

Ohio Environmental Protection Agency

Division of Emergency
and Remedial Response

Focused Site Inspection Prioritization

for

Clyde Dump

Clyde, Ohio Sandusky County

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2/8/95

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Focused Site Inspection Prioritization (FSIP)

for

Clyde Dump

STATEMENT OF PURPOSE: The purpose of this FSIP is to update and re-evaluate previously collected data regarding potential environmental hazards associated with the Clyde Dump site. Information collected has been scored according to Hazard Ranking System 2 and is used to determine whether or not the Clyde Dump site is of National Priority List (NPL) caliber.

Date of FSIP: February 8, 1995

County: Sandusky

USEPA ID: OHD980905251

Ohio ID: 372-0983

Site Location: U.S. Route 20, Clyde, Ohio

Latitude: 41°19' 02"

Longitude: 82° 59' 02"

U.S.G.S. Map Info(Quadrant): Clyde, Ohio

Site Investigation History

The Clyde Dump site was operating as early as 1930, well before promulgation of Ohio's solid waste law in 1968. The earliest written documentation found on the site is a letter dated 1962 from the Sandusky County Health Department. Upon implementation of the solid waste administrative rules in 1969, the Clyde Dump ceased daily disposal operations due to its inability to come into compliance; but did not properly close the site. The site was never licensed or approved for solid waste disposal under the 1968 law. Licensing, plan approvals, and regulatory inspections were delegated to the Ohio Department of Health and local county health departments under the 1968 law. Ohio EPA was created in 1972, at which time the Ohio Department of Health's solid waste authority was delegated to Ohio EPA. From 1972 until 1977, Ohio EPA correspondence documented environmental problems at the site.

In 1977 after pressure from Ohio EPA and the Sandusky County Health Department, the City of Clyde hired a contractor (J. A. Schultz & Son, Inc.) to conduct remedial work at the site to stop leachate discharges from entering Raccoon Creek. Also during this time, the City settled a lawsuit for alleged property damage to 3.5 acres of farm ground adjacent to the north property line of the fill area. Runoff from the landfill had contaminated the soil leaving it useless for agricultural purposes.

According to Ohio EPA correspondence from 1978 until present, the remedial work was unsuccessful at controlling leachate discharges to waters of the State.

The site was evaluated in 1987 by Ohio EPA through a Preliminary Assessment (PA). Observed site conditions, leachate discharges to Raccoon Creek, and site history resulted in a determination of potential ground water and drinking water contamination. The PA recommended a low priority for Field Investigation Team (FIT) activities and a medium priority for State activities.

A Screening Site Inspection (SSI) was performed on September 19, 1990 by Ecology & Environment (E & E). The Clyde Dump was recommended for additional site investigation of ground water and surface water pathways due to elevated levels of Polycyclic Aromatic Hydrocarbons (PAH) in sediment samples from Raccoon Creek and soil samples from the fill area.

Ohio EPA conducted a complaint investigation at the Clyde Dump on June 3, 1994. Results of the investigation confirmed numerous leachate outbreaks, discharges of leachate into waters of the state, the presence of numerous drums both on site and in Raccoon Creek, open dumping, and inadequate cover.

FSIP Reconnaissance

Ohio EPA conducted an FSIP reconnaissance of the site on February 8, 1995. The following paragraphs summarize the reconnaissance results:

Site Description and Operational History

The Clyde Dump site is located in Sandusky County, Ohio on three adjacent parcels of land together totalling 27.72 acres. The northern part of the site contains 11 acres of landfill and the southern part contains the City of Clyde Fire Station. Centrally located on the site is the City of Clyde's Waste Water Treatment Plant (WWTP). A sludge disposal area (acreage unknown) exists on land between the Clyde WWTP and Clyde Fire Station. The Clyde WWTP and Clyde Fire Station may be constructed on portions of the sludge disposal area. The site is located in the northwest portion of the City of Clyde within the corporation limits and is residentially developed in addition to industrial and commercial development (See Appendix A, Site Locator Map). The address of the Clyde WWTP is 749 West McPherson Highway Clyde, Ohio 43410. The site is owned by the City of Clyde, 222 North Main Street Clyde, Ohio 43410. The City Manager at the time of the FSIP was Dennis Albrink.

The dump site was owned by the City of Clyde during its existence. However, operations were contracted on at least one occasion to Mr. George Snyder and Mr. Larry Fultz, joint partners in a private trash hauling business. Mr. Snyder's half of the trash hauling operation was purchased in 1968 by Mr. Fultz. Mr. Fultz denies ever managing the site for the City of Clyde. According to Ohio EPA files, Mr. Fultz burned Whirlpool Corporation's rubbish at the Clyde Dump for a monthly fee of \$300.00. Both Mr. Snyder and Mr. Fultz were police officers for the City of Clyde, but the dump operations were not part of their police responsibilities.

The site ceased operations in late 1969 due to the implementation of the first solid waste law in the State of Ohio. The site was never properly covered or closed which resulted in numerous environmental problems. Open dumping has occurred over the years since closure on the surface of the fill area by the City of Clyde. Wastes included leaves, brush, wood chips, lime sludge and construction/demolition debris.

According to Ohio EPA files, the Clyde Dump accepted for disposal a wide variety of wastes including municipal, commercial, and industrial wastes. A large quantity of the industrial wastes deposited at the site were from Whirlpool Corporation and Clyde Paint Company. Known wastes deposited at the site included appliances, paint/enamel sludges, auto parts, waste oils, solvents, and 900 tons of asphaltic concrete. Whirlpool Corporation has no record of a CERCLA 103(c) notification submittal or the types and quantities of waste that may have been placed into the Clyde Dump. Clyde Paint Company is no longer in business. The majority of the industrial wastes were deposited immediately north of the Clyde WWTP lagoons. Wastes were frequently burned for volume reduction and to control odor and vectors.

According to Mr. Snyder, the dump did not involve the deposition of waste materials below natural grade prior to 1964. A swale area existed just north of the Clyde WWTP that sloped toward Raccoon Creek and the wastes were deposited on the ground in the swale area. From 1964 through 1968, Mr. Snyder excavated 10 foot deep trenches with a bulldozer primarily oriented north to south. Liquid paint sludges, oils, paints and enamels were deposited in both bulk and containerized form into the fill area. No liners were utilized in the fill areas of the Clyde Dump. Mr. Snyder reported excavating into quicksand at depths of 8 to 10 feet across the site. Mr. Snyder was also badly burned when a drum of solvents from Clyde Paint Company exploded while being opened for disposal into the dump. Apparently Whirlpool also land applied industrial sludges on the ground south of the Clyde WWTP. The Clyde Fire Station and part of the new buildings at the Clyde WWTP are presently located in this area. The remainder of the area is presently well vegetated with grass.

In 1977, J. A. Schultz & Son (construction contractor) and Floyd Browne Associates (engineering consultant) were hired by the City of Clyde to conduct remedial activities at the site in response to requests from Ohio EPA and the Sandusky County Health Department. A large borrow area was excavated six feet below natural grade in the northern unfilled portion of the site to obtain cover soils and create a disposal area for waste relocation. Waste was removed along Raccoon Creek and deposited into the borrow area excavation. A portion of the borrow area was left unfilled at the northeast corner of the site. This area has since filled with water and is directly connected with the waste materials. A perimeter drainage ditch was also installed by the contractor along the east and north fill boundaries which ultimately discharges into Raccoon Creek. Portions of the east perimeter ditch are excavated into waste.

According to Mr. Biggs, Clyde WWTP Superintendent, Whirlpool constructed a distribution center adjacent to their manufacturing facility in Clyde a couple years ago. Considerable quantities of soil material from the construction project were placed on the Clyde Dump to enhance the existing cover material. It is not clear whether the soil was ever spread across the site and properly graded.

Current Site Conditions:

A site reconnaissance was performed on February 8, 1995 by staff of the Ohio EPA. The surrounding area is considerably populated and is developing residentially and commercially. A residential housing subdivision (Warnke Subdivision) is under construction approximately 350 feet west the site. The Clyde Dump is bordered to the west by Raccoon Creek. The land immediately west of Raccoon Creek is occupied by a junk yard and Warnke Subdivision. The northern and eastern sides of the dump are bordered by a manmade perimeter drainage channel and agricultural land. The Clyde WWTP is immediately south of the site. A high pressure natural gas line transects the dump just north of the Clyde WWTP lagoons (See Appendix B, Site Features Map).

An inspection of the site indicated the fill area is well vegetated on the northern quarter and sparsely vegetated in the southern three-quarters. Cover soils range in depth from 0 to 8 feet and are poorly graded. A large number of gravelly soil piles noted in the E & E report still exist on the southern portion of the fill area. Small trees are growing on the soil piles. The fill area generally slopes to the north at 2 to 5 percent. The site is accessible on foot from any direction, however, vehicle access is restricted by Raccoon Creek to the west, the perimeter ditch to the north and east, and a gate to the south.

There are no on-site monitoring wells. However, there is an artesian spring capable of being sampled at the junk yard approximately 500 feet west of the fill area. The closest residence is located approximately 400 feet west of the site. Open dumping of yard wastes continues to occur on the surface of the fill area as well as the disposal of construction/demolition debris.

Whirlpool Corporation is no longer discharging process waters directly into Raccoon Creek. The process waters are being discharged to the City sewer system. Storm water is still discharged through permitted outfalls into Raccoon Creek. The Clyde Paint Company, referenced in E & E's SSI report, is no longer in business upstream of the site. The Clyde WWTP's primary outfall is located at the southwest corner of the fill area in Raccoon Creek. The Clyde WWTP is a major contributor to the flow in the stream averaging 1.5 million gallons per day. The average annual flow of Raccoon Creek in the area of the site is 5 cubic feet per second. The stream bed of Raccoon Creek is primarily gravel.

The fill area continues to discharge leachate directly into Raccoon Creek through the stream bank and indirectly into Raccoon Creek via the perimeter drainage ditch. Drums were still present both in Raccoon Creek and the perimeter drainage ditch (See Appendix C, Photograph Log).

Potential Exposure Pathways:

Surface Water:

Based on FIT sampling data (See Appendix D, Sampling and Analytical Procedures Data) and the FSIP reconnaissance, an observed release has occurred and continues to occur to the surface water of Raccoon Creek. The observed release is confirmed by both direct observation and chemical analysis. Both organic and inorganic compounds are migrating from the site via surface water runoff and leachate discharges. Surface run-off is not contained; therefore, it flows toward the perimeter drainage ditch and Raccoon Creek.

There are no surface water intakes within the downstream segment of Raccoon Creek or within the target distance. However, Raccoon Creek flows into wetlands of Sandusky Bay approximately 11 miles from the site. The frontage of wetlands influenced by Raccoon Creek is difficult to determine since the majority of the wetlands are diked and managed by the State and other conservation clubs. The target distance for this route extends approximately 4 miles into Sandusky Bay. Both Raccoon Creek and Sandusky Bay are fisheries and are utilized for recreational purposes. According to Mr. Biggs, hunters and fishermen take game and aquatic species from the site and Raccoon Creek seasonally.

