No metals detected. Detection limits?

Additional work performed at the facility is summarized in a February 23, 1987 report entitled Ground water and Subsurface Soil Sampling for the Grady-McCauley Creative Graphics, Inc., Middlebranch, Ohio. In this report data for chemical analysis on twenty-three soil borings performed near the area of open burning at the site is summarized. The locations of these borings are located in Figure 14. Results showed ten of twenty-three soil samples to contain from 0.08 mg/l to 0.28 mg/l lead (Appendix F). Data from chemical analysis on water samples from monitor wells is also included. Table 9 summarizes the results of the chemical analysis of the monitor well sampling.

Table 9.
Results of Monitor Well Sampling
February 23, 1987

Monitor well #1

Chemical	Concentration four samples	Det. limit
Ethylbenzene	7, 6, 5,and 5 ug/l	1 ug/l ?
Xylene	14,13,11,and 11ug/l	1 ug/l ?

Monitor well #3A

Chemical	Concentration	Det. limit
Isophorone	120,100,91,92 ug/l	1 ug/l ?

Monitor well #5

Chemical	Concentration	Det. limit
Isophorone	530,280,400,440 ug/l	1 ug/l ?

* Monitor wells #1A, 2, 3, 4 and 9 showed no detectable contaminants in this round of sampling February 23, 1987.

During the month of August, another round of monitor well sampling was performed. Wells 1A, 3A, 5 and 11 were

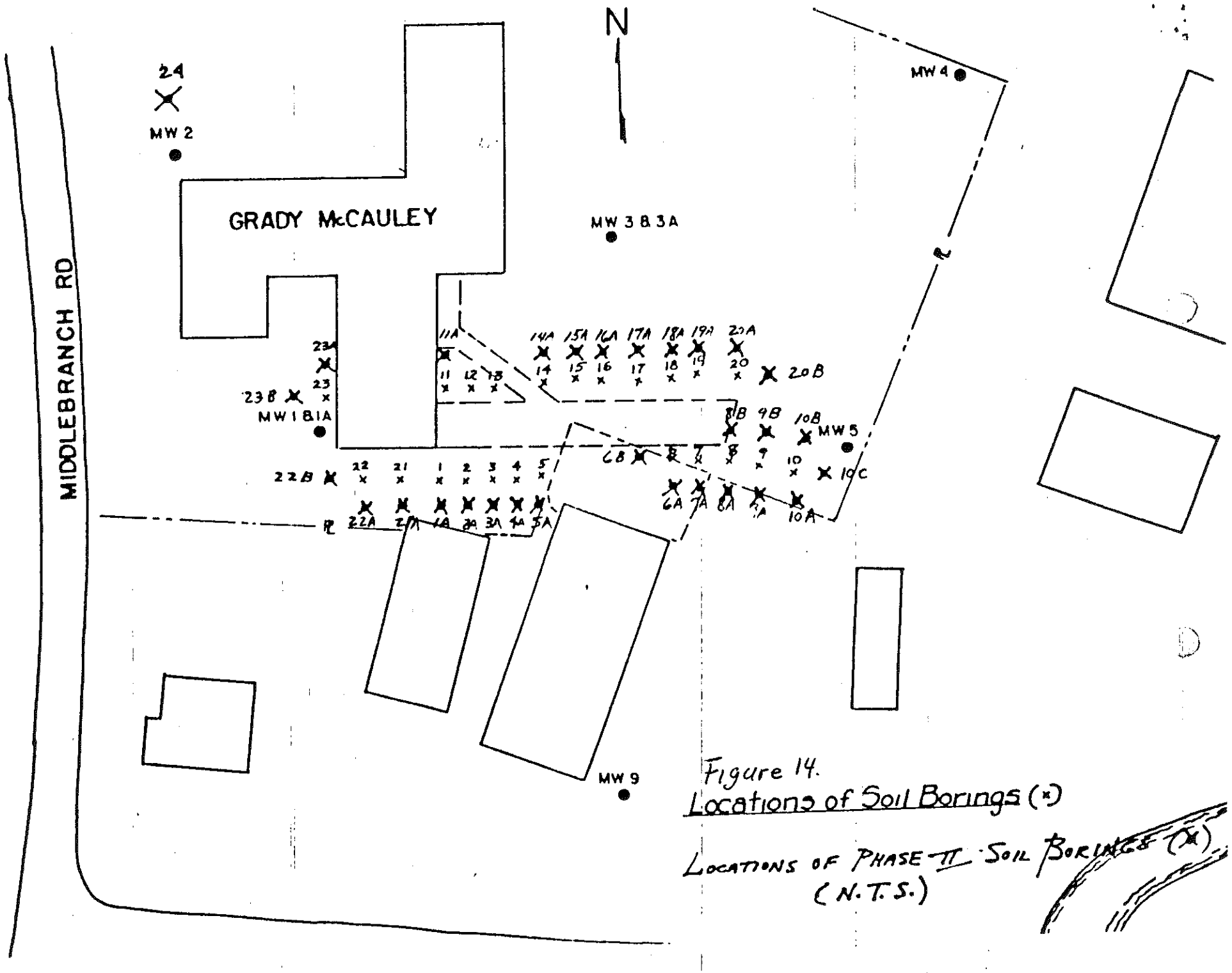


Figure 14.
Locations of Soil Borings (×)

LOCATIONS OF PHASE II SOIL BORINGS (X)
(N.T.S.)

sampled for three parameters: ethyl benzene, xylenes and isophorone. Results of the analysis are shown as Table 10.

Table 10.
Results of Monitor Well Sampling
August 1, 1987

Monitor well #1A

Chemical	Concentration	Det. Limit
Ethyl Benzene	ND	1 ug/l
Xylenes	1 ug/l	1 ug/
Isophorone	ND	5 ug/l

Monitor well #3A

Chemical	Concentration	Det. Limit
Ethyl Benzene	ND	1 ug/l
Xylenes	ND	1 ug/l
Isophorone	ND	5 ug/l

Monitor well # 5

Chemical	Concentration	Det. Limit
Ethyl benzene	ND	250 ug/l
Xylenes	ND	250 ug/l
Isophorone	380 ug/l	50 ug/l

Monitor well #11

Chemical	Concentration	Det. Limit
Ethyl Benzene	ND	1 ug/l
Xylenes	ND	1 ug/l
Isophorone	ND	5 ug/l

* Note variations in lower detection limits.

COMPLIANCE STATUS SUMMARY

The facility is in violation of the following portions of 40 CFR 265 Subpart F:

265.93(d)(4)(i) - The rate and extent of migration of the hazardous waste or hazardous waste constituents in the ground water has not been determined.

265.91(c) - The construction of the monitor wells is inadequate and needs to be upgraded.

RECOMMENDATIONS

1) The current monitor well system does not appear adequate to detect the presence of floating/sinking organic layers and thus the vertical extent of contamination within the aquifer. Monitor wells should be screened across the water table to detect floating organic layers and should be screened near bedrock to detect sinking organic layers. Dissolved organic layers will be adequately detected by the current monitor well system.

2) The present sampling and analysis plan should be expanded to include a more detailed explanation of the following: sample collection techniques, decontamination procedures, well purging techniques, sample collection techniques, analytical methods and detection limits. The present sampling techniques at the facility appear improper.

APPENDIX A

COMPREHENSIVE GROUND-WATER MONITORING EVALUATION WORKSHEET

The following worksheets have been designed to assist the enforcement officer/technical reviewer in evaluating the ground-water monitoring system an owner/operator uses to collect and analyze samples of ground water. The focus of the worksheets is technical adequacy as it relates to obtaining and analyzing representative samples of ground water. The basis of the worksheets is the final RCRA Ground Water Monitoring Technical Enforcement Guidance Document which describes in detail the aspects of ground-water monitoring which EPA deems essential to meet the goals of RCRA.

Appendix A is not a regulatory checklist. Specific technical deficiencies in the monitoring system can, however, be related to the regulations as illustrated in Figure 4.3 taken from the RCRA Ground-Water Monitoring Compliance Order Guide (COG) (included at the end of the appendix). The enforcement officer, in developing an enforcement order, should relate the technical assessment from the worksheets to the regulations using figure 4.3 from the COG as a guide.

I. Office Evaluation - Technical Evaluation of the Design of the Ground-water Monitoring System

A. Review of relevant documents:

1. What documents were obtained prior to conducting the inspection:

a. RCRA Part A permit application? (Y/N) N — NOT PERMITTED FOR EITHER PART A or B (FACILITY RELOCATED)
b. RCRA Part B permit application? (Y/N) N
c. Correspondence between the owner/operator and appropriate agencies or citizen's groups? (Y/N) Y - NEDO Files
d. Previously conducted facility inspection reports? (Y/N) Y - NEDO Files
e. Facility's contractor reports? Wadsworth Labs, Oil Drilling, Boinski Environ. (Y/N) Y
f. Regional hydrogeologic, geologic, or soil reports? (Y/N) Y - DGW, NEDO
g. The facility's Sampling and Analysis Plan? (Y/N) Y
h. Ground-water Assessment Program Outline (or Plan, if the facility is in assessment monitoring)? (Y/N) Y INITIAL PLAN DATED 9/26/84
i. Other (specify) US EPA CAFO

B. Evaluation of the Owner/Operator's Hydrogeologic Assessment:

1. Did the owner/operator use the following direct techniques in the hydrogeologic assessment:

a. Logs of the soil borings/rock corings (documented by a professional geologist, soil scientist, or geotechnical engineer)? (Y/N) Y Mr. Tom Perkins (Geologist) Oil Drilling
b. Materials tests (e.g., grain size analyses, standard penetration tests, etc.)? (Y/N) N
c. Piezometer installation for water level measurements at different depths? (Y/N) N
d. Slug tests? (Y/N) N

e. Pump tests? (Y/N) N
f. Geochemical analyses of soil samples? (Y/N) Y
g. Other (specify) (e.g., hydrochemical diagrams and wash analysis) _____

2. Did the owner/operator use the following indirect techniques to supplement direct techniques data:

a. Geophysical well logs? (Y/N) N
b. Tracer studies? (Y/N) N
c. Resistivity and/or electromagnetic conductance? (Y/N) N
d. Seismic Survey? (Y/N) N
e. Hydraulic conductivity measurements of cores? (Y/N) N
f. Aerial photography? (Y/N) N
g. Ground penetrating radar? (Y/N) N
h. Other (specify) _____

3. Did the owner/operator document and present the raw data from the site hydrogeologic assessment? (Y/N) Y

4. Did the owner/operator document methods (criteria) used to correlate and analyze the information? (Y/N) ___

5. Did the owner/operator prepare the following:

a. Narrative description of geology? (Y/N) Y
b. Geologic cross sections? (Y/N) N
c. Geologic and soil maps? (Y/N) N
d. Boring/coring logs? (Y/N) Y Driller logs for monitor/private wells
e. Structure contour maps of the differing water bearing zones and confining layer? (Y/N) N
f. Narrative description and calculation of ground-water flows? (Y/N) N - NO CALCS.
g. Water table/potentiometric map? (Y/N) Y
h. Hydrologic cross sections? (Y/N) N

6. Did the owner/operator obtain a <u>regional</u> map of the area and delineate the facility? (Y/N) Y 7½' USGS topographic map

If yes, does this map illustrate:

a. Surficial geology features? (Y/N) N
b. Streams, rivers, lakes, or wetlands near the facility? (Y/N) Y poor quality & scale
c. Discharging or recharging wells near the facility? (Y/N) N

7. Did the owner/operator obtain a regional hydrogeologic map? (Y/N) N

   If yes, does this hydrogeologic map indicate:

   a. Major areas of recharge/discharge? (Y/N) —
   b. Regional ground-water flow direction? (Y/N) —
   c. Potentiometric contours which are consistent with observed water level elevations? (Y/N) —

8. Did the owner/operator prepare a facility site map? (Y/N) Y

   If yes, does the site map show:

   a. Regulated units of the facility (e.g., landfill areas, impoundments)? (Y/N) Y
   b. Any seeps, springs, streams, ponds, or wetlands? (Y/N) Y
   c. Location of monitoring wells, soil borings, or test pits? (Y/N) Y - NOT ALL SHOWN ON ONE MAP
   d. How many regulated units does the facility have? 6? (4 "leach wells", 1 septic tank 1 open burning pit)
      If more than one regulated unit then,
      o Does the waste management area encompass all regulated units? (Y/N) —

