FINAL REPORT

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

PHASE II INVESTIGATIONS

Volume I

Tri-Cities Barrel	Site No. 704005
Town of Fenton	Broome County

Prepared for:

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Environmental Conservation
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ENGINEERING-SCIENCE
In Association With
DAMES & MOORE

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

VOLUME I

TRI-CITIES BARREL
NYS SITE NUMBER 704005
TOWN OF FENTON
BROOME COUNTY
NEW YORK STATE

Prepared For

DIVISION OF SOLID AND HAZARDOUS WASTE
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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TRI-CITIES BARREL

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SECTION I
EXECUTIVE SUMMARY

SITE BACKGROUND

The Tri-Cities Barrel site is located approximately five miles northeast of Binghamton, adjacent to old Route 7, in the Town of Fenton, Broome County, New York. Interstate 88 borders the site to the north while the rest of the site is bordered by rural residential areas and farmlands (see Figures I-1 and I-2).

The site is owned and operated by Mr. Gary Warner of Port Crane, New York who uses the site to reprocess used drums. The reclamation process involves a thorough cleaning of the interior of the barrels with a sodium hydroxide solution and repainting. Although the wastewater generated in the cleaning process is currently collected in a holding tank and hauled off-site for disposal, the wastewater was previously held in three on-site, unlined storage lagoons and allowed to evaporate. In 1980, the lagoons were emptied and covered with indigenous soil in response to a consent order filed by the New York State Department of Environmental Conservation (NYSDEC) (Manes, 1986).

An incinerator was also used at this site for the incineration of flammable solids (Warner, G., 1983). The ash produced in this process was packaged and shipped off-site for disposal (Warner, G., 1983). Ash has also been spilled on the ground in the viciity of the site (Alden, 1986).

PHASE II INVESTIGATION

The field investigation included electrical resistivity and magnetometer surveys to define the site geologic conditions and the presence of any potential contaminant plume. Surface water, groundwater, sediment, soil, and air sampling and analysis was conducted to define the extent of potential contamination at the Tri-Cities Barrel site.

The geological stratigraphy at the site can be summarized as follows:

- Fill (silty sands with some clayey fine sands)
- Inorganic silts and very fine sands
- Fine sands and silt mixtures with little clayey silts
- Bedrock (moderately fissile, gray shale)

The water table at this area is at a depth of less than 30 feet with local groundwater flow to the north.

SITE ASSESSMENT

Four groundwater samples were collected at the Tri-Cities Barrel site and were analyzed for organic compounds (GC/MS scan). One of the downgradient monitoring wells had concentrations of Trans-1,2-dichloroethylene (17 ug/l), trichloroethylene (10 ug/l), Bis(2-ethylhexyl)-phthalate (24 ug/l), 1,1-dichloroethane (9.2 ug/l), 1,1,1-trichloroethane (12 ug/l) and toluene (68 ug/l) at levels higher than the upgradient sample.

Three surface water and sediment samples were collected and analyzed for metals (ICPES), and organics (GC/MS scan). No organic constituents were found in any of these samples. Chromium, manganese, potassium, tin, zinc, and lead were found at higher concentrations in the downgradient sediment samples than in the upgradient sample.

Three soil samples were collected from this site, one from an auger hole and two from surface soil locations. The sample collected from the auger hole (SS-3) had detectable concentrations of several halogenated organic contaminants including tetrachloroethylene (76 ug/kg), 1,1-dichloroethene (6.3 ug/kg), Trans-1,2-dichloroethene (20 ug/kg), 1,1,1-trichloroethane (17 ug/kg), and trichloroethylene (14 ug/kg). Tetrachloroethylene was also detected in the SS-2 surface soil sample at 20 ug/kg.

The HNU meter air quality survey showed no detectable concentrations of volatile organic chemicals in the air above background levels, although high readings were encountered at a depth of 4 feet as the SS-2 auger hole was drilled.

The electrical resistivity study at this site indicated a geophysical anomaly north of the site which may indicate the presence of a contaminant plume. The magnetometer survey identified the areas of disturbed and/or contaminated soil around the perimeter of the filled in lagoons.