Sediment samples taken from Raccoon Creek contained significantly higher levels of contaminants than sediment samples taken from the perimeter drainage ditch. Since the upstream background sediment sample (S3) from Raccoon Creek was not representative, these higher analytical values were not used for scoring purposes. The upstream background sediment sample was not representative due to past contaminant discharges from Whirlpool Corporation, Clyde Paint Company, and CWWTP; thereby making it difficult to attribute the high contaminant levels strictly to Clyde Dump. The background soil sample taken from the site (S8) was predominantly compared to sediment release sample (S6) and sediment release sample (S4) for scoring purposes since these sample locations are unaffected by contaminants in Raccoon Creek. However, it is likely that sample (S8) was taken from the area that Whirlpool land applied industrial sludges. Water quality samples taken by E & E were not used for scoring purposes, again due to a poor background sample.

The following contaminants were found by E & E in sediment release sample (S6) taken from the east perimeter drainage ditch at concentrations above 3 times background (S8):

<u>Compound</u>	<u>Concentration (ppb)</u>
<i>methylene chloride</i>	190
<i>ethylbenzene</i>	870
<i>xylenes (total)</i>	5000
<i>naphthalene</i>	450
<i>2-methylnaphthalene</i>	81
<i>phenanthrene</i>	330
<i>fluoranthene</i>	510
<i>pyrene</i>	470
<i>benzo[a]anthracene</i>	320
<i>chrysene</i>	560
<i>benzo[b]fluoranthene</i>	460
<i>benzo[a]pyrene</i>	410
<u>Analyte</u>	<u>Concentration (mg/kg)</u>
<i>calcium</i>	20200
<i>copper</i>	543
<i>iron</i>	17000
<i>lead</i>	118
<i>sodium</i>	1090

Due to the levels of PAH's and the presence of a fishery in Raccoon Creek and Sandusky Bay, a potential exists to contaminate the food chain in this area. Ohio EPA's Division of Surface Water has been notified of this site's condition for evaluation under Ohio Revised Code Section 6111, Water Pollution Control. Also, it is difficult to determine the actual contaminants and their concentrations that can be attributed to this site because of the poor background samples.

Ground Water:

The regional aquifer is the silurian carbonate bedrock and is the aquifer of concern (AOC) for this site. A glacial sand/gravel unit is interconnected with carbonate bedrock and is considered part of the AOC. The carbonate aquifer is confined by the overlying glacial unit which also contains intermittent clay lenses ranging in thickness from 1 to 63 feet. The depth to bedrock near the site ranges from 50 to 70 feet. Ground water recharge areas exist several miles south-southeast of the site. Ground water discharge areas occur in local streams, rivers, artesian springs immediately west of the site, a buried river valley 4 miles west of the site, and Sandusky Bay within 11 miles of the site. Raccoon Creek is potentially a discharge point for ground water. The direction of groundwater flow regionally is to the north-northwest.

No ground water monitoring wells exist on site and no ground water samples were taken during the E & E SSI or during the FSIP. Therefore, the direction of ground water flow at the site is unknown. An artesian spring exists at the junkyard west of the site that is capable of being sampled. The spring is located approximately 500 feet west of the fill area. This potential sample location may be capable of detecting contaminants from the site. However, the presence of Raccoon Creek between the site and the spring may significantly influence the direction of ground water flow in the immediate vicinity.

The nearest ground water well is 2000 feet north-northwest of the site. Several residential dwellings exist beginning at 2,000 feet north of the site that utilize ground water as a potable water supply. These wells are developed into the carbonate bedrock and a glacially deposited sand/gravel unit overlying the carbonate bedrock. According to area well logs, the sand/gravel unit extends to the ground surface in some areas (See Appendix E, Ground Water Well Logs). Residences south of the site are connected to the public water

supply of the City of Clyde. The intake for this supply system is not in the Raccoon Creek watershed.

There is a potential for organic and inorganic compounds to migrate from the fill area to the AOC due to past operating practices and based on local and regional geology. Further investigation of site specific geology and ground water quality is warranted.

Air:

The air pathway exposure risk is relatively low due to prevailing wind directions and minimal activity on the fill area. Access roads on the fill area are relatively void of vegetation and are subject to dusting with vehicular traffic. Presently the City of Clyde Services Department utilizes the fill area for disposal of yard wastes and construction/demolition debris. Ohio EPA's Division of Solid and Infectious Waste has been informed of this activity so that appropriate measures can be instituted to cease the open dumping problem.

Soil:

No incidents of direct soil contact with organic or inorganic compounds from the site have been documented. However, Mr. Biggs indicated that children and adults occasionally utilize the site and Raccoon Creek for recreational purposes. E & E soil samples collected from the fill area contained the following contaminants at concentrations 3 times above background:

<u>Compound</u>	<u>Concentration (ppb)</u>
<i>toluene</i>	8
<i>phenanthrene</i>	130
<i>pyrene</i>	410
<i>benzo[a]anthracene</i>	320
<i>chrysene</i>	200
<i>benzo[b]fluoranthene</i>	290

<u>Analyte</u>	<u>Concentration (mg/kg)</u>
<i>barium</i>	957
<i>calcium</i>	31600

E & E SSI Sampling Data (cont.)

<i>cobalt</i>	<i>104</i>
<i>iron</i>	<i>29700</i>
<i>lead</i>	<i>201</i>
<i>nickel</i>	<i>104</i>
<i>sodium</i>	<i>1940</i>

The above analysis represents soil release sample (S7) compared to background sample (S8).

A potential exposure risk exists for this pathway given the contaminants in the soils and the lack of restricted access to the site.

REFERENCES

Ohio EPA, Clyde Dump Files.

City of Clyde Landfill Map, Floyd Browne Associates 1977.

Flood Insurance Study, City of Clyde, 1978.

Raccoon Creek Comprehensive Water Quality Report, Ohio EPA 1984.

Biological and Water Quality Study of Raccoon Creek, Ohio EPA 1987.

Ohio EPA, Preliminary Assessment Report, 12/04/87.

Urban Hydrology for Small Watersheds, 1986

Geohydrology and Water Quality in Aquifers in Northwest Ohio, U.S.G.S. 1991.

Ecology & Environment Screening Site Inspection Report, 09/20/91.

Ohio EPA Complaint Investigation, 06/03/94.

Ohio EPA, Focused Site Inspection Prioritization Reconnaissance, 02/08/95.

Groundwater Resources Map, Sandusky County.

Ohio EPA Geographical Information System, 4 mile radius map.

USGS Topographical Map, Clyde Quadrant

Ohio EPA Division of Drinking and Ground Water.