      Or

      o Is a waste management area delineated for each regulated unit? (Y/N) N

C. Characterization of Subsurface Geology of Site

1. Soil boring/test pit program:

   a. Were the soil borings/test pits performed under the supervision of a qualified professional? (Y/N) ___
   b. Did the owner/operator provide documentation for selecting the spacing for borings? (Y/N) N
   c. Were the borings drilled to the depth of the first confining unit below the uppermost zone of saturation or ten feet into bedrock? (Y/N) Y
   d. Indicate the method(s) of drilling:
      o Auger (hollow or solid stem) ✓ wells # 4, 5, 9, 11
      o Mud rotary ___
      o Reverse rotary ___
      o Cable tool ✓ mwells 1-1A, 2, 3-3A
      o Jetting ___
      o Other (specify) ___
   e. Were continuous sample corings taken? (Y/N) Y

f. How were the samples obtained (checked method[s])
- o Split spoon ✓
- o Shelby tube, or similar
- o Rock coring
- o Ditch sampling
- o Other (explain)

Hollow tube sampler

g. Were the continuous sample corings logged by a qualified professional in geology? (Y/N) Y

h. Does the field boring log include the following information:
- o Hole name/number? (Y/N) Y
- o Date started and finished? (Y/N) N DATE STARTED?
- o Driller's name? (Y/N) Y - Glyn Davis
- o Hole location (i.e., map and elevation)? (Y/N) N
- o Drill rig type and bit/auger size? (Y/N) N
- o Gross petrography (e.g., rock type) of each geologic unit? (Y/N) Y
- o Gross mineralogy of each geologic unit? (Y/N) N
- o Gross structural interpretation of each geologic unit and structural features (e.g., fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)? (Y/N) N
- o Development of soil zones and vertical extent and description of soil type? (Y/N) N
- o Depth of water bearing unit(s) and vertical extent of each? (Y/N) N
- o Depth and reason for termination of borehole? (Y/N) N
- o Depth and location of any contaminant encountered in borehole? (Y/N) N - only logs for MW 1-3
- o Sample location/number? (Y/N) Y no #
- o Percent sample recovery? (Y/N) N
- o Narrative descriptions of:
  - -- Geologic observations? (Y/N) N
  - -- Drilling observations? (Y/N) N

i. Were the following analytical tests performed on the core samples:
- o Mineralogy (e.g., microscopic tests and x-ray diffraction)? (Y/N) N
- o Petrographic analysis:
  - - degree of crystallinity and cementation of matrix? (Y/N) N
  - - degree of sorting, size fraction (i.e., sieving), textural variations? (Y/N) N

- rock type(s)? (Y/N) N
- soil type? (Y/N) N
- approximate bulk geochemistry? (Y/N) N
- existence of microstructures that may effect or indicate fluid flow? (Y/N) N

o Falling head tests? (Y/N) N
o Static head tests? (Y/N) N
o Settling measurements? (Y/N) N
o Centrifuge tests? (Y/N) N
o Column drawings? (Y/N) N

D. Verification of subsurface geological data

1. Has the owner/operator used indirect geophysical methods to supplement geological conditions between borehole locations? (Y/N) N
2. Do the number of borings and analytical data indicate that the confining layer displays a low enough permeability to impede the migration of contaminants to any stratigraphically lower water-bearing units? (Y/N) N - NO ANAL. DATA PROVIDED
3. Is the confining layer laterally continuous across the entire site? (Y/N) Y
4. Did the owner/operator consider the chemical compatibility of the site-specific waste types and the geologic materials of the confining layer? (Y/N) N
5. Did the geologic assessment address or provide means for resolution of any information gaps of geologic data? (Y/N) Y
6. Do the laboratory data corroborate the field data for petrography? (Y/N) N - NO LAB DATA
7. Do the laboratory data corroborate the field data for mineralogy and subsurface geochemistry? (Y/N) N - NO LAB DATA

E. Presentation of geologic data

1. Did the owner/operator present geologic cross sections of the site? (Y/N) N
2. Do cross sections:
   a. identify the types and characteristics of the geologic materials present? (Y/N) ___
   b. define the contact zones between different geologic materials?
   c. note the zones of high permeability or fracture? (Y/N) ___
   d. give detailed borehole information including:
      o location of borehole? (Y/N) ___
      o depth of termination? (Y/N) ___
      o location of screen (if applicable)? (Y/N) ___
      o depth of zone(s) of saturation? (Y/N) ___
      o backfill procedure?

NO CROSS-SECTION SUBMITTED

3. Did the owner/operator provide a topographic map which was constructed by a licensed surveyor? (Y/N) U - Licensed surveyor?
4. Does the topographic map provide: (Y/N) N - 5ft contours (improperly contoured)
   a. contours at a maximum interval of two-feet?
   b. locations and illustrations of man-made features (e.g., parking lots, factory buildings, drainage ditches, storm drains, pipelines, etc.)? (Y/N) Y
   c. descriptions of nearby water bodies? (Y/N) Y
   d. descriptions of off-site wells? (Y/N) Y
   e. site boundaries? (Y/N) Y
   f. individual RCRA units? (Y/N) Y
   g. delineation of the waste management area(s)? (Y/N) N
   h. well and boring locations? (Y/N) Y - but not all wells plotted on the map
5. Did the owner/operator provide an aerial photograph depicting the site and adjacent off-site features? (Y/N) N
6. Does the photograph clearly show surface water bodies, adjacent municipalities, and residences and are these clearly labelled? (Y/N) N/A

F. Identification of Ground-Water Flowpaths

1. Ground-water flow direction

   a. Was the well casing height measured by a licensed surveyor to the nearest 0.01 feet? (Y/N) N NOT LICENSED SURVEYOR
   b. Were the well water level measurements taken within a 24 hour period? (Y/N) Y
   c. Were the well water level measurements taken to the nearest 0.01 feet? (Y/N) Y
   d. Were the well water levels allowed to stabilize after construction and development for a minimum of 24 hours prior to measurements? (Y/N) Y
   e. Was the water level information obtained from (check appropriate one):
      o multiple piezometers placed in single borehole? ____
      o vertically nested piezometers in closely spaced separate boreholes? ____
      o monitoring wells ✓

f. Did the owner/operator provide construction details for the piezometers? (Y/N) N/A - No piezometers installed

g. How were the static water levels measured (check method(s).
   - o Electric water sounder ✓
   - o Wetted tape ___
   - o Air line ___
   - o Other (explain) ___
     electric probe plus wooden fold out ruler

h. Was the well water level measured in wells with equivalent screened intervals at an equivalent depth below the saturated zone? (Y/N) N DIFF SCREEN LENGTHS, INTERVALS,

i. Has the owner/operator provided a site water table (potentiometric) contour map? If yes,
   - o Do the potentiometric contours appear logical and accurate based on topography and presented data? (Consult water level data) (Y/N) N
   - o Are ground-water flow-lines indicated? (Y/N) N
   - o Are static water levels shown? (Y/N) Y
   - o Can hydraulic gradients be estimated? (Y/N) Y

j. Did the owner/operator develop hydrologic cross sections of the vertical flow component across the site using measurements from all wells? (Y/N) N

k. Do the owner/operator's flow nets include:
   - o piezometer locations? (Y/N)
   - o depth of screening? (Y/N)
   - o width of screening? (Y/N)
   - o measurements of water levels from all wells and piezometers? (Y/N)

   No flow net provided

2. Seasonal and temporal fluctuations in ground-water level

   a. Do fluctuations in static water levels occur? (Y/N) Y
      - o If yes, are the fluctuations caused by any of the following:
      - — Off-site well pumping (Y/N) U
      - — Tidal processes or other intermittent natural variations (e.g., river stage, etc.) (Y/N) Y
      - — On-site well pumping (Y/N) Y - MINIMAL
      - — Off-site, on-site construction or changing land use patterns (Y/N) U
      - — Deep well injection (Y/N) U
      - — Seasonal variations (Y/N) Y
      - — Other (specify) ___

b. Has the owner/operator documented sources and patterns that contribute to or affect the ground-water patterns below the waste management? (Y/N) Y

c. Do water level fluctuations alter the general ground-water gradients and flow directions? (Y/N) Y flow direction changes from SE to NE

d. Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone? (Y/N) Y MW 3, 3A slow diff SWL on 5/5/85

e. Did the owner/operator implement means for gauging long term effects on water movement that may result from on-site or off-site construction or changes in land-use patterns? (Y/N) Y - 8 monitor wells

3. Hydraulic conductivity - NOT DETERMINED

a. How were hydraulic conductivities of the subsurface materials determined?
   - o Single-well tests (slug tests)? (Y/N) — NOT DETERMINED
   - o Multiple-well tests (pump tests) (Y/N) —
   - o Other (specify)

b. If single-well tests were conducted, was it done by:
   - o Adding or removing a known volume of water, (Y/N) —
   - or
   - o Pressurizing well casing (Y/N) —

c. If single well tests were conducted in a highly permeable formation, were pressure transducers and high-speed recording equipment used to record the rapidly changing water levels? (Y/N) —

d. Since single well tests only measure hydraulic conductivity in a limited area, were enough tests run to ensure a representative measure of conductivity in each hydrogeologic unit? (Y/N) —

e. Is the owner/operator's slug test data (if applicable) consistent with existing geologic information (e.g., boring logs)? (Y/N) —

f. Were other hydraulic conductivity properties determined? (Y/N) N

g. If yes, provide any of the following data, if available:
   - o Transmissivity ____
   - o Storage coefficient ____
   - o Leakage ____
   - o Permeability ____
   - o Porosity ____
   - o Specific capacity ____
   - o Other (specify) _____

4. Identification of the uppermost aquifer

a. Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? If yes, (Y/N) N extent not defined
o Are soil boring/test pit logs included? (Y/N) —
o Are geologic cross-sections included? (Y/N) —

b. Is there evidence of confining (competent, unfractured, continuous, and low permeability) layers beneath the site? (Y/N) Y
o If yes, how was continuity demonstrated?
9 borings to bedrock (Shale)
6 private well logs - at least 4 show shale as bedrock

c. What is hydraulic conductivity of the confining unit (if present)? U CM/Sec
How was it determined? NOT DETERMINED

d. Does potential for other hydraulic communication exist (e.g., lateral incontinuity between geologic units, facies changes, fracture zones, cross cutting structures, or chemical corrosion/alteration of geologic units by leachage? (Y/N) Y
If yes or no what is the rationale? lateral/vertical extent of aquifer not defined; relation to deeper aquifers not defined

G. Office Evaluation of the Facility's Ground-Water Monitoring System

Monitoring Well Design and Construction:
These questions should be answered for each different well design present at the facility.