HAZARD RANKING SYSTEM SCORE

In an attempt to quantify the risk associated with this site, the Hazard Ranking Scoring system (HRS) was applied as currently being used by the NYSDEC to evaluate abandoned hazardous waste sites in New York State. This system takes into account the types of wastes at the site, receptors, and transport routes to apply a numerical ranking of the site. As stated in 40 CFR Subpart H Section 300.81, the HRS scoring system was developed to be used in evaluating the relative potential of uncontrolled hazardous disposal facilities to cause health or safety problems or ecological or environmental damage. It is assumed by the EPA that a uniform application of the ranking system in each state will permit EPA to identify those releases of hazardous substances that pose the greatest hazard to humans or the environment.

Under the HRS, three numerical scores are computed for each site, to express the relative risk or danger from the site, taking into account the population at risk, the potential for contamination of drinking water supplies, for direct human contact, and for destruction of sensitive ecological systems and other appropriate factors. The three scores are:

- S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving groundwater, surface water and air. It is a composite of separate scores for each of the three routes (S_{GW} = groundwater route score, S_{SW} = surface water route score, and S_A = air route score).

- S_{FE} reflects the potential for harm from substances that can explode or cause fires.

- S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

Based on the results of this study and previous studies, the HRS scores for the Tri-Cities Barrel site have been calculated as follows:

S_M = 48.33

S_{FE} = 0.00

S_{DC} = 25.00

S_{GW} = 82.89

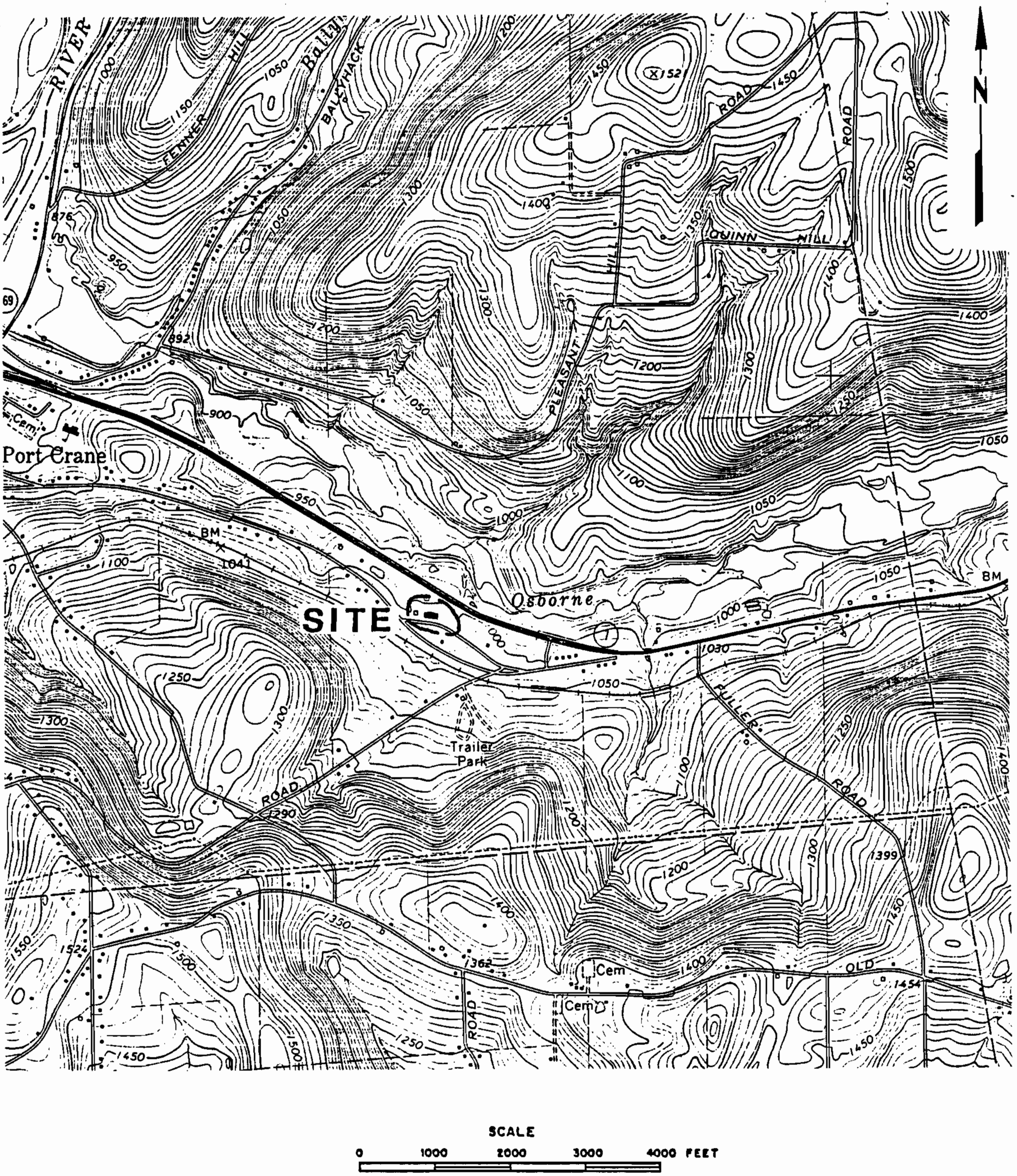
S_{SW} = 10.91

S_A = 0.00

These scores reflect the presence of toxic and persistent chemicals in the groundwater and the use of the groundwater as a sole source of drinking water for the nearby residents.

RECOMMENDATIONS

Based on the results of the Phase II investigation, a complete remedial investigation and feasibility study is recommended for the Tri-Cities Barrel facilities. This study should include an expanded network of groundwater monitoring wells and auger holes to better define the extent of aquifer and soil contamination.



Latitude = 42° 09' 45.4"
Longitude = 75° 50' 29.6"

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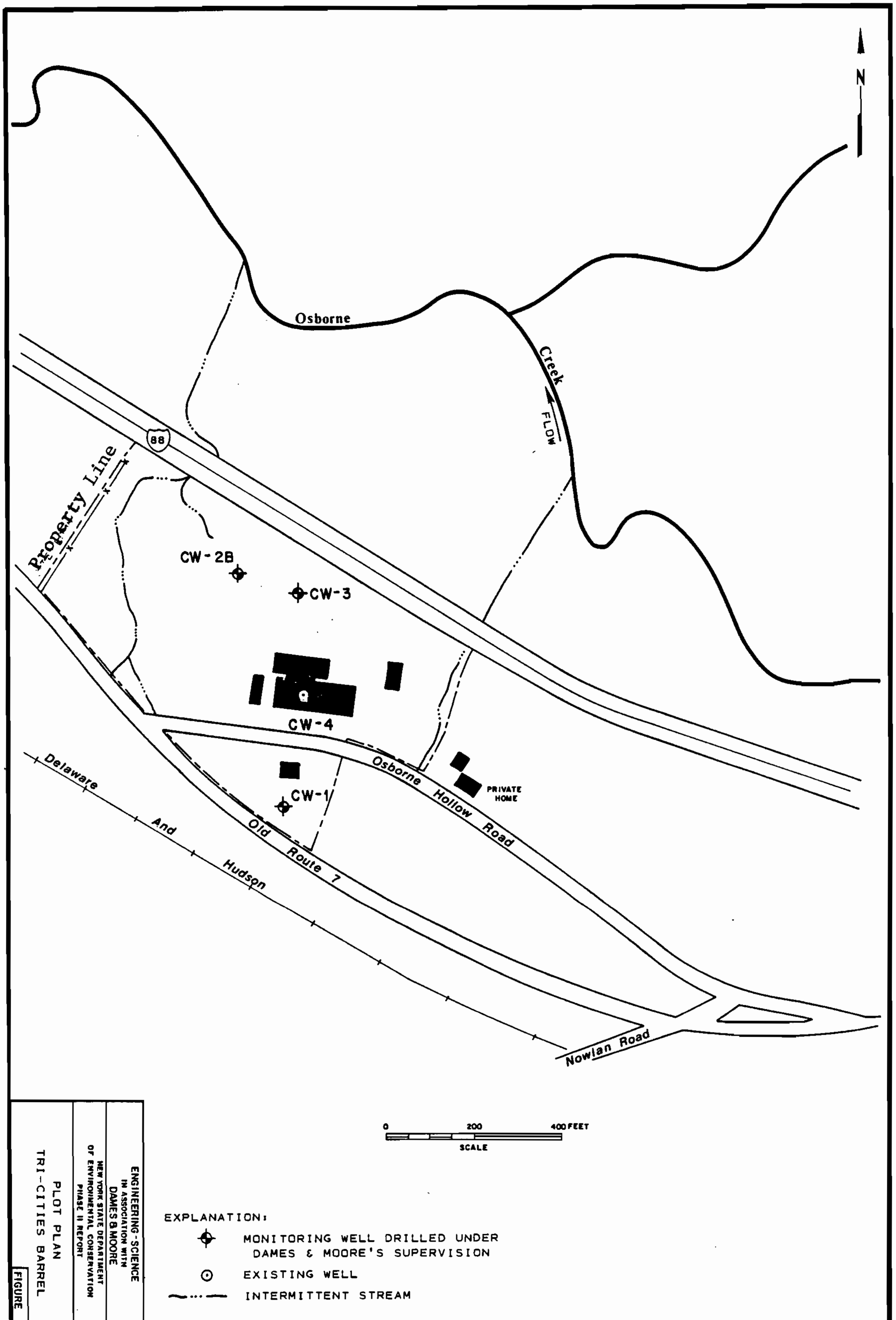
PHASE II REPORT