Ohio Department of Natural Resources Well Logs

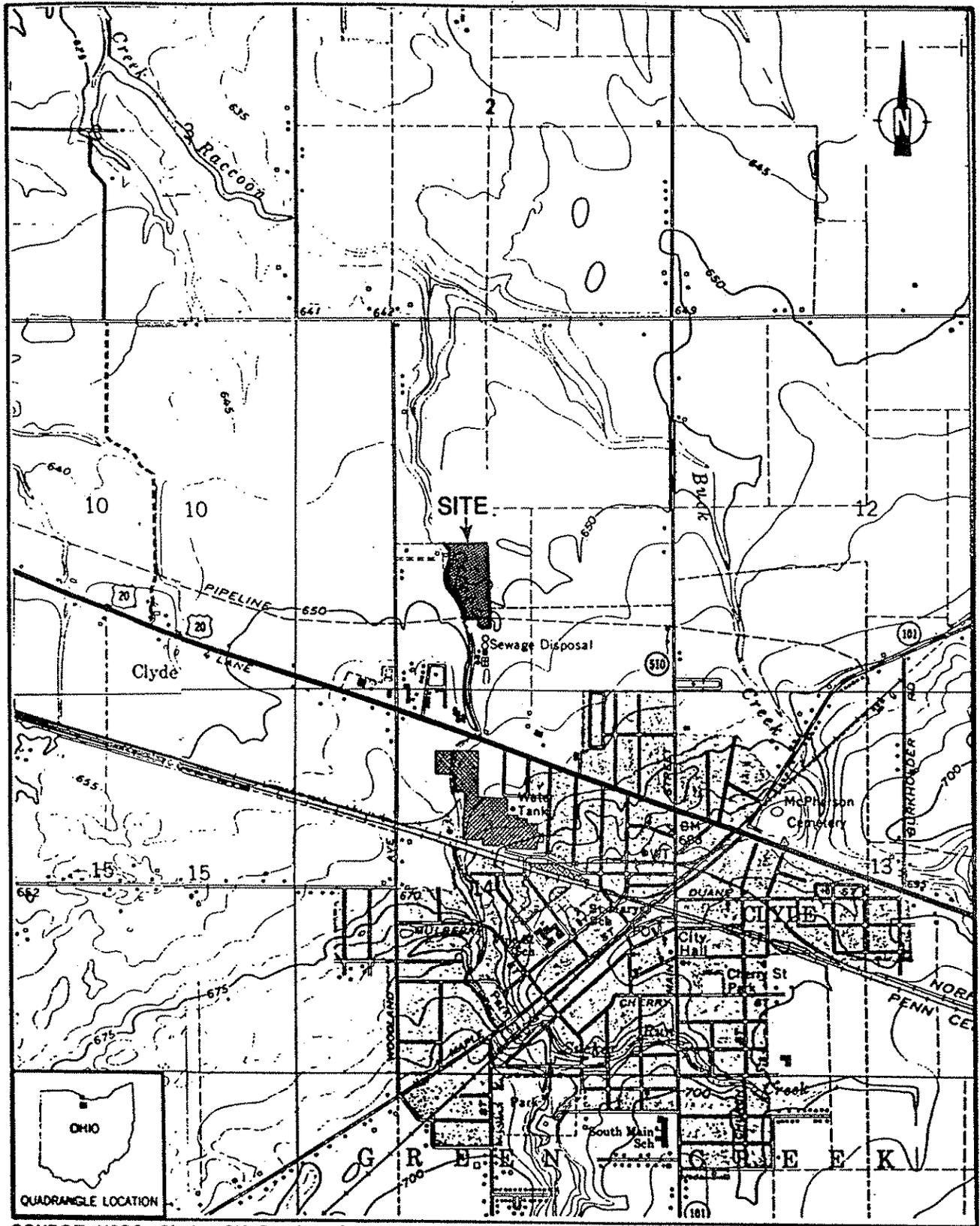
City of Clyde Landfill File

Sandusky County Courthouse, Auditor and Tax Map Offices

Y. Kato: 1994
1994



Appendix A

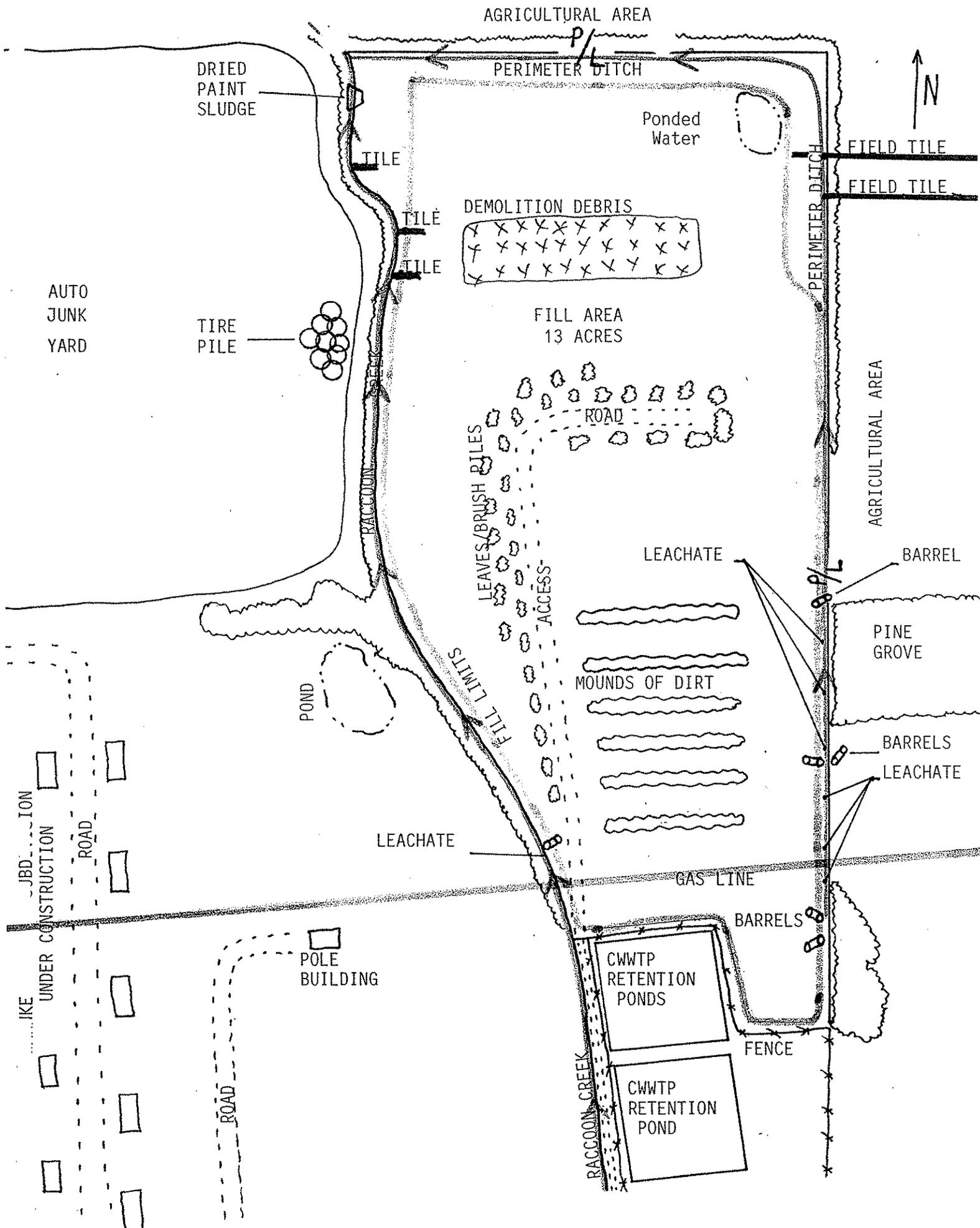


SOURCE: USGS, Clyde, OH Quadrangle, 7.5 Minute Series, 1969; Fremont East, OH Quadrangle, 7.5 Minute Series, 1969, photorevised 1980.



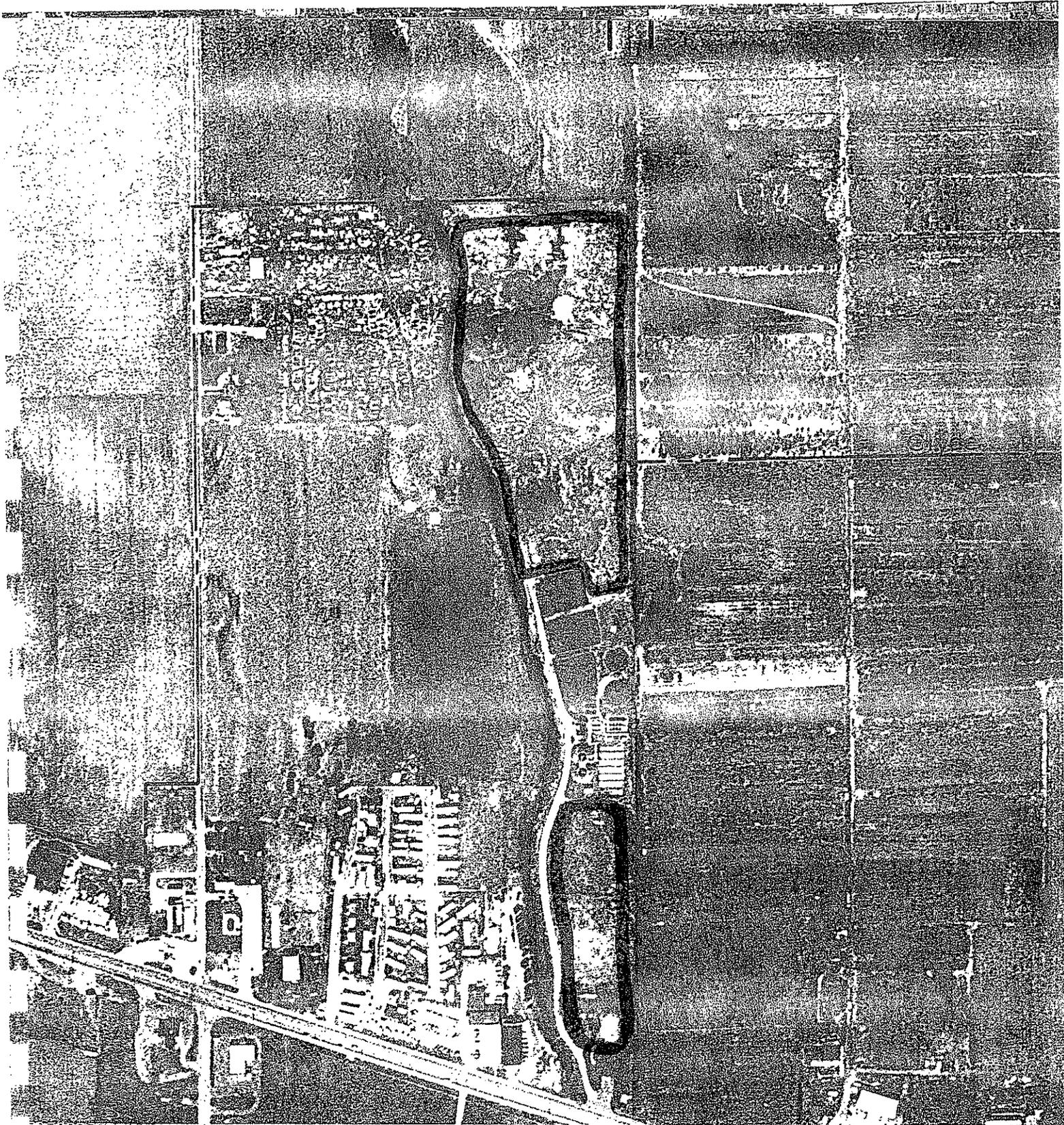
FIGURE 2-1 SITE LOCATION

Appendix B



SITE FEATURES MAP

SCALE: 1.0" = 150'



● site

■ Fill Areas

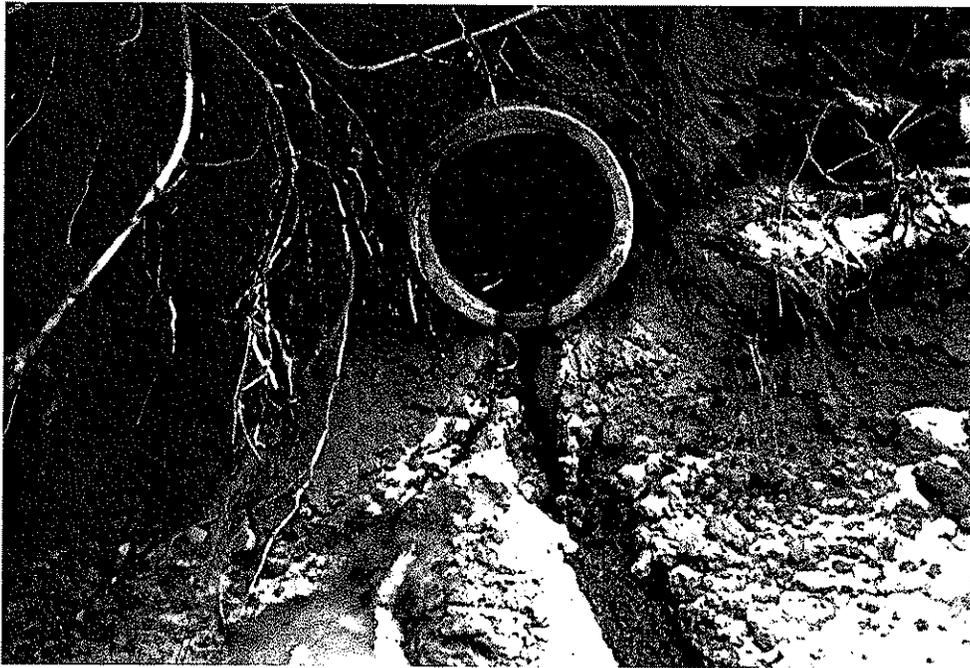
Appendix C



Photograph No: 1
Date: February 8, 1995
Orientation: Picture taken looking north at Raccoon Creek.
Description: Western edge of fill area with 10 inch clay field tile protruding into Raccoon Creek.



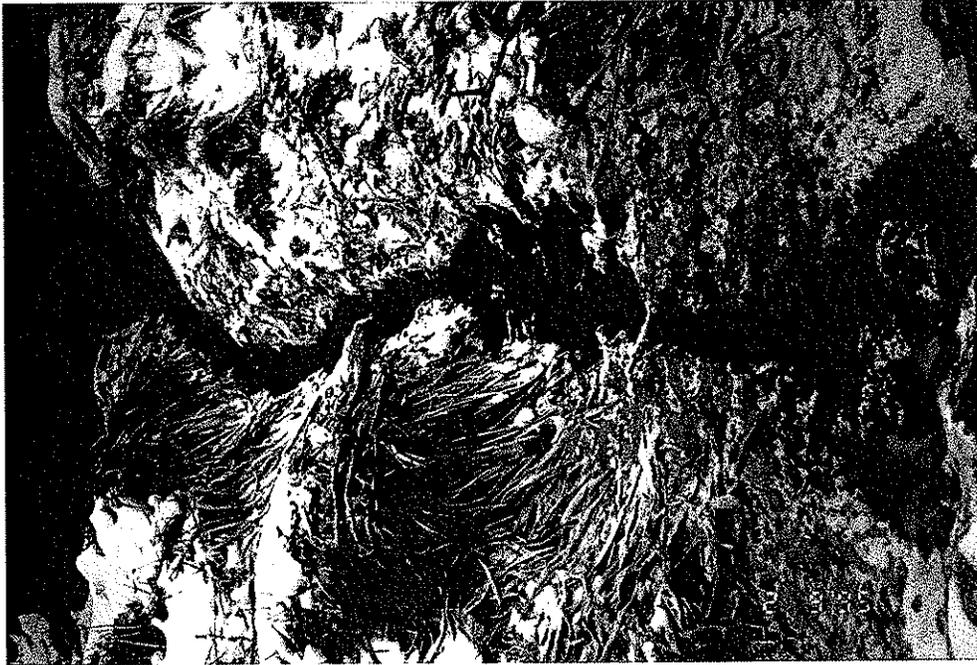
Photograph No: 2
Date: February 8, 1995
Orientation: Picture taken looking east at west edge of fill area in Raccoon Creek stream bed.
Description: 6 inch clay field tile plugged with waste and frozen leachate. Exposed waste around tile due to erosion of stream bank. Frozen leachate noted in stream bed beneath tile with purple/red color.