1. Drilling Methods

a. What drilling method was used for the well?
✓ o Hollow-stem auger ✓ MW's-4,5,9
o Solid-stem auger —
o Mud rotary —
o Air rotary —
o Reverse rotary —
✓ o Cable tool ✓ MW's - 1,1A,2,3,3A
o Jetting —
o Air drill with casing hammer —
o Other (specify) _____

b. Were any cutting fluids (including water) or additives used during drilling? (Y/N) N
If yes, specify
Type of drilling fluid _____
Source of water used _____
Foam _____
Polymers _____
Other _____

c. Was the cutting fluid, or additive, identified? (Y/N) N
d. Was the drilling equipment steam-cleaned prior to drilling the well? (Y/N) Y
Other methods _____

e. Was compressed air used during drilling? (Y/N) N
o If yes, was the air filtered to remove oil? (Y/N) –
f. Did the owner/operator document procedure for establishing the potentiometric surface? (Y/N) Y
o If yes, how was the location established?
Monitor wells surveyed to determine elevations to top of casing; pump off 48 hrs before SWLs measured with electric probe and wooden fold out ruler

g. Formation samples
o Were formation samples collected initially during drilling? (Y/N) Y
o Were any cores taken continuous? (Y/N) Y
If not, at what interval were samples taken? _____

o How were the samples obtained?
- Split spoon
- Shelby tube ✓ Roller tube sampler
- Core drill
- Other (specify) _____
o Identify if any physical and/or chemical tests were performed on the formation samples (specify) Chemical tests to determine nature of soil contamination

2. Monitoring Well Construction Materials

a. Identify construction materials (by number) and diameters (ID/OD)

	Material	Diameter (ID/OD)
o Primary Casing	PVC	2 inch wells 4, 5, 9
o Secondary or outside casing (double construction)	Galv. steel	2 inch wells 1, 1A, 2, 3, 3A
o Screen	N/A	N/A
	PVC screen	2 inch wells 4, 5, 9
	Stainless steel	2 inch wells 1, 1A, 2, 3A, 3

b. How are the sections of casing and screen connected?
o Pipe sections threaded ✓ Wells 1-3A ?
o Couplings (friction) with adhesive or solvent
o Couplings (friction) with retainer screws
o Other (specify) _____

c. Were the materials steam-cleaned prior to installation? (Y/N) Y
If no, how were the materials cleaned? _____

3. Well Intake Design and Well Development

a. Was a well intake screen installed? (Y/N) Y
o What is the length of the screen for the well?
Variable: #1, 3, 4, 5, 9 (5ft); #2 (10ft), 1A, 3A (15ft)
o Is the screen manufactured? (Y/N) Y

b. Was a filter pack installed? (Y/N) —
o What kind of filter pack was employed? NO FILTER PACK
o Is the filter pack compatible with formation materials? (Y/N) —
o How was the filter pack installed? N/A
o What are the dimensions of the filter pack? N/A
o Has a turbidity measurement of the well water ever been made? (Y/N) N
o Have the filter pack and screen been designed for the in situ materials? (Y/N) N/A

c. Well development
Was the well developed? (Y/N) Y
o What technique was used for well development?
- Surge block ____
- Bailer ____
- Air surging ____
- Water pumping ✓ well #2
- Other (specify) Air lifting - all wells except #2

4. Annular Space Seals

a. What is the annular space in the saturated zone directly above the filter pack filled with?
- Sodium bentonite (specify type and grit)
Bentonite pellet seal (dropped in) Wells 1, 1A, 2, 3, 3A
- Cement (specify neat or concrete) ____
- Other (specify) Bentonite-sand-portland cement mix - wells 4, 5 & 9
o Was the seal installed by?
- Dropping material down the hole and tamping ✓ wells 1, 1A, 2, 3, 3A
- Dropping material down the inside of hollow-stem auger ____
- Tremie pipe method ____
- Other (specify) ✓ pumped down side as casing withdrawn 4, 5, 9

b. Was a different seal used in the unsaturated zone? (Y/N) N
If yes,
o Was this seal made with?
- Sodium bentonite (specify type and grit) ____
- Cement (specify neat or concrete) ____
- Other (specify) ____

o Was this seal installed by?
- Dropping material down the hole and tamping _____
- Dropping material down the inside of hollow stem auger _____
- Other (specify) _____

c. Is the upper portion of the borehole sealed with a concrete cap to prevent infiltration from the surface? (Y/N) Y #2 cracked

d. Is the well fitted with an above-ground protective device and bumper guards? (Y/N) N locking cap only

e. Has the protective cover been installed with locks to prevent tampering (Y/N) Y

H. Evaluation of the Facility's Detection Monitoring Program

1. Placement of Downgradient Detection Monitoring Wells

a. Are the ground-water monitoring wells or clusters located immediately adjacent to the waste management area? (Y/N) N

b. How far apart are the detection monitoring wells?
approximately ranging from 125-200 ft

c. Does the owner/operator provide a rationale for the location of each monitoring well or cluster? (Y/N) Y gw flow direct & DEPA approval

d. Has the owner/operator identified the well screen lengths of each monitoring well or clusters? (Y/N) Y

e. Does the owner/operator provide an explanation for the well screen lengths of each monitoring well or cluster? (Y/N) N not explained for wells 4, 5 & 9.

f. Do the actual locations of monitoring wells or clusters correspond to those identified by the owner/operator? (Y/N) Y

2. Placement of Upgradient Monitoring Wells

a. Has the owner/operator documented the location of each upgradient monitoring well or cluster? (Y/N) Y - MW #2

b. Does the owner/operator provide an explanation for the location(s) of the upgradient monitoring wells? (Y/N) Y

c. What length screen has the owner/operator employed in the background monitoring well(s)?
10 ft

d. Does the owner/operator provide an explanation for the screen length(s) chosen? (Y/N) N

e. Does the actual location of each background monitoring well or cluster correspond to that identified by the owner/operator? (Y/N) Y

I. Office Evaluation of the Facility's Assessment Monitoring Program

1. Does the assessment plan specify: - 4 plans Use 1st plan - GW Assessment Proposal Dated Dec. 26, 1989
   a. The number, location, and depth of wells? (Y/N) N
   b. The rationale for their placement and identify the basis that will be used to select subsequent sampling locations and depths in later assessment phases? (Y/N) N
2. Does the list of monitoring parameters include all hazardous waste constituents from the facility? (Y/N) N - NO LIST
   a. Does the water quality parameter list include other important indicators not classified as hazardous waste constituents? (Y/N) —
   b. Does the owner/operator provide documentation for the listed wastes which are not included? (Y/N) —
3. Does the owner/operator's assessment plan specify the procedures to be used to determine the rate of constituent migration in the ground-water? (Y/N) N
4. Has the owner/operator specified a schedule of implementation in the assessment plan? (Y/N) N
5. Have the assessment monitoring objectives been clearly defined in the assessment plan? (Y/N) Y
   a. Does the plan include analysis and/or re-evaluation to determine if significant contamination has occurred in any of the detection monitoring wells? (Y/N) Y
   b. Does the plan provide for a comprehensive program of investigation to fully characterize the rate and extent of contaminant migration from the facility? (Y/N) Y
   c. Does the plan call for determining the concentrations of hazardous wastes and hazardous waste constituents in the ground water? (Y/N) Y
   d. Does the plan employ a quarterly monitoring program? (Y/N) N
6. Does the assessment plan identify the investigatory methods that will be used in the assessment phase? (Y/N) Y
   a. Is the role of each method in the evaluation fully described? (Y/N) N
   b. Does the plan provide sufficient descriptions of the direct methods to be used? (Y/N) N
   c. Does the plan provide sufficient descriptions of the indirect methods to be used? (Y/N) — NO INDIRECT METHODS
   d. Will the method contribute to the further characterization of the contaminant movement? (Y/N) Y
7. Are the investigatory techniques utilized in the assessment program based on direct methods? (Y/N) Y
   a. Does the assessment approach incorporate indirect methods to further support direct methods? (Y/N) N
   b. Will the planned methods called for in the assessment approach ultimately meet performance standards for assessment monitoring? (Y/N) N - Depths of wells, screen lengths for wells, well construct

c. Are the procedures well defined? (Y/N) N

d. Does the approach provide for monitoring wells similar in design and construction as the detection monitoring wells? (Y/N) N

e. Does the approach employ taking samples during drilling or collecting core samples for further analysis? (Y/N) Y - both

8. Are the indirect methods to be used based on reliable and accepted geophysical techniques? (Y/N) N/A

a. Are they capable of detecting subsurface changes resulting from contaminant migration at the site? (Y/N) N/A

b. Is the measurement at an appropriate level of sensitivity to detect ground-water quality changes at the site? (Y/N) N/A

d. Is the method appropriate considering the nature of the subsurface materials? (Y/N) N/A

e. Does the approach consider the limitations of these methods? (Y/N) N/A

f. Will the extent of contamination and constituent concentration be based on direct methods and sound engineering judgment? (Using indirect methods to further substantiate the findings) (Y/N) N/A

9. Does the assessment approach incorporate any mathematical modeling to predict contaminant movement? (Y/N) Y

a. Will site specific measurements be utilized to accurately portray the subsurface? (Y/N) U

b. Will the derived data be reliable? (Y/N) U

c. Have the assumptions been identified? (Y/N) N

d. Have the physical and chemical properties of the site-specific wastes and hazardous waste constituents been identified? (Y/N) N

J. Conclusions

1. Subsurface geology

a. Has sufficient data been collected to adequately define petrography and petrographic variation? (Y/N) N - no lab tests

b. Has the subsurface geochemistry been adequately defined? (Y/N) N background vs contaminated gw

c. Was the boring/coring program adequate to define subsurface geologic variation? (Y/N) Y

d. Was the owner/operator's narrative description complete and accurate in its interpretation of the data? (Y/N) N

e. Does the geologic assessment address or provide means to resolve any information gaps? (Y/N) Y

2. Ground-water flowpaths

a. Did the owner/operator adequately establish the horizontal and vertical components of ground-water flow? (Y/N) N - NO VERTICAL

b. Were appropriate methods used to establish ground-water flowpaths? (Y/N) N well const + procedures

c. Did the owner/operator provide accurate documentation? (Y/N) U

d. Are the potentiometric surface measurements valid? (Y/N) U

e. Did the owner/operator adequately consider the seasonal and temporal effects on the ground-water? (Y/N) U

f. Were sufficient hydraulic conductivity tests performed to document lateral and vertical variation in hydraulic conductivity in the entire hydrogeologic subsurface below the site? (Y/N) N - NOT DONE

3. Uppermost aquifer

a. Did the owner/operator adequately define the uppermost aquifer? (Y/N) N

4. Monitoring Well Construction and Design

a. Do the design and construction of the owner/operator's ground-water monitoring wells permit depth discrete ground-water samples to be taken? (Y/N) Y

b. Are the samples representative of ground-water quality? (Y/N) U screen lengths, depths

c. Are the ground-water monitoring wells structurally stable? (Y/N) N

d. Does the ground-water monitoring well's design and construction permit an accurate assessment of aquifer characteristics? (Y/N) N

5. Detection Monitoring

a. Downgradient Wells
Do the location, and screen lengths of the ground-water monitoring wells or clusters in the detection monitoring system allow the immediate detection of a release of hazardous waste or constituents from the hazardous waste management area to the uppermost aquifer? (Y/N) Y

b. Upgradient Wells
Do the location and screen lengths of the upgradient (background) ground-water monitoring wells ensure the capability of collecting ground-water samples representative of upgradient (background) ground-water quality including any ambient heterogenous chemical characteristics? (Y/N) N

6. Assessment Monitoring

a. Has the owner/operator adequately characterized site hydrogeology to determine contaminant migration? (Y/N) N
b. Is the detection monitoring system adequately designed and constructed to immediately detect any contaminant release? (Y/N) Y
c. Are the procedures used to make a first determination of contamination adequate? (Y/N) Y
d. Is the assessment plan adequate to detect, characterize, and track contaminant migration? (Y/N) Y
e. Will the assessment monitoring wells, given site hydrogeologic conditions, define the extent and concentration of contamination in the horizontal and vertical planes? (Y/N) N
f. Are the assessment monitoring wells adequately designed and constructed? (Y/N) N
g. Are the sampling and analysis procedures adequate to provide true measures of contamination? (Y/N) N
h. Do the procedures used for evaluation of assessment monitoring data result in determinations of the rate of migration, extent of migration, and hazardous constituent composition of the contaminant plume? (Y/N) N
i. Are the data collected at sufficient frequency and duration to adequately determine the rate of migration? (Y/N) N
j. Is the schedule of implementation adequate? (Y/N) U
k. Is the owner/operator's assessment monitoring plan adequate? (Y/N) N
   o If the owner/operator had to implement his assessment monitoring plan, was it implemented satisfactorily? (Y/N) N

II. Field Evaluation

A. Ground-water monitoring system:
Are the numbers, depths, and locations of monitoring wells in agreement with those reported in the facility's monitoring plan? (See Section 3.2.3) (Y/N) Y

B. Monitoring well construction:
1. Identify construction material

	Material	Diameter
a. Primary Casing	PVC galv steel	2 inch wells 4,5,9 2 inch wells 1,1A,2,3,3A
b. Secondary or outside casing	steel	2 inch - well #11 to be completed

2. Is the upper portion of the borehole sealed with concrete to prevent infiltration from the surface? (Y/N) N Well #2 cracked

3. Is the well fitted with an above-ground protective device? (Y/N) N

4. Is the protective cover fitted with locks to prevent tampering? No protective device, locking cap only (Y/N) N

If a facility utilizes more than a single well design, answer the above questions for each well design.