SITE LOCATION MAP
TRI-CITIES BARREL

FIGURE I-1

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP,
CHENANGO FORKS, NY (1968) QUADRANGLE



REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP,
CHENANGO FORKS, NY (1968) QUADRANGLE

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PLOT PLAN
TRI-CITIES BARREL

FIGURE I-2

SECTION II
PURPOSE

BACKGROUND INFORMATION

The Tri-Cities Barrel site (Site I.D. 704005) is located along Interstate Highway I-88 in the Town of Fenton in Broome County. The property is owned and operated by Mr. Gary Warner of Port Crane, New York.

This facility has been used as a barrel reclamation facility since 1955 (Warner, 1985). The reclamation process involves a thorough cleaning of the interior of the barrels with a sodium hydroxide solution and repainting. Although the wastewater generated in the cleaning process is currently collected in a holding tank and hauled off-site for disposal, the wastewater was previously discharged to unlined lagoons and allowed to evaporate. The first lagoon acted as an oil and water separator, the second lagoon received the sodium hydroxide solution, and the third contained relatively clean rinse water.

The period of operation of the lagoons is not certain, however, a 1973 aerial photograph shows the lagoons in operation (Warner, 1985). Under a consent order with the New York State Department of Environmental Conservation (NYSDEC), the lagoons were pumped out and backfilled in 1980.

A Phase I investigation was conducted at this site by Engineering-Science in conjunction with Dames & Moore in June 1983. The data used to complete the HRS score for the Phase I report was insufficient. A Phase II investigation was implemented at the Tri-Cities Barrel site to provide additional geophysical data and groundwater, surface water, soil, sediment, and air contamination data.

OBJECTIVES

The purpose of this New York State Department of Environmental Conservation (NYSDEC) Phase II project was to conduct a preliminary engineering investigation and evaluation at the Tri-Cities Barrel site in order to: (1) gather necessary data to calculate the final Hazard Ranking System (HRS) score; (2) formulate a conceptual evaluation of remedial alternatives for the site and to estimate a budgetary capital cost for each alternative; and (3) prepare a site investigation report.

SECTION III
SCOPE OF WORK

INTRODUCTION

The Phase II investigation at the Tri-Cities Barrel site was begun in August, 1985 and completed in December, 1985. A Phase II Work Plan was prepared and approved by the NYSDEC prior to field investigations to define the scope of work at the site. This work plan was later revised based on actual field conditions present during the site visit.

The original work plan included four waste samples which were to be collected if standing water was found in the lagoons. The lagoons were filled in 1980, and are no longer discernable. In addition, a fourth groundwater sample was collected from the on-site 100 foot deep well used by Tri-Cities Barrel for process water. This sample was analyzed for organics using a GC/MS scan. The final change in the work plan was a reduction in the number of soil samples collected from four to three.

SITE INVESTIGATION

The scope of the investigation is summarized in Table III-1 and is described below.

Geophysical Survey

A geophysical study consisting of electrical resistivity and a magnetometer survey was conducted. The electrical