Photograph No: 3
Date: February 8, 1995
Orientation: Picture taken facing east looking at western edge of fill area in Raccoon Creek stream bed.
Description: 10 inch clay field tile noted in photograph number 1 discharging brown/red leachate into Raccoon Creek.



Photograph No: 4
Date: February 8, 1995
Orientation: Standing in northwest corner of fill area looking east.
Description: Orientation view of northern perimeter drainage ditch.



Photograph No: 5
Date: February 8, 1995
Orientation: Picture taken looking east at the west edge of fill area in Raccoon Creek stream bed.
Description: 10 inch clay field tile embedded in concrete protruding from fill area and discharging into Raccoon Creek. Leachate is relatively clear and flowing at approximately 1 gpm. Brown sediment noted settling out of leachate.



Photograph No: 6
Date: February 8, 1995
Orientation: Picture taken looking east at the west edge of the fill area in Raccoon Creek stream bed.
Description: Solidified contents of a 55 gallon drum laying in Raccoon Creek. Waste material appeared to be paint sludge.



Photograph No: 7

Date: February 8, 1995

Orientation: Picture taken facing south standing in the northeast corner of the site and looking along the eastern edge of the fill area.

Description: Poned area in the northeast corner of the site frozen over. Ditch drains poned area into the northern perimeter ditch. Waste is exposed in background in direct contact with ice.



Photograph No: 8

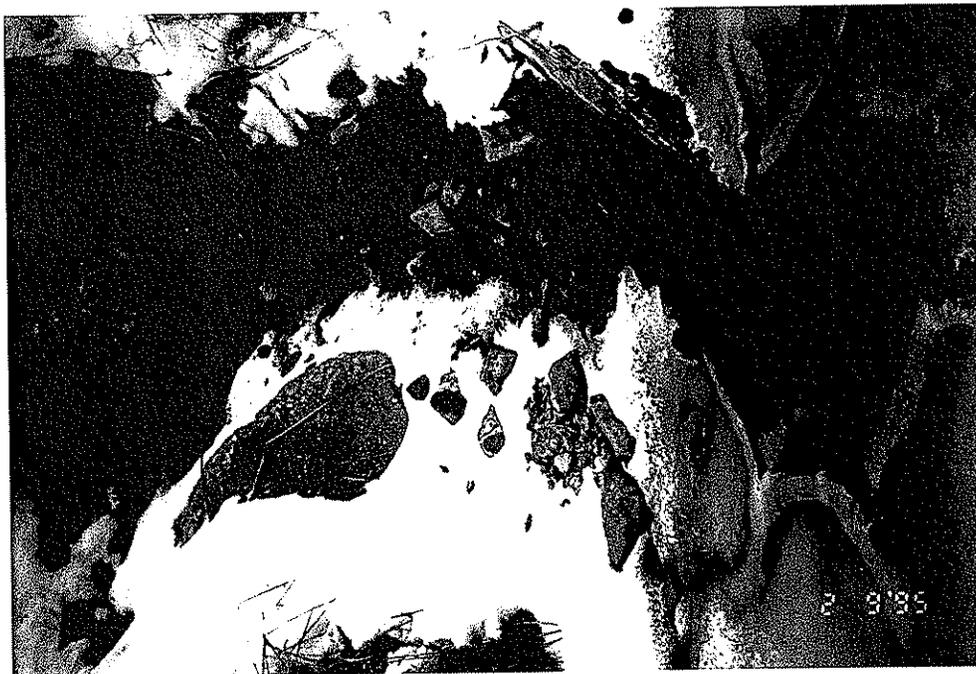
Date: February 8, 1995

Orientation: Picture taken looking south standing near the northeast corner of the site.

Description: Picture shows the east perimeter ditch around the fill area.



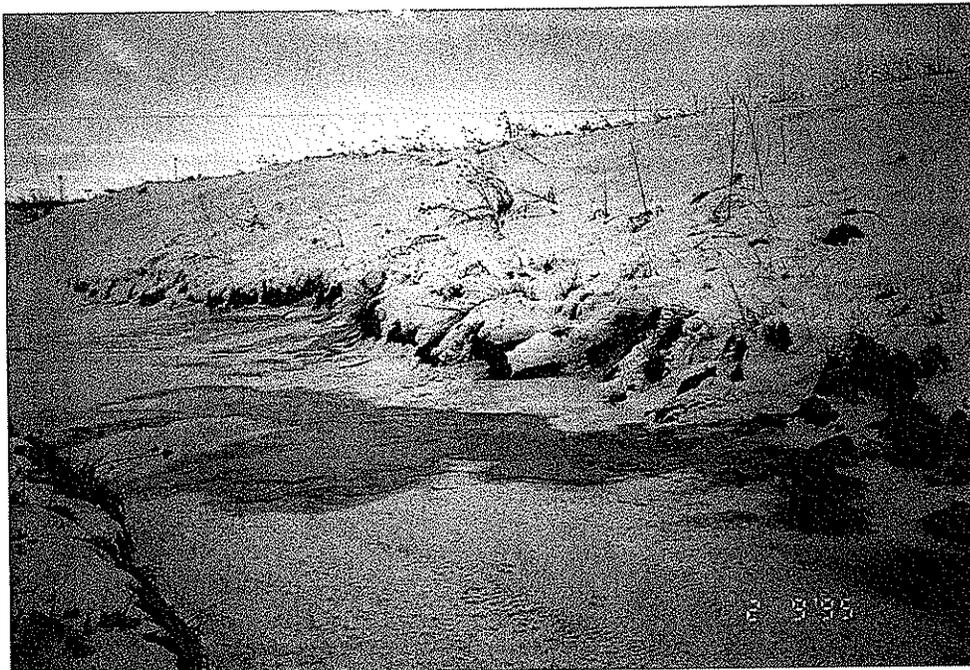
Photograph No: 9
Date: February 8, 1995
Orientation: Picture taken looking west at the east edge of fill area near the center of the site
Description: Black Leachate outbreak discharging into east perimeter ditch beneath a large rock protruding from fill area.



Photograph No: 10
Date: February 8, 1995
Orientation: Picture taken looking west at the east edge of fill area near the center of the site
Description: Black Leachate outbreak discharging into east perimeter ditch beneath a large rock protruding from fill area.



Photograph No: 11
Date: February 8, 1995
Orientation: Picture taken looking northwest at the east edge of fill area near the center of the site
Description: Brown/red Leachate outbreak discharging into east perimeter ditch near two 55 gallon drums.



Photograph No: 12
Date: February 8, 1995
Orientation: Picture taken standing near the center of the site looking south at the east edge of the fill area and the east perimeter ditch
Description: Brown/red Leachate outbreaks discharging into east perimeter ditch from fill area.



Photograph No: 13

Date: February 8, 1995

Orientation: Picture taken standing near the high point (beginning) of the east perimeter ditch looking south.

Description: Brown/red Leachate outbreaks discharging from the fill area into east perimeter ditch where Columbia Gas transmission line enters the site.



Photograph No: 14

Date: February 8, 1995

Orientation: Picture taken standing near the high point (beginning) of the east perimeter ditch looking west.

Description: Brown/red Leachate outbreaks discharging from the fill area into east perimeter ditch near Columbia Gas transmission line.



Photograph No: 15

Date: February 8, 1995

Orientation: Picture taken standing at the high point (beginning) of the east perimeter ditch looking south.

Description: Brown/red Leachate in east perimeter ditch. Cab from old pick-up truck submerged in leachate. Ditch is excavated into waste in this area.



Photograph No: 16

Date: February 8, 1995

Orientation: Picture taken just south of the high point (beginning) of the east perimeter ditch looking southwest.

Description: 55 gallon barrel protruding from fill area.



Photograph No: 17
Date: February 8, 1995
Orientation: Picture taken near southwest corner of site in Raccoon Creek stream bed looking north.
Description: Leachate outbreak discharging from fill area near large boulder that has eroded from stream bank.



Photograph No: 18
Date: February 8, 1995
Orientation: Picture taken near southwest corner of site in Raccoon Creek stream bed looking west.
Description: 55 gallon drum in Raccoon Creek just north of leachate outbreak in Photo No. 17.



Photograph No: 19
Date: February 8, 1995
Orientation: Picture taken near southwest corner of site near Raccoon Creek looking northeast across fill area.
Description: Piles of brush, wood chips, and demolition debris currently being dumped at the site.



Photograph No: 20
Date: February 8, 1995
Orientation: Picture taken near center of site along Raccoon Creek looking northwest
Description: Tire pile at junkyard located along the western property boundary of the site.

Note: Date stamp on pictures is incorrect.

Appendix D

Deteriorating drums, some containing solidified material, were observed throughout the site. Four drums were observed on the southwest side of the pond. Another drum was located east of the fill area in the drainage ditch, and another drum was located next to Raccoon Creek approximately 50 feet north of the site.

Grasses, trees, and shrubs border the creek and drainage ditch. Black leachate emanating from the fill area and an unpleasant odor were noted in the drainage ditch east of the fill area. FIT instrumentation, however, did not detect organic vapors that deviated from background levels in this area. Several areas of ponded water existed throughout the fill area because of recent rains.

No FIT photographs from the SSI of the Clyde Dump site are available because of camera failure. However, copies of the aerial photographs of the site from 1965 as well as aerial photographs from 1985 are provided in Appendix B.

3.4 SAMPLING PROCEDURES

Samples were collected by FIT at locations selected during the reconnaissance inspection to determine whether U.S. EPA Target Compound List (TCL) compounds or Target Analyte List (TAL) analytes were present at the site. The TCL and TAL are included with corresponding quantitation/detection limits in Appendix D.

On September 19, 1990, FIT collected three sediment samples, five soil samples, and three surface water samples. The site representative did not accept offered portions of the FIT-collected soil/sediment and surface water samples.