III. Review of Sample Collection Procedures

A. Measurement of well depths elevation:

1. Are measurements of both depth to standing water and depth to the bottom of the well made? (Y/N) N

2. Are measurements taken to the 0.01 feet? (Y/N) Y

3. What device is used?
electric probe plus fold-out wooden rules

4. Is there a reference point established by a licensed surveyor? No licensed surveyor (Y/N) N

5. Is the measuring equipment properly cleaned between well locations to prevent cross contamination? (Y/N) N

B. Detection of immiscible layers:

1. Are procedures used which will detect light phase immiscible layers? pumped and then bailed before sampling (Y/N) N

2. Are procedures used which will detect heavy phase immiscible layers? pumped then bailed before sampling (Y/N) N

C. Sampling of immiscible layers:

1. Are the immiscible layers sampled separately prior to well evacuation? (Y/N) N

2. Do the procedures used minimize mixing with water soluble phases? (Y/N) N

D. Well evacuation:

1. Are low yielding wells evacuated to dryness? (Y/N) U

2. Are high yielding wells evacuated so that at least three casing volumes are removed? (Y/N) Y

3. What device is used to evacuate the wells?
   centrifugal pump for 3 well volume, then bailed

4. If any problems are encountered (e.g., equipment malfunction) are they noted in a field logbook? (Y/N) U

E. Sample withdrawal: based on mock sampling of MW #2

1. For low yielding wells, are samples for volatiles, pH, and oxidation/reduction potential drawn first after the well recovers? - NOT TAKEN (Y/N) N

2. Are samples withdrawn with either flurocarbon/resins or stainless steel (316, 304 or 2205) sampling devices? (Y/N) Y Teflon bailer

3. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps? (Y/N) Y

4. If bailers are used, is fluorocarbon/resin coated wire, single strand stainless steel wire, or monofilament used to raise and lower the bailer? rope with galvanized cupset link. (Y/N) N

5. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample? (Y/N) NA

6. If bailers are used, are they lowered slowly to prevent degassing of the water? (Y/N) N

7. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration? (Y/N) N

8. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to insertion into the well? (Y/N) N

9. If dedicated sampling equipment is not used, is equipment disassembled and thoroughly cleaned between samples? (Y/N) N

10. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps:
    a. Dilute acid rinse (HNO_3 or HCl)? (Y/N) N

11. If samples are for organic analysis, does the cleaning procedure include the following sequential steps:
    a. Nonphosphate detergent wash? Non-phosphate? (Y/N) U
    b. Tap water rinse? (Y/N) N

c. Distilled/deionized water rinse? (Y/N) Y
d. Acetone rinse? (Y/N) N
e. Pesticide-grade hexane rinse? (Y/N) N

12. Is sampling equipment thoroughly dry before use? (Y/N) N

13. Are equipment blanks taken to ensure that sample cross-contamination has not occurred? (Y/N) N

14. If volatile samples are taken with a positive gas displacement bladder pump, are pumping rates below 100 ml/min? (Y/N) N/A

F. In-situ or field analyses: No field analysis observed

1. Are the following labile (chemically unstable) parameters determined in the field:
   a. pH? (Y/N) N
   b. Temperature? (Y/N) N
   c. Specific conductivity? (Y/N) N
   d. Redox potential? (Y/N) N
   e. Chlorine? (Y/N) N
   f. Dissolved oxygen? (Y/N) N
   g. Turbidity? (Y/N) N
   h. Other (specify) _____

2. For in-situ determinations, are they made after well evacuation and sample removal? (Y/N) N/A

3. If sample is withdrawn from the well, is parameter measured from a split portion? (Y/N) N/A

4. Is monitoring equipment calibrated according to manufacturers' specifications and consistent with SW-846? (Y/N) U

5. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook? (Y/N) U

IV. Review of Sample Preservation and Handling Procedures

A. Sample containers:

1. Are samples transferred from the sampling device directly to their compatible containers? (Y/N) Y

2. Are sample containers for metals (inorganics) analyses polyethylene with polypropylene caps? (Y/N) U

3. Are sample containers for organics analysis glass bottles with fluorocarbonresin-lined caps? (Y/N) U

4. If glass bottles are used for metals samples are the caps fluorocarbonresin-lined? (Y/N) U

5. Are the sample containers for metal analyses cleaned using these sequential steps?
   a. Nonphosphate detergent wash? (Y/N) U
   b. 1:1 nitric acid rinse? (Y/N) U
   c. Tap water rinse? (Y/N) U
   d. 1:1 hydrochloric acid rinse? (Y/N) U
   e. Tap water rinse? (Y/N) U
   f. Distilled/deionized water rinse? (Y/N) U

6. Are the sample containers for organic analyses cleaned using these sequential steps?
   a. Nonphosphate detergent/hot water wash? (Y/N) U
   b. Tap water rinse? (Y/N) U
   c. Distilled/deionized water rinse? (Y/N) U
   d. Acetone rinse? (Y/N) U
   e. Pesticide-grade hexane rinse? (Y/N) U

7. Are trip blanks used for each sample container type to verify cleanliness? (Y/N) U

B. Sample preservation procedures:
1. Are samples for the following analyses cooled to 4°C:
   a. TOC? (Y/N) U
   b. TOX? (Y/N) U
   c. Chloride? (Y/N) U
   d. Phenols? (Y/N) U
   e. Sulfate? (Y/N) U
   f. Nitrate? (Y/N) U
   g. Coliform bacteria? (Y/N) U
   h. Cyanide? (Y/N) U
   i. Oil and grease? (Y/N) U
   j. Hazardous constituents (§261, Appendix VIII)? (Y/N) U

2. Are samples for the following analyses field acidified to pH <2 with HNO_3:
   a. Iron? (Y/N) U
   b. Manganese? (Y/N) U
   c. Sodium? (Y/N) U
   d. Total metals? (Y/N) U
   e. Dissolved metals? (Y/N) U
   f. Fluoride? (Y/N) NA
   g. Endrin? (Y/N) NA
   h. Lindane? (Y/N) NA
   i. Methoxychlor? (Y/N) NA
   j. Toxaphene? (Y/N) NA

k. 2,4, D? (Y/N) NA
l. 2,4,5, TP Silvex? (Y/N) NA
m. Radium? (Y/N) NA
n. Gross alpha? (Y/N) NA
o. Gross beta? (Y/N) NA

3. Are samples for the following analyses field acidified to pH <2 with H_2SO_4: (Y/N) U
a. Phenols? (Y/N) U
b. Oil and grease? (Y/N) U

4. Is the sample for TOC analyses field acidified to pH <2 with HCl? (Y/N) U

5. Is the sample for TOX analysis preserved with 1 ml of 1.1 M sodium sulfite? (Y/N) U

6. Is the sample for cyanide analysis preserved with NaOH to pH >12? (Y/N) U

C. Special handling considerations:
1. Are organic samples handled without filtering? (Y/N) U

2. Are samples for volatile organics transferred to the appropriate vials to eliminate headspace over the sample? (Y/N) Y

3. Are samples for metal analysis split into two portions? (Y/N) U

4. Is the sample for dissolved metals filtered through a 0.45 micron filter? (Y/N) U

5. Is the second portion not filtered and analyzed for total metals? (Y/N) U

6. Is one equipment blank prepared each day of ground-water sampling? (Y/N) U

V. Review of Chain-of-Custody Prodecures

A. Sample labels
1. Are sample labels used? (Y/N) Y

2. Do they provide the following information:
a. Sample identification number? (Y/N) U
b. Name of collector? (Y/N) U
c. Date and time of collection? (Y/N) U
d. Place of collection? (Y/N) U
e. Parameter(s) requested and preservatives used? (Y/N) U

3. Do they remain legible even if wet? (Y/N) U

B. Sample seals:
1. Are sample seals placed on those containers to ensure the samples are not altered? (Y/N) N

C. Field logbook:
1. Is a field logbook maintained? (Y/N) U

2. Does it document the following:
a. Purpose of sampling (e.g., detection or assessment)? (Y/N) U
b. Location of well(s)? (Y/N) U
c. Total depth of each well? (Y/N) U
d. Static water level depth and measurement technique? (Y/N) U
e. Presence of immiscible layers and detection method? (Y/N) U
f. Collection method for immiscible layers and sample identification numbers? (Y/N) U
g. Well evacuation procedures? (Y/N) U
h. Sample withdrawal procedure? (Y/N) U
i. Date and time of collection? (Y/N) U
j. Well sampling sequence? (Y/N) U
k. Types of sample containers and sample identification number(s)? (Y/N) U
l. Preservative(s) used? (Y/N) U
m. Parameters requested? (Y/N) U
n. Field analysis data and method(s)? (Y/N) U
o. Sample distribution and transporter? (Y/N) U
p. Field observations? (Y/N) U
o Unusual well recharge rates? (Y/N) U
o Equipment malfunction(s)? (Y/N) U
o Possible sample contamination? (Y/N) U
o Sampling rate? (Y/N) U

D. Chain-of-custody record:
1. Is a chain-of-custody record included with <u>each</u> sample? (Y/N) N
2. Does it document the following:
a. Sample number? (Y/N) U
b. Signature of collector? (Y/N) U
c. Date and time of collection? (Y/N) U
d. Sample type? (Y/N) U
e. Station location? (Y/N) U
f. Number of containers? (Y/N) U
g. Parameters requested? (Y/N) U
h. Signatures of persons involved in the chain-of-possession? (Y/N) U
i. Inclusive dates of possession? (Y/N) U

E. Sample analysis request sheet:
   1. Does a sample analysis request sheet accompany each sample? (Y/N) N

   2 Does the request sheet document the following:
      a. Name of person receiving the sample? (Y/N) Y
      b. Date of sample receipt? (Y/N) Y
      c. Laboratory sample number (if different than field number)? (Y/N) Y
      d. Analyses to be performed? (Y/N) Y

VI. Review of Quality Assurance/Quality Control

A. Is the validity and reliability of the laboratory and field generated data ensured by a QA/QC program? (Y/N) Y

B. Does the QA/QC program include:
   1. Documentation of any deviations from approved procedures? (Y/N) Y

   2. Documentation of analytical results for:
      a. Blanks? (Y/N) Y
      b. Standards? (Y/N) Y
      c. Duplicates? (Y/N) Y
      d. Spiked samples? (Y/N) Y
      e. Detectable limits for each parameter being analyzed? (Y/N) Y

C. Are approved statistical methods used? (Y/N) Y

D. Are QC samples used to correct data? (Y/N) Y

E. Are all data critically examined to ensure it has been properly calculated and reported? (Y/N) Y

VII. Surficial Well Inspection and Field Observation

A. Are the wells adequately maintained? (Y/N) N

B. Are the monitoring wells protected and secure? (Y/N) N

C. Do the wells have surveyed casing elevations? (Y/N) Y

D. Are the ground-water samples turbid? (Y/N) U

E. Have all physical characteristics of the site been noted in the inspector's field notes (i.e., surface waters, topography, surface features)? (Y/N) N

F. Has a site sketch been prepared by the field inspector with a scale, north arrow, location(s) of buildings, location(s) of regulated units, location of monitoring wells, and a rough depiction of the site drainage pattern? (Y/N) Y

VIII. Conclusions

A. Is the facility currently operating under the correct monitoring program according to the statistical analyses performed by the current operator? (Y/N) N

B. Does the ground-water monitoring system, as designed and operated, allow for detection or assessment of any possible ground-water contamination caused by the facility? (Y/N) U

C. Does the sampling and analysis procedures permit the owner/operator to detect and, where possible, assess the nature and extent of a release of hazardous constituents to ground water from the monitored hazardous waste management facility? (Y/N) N

APPENDIX A-1

FACILITY INSPECTION FORM FOR COMPLIANCE WITH INTERIM STATUS STANDARDS COVERING GROUND-WATER MONITORING

Company Name: Grady McCauley Creative Graphics Inc. ; EPA I.D. Number: OHD 004468609 ?