Soil/Sediment Sampling Procedures. Sediment samples S1, S2, and S3 were collected from Raccoon Creek. Unless otherwise indicated, all soil/sediment samples were collected at depths of 0 to 6 inches. Sediment sampling location S1 was located off-site, approximately 20 yards downstream of the point where the drainage ditch enters Raccoon Creek (see Figure 3-2 for soil/sediment sampling locations). Sediment sampling location S2 was located west of the fill area. These sediment samples were collected to determine whether TCL compounds and TAL analytes had migrated from the site into Raccoon Creek. Sediment sample S3 was collected off-site from Autswood Park, which is located approx-

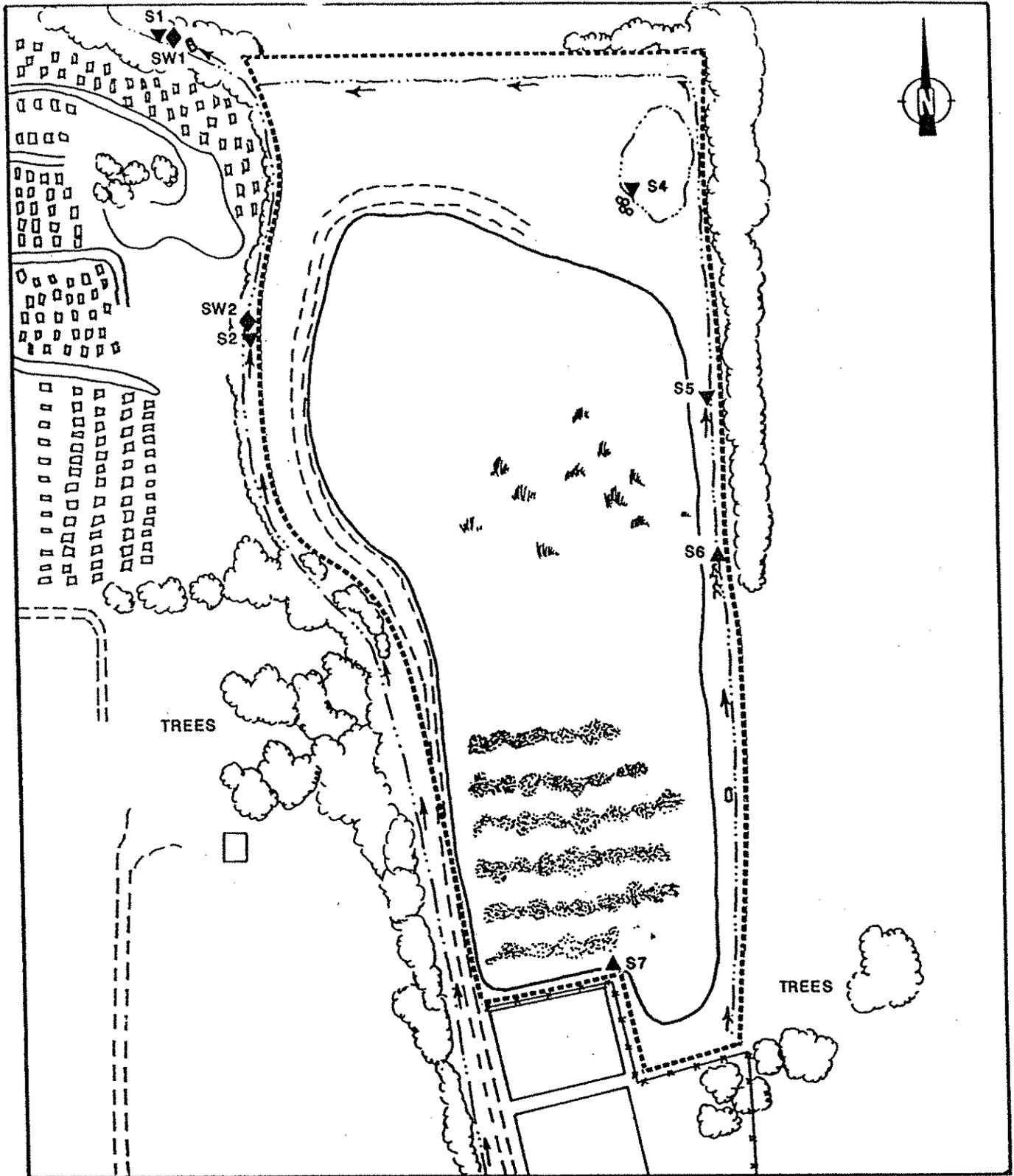


FIGURE 3-2 SOIL/SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS

imately 1 mile south of the site (see Figure 3-3 for additional soil/sediment sampling locations). Sediment sample S3 was collected as a potential background sample.

Sediment sample S4 was collected from the southeastern edge of the area of ponded water (see Figure 3-2 for soil/sediment sampling locations). Sample S4 was collected to determine the chemical characteristics of the sediment in the area of ponded water and to determine whether TCL compounds and TAL analytes were present in this area.

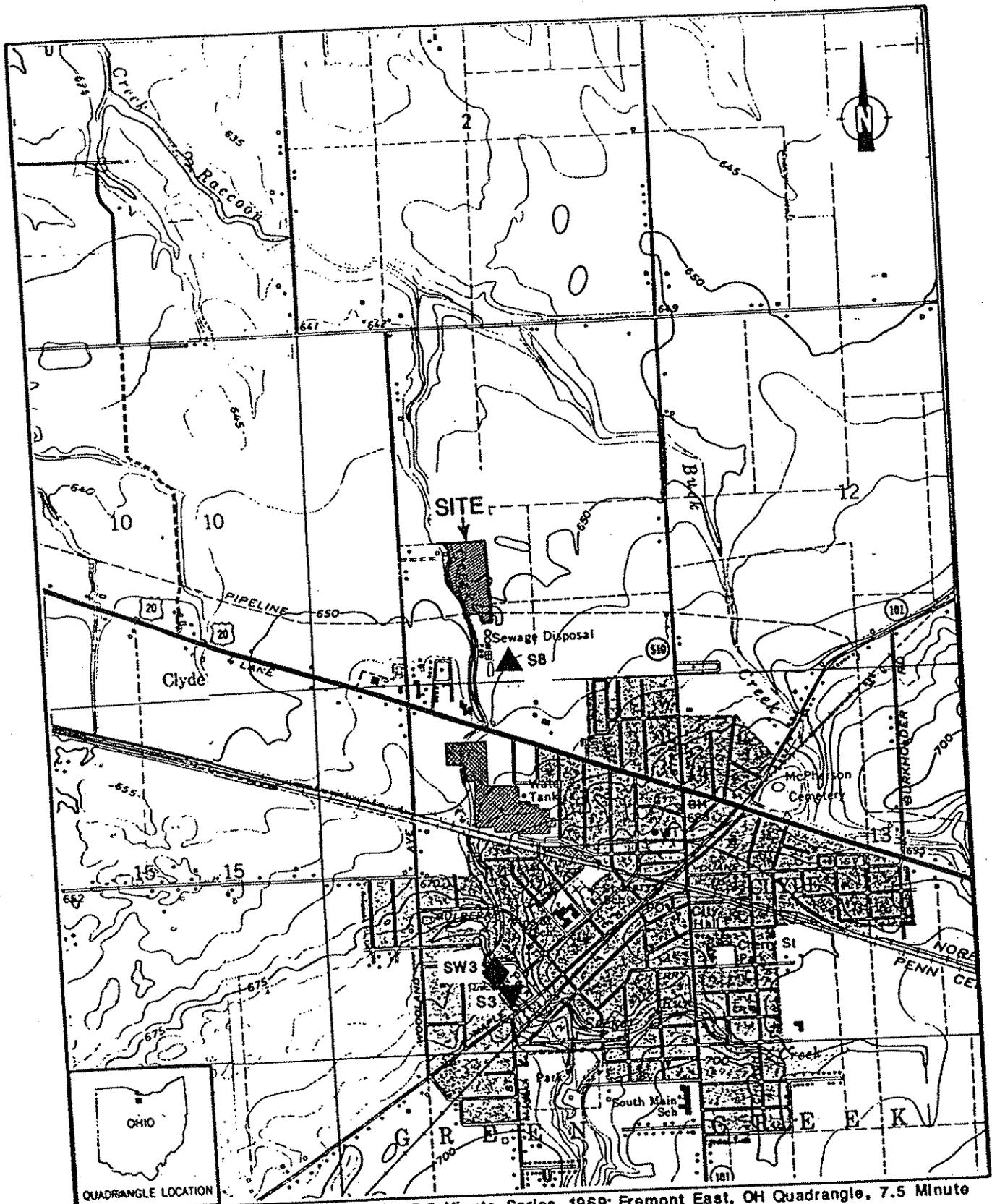
Sediment sample S5 was collected from the portion of the drainage ditch where FIT noticed unpleasant odors. Sample S5 was collected to determine whether TCL compounds and TAL analytes had migrated from the fill area to the drainage ditch.

Soil sample S6 was collected from a location approximately 200 feet south of sampling location S5, in the drainage ditch. Sampling location S6 was selected because black leachate had been observed in this area. Sample S6 was collected to determine whether TCL compounds and TAL analytes were leaching into the drainage ditch from the fill area.

Subsurface soil sample S7 was collected with a shovel at a depth of 1 to 2 feet from a sampling location south of the fill area and adjacent to the CWWTTP retention ponds. Sampling location S7 was selected to determine the chemical characteristics of on-site wastes.

Surface soil sample S8 was collected off-site as a potential background soil sample from a wooded area just southeast of the site on CWWTTP's property (see Figure 3-3 for additional soil/sediment sampling locations). The background soil sample was collected to determine the representative chemical content of the soil in the area of the site.

Standard E & E decontamination procedures were adhered to during the collection of all soil/sediment samples. The procedures included the scrubbing of all equipment (e.g., shovels, bowls, and trowels) with a solution of detergent (Alconox) and distilled water, and triple-rinsing the equipment with distilled water before the collection of each sample (E & E 1987). All soil/sediment samples were packaged and shipped in accordance with U.S. EPA-required procedures. The soil samples were collected with either a trowel or a shovel and placed into a bowl. The sample material was then transferred to sample bottles.



SOURCE: USGS, Clyde, OH Quadrangle, 7.5 Minute Series, 1969; Fremont East, OH Quadrangle, 7.5 Minute Series, 1969, photorevised 1980.

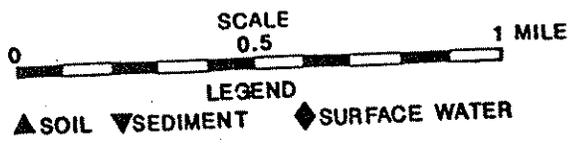


FIGURE 3-3 ADDITIONAL SOIL/SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS
3-7

The volatile organic analysis portions of the samples were collected first and placed directly into the sample bottles.

As directed by U.S. EPA, all soil/sediment samples were analyzed using the U.S. EPA Contract Laboratory Program (CLP).

Surface Water Sampling Procedures. FIT collected three surface water samples during the SSI of the Clyde Dump site to determine whether TCL compounds and TAL analytes had migrated from the site into Raccoon Creek. Surface water sample SW1 was collected from Raccoon Creek from a sampling location approximately 20 yards downstream of the point at which the drainage ditch enters Raccoon Creek (see Figure 3-2 for surface water sampling locations). Surface water sample SW2 was collected from Raccoon Creek, near where a surface water pathway on the northwest portion of the fill area drains into Raccoon Creek. Surface water sample SW3 was collected as a potential background sample from Raccoon Creek in Autswood Park, approximately 1 mile south of the site (see Figure 3-3 for an additional surface water sampling location).

All surface water samples were collected by submerging the sample bottles beneath the water. In accordance with U.S. EPA quality assurance/quality control requirements, a duplicate surface water sample and a field blank sample were collected. The field blank sample was prepared from distilled water. The duplicate sample was collected at location SW2.

As directed by U.S. EPA, all surface water samples were analyzed using the U.S. EPA CLP.

4. ANALYTICAL RESULTS

This section presents results of the chemical analysis of FIT-collected soil/sediment and surface water samples for TCL compounds and TAL analytes. All samples were analyzed for volatile organics, semi-volatile organics, pesticides/polychlorinated biphenyls (PCBs), metals, and cyanides. Complete chemical analysis results of FIT-collected soil/sediment and surface water samples are provided in Tables 4-1 and 4-2.

Quantitation/detection limits used in the analysis of soil/sediment and surface water samples are provided in Appendix D.

The analytical data for the chemical analysis of soil/sediment and surface water samples collected for this SSI have been reviewed by U.S. EPA for compliance with the terms of CLP, and the review has been approved by U.S. EPA. The analytical data have also been reviewed by FIT for validity and usability. Any additions, deletions, or changes to the data have been incorporated in the chemical analysis results tables presented in this section.

Table 4-1 (Cont.)

COMPOUND QUALIFIERS	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.	Alerts data user to a possible change in the CRDL. Data is quantitative.
ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
N	Spike recoveries outside QC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.	Value may be quantitative or semiquantitative.
A	Duplicate value outside QC protocols which indicates a possible matrix problem.	Value may be quantitative or semiquantitative.
B	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semiquantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.
W	Post-digestion spike for furnace AA analysis is out of control limits (35-115%), while sample absorbance is <50% of spike absorbance.	Value may be semiquantitative.

Table 4-1 (Cont.)

Sample Collection Information
and Parameters

Analyte Detected (values in mg/kg)	Sample Number							
	S1 <i>Sed. Waste</i> Compare to S3	S2 <i>Sed. Waste adj.</i> Compare to S3	S3 <i>Sed. Block upst. no.</i> Park	S4 <i>Soil/sed. Pond</i> Compare to S8	S5 <i>Soil/sed. east</i> compare to S8	S6 <i>Leachate/sed. east</i> Compare to S8	S7 <i>Soil/Waste</i> compare to S8	S8 <i>On site Block</i> EWTP
aluminum	25,600	10,300	4,140	15,000	19,800	10,200	12,500	22,700
antimony	--	--	--	11.9BNJ <i>yes</i>	--	--	--	--
arsenic	9.3NAJ	6.8NAJ	1.88NAJ	9.8NAJ	8NAJ	5.6NAJ	20.2NAJ	12.4NAJ
barium	249 <i>yes</i>	209 <i>yes</i>	20.1B	90.5	116	183	957 <i>yes</i>	120
beryllium	1.2BJ	0.95BJ	--	0.65BJ	0.91BJ	0.34BJ	0.44BJ	1.7
cadmium	1.7B	--	--	--	--	1.3B	--	--
calcium	36,800 <i>yes</i>	38,600 <i>yes</i>	8,120	48,300 <i>yes</i>	16,100 <i>yes</i>	20,200 <i>yes</i>	31,600 <i>yes</i>	4,130
chromium	43.4	31.8	6.3J	18.2	24.1	17	31.9	22.2
cobalt	49 <i>yes</i>	38 <i>yes</i>	2.6B	9.9B	11.4B	13.1B	104 <i>yes</i>	13.7
copper	99.8AJ <i>yes</i>	73AJ	6.3AJ	23.3AJ	27.8AJ	543AJ <i>yes</i>	64.2AJ	26.6AJ
iron	27,300 <i>yes</i>	17,500	6,550	--	20,800 <i>yes</i>	17,000 <i>yes</i>	29,700 <i>yes</i>	298
lead	74.9AJ	188AJ <i>yes</i>	7.2AJ	17.6AJ	31.3AJ	118AJ <i>yes</i>	201AJ <i>yes</i>	34AJ
magnesium	12,000 <i>yes</i>	13,000 <i>yes</i>	2,670	15,900 <i>yes</i>	6,390	5,990	9,560	4,580
manganese	503	269	94.2	399	350	322	565	686
mercury	0.41	0.21	--	--	--	--	--	--
nickel	90.3 <i>yes</i>	50.5	--	20.8	19.3	17.6	104 <i>yes</i>	30.1
potassium	6,810 <i>yes</i>	2,760	989B	4,500	6,070	2,820	4,190	5,010
selenium	0.598NAJ	--	--	--	--	0.358NAJ	--	0.438NAJ
silver	--	--	--	--	--	--	1.1BNJ	--
sodium	476B <i>yes</i>	585B <i>yes</i>	146B	289B	1,260B <i>yes</i>	1,090B <i>yes</i>	1,940 <i>yes</i>	151B
vanadium	49.7	22.2	10.3B	31.6	39.3	23.3	26	46.9
zinc	351	359 <i>yes</i>	32.2	62.2	104	159	331	125

-- Not detected.

Table A
 Contract Laboratory Program
 Target Compound List
 Pesticide and PCB Quantitation Limits

COMPOUND	CAS #	WATER	SOIL
			SEDIMENT SLUDGE
alpha-BHC	319-84-6	0.05 ug/L	8 ug/Kg
beta-BHC	319-85-7	0.05	8
delta-BHC	319-86-8	0.05	8
gamma-BHC (Lindane)	58-89-9	0.05	8
Heptachlor	76-44-8	0.05	8
Aldrin	309-00-2	0.05	8
Heptachlor epoxide	1024-57-3	0.05	8
Endosulfan I	959-98-8	0.05	8
Dieldrin	60-57-1	0.10	16
4,4'-DDE	72-55-9	0.10	16
Endrin	72-20-8	0.10	16
Endosulfan II	33213-65-9	0.10	16
4,4'-DDD	72-54-8	0.10	16
Endosulfan sulfate	1031-07-8	0.10	16
4,4'-DDT	50-29-3	0.10	16
Methoxychlor (Mariate)	72-43-5	0.5	80
Endrin ketone	53494-70-5	0.10	16
alpha-Chlordane	5103-71-9	0.5	80
gamma-chlordane	5103-74-2	0.5	80
Toxaphene	8001-35-2	1.0	160
AROCLOR-1016	12674-11-2	0.5	80
AROCLOR-1221	11104-28-2	0.5	80
AROCLOR-1232	11141-16-5	0.5	80
AROCLOR-1242	53469-21-9	0.5	80
AROCLOR-1248	12672-29-6	0.5	80
AROCLOR-1254	11097-69-1	1.0	160
AROCLOR-1260	11096-82-5	1.0	160

Contract Laboratory Program
Target Compound List
Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Chloromethane	74-87-3	10 ug/L	10 ug/Kg
Bromomethane	74-83-9	10	10
Vinyl chloride	75-01-4	10	10
Chloroethane	75-00-3	10	10
Methylene chloride	75-09-2	5	5
Acetone	67-64-1	10	5
Carbon disulfide	75-15-0	5	5
1,1-dichloroethene	75-35-4	5	5
1,1-dichloroethane	75-34-3	5	5
1,2-dichloroethene (total)	540-59-0	5	5
Chloroform	67-66-3	5	5
1,2-dichloroethane	107-06-2	5	5
2-butanone (MEK)	78-93-3	10	10
1,1,1-trichloroethane	71-55-6	5	5
Carbon tetrachloride	56-23-5	5	5
Vinyl acetate	108-05-4	10	10
Bromodichloromethane	75-27-4	5	5
1,2-dichloropropane	78-87-5	5	5
cis-1,3-dichloropropene	10061-01-5	5	5
Trichloroethene	79-01-6	5	5
Dibromochloromethane	124-48-1	5	5
1,1,2-trichloroethane	79-00-5	5	5
Benzene	71-43-2	5	5
Trans-1,3-dichloropropene	10061-02-6	5	5
Bromoform	75-25-2	5	5
4-Methyl-2-pentanone	108-10-1	10	10
2-Hexanone	591-78-6	10	10
Tetrachloroethene	127-18-4	5	5
Toluene	108-88-3	5	5
1,1,2,2-tetrachloroethane	79-34-5	5	5
Chlorobenzene	108-90-7	5	5
Ethyl benzene	100-41-4	5	5
Styrene	100-42-5	5	5
Xylenes (total)	1330-20-7	5	5

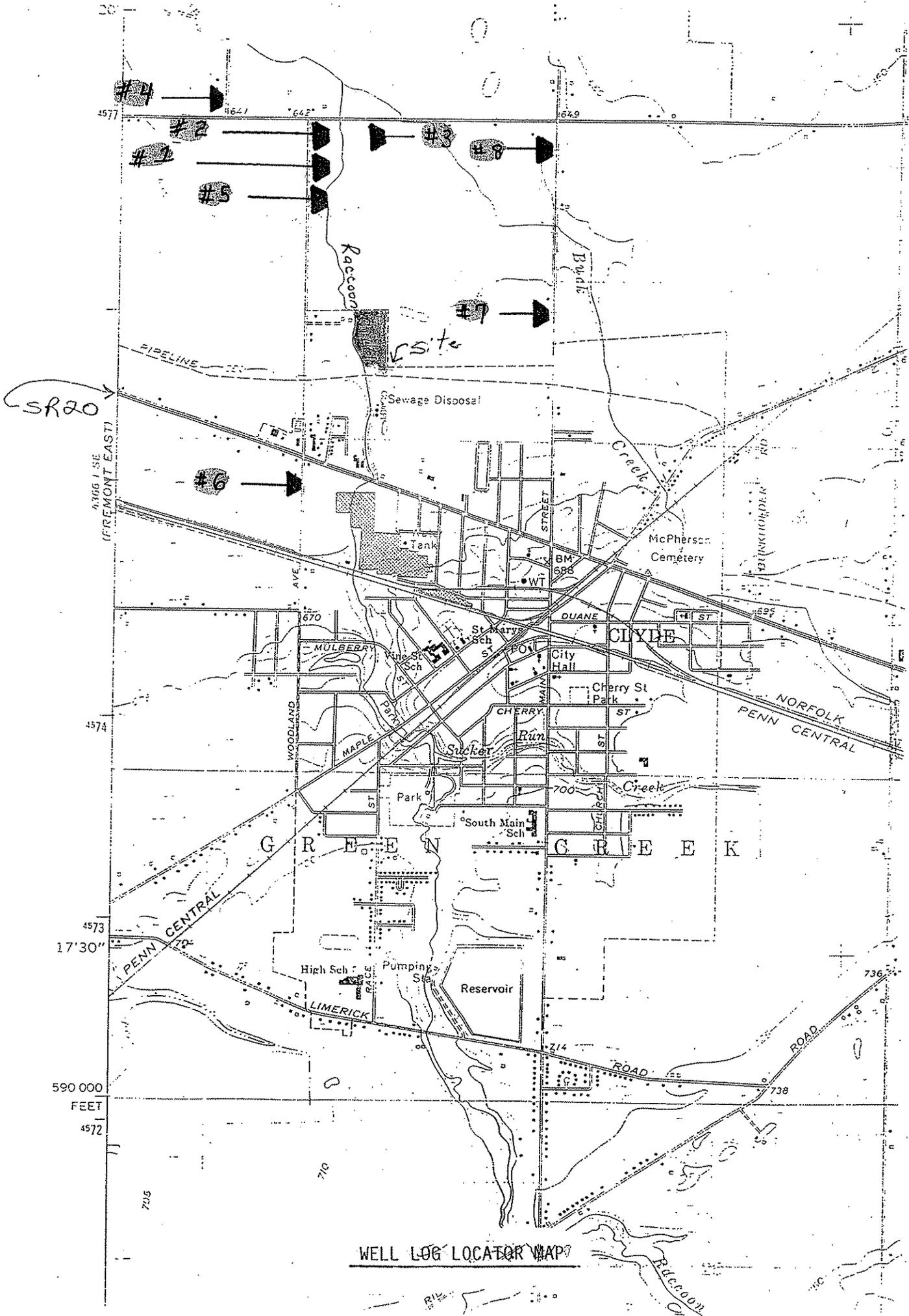
Table A (Cont.)

CONTRACT LABORATORY PROGRAM
 TARGET ANALYTE LIST (TAL)
 INORGANIC DETECTION LIMITS

Compound	Procedure	Detection Limits	
		Water (µg/L)	Soil Sediment Sludge (mg/kg)
aluminum	ICP	200	40
antimony	furnace	60	2.4
arsenic	furnace	10	2
barium	ICP	200	40
beryllium	ICP	5	1
cadmium	ICP	5	1
calcium	ICP	5,000	1,000
chromium	ICP	10	2
cobalt	ICP	50	10
copper	ICP	25	5
iron	ICP	100	20
lead	furnace	5	1
magnesium	ICP	5,000	1,000
manganese	ICP	15	3
mercury	cold vapor	0.2	0.008
nickel	ICP	40	8
potassium	ICP	5,000	1,000
selenium	furnace	5	1
silver	ICP	10	2
sodium	ICP	5,000	1,000
thallium	furnace	10	2
tin	ICP	40	8
vanadium	ICP	50	10
zinc	ICP	20	4
cyanide	color	10	2

3767:1

Appendix E



WELL LOG LOCATOR MAP

WELL LOG AND DRILLING REPORT

21-605 AP ORIGINAL



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

#8

~~No. 130144~~

County Sandusky Township GreenCreek Section of Township _____
or Lot Number _____

Owner D.R. Rini Address Clyde, Ohio.

Location of property N. of Clyde, O. on Rt. 510

CONSTRUCTION DETAILS

PUMPING TEST

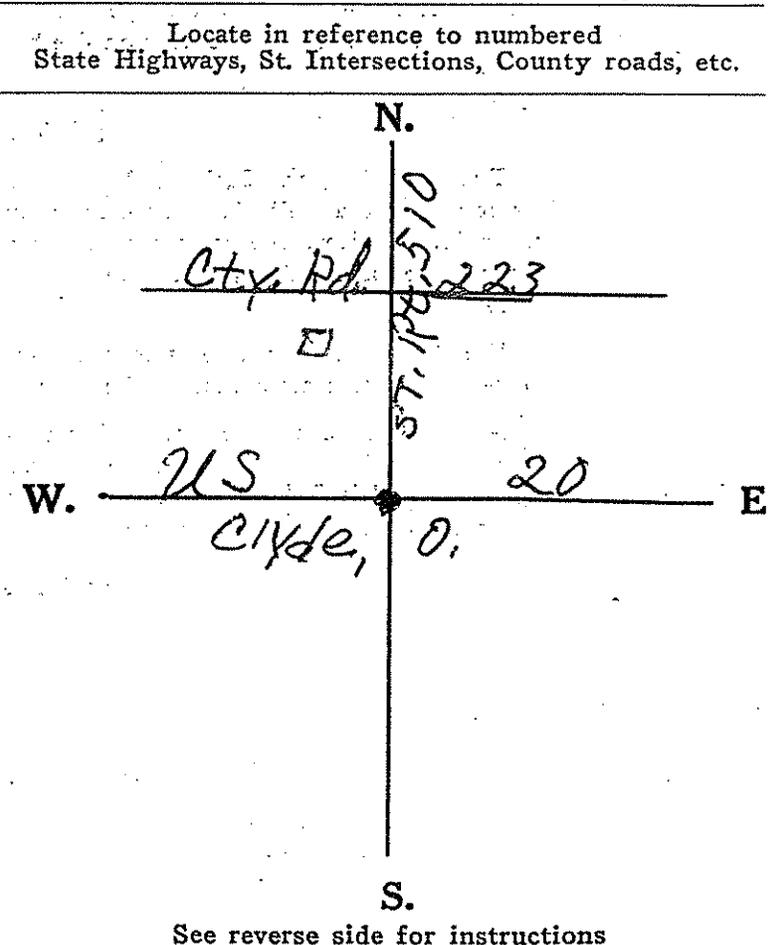
Casing diameter 4 3/4" Length of casing 47'
Type of screen _____ Length of screen _____
Type of pump _____
Capacity of pump _____
Depth of pump setting _____

Pumping rate _____ G.P.M. Duration of test _____ hrs
Drawdown _____ ft. Date 6/15/56
Developed capacity _____
Static level—depth to water Flowing Well ft.
Pump installed by _____

WELL LOG

SKETCH SHOWING LOCATION

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	13 Ft.
Grey Muck	13	26
Blue Clay	26	43
Hard Pan	43	45
Limestone	45	51



See reverse side for instructions

Drilling Firm Robertson's
Address Belleveue, O.

Date 6/15/56
Signed H. W. Robertson

1869 500
601 900 N

WELL LOG AND DRILLING REPORT

29 ⁴³/₁₀ BP

ORIGINAL

LOCATED

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

~~N: 121610~~
#7

County Sandusky Township Green Creek Section of Township or Lot Number P.E. S.E. 1/4 Sec 11
Owner Mr. Hal E. Shaul Address 168 1/2 East Buckeye st Clyde Ohio
Location of property on Ohio' Rant 510 1/2 mi north of Clyde Ohio

CONSTRUCTION DETAILS

PUMPING TEST

Casing diameter 4 1/2 od Length of casing 54' 6"
Type of screen NONE Length of screen _____
Type of pump _____
Capacity of pump _____
Depth of pump setting _____

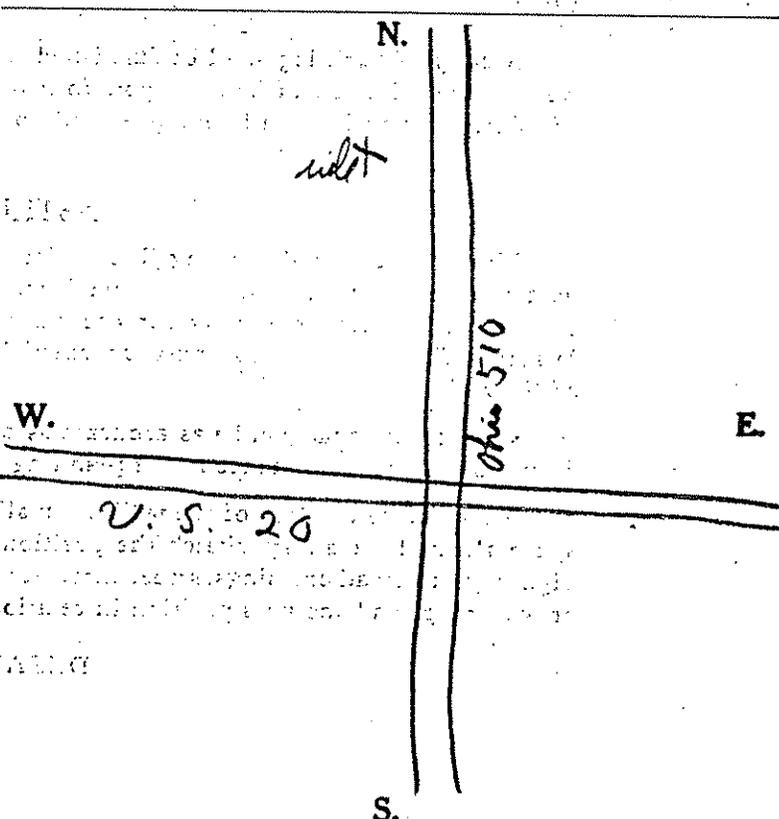
Pumping rate 7 G.P.M. Duration of test 1 hrs.
Drawdown 9" ft. Date 5-26-54
Developed capacity _____
Static level—depth to water 1 ft.
Pump installed by _____

WELL LOG

SKETCH SHOWING LOCATION

Formations Sandstone, shale, limestone, gravel and clay	From	To
Low Clay	0 Feet	12 Ft.
of Clay	12	26
red Sand	26	43
sh.	43	68
Total Depth	68	

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



See reverse side for instructions

Drilling Firm Clayton Cessna
Address Kansas Ohio

Date May 26-54
Signed C. Cessna

WELL LOG AND DRILLING REPORT

63 ⁵²/₆₀₈ (p #6) ORIGINAL

1865 400

LOCATED

State of Ohio
OHIO WATER RESOURCES BOARD
Department of Public Works
553 E. Broad St., Columbus 15, Ohio

63 N° ~~57649~~

599 300

County Sandusky Township Greencreek Section of Township Pt. NW. 1/4 Sec 14
or Lot Number
Owner Mr. Harold Bucklew Address P.O. Box 52 Clyde Ohio
Location of property on County Road #246 about 1000 ft. South of R.S. 20.

CONSTRUCTION DETAILS

PUMPING TEST

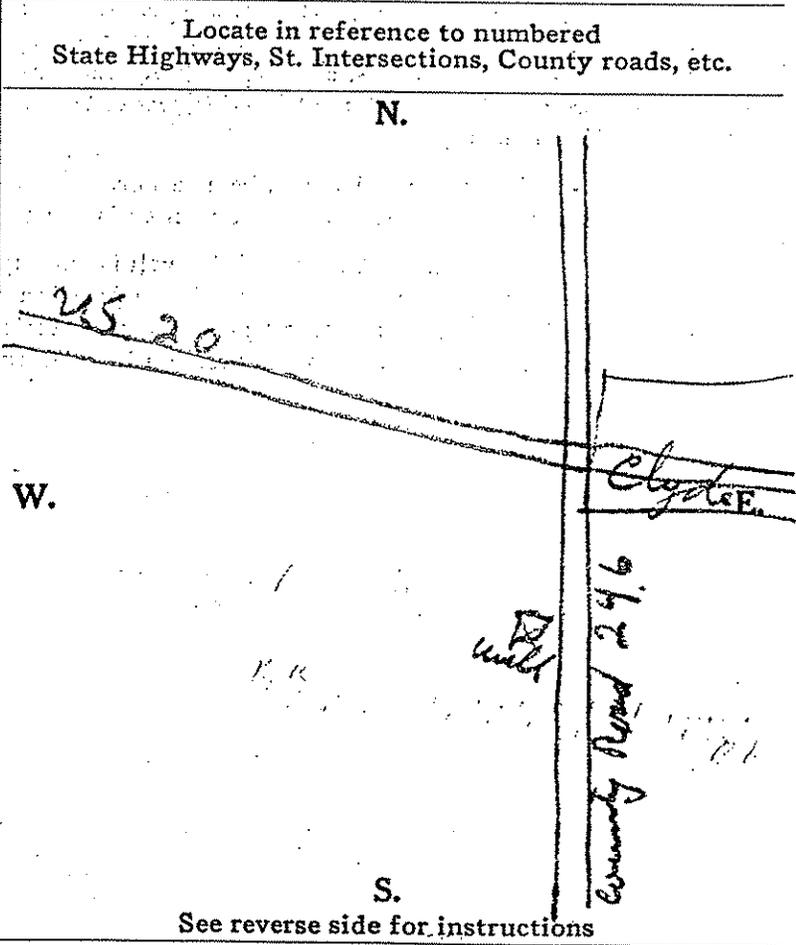
Casing diameter 4 1/2" OD Length of casing 60
Type of screen NONE Length of screen
Type of pump
Capacity of pump
Depth of pump setting

Pumping rate 1.0 G.P.M. Duration of test _____ hrs.
Drawdown NONE ft. Date Aug 29-51
Developed capacity
Static level of completed well interior ft.
Pump installed by

WELL LOG

SKETCH SHOWING LOCATION

Formations Sandstone, shale, limestone, gravel and clay	From	To
<u>1st Pan</u>	<u>0 Feet</u>	<u>15 Ft.</u>
<u>red & gravel</u>	<u>18</u>	<u>35</u>
<u>ve clay</u>	<u>35</u>	<u>50</u>
<u>2nd Pan</u>	<u>35</u>	<u>50</u>
<u>red & gravel</u>	<u>50</u>	<u>52</u>
<u>sh</u>	<u>52</u>	<u>64</u>
<u>total Depth</u>	<u>64</u>	



Drilling Firm Clayton Cessna
Address Kansas Ohio

Date Aug 29-51
Signed Clayton Cessna

WELL LOG AND DRILLING REPORT

20 ⁶⁰/₅₉₂ 13P

ORIGINAL



State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

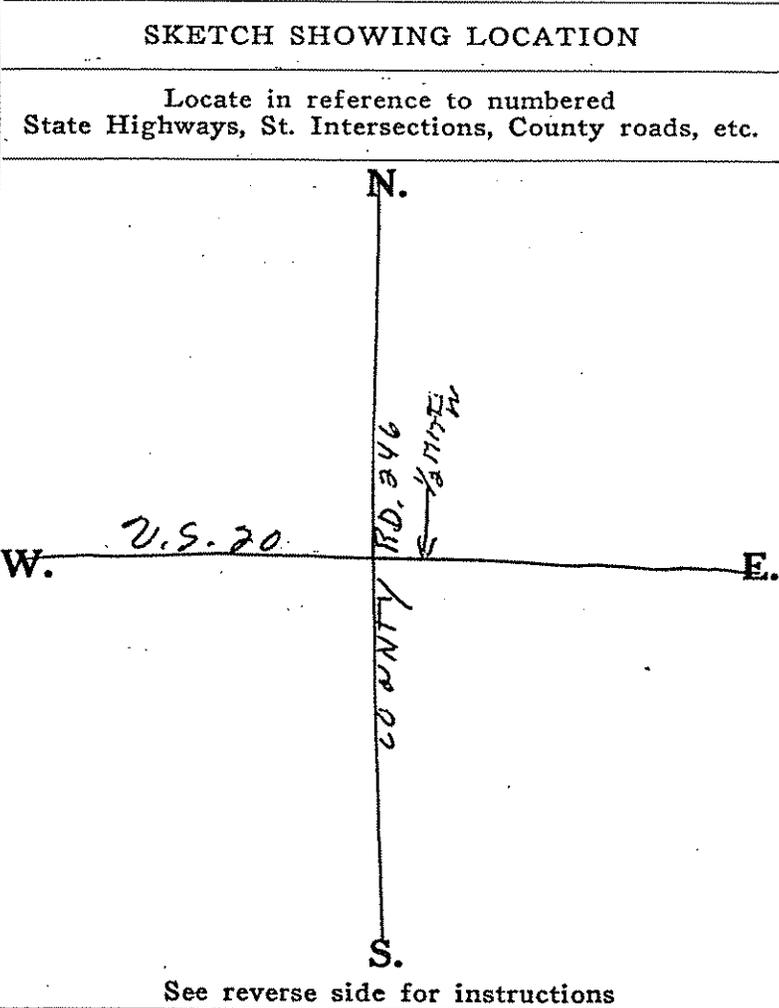
#5

~~No. 213556~~

County SANDUSKY Township GREEN CREEK Section of Township _____
 Owner CARL G. WILT Address CLYDE, O
 Location of property CLYDE, O COUNTY ROAD 246-N.

CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Drilling diameter <u>4 1/4</u> Length of casing <u>67</u>	Pumping rate <u>5</u> G.P.M. Duration of test <u>1</u> hrs.
Depth of screen _____ Length of screen _____	Drawdown <u>3</u> ft. Date <u>1-24-58</u>
Type of pump _____	Developed capacity _____
Capacity of pump _____	Static level—depth to water <u>FLOWING</u> ft.
Depth of pump setting _____	Pump installed by _____
Date of completion <u>1-24-58</u>	

WELL LOG		
Formations sandstone, shale, limestone, gravel and clay	From	To
<u>TOP SOIL</u>	<u>0 Feet</u>	<u>20 Ft.</u>
<u>HARD PAN</u>	<u>20</u>	<u>35</u>
<u>SAND & GRAVEL</u>	<u>35</u>	<u>35</u>
<u>GRAVEL</u>	<u>35</u>	<u>60</u>
<u>LIME STONE</u>	<u>60</u>	<u>64</u>



RECEIVED
10887 MAR 12 9 21 AM '58

See reverse side for instructions

Drilling Firm Robert O. Martin
 Address Belleme, O.

Date Jul. 28, 1958
 Signed Robert O. Martin

WELL LOG AND DRILLING REPORT

PLEASE USE PENCIL
OR TYPEWRITER.
DO NOT USE INK.

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

95 (#4)
~~No. 233362~~
OK
3

County SANDUSKY Township FRESH CREEK Section of Township 3
Owner TOM CULLEN Address RFD CLYDE, O
Location of property ON 242 1/10 Mi N. OF 223

CONSTRUCTION DETAILS

Casing diameter 4 1/4 Length of casing 74
Diameter of screen..... Length of screen.....
Type of pump.....
Capacity of pump.....
Depth of pump setting.....
Date of completion.....

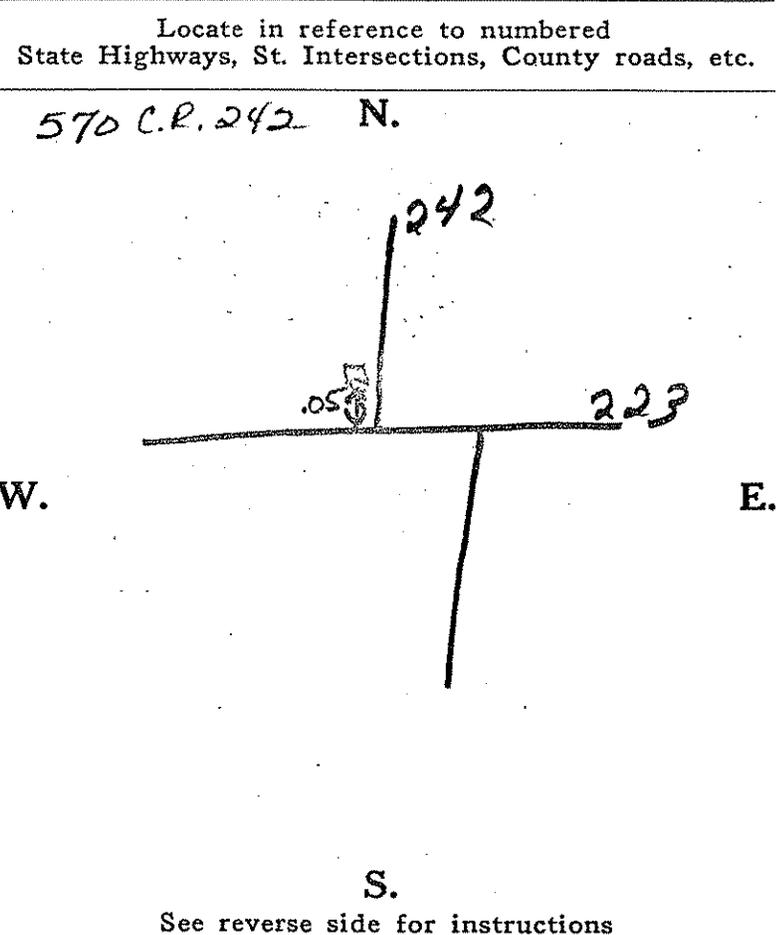
BAILING OR PUMPING TEST

Pumping rate 10 G.P.M. Duration of test..... hrs.
Drawdown 0 ft. Date.....
Developed capacity.....
Static level—depth to water 10 ft.
Pump installed by.....

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	<u>28</u> Ft.
<u>CLAY</u>	<u>28</u>	<u>34</u>
<u>GRAVEL</u>	<u>34</u>	<u>70</u>
<u>CLAY</u>	<u>70</u>	<u>78</u>
<u>LIMESTONE</u>		

SKETCH SHOWING LOCATION



Drilling Firm PARMENTER DRILLING CO.
Address 631 N. MAIN FOSTORIA, O.
PHONE HE 5-6151

Date 5-59
Signed J.P. Parmenter

(21)

County Permit No. _____

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER
NECESSARY -
SELF-TRANSCRIBING

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

#07

550433

#3

COUNTY Sandusky TOWNSHIP Green Creek SECTION OF TOWNSHIP 11

OWNER Himerick Sales & Supply ADDRESS Co Rd 197 Clyde, O

LOCATION OF PROPERTY Co Rd 233 - 1/4 mi. E. of Co Rd 246

CONSTRUCTION DETAILS		BAILING OR PUMPING TEST (specify one by circling)	
Log diameter <u>5 7/8"</u>	Length of casing <u>66 3/4"</u>	Test rate <u>25</u> gpm	Duration of test <u>1</u> hrs
Depth of screen _____	Length of screen _____	Drawdown <u>10</u> ft	Date <u>3-12-79</u>
Type of pump <u>Deep Well</u>		Static level (depth to water) <u>1'</u>	ft
Capacity of pump _____		Quality (clear, cloudy, taste, odor) <u>Appears Good</u>	
Depth of pump setting <u>60'</u>		Pump installed by _____	
Date of completion <u>3-12-79</u>			

WELL LOG*			SKETCH SHOWING LOCATION
Formations: sandstone, shale, limestone, gravel, clay	From	To	Locate in reference to numbered state highways, street intersections, county roads, etc.
<u>Yellow clay</u>	<u>0</u> ft	<u>15</u> ft	<u>3805 C.R. 223 N</u>
<u>Blue clay</u>	<u>15</u>	<u>40</u>	
<u>red gravel</u>	<u>40</u>	<u>67</u>	

DRILLING FIRM TIBBOL'S WELL DRILLING, INC.
ADDRESS 8377 No. St. Rt 18
RR 3 Bellevue, Ohio 44811

DATE 3-12-79
SIGNED W.M. Tibbols

75

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

Appendix F

See Confidential File