Company Address: 7390 Middlebranch Rd. Middlebranch, Ohio ; Inspector's Name: Richard Freitas

Company Contact/Official: Dennis Grady ; Branch/Organization: _____

Title: _____ ; Date of Inspection: Oct. 23, 1987

	Yes	No	Unknown
Type of facility: (check appropriately)			
a) surface impoundment		✓	
b) landfill			
c) land treatment facility	✓		
d) storage facility			✓
Ground-Water Monitoring Plan			
1. Has a ground-water monitoring plan been submitted to the Regional Administrator for facilities containing a surface impoundment, landfill, land treatment process, or storage facility?	✓		
2. Was the ground-water monitoring plan reviewed prior to site visit? If "No",	✓		
a) Was the ground-water plan reviewed at the facility prior to actual site inspection? If "No", explain.			

	Yes	No	Unknown
3. Has a ground-water monitoring program (capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility) been implemented? §265.90(a)	✓		
4. Has at least one monitoring well been installed in the uppermost aquifer hydraulically upgradient from the limit of the waste management area? §265.91(aX1)		✓	
a) Are sufficient ground-water samples from the uppermost aquifer, representative of background ground-water quality and not affected by the facility, ensured by proper well			
1) Number(s)?		✓	
2) Location?		✓	
3) Depth?		✓	
5. Have at least three monitoring wells been installed hydraulically downgradient at the limit of the waste handling or management area? §265.91(a)	✓		
6. Have the locations of the waste handling, storage, or disposal areas been verified to conform with information in the ground-water plan?	✓		
7. Do the numbers, locations, and depths of the ground-water monitoring wells agree with the data in the ground-water monitoring system program? If "No", explain discrepancies.			✓

Both upgradient wells have shown contaminants in the past therefore, not representative of background water quality

depths not verified

	Yes	No	Unknown
8. Has a ground-water sampling and analysis plan been developed? §265.92(a)		✓	
a) Has it been followed?			
b) Is the plan kept at the facility?		✓	-closed
c) Does the plan include procedures and techniques for:			
1) Sample collection?		✓	
2) Sample preservation?		✓	
3) Sample shipment?		✓	
4) Analytical procedures?		✓	
5) Chain of custody control?		✓	
9. Are the required parameters in ground-water samples planned to be tested quarterly for the first year? §265.92(b) and §265.92 (c)(1)		✓	
a) Are the ground-water samples analyzed for the following:			
1) Parameters characterizing the suitability of the ground-water as a drinking supply? §265.92(b)(1)		✓	
2) Parameters establishing ground-water qaulity? §265.92(b)(2)		✓	
3) Parameters used as indicators of ground-water contamination? §265.92(b)(2) (3)		✓	
(i) Are at least four replicate measurements obtained for each sample? §265.92(c)(2)		✓	
(ii) Are provisions made to calculate the initial background arithmetic mean and variance of the respective parameter concentrations or values obtained from well(s) during the first year? §265.92(c)(2)		✓	
b) For facilities which have complied with first year ground-water sampling and analysis requirements:			
1) Have samples been obtained and analyzed for the ground-water qaulity parameters at least annually? §265.92(d)(1)	N/A		
2) Have samples been obtained and analyzed for the indicators of ground-water contamination at least semi-annually? §265.92(d)(2)	N/A		

	Yes	No	Unknown
c) Were ground-water surface elevations determined at each monitoring well each time a sample was taken? §265.92(e)	✓		
d) Were the ground-water surface elevations evaluated to determine whether the monitoring wells are properly placed? §265.93(f)		✓	
e) If it was determined that modification of the number, location or depth of monitoring wells was necessary, was the system brought into compliance with §265.91(a)? 265.93(f)	—	—	NA- NOT DETERMINED
10. Has an outline of a ground-water quality assessment program been prepared? §265.93(a)	✓		
a) Does it describe a program capable of determining:			
1) Whether hazardous waste or hazardous waste constituents have entered the ground water?	✓		
2) The rate and extent of migration of hazardous waste or hazardous waste constituents?		✓	
3) Concentrations of hazardous waste or hazardous waste constituents in in ground water?		✓	
b) Have at least four replicate measurements of each indicator parameter been obtained for samples taken for each well? §265.93(b)		✓	
1) Were the results compared with the initial background mean?		✓	
(i) Was each well considered individually?		✓	
(ii) Was the Student's t-test used (at the 0.01 level of significance)?		✓	
2) Was a significant increase (or pH decrease) found in the:			
(i) Upgradient wells	—	—	NOT PERFORMED
(ii) Downgradient wells	—	—	NOT PERFORMED
If "Yes", Compliance Checklist A-2 must also be completed.			

	Yes	No	Unknown
11. Have records been kept of analyses for parameters establishing ground-water quality and indicators of ground-water contamination? §265.94(a)(1)	___	___	✓
12. Have records been kept of ground-water surface elevations taken at the time of sampling for each well? §265.94(a)(1)	___	___	✓
13. Have the following been submitted to the Regional Administrator §265.94(a)(2) :			
a) Initial background concentrations of parameters listed in §265.92(b) within 15 days after completing each quarterly analysis required during the first year?	___	✓	
b) For each well, any parameters whose concentrations or values have exceeded the maximum contaminant levels allowed in drinking water supplies?	___	✓	
c) Annual reports including:			
1) Concentrations or values of parameters used as indicators of ground-water contamination for each well?	___	✓	
2) Results of the evaluation of ground-water surface elevations?	___	✓	

APPENDIX A-2

INSPECTION COMPLIANCE FORM FOR A FACILITY WHICH HAS DETERMINED IT MAY BE AFFECTING GROUND-WATER QUALITY

Company Name: Grady McCauley ; EPA I.D. Number: OHD 004468609 ?

Company Address: 7390 Middlebranch Rd ; Inspector's Name: Richard Freitas

Middlebranch, Ohio

Company Contact/Official: _____ ; Branch/Organization: _____

Title: _____ ; Date of Inspection: _____

	Yes	No	Unknown
Type of facility: (Check appropriately)			
a) surface impoundment		✓	
b) landfill		✓	
c) land treatment facility	✓		
d) storage facility			✓
Ground-Water Monitoring Plan			
1. Has(Have) comparison(s) of ground-water contamination indicator parameters for the upgradient well(s) 265.93(b) shown a significant increase (or pH decrease) over initial background?			✓
a) If "Yes", has(have) the increases(s) been submitted to the Regional Administrator as part of the annual report? 265.94(a)(2)(ii)			
2. Have comparisons of indicator parameters for the downgradient wells 265.93(b) shown a significant increase (or decrease) over initial background?			✓
a) If "Yes", were additional ground-water samples taken for those downgradient wells where the significant difference was determined? 265.93(c)(2)			
1) Were samples split in two?			
2) Was the significant difference due to laboratory error? (If "Yes", do not continue.)			

	Yes	No	Unknown
3. If significant differences were not due to laboratory error, was a written notice sent to the Regional Administrator within 7 days of (laboratory) confirmation?			✓
4. Within 15 days of notification of the Regional Administrator was a ground-water quality assessment program submitted? 265.93(dX2)		✓	
a) Does the plan specify 265.93(dX3) :			
1) Well information (specifics)		✓	
(a) number?		✓	
(b) locations?		✓	
(c) depths?		✓	
2) Sampling methods?		✓	
3) analytical methods?		✓	
4) evaluation methods?		✓	
5) schedule of implementation?			
b) Does the plan allow for determination of 265.93(dX4) :			
1) Rate and extent of migration of hazardous waste or hazardous waste constituents?	✓		
2) Concentrations of the hazardous waste or hazardous waste constituents?	✓		
c) Is it indicated that the 1st determination was made as soon as technically feasible? 265.93(dX5)			
1) Within 15 days after determination was a written report containing the assessment of ground-water quality submitted to the Regional Administrator?			
d) Was it determined that hazardous waste or hazardous waste constituents from the facility has entered the ground water?			
1) If "No", was the original indication evaluation program, required by 265.92, reinstated?			
(a) Was the Regional Administrator notified of the reinstatement of program within 15 days of the determination? 265.93(dX7)			

	Yes	No	Unknown
e) If it was determined that hazardous waste or hazardous waste constituents have entered the ground water 265.93(dX7) :			
1) For facilities where program was implemented prior to final closure, are determinations of hazardous waste or hazardous waste constituents continued on a quarterly basis? (If program was implemented during the post-closure care period, determinations made in accordance with the ground-water quality assessment plan may cease.)	____	____	
(a) Were ground-water quality reports submitted to the Regional Administrator within 15 days of determination?	____	____	
2) Were(are) records kept of the analyses and evaluations, specified in the ground-water qaulity assessment (throughout the active life of the facility)? 265.94(bX1)	____	____	
(a) If a disposal facility, were(are) records dept throughout the post-closure period as well?	____	____	
f) Are annual reports submitted to the Regional Administrator containing the results of the ground-water quality assessment program? 265.94(bX2)	____	____	
1) Do the reports include the calculated or measured rate of migration of hazardous waste or hazardous waste constituents?	____	____	

APPENDIX B

ANALYTICAL RESULTS

WASTE MATERIAL FROM
LEACH WELL LW-4 AND SEPTIC TANK ST-5

GRADY McCAULEY CREATIVE GRAPHICS, INC.
MIDDLEBRANCH, OHIO

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted:
Date analyzed: 4/17/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	38
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Others:

Xylenes	60

Note: ND (None detected, lower detectable limit = 10 mg/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted: 4/12/85
Date analyzed: 4/15/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	7,000
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 5 mg/L)
ND* (None detected, lower detectable limit =25 mg/L)

ACID COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted: 4/12/85
Date analyzed: 4/15/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	ND
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 5 mg/L)
ND* (None detected, lower detectable limit =25 mg/L)

MS/DS IDENTIFIED COMPOUND (non-Regulated) WITH THEIR ESTIMATED CONCENTRATION

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Cyclohexanone	500 ug/L
1-methyl-2-Pyrrolidinone	25 ug/L
2-Cyclohexylidene Cyclohexanone	500 ug/L

ANALYTICAL RESULTS

What TCLP procedure used?

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW-4
Laboratory Identification: 86192
Sample Matrix: Water

Total Metals:

Arsenic	<0.005	mg/L
Barium	0.7	mg/L
Cadmium	0.11	mg/L
Chromium	0.47	mg/L
Hexavalent Chromium	<0.02	mg/L
Mercury	<0.005	mg/L
Lead	1.6	mg/L
Selenium	0.01	mg/L
Silver	0.18	mg/L

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Septic Tank #5 - ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/85
Date extracted:
Date analyzed: 3/12/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	40
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Others:

Acetone	69
Xylenes	180
Methyl Ethyl Ketone	83

Note: ND (None detected, lower detectable limit = 10 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Septic Tank #5- ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/855
Date extracted: 3/19/85
Date analyzed: 3/20/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 20 ug/L)
ND* (None detected, lower detectable limit =100 ug/L)

ACID COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: Septic Tank #5 - ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/855
Date extracted: 3/19/85
Date analyzed: 3/20/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	ND
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 20 ug/L)
ND* (None detected, lower detectable limit =100 ug/L)

APPENDIX C

SUMMARY OF CORRESPONDENCE

US EPA AND OHIO EPA WITH

GRADY-McCAULEY CREATIVE GRAPHICS, INC.

NORTH CANTON, OHIO.

November 20, 1980

US EPA potential hazardous waste site inspection conducted at the Dice Decal Corporation. Report notes that the hazardous waste methyl ethyl ketone was generated at the site. The wastes drained into "dry wells" that were pumped twice a year. "Dry wells" were mistakenly considered as non-leaking underground holding tanks. Thus, no hazardous conditions were noted at the site.

July 22, 1983

Letter from Scott Byram (USEPA) to file. This letter stated that the manufacturer uses approximately 1,200 gallons per year of MEK. Waste solvent and wastewater flow to underground "dry well". The "dry well" was mistakenly considered to be equivalent of non-leaking underground holding tanks. The tank was pumped twice a year by a waste hauler. Since there was no evidence that the tank was leaking, no further investigation was recommended.

February 3, 1984

Site was referred to RCRA for investigation.

February 9, 1984

Notes from Mark Bergman. Company waste stream was discussed. A site inspection by Mark Bergman of OEPA notes that hazardous waste is being stored and disposed of improperly (violation of OAC-3745-51-03 (a)(2)(IV)). The company was notified of the violation.

August 24, 1984

Letter to Mr. David McCauley of The Dice Decal Corporation from Mark Bergman of the OEPA summarizing the February 9th and July 12th inspections at the facility. The letter notes that hazardous wastes methyl ethyl ketone/other solvents were improperly disposed. The hazardous waste stream was eliminated by time of the second visit. OEPA requests Dice Decal to perform soil borings near the abandoned leach wells and to test for the presence of halogenated and non-halogenated solvents in the soils. Diagrams/maps of leach well system were requested.

October 16, 1984

Mark Bergman meeting notes. Meeting between Dave McCauley of Dice Decal and Mark Bergman of OEPA at the facility. Locations where soil borings would be made were discussed.

October 23, 1984

Results of soil analysis/borings were forwarded by David McCauley of Grady McCauley Creative Graphics, Inc., to Mark Bergman of the OEPA. Results of four soil samples near leach

wells indicated low level contamination with ethyl benzene, xylene, acetone and methylene chloride. Location and pictures of leach well system were included in the report.

November 23, 1984

Results of VOC analysis of Dice Decal company water supply well were forwarded to Mark Bergman of the OEPA by David McCauley. Results show water to contain 39 ppb ethyl benzene and 140 ppb xylene. In the cover letter, David McCauley requested the November 26th phone call from Mark Bergman of the OEPA to discuss the matter.

November 27, 1984

Footnote on water analysis report. Dave McCauley of Dice Decal was notified by phone by Mark Bergman through Dr. Applegate of the OEPA that plant water should not be used for consumption purposes if xylenes or ethyl benzenes exceed 8 ug/l.

December 5, 1984

Mark Bergman meeting notes. OEPA informational meeting with Dice Decal representatives. OEPA requests a site investigation and ordered an investigation to delineate extent of contamination and to include testing of local private wells for contaminants.

December 10, 1984

Memo to Mark Bergman and Gary Gifford. David McCauley of Dice Decal notifies the OEPA that 2 of 5 private water wells tested show a concentration of 1ppb methylene chloride.

December 10, 1984

Letter from Gary Gifford of the OEPA to David McCauley summarizing the discussion at the December 5, 1984 meeting between the two. The letter outlined the extent of the problem at the site and the necessity for further investigation to determine the full extent of contamination. The letter also requests a commitment by the company in writing to carry-out environmental investigation no later than December 17, 1984.

December 12, 1984

Letter to Gary Gifford of OEPA from Dennis Grady of Dice Decal Corp giving written confirmation of his intent to comply with objectives outlined in the Dec. 5 meeting.

December 13, 1984

Dennis Grady of Grady-McCauley forwards results of water sampling of private wells near the site to Gary Gifford of the OEPA. Results show 2 of 5 wells contaminated with 1ppb of methylene chloride.

January 2, 1985

Letter to Dennis Grady from Gary Gifford. Gary Gifford

of OEPA responds to water sampling data for private wells. He notes that a National Drinking Water Standard for methylene chloride is not available. The proposed USEPA water criteria standard applicable to methlyene chloride indicates an acceptable concentration to be within the range of 0 to 1.9 ug/l. Based on this and discussions with OEPA and Health Department officials, Gary Gifford believes that the two contaminated wells are acceptable for use. Periodic monitoring of these two wells, however, should be considered.

January 3, 1985

Letter from Dennis McCauley to Gary Gifford of OEPA. Grady McCauley submits Groundwater Assessment Proposal for OEPA review dated Dec. 26, 1984.

January 10, 1985

Letter from Gary Gifford to Dennis McCauley which was a response to the Ground water quality Assessment Proposal.

January 24, 1985

Grady-McCauley forwards letter from consultant requesting clarification and written approval to begin site investigation.

February 4, 1985

Letter received at the OEPA. A formal complaint was lodged at the Stark County Health Dept. by The Citizens for a Safe Middlebranch against Grady-McCauley Creative Graphics, Inc.

February 13, 1985

Letter from John Steffen, Stark County Health Dept. to OEPA. Representatives from the Stark County Health Dept. inspect the Grady McCauley site on Feb. 5, 1985 to investigate allegations filed in a formal complaint. Results of the investigation were stated in letter to Grady-McCauley and the OEPA.

February 15, 1985

Letter from Grady-McCauley to OEPA requesting information on proper disposal methods.

February 22, 1985

Mark Bergman meeting notes. Ohio EPA representatives meet with representatives of Grady-McCauley, Inc. to discuss: 1) Ground water and soil project update, 2) Letter of complaint filed against the company and 3) Materials used at company and review of current disposal practices.

February 27, 1985

Mark Bergman meeting notes. Grady-McCauley representatives meet at the OEPA office to discuss facility waste streams.

May 20, 1985

Results of site geologic investigation and ground water analysis. Ground water analysis indicates the presence of ethyl benzene (monitor wells #1, 1A, 3A), toluene (#1), Xylenes (#1, 3A), isophorone (#3A), 1,1,1-trichloroethane (#3A), 1,1-dichloroehtane (#3A) and 3,3,5-trimethylcyclohexane (#3A).

May 20, 1985

Letter from Ohio Drilling to John Bradshaw of Wadsworth Laboratories. Supplement to previous geologic report showing water level measurement data for monitor wells and piezometric surface map.

June 10, 1985

Mark Bergman meeting notes. OEPA representatives meet with representatives of Grady-McCauley and OEPA requests Remedial Investigative Report. Grady-McCauley was notified of possible US EPA action.

June 18, 1985

Footnote on Mark Bergman meeting notes of June 10, 1985: Notification packet sent.

June 28, 1985

US EPA files a Complaint and Compliance Order against Grady McCauley Creative Graphics, Inc.

October 7, 1985

OEPA receives copy of Consent Agreement and Final Order against Grady McCauley Creative Graphics of Middlebranch, Ohio.

November 1, 1985

Meeting notes, of OEPA meeting with Grady-McCauley representatives. The possibility of site clean-up using a three phase anaerobic bacterial treatment is discussed.

December 2, 1985

Letter to Gary Gifford from Dennis Grady. Ground water and Subsurface Soil Sampling Plan was submitted to OEPA dated November 26, 1985.

January 7, 1986

Letter to Dennis Grady from Gary Gifford, OEPA. OEPA responds to Dennis Grady concerning the Ground water and Subsurface Soil Sampling Plan.

January 29, 1986

Mark Bergman notes to file. Mark Bergman approves the Ground water/Soil Sampling Plan.

February 11, 1986

Mark Bergman notes to file. Mark Bergman of the OEPA speaks with Grady-McCauley to agree with proposal outlined in letter of January 17, 1987. He noted that Grady-McCauley needs to work out an agreement with the US EPA and begin work.

May 14, 1986

US EPA notifies OEPA of potential loss of interim status of several facilities. Grady-McCauley was included on that list since they had never applied for a Part A or B permit yet handled hazardous wastes.

May 21, 1986

Draft CAFO received at the OEPA.

May 30, 1986

Letter to T. Leverett, US EPA, from Kenneth Moore legal representative of Grady-McCauley. Ground water and Subsurface Soil Sampling Plan dated May 29, 1986, was submitted to US EPA Region V.

March 2, 1987

Letter to Paul Dimock, US EPA from Kenneth Moore. Grady-McCauley submits a series of technical reports through its legal representative in fulfillment of requirements outlined in the CAFO.

March 17, 1987

Results of Ground water/Soil Sampling Plan dated Feb. 23, 1987 submitted to OEPA.

May 14, 1987

Letter from US EPA to Ken Moore Esquire, legal representative of Grady-McCauley. The leter requests additional information in Phase II Ground water/Soil sampling plan. A ninety day deadline within receipt of notification to comply.

June 16, 1987

Grady McCauley letter to James Saric responding to US EPA request. New monitoring well location are proposed and additional sampling needs to be performed at the site upon approval.

June 24, 1987

US EPA letter from James Saric to Dennis Grady. Location for new monitor well was approved.

July 16, 1987

Letter to James Saric from Kenneth Moore regarding requirement for total lead determination in site soils as opposed to EP extractable lead.

August 14, 1987

OEPA receives analytical report dated Aug. 5, 1987 for water samples taken at Grady-McCauley site.

September 3, 1987

Inspection of the Grady-McCauley Creative Graphics, Inc. facility by Mark Bergman of the OEPA. (RCRA Interim Status Inspection Form).

September 3, 1987

Letter from William Muno, US EPA, to Kenneth Moore, legal representative of Grady-McCauley. Detection limits of sample #5 was too high and need resampling using lower detection limits is needed.

September 3, 1987

Letter from William Muno of the US EPA to Ken Moore, legal representative of Grady-McCauley regarding requirement for total lead determination in soil samples as opposed to EP extractable lead.

September 18, 1987

Letter to James Saric of US EPA from Kenneth Moore, legal representative for Grady-McCauley. Phase II Soil Sampling Plan dated Sept. 11, 1987 was submitted to US EPA.

APPENDIX D

DRILLER'S LOGS

FOR WELLS IN THE VICINITY OF

GRADY-McCAULEY CREATIVE GRAPHICS, INC.

MIDDLEBRANCH, OHIO

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady Mc Cauley - Middlebranch, Ohio HOLE NO. MW-1 3rd Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 15, 19 85

LOCATION 94 ft. east of Middlebranch Rd., 6 ft. west of building, 29 ft. north of south property line

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones,	5 ft.		
5 ft.	Sand, Clay & Stones	10 ft.		
5 ft.	Sand, Gravel & Little Clay			
	(dry)	15 ft.		
5 ft.	Fine Sand, Gravel & Little			
	Clay (stratified)	20 ft.		
22 ft.	Sand, Gravel & Little Clay	42 ft.		
7 ft.	Sand, Gravel & Clay	49 ft.	yes	
16 ft.	Sand, Gravel & Clay (dirty)	65 ft.		
4 ft.	Clay	69 ft.		
	Shale at	69 + ft.		
	Static water level = 12' 3"			
	Water encountered at 23 ft.			
	Pumped for water samples:	20' - 25'		
		35' - 40'		
		42' - 47'		
		48' - 53'		
		59' - 63'		

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-2
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 21, 19 85

LOCATION Approx. 40 ft. east of Middlebranch Rd., 8 ft. north of plant

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Sand, Clay & Large Stones	7 ft.		
7 ft.	Sand, Gravel & Clay	14 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	21 ft.		
7 ft.	Sand, Gravel & Clay	28 ft.		
7 ft.	Sand, Gravel & Little Clay			
	(Layer of stones 34 - 36 ft)	35 ft.		8' 6"
4 ft.	Sand, Larger Gravel &			
	Little Clay	39 ft.		
10 ft.	Fine Sand, Gravel & Clay	49 ft.		
7 ft.	Sand, Gravel & Clay	56 ft.		
7 ft.	Sand, Gravel & Little Clay	63 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	70 ft.		
4 ft.	Sand, Gravel & Little Clay	74 ft.		
2 ft.	Clay, Sand & Gravel	76 ft.		
	Shale at 76 feet			
	Pumped for water sample:			
	1. 28' - 31'			
	2. 35' - 38'			
	3. 42' - 45'			
	4. 49' - 52'			
	5. 56' - 59' (oily film on surface of water)			
	6. 63' - 66' (oily film on surface of water)			
	7. 70' - 73'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-3
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 28, 19 85

LOCATION Approx. 130 ft. north of south property line, 41 ft. east of building

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Clay, Sand & Stones	7 ft.		
3 ft.	Sand, Gravel & Clay	10 ft.		
4 ft.	Sand, Small Gravel & Clay	14 ft.		
7 ft.	Fine Sand, Small Gravel &			
	Clay (tight)	21 ft.		
7 ft.	Sand, Gravel & Little Clay			
	(tight)	28 ft.		
7 ft.	Fine Sand, Gravel & Clay			
	(tight)	35 ft.		
7 ft.	Fine Sand, Gravel & Little			
	Clay	42 ft.		
8 ft.	Sand, Larger Gravel &			
	Little Clay	50 ft.		
	Shale at 50 ft.			
	Pumped for water samples:			
	1. 14' - 17' (Foam present on water surface)			
	2. 21' - 24'			
	3. 28' - 31'			
	4. 35' - 38'			
	5. 42' - 45'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 4 - 2" Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Jan. 16, 19 87

LOCATION 166 ft. east of Grady-McCauley plant bldg., 354 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones	5 ft.		
5 ft.	Sand, Clay & Stones	10 ft.		
5 ft.	Brown Sand, Gravel & Clay	15 ft.		
7 ft.	Brown Sand, Gravel & Minor Clay	22 ft.		
2 ft.	Gray Sand, Gravel & Minor Clay	24 ft.		
2 ft.	Gray Clay	26 ft.		
	Shale at 26 feet			
	screen set 19 to 24 ft.			

THE OHIO DRILLING CO.
INCORPORATED
MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 5 - 2"
Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Feb. 8, 19 87

LOCATION 49 ft. east of concrete walk edge, 204 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones	5 ft.		
5 ft.	Sand, Gravel & Clay	10 ft.		
5 ft.	Sand, Gravel & Little Clay	15 ft.		
5 ft.	Sand, Gravel & Little Clay	20 ft.	Water	
5 ft.	Fine Sand, Gravel & Clay	25 ft.	Made no water	
	screen set 15 to 20 ft.			

THE OHIO DRILLING CO.
INCORPORATED
MASSILLON, OHIO

DRILLED FOR Grady-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 9 - 2" Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED Feb. 5, 19 87

LOCATION 15 ft. east of southeast corner of annex bldg., 55 ft. north of Werner Church Rd.

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Brown Clay & Fill	5 ft.		
5 ft.	Brown Clay, Sand & Stones	10 ft.		
5 ft.	Brown Sand, Clay & Stones	15 ft.		
5 ft.	Brown sand, Gravel & Clay	20 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	25 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	30 ft.		
5 ft.	Gray Sand, Gravel & Little Clay	35 ft.		
12 ft.	Gray Clay, Fine Sand & Gravel	47 ft.		
	screen set 30 to 35 ft.			

THE OHIO DRILLING CO.
INCORPORATED
MASSILLON, OHIO

DRILLED FOR Gardy-McCauley Graphics, Inc. - Middlebranch, Ohio HOLE NO. 11 - 2"
Monitoring Well

DRILLED BY Glyn Davis DRILLER COMPLETED July 15, 19 87

LOCATION 20 ft. east of leach pit area

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Brown Clay, Sand & Stones	5 ft.		
5 ft.	Brown Sand, Clay & Gravel	10 ft.		
5 ft.	Brown Sand, Larger Gravel & Clay	15 ft.		
10 ft.	Gray Fine & Medium Sand, Gravel			
	& Clay	25 ft.		
5 ft.	Gray Fine & Medium Sand, Gravel			
	Little Clay	30 ft.		
10 ft.	Gray Sand, Gravel & Little Clay	40 ft.		
5 ft.	Sand, Clay & Stones (hardpan)	45 ft.		
	Shale below 45 feet			
	Water-bearing zone 6 ft. to 40 ft.			

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

No. 255983

County Stark Township Plain Section of Township 11

Owner Glenn Boettler Address 2955 Werner Church Rd. Canton, O.

Location of property Going north on Rt. 43, turn right onto Easton St., cont. approx. 2 miles, turn left onto Middlebranch Rd. Cont. 1/4 mile, turn right. House on le

CONSTRUCTION DETAILS

Casing diameter 4 inch Length of casing 45 feet

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping rate 15 G.P.M. Duration of test hrs.

Drawdown 10 ft. Date

Developed capacity

Static level—depth to water 18 ft.

Pump installed by

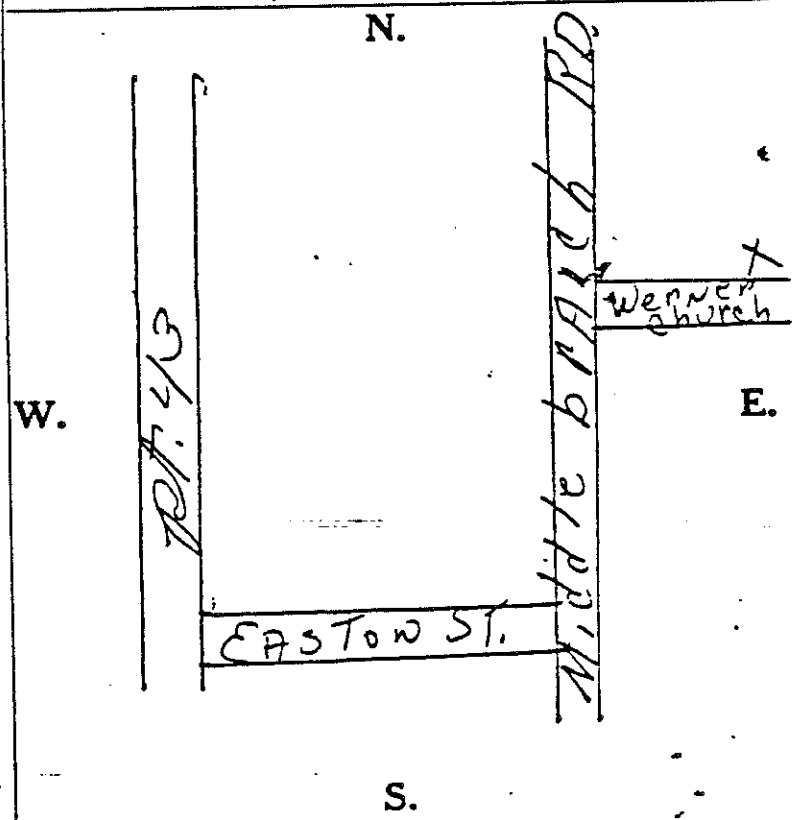
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
yellow clay stone	0 Feet	24 Ft.
[illegible]y clay stone	24	40
gray shale	40	50
lime layer	50	52
gray sandy shale	52	85

Total Depth 85 feet

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Parker Graham

Address 1174 Mt. Pleasant Rd. N.W.
North Canton 20, Ohio

Date June 25, 1961

Signed Parker Graham

4511

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

591609

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP 14

OWNER Don Heater ADDRESS 7412 Middlebranch N.Canton

LOCATION OF PROPERTY same as above

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 95'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test 1 hrs

Drawdown 0 ft Date 3/20/81

Static level (depth to water) 38 ft

Quality (clear, cloudy, taste, odor) clear

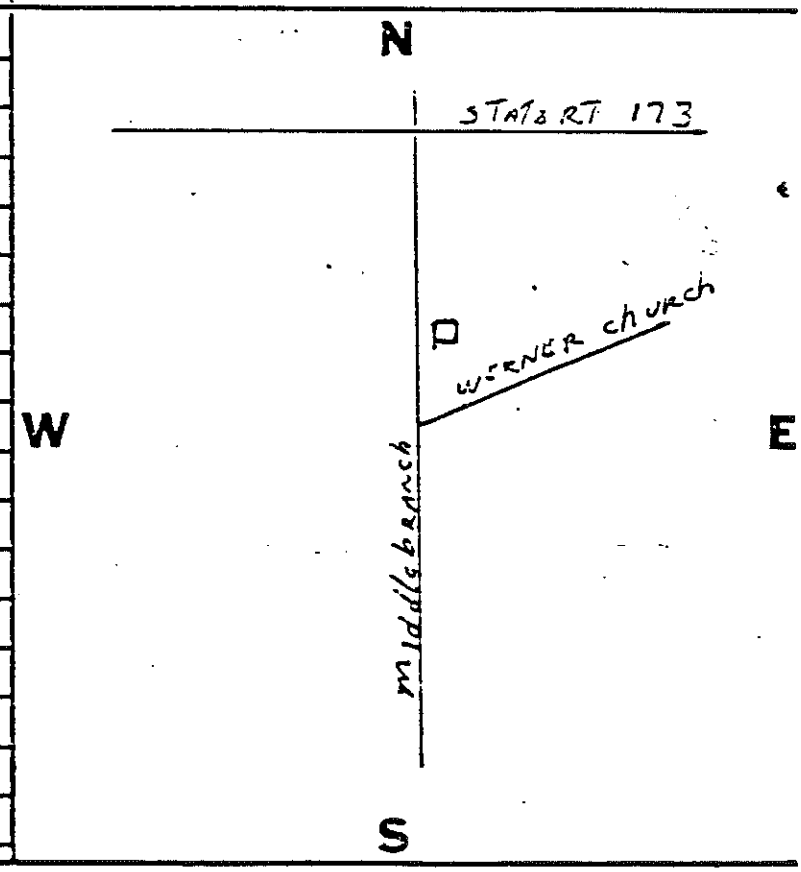
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
drift	0 ft	88 ft
shale	88	120

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ADAMS & SONS

ADDRESS 4310 - 28th St. N.W.

DATE 3/26/81

SIGNED R Dary Adams

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR, DIVISION OF WATER, FOUNTAIN SQ., COLS., OHIO 43224

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

№ 107099

County Stark Township Plain Section of Township or Lot Number 2

Owner Diamond Portland Cement Co Address Middlebranch O.

Location of property Main office in Middlebranch

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 191 ft.

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate 100 G.P.M. Duration of test 4 hrs

Drawdown 17 ft. Date Jan 26, 19

Developed capacity 100 gpm

Static level—depth to water 42.1 ft

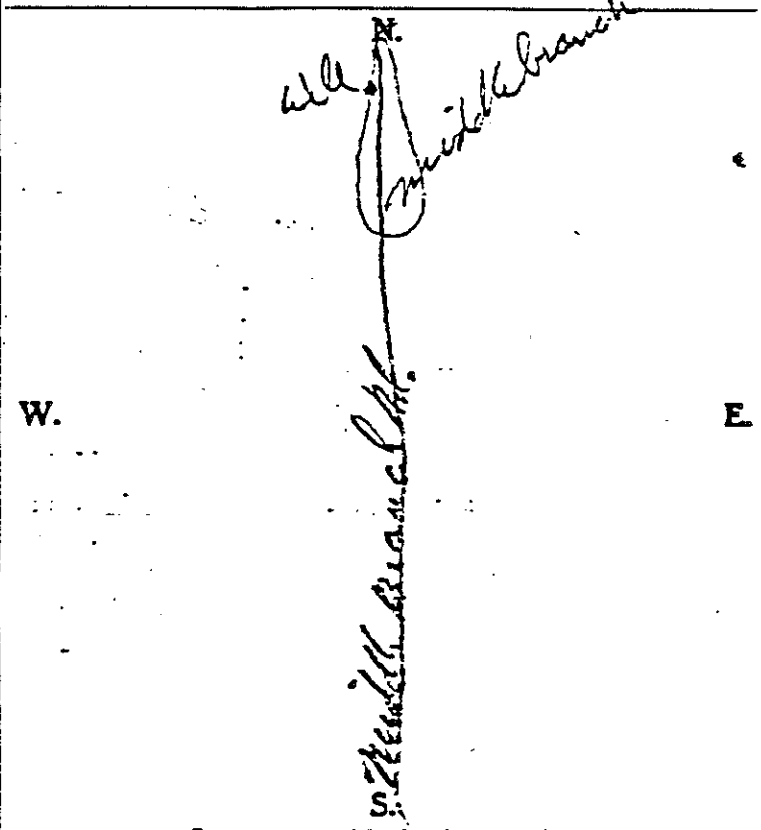
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay sand + gravel	0 Feet	60 Ft.
shale	60	100
sand rock	100	178
shale	178	197
sand rock	197	218
shale	218	231
sand rock	231	254
shale	254	284
sand rock	284	316
shale	316	329
sand rock	329	357

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm W. J. Engel Drilling Co Date Jan 26 1954

Address N. Dth St Massillon O. Signed W. J. Engel

102.44

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

№ 277799

County Stark Township Pl Co Section of Township 11

Owner Maurice Brittles Address 1654 Middlebrook Ave

Location of property Louisville on Easton, turn left 27.2 into Middlebrook Ave 1st house on right

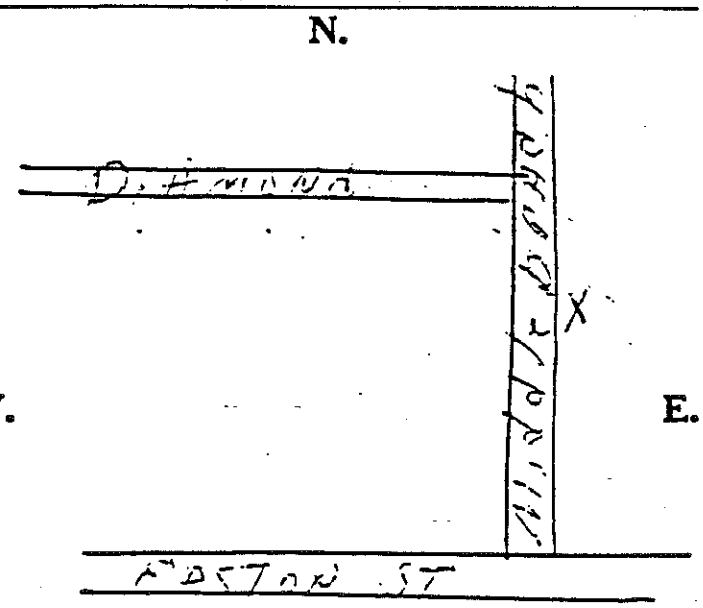
CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 4 inch Length of casing 70 ft.	Pumping Rate 10 G.P.M. Duration of test ____ hrs.
Type of screen ____ Length of screen ____	Drawdown Not Rec ft. Date ____
Type of pump ____	Static level-depth to water 9 ft.
Capacity of pump ____	Quality (clear, cloudy, taste, odor)
Depth of pump setting ____	Cloudy
Date of completion ____	Pump installed by ____

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	____ Ft.
yellow clay stone		40
gray clay stone	40	68
Coarse gravel	68	70
Total depth 70 feet		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Paulin Bros Date 7/16/62

Address 1174 Mt Pleasant NW Signed Paulin Bros

N. Canton 20, O.

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

495736

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Lee Zimmerman ADDRESS 7460 Panther Ave. N.E., N. Canton

LOCATION OF PROPERTY 7530/7532 Lynx Ave. N.E., North Canton 44721

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 71' 9"

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test ½ hrs

Drawdown 35 ft Date March 18, 1976

Static level (depth to water) 25 ft

Quality (clear, cloudy, taste, odor) clear, no odor

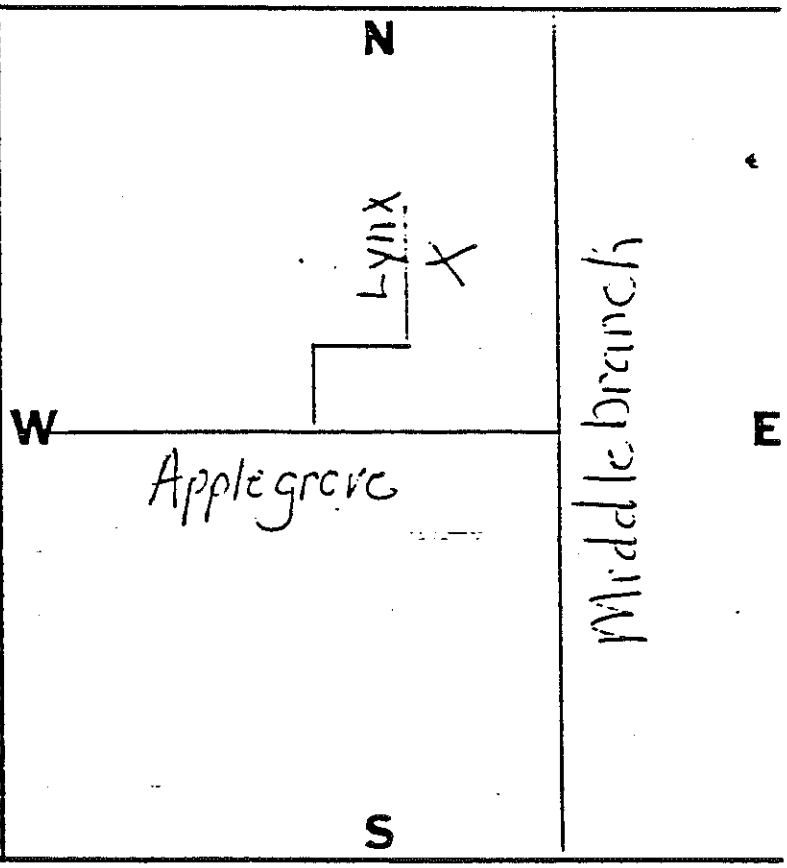
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
sand and gravel	0 ft	55 ft
soft gray shale	55	69
gray sandstone	69	83
gray shale	83	90
blue shale	90	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM A.B. CULP DRILLING CO. DATE March 23, 1976

ADDRESS LOUISVILLE, OHIO 44641 SIGNED A.B. Culp

site.

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

471099

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Dice Decal Corp. ADDRESS 7390 Middlebranch Rd., Middlebr

LOCATION OF PROPERTY Same

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 40

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 30 gpm Duration of test 1 hr

Drawdown -0- ft Date 8-21-74

Static level (depth to water) 12

Quality (clear, cloudy, taste, odor) good

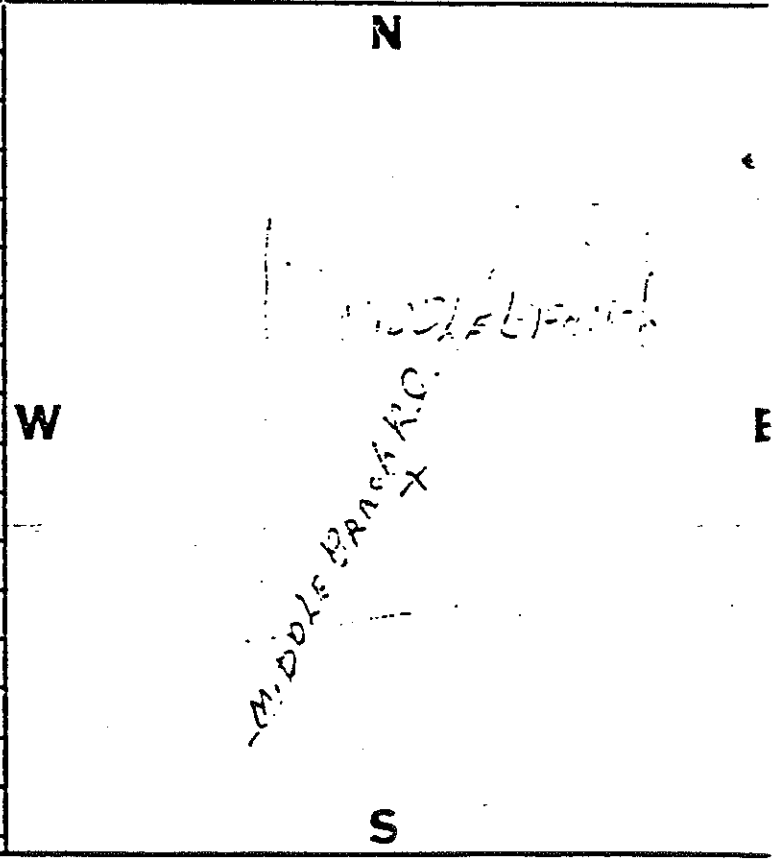
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Gravel	0 ft	38 ft

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM D.M. Waltz Drilling Co. DATE August 22, 1974

ADDRESS Route 1, Strasburg, Oh 44680 SIGNED Paul W. Bate

*If additional space is needed to complete well log, use next consecutive numbered form.

APPENDIX E

ANALYTICAL RESULTS

FOR

WATER SAMPLES

COLLECTED DURING THE DRILLING

OF

MONITOR WELLS #1 THROUGH #3A

GRADY-McCAULEY
TEST HOLE ANALYTICAL RESULTS 3/21/85

MW #1 602, 8020

Sample Matrix

Depth(s)(ft.)	Soil(mg/kg)	Water(mg/L)
0-5	Ethylbenzene - 2,000 Xylenes - 13,000	
5-9	Ethylbenzene - 2,300 Toluene - BMDL Xylenes - 8,900	
9-15	Ethylbenzene - 730 Toluene - 170 Xylenes - 3,400	
15-20	Ethylbenzene - 140 Toluene - 420 Xylenes - 640	
20-25		Ethylbenzene - 0.029 Toluene - 0.029 Xylenes - 0.037
28-33		Ethylbenzene - 0.014 Toluene - 0.011 Xylenes - 0.020
35-40		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
42-47		Ethylbenzene - 0.046 Toluene - 0.017 Xylenes - 0.078
48-53		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
59-63		ND
62-67	ND	

ND - None Detected
BMDL - Below Minimum Detection limit

GRADY-McCAULEY
TEST HOLE ANALYTICAL RESULTS

MW #2

Depth(s)(ft.)	Sample Matrix: Soil(mg/kg)	Sample Matrix: Water(mg/L)
0-7	ND	
7-14	ND	
14-21	ND	.010 = BMDL
21-28	ND	
28-31		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.016
35-38		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
42-45		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
49-52		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.014
56-59		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
63-66		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.011
70-74	? Methylene Chloride - 120 Toluene - 7	Xylenes - BMDL

ND - None Detected
BMDL - Below Minimum Detection limit

GRADY-McCAULEY
TEST HOLE ANALYTICAL RESULTS

MW #3

Depth(s)(ft.)	Sample Matrix Soil(mg/kg)	Sample Matrix Water(mg/L)
0-7	Methylene Chloride - 25	
7-11	Methylene Chloride - 81	
10-14	ND	
14-17		Isophorone present unable to quantitate with GC
21-24		1,1,1-Trichloroethane-0.026
28-31		Ethylbenzene - BMDL Toluene - 0.016 Xylenes - 0.032
35-38		ND
42-45		Ethylbenzene - 0.021 Toluene - 0.017 Xylenes - 0.094
42-49	Methylene Chloride - 8	

ND - None Detected
BMDL - Below Minimum Detection limit

APPENDIX F

RESULTS OF CHEMICAL ANALYSIS

SOIL BORINGS

February 23, 1987

GRADY-McCAULEY CREATIVE GRAPHICS, INC.

SW 846 Method 1310 for lead, GC volatile scan for VOC's

CHEMICAL ANALYSES OF THE SOIL BORINGS
REPLICATES A,B,C,&D (mg/l) LEAD

From report date Feb 23, 1987
GW & Subsurf Soil Sampling

Boring #	A*	B	C	D	Volatile Scan**
S1	ND	ND	ND	.07	ND
S2	ND	ND	ND	ND	ND
S3	ND	ND	ND	ND	ND
S4	ND	.10	ND	.06	ND
S5	ND	.18	ND	ND	ND
S6	ND	ND	ND	ND	ND
S7	.09	.13	.06	ND	ND
S8	ND	ND	ND	.07	ND
S9	ND	ND	ND	ND	ND
S10	ND	ND	ND	ND	ND
S11	ND	ND	ND	ND	ND
S12	.26	.24	.16	ND	ND
S13	ND	.11	.06	ND	ND
S14	.17	.28	.18	.14	ND
S15	.06	.14	.06	ND	ND
S16	ND	.08	ND	ND	ND
S17	ND	.08	ND	ND	ND
S18	ND	ND	ND	ND	ND
S19	ND	ND	ND	ND	ND
S20	ND	ND	ND	ND	ND
S21	ND	ND	ND	ND	ND
S22	ND	ND	ND	ND	ND
S23	.08	ND	.08	.13	ND

* Detection limit=.05 mg/l

** Detection limit=10 mg/kg

10 ft intervals between borings
5 ft deep

March 9, 1987

Lead Concentration in Monitoring Wells - "Dry Season"

for

Grady McCauley Creative Graphics, Inc.

Well No.	Concentration (mg/l)
1	ND
1A	ND
2	ND
3	ND
3A	ND
4	ND
5	ND
9	ND

soil or water?

Note: Detection Level .05 mg/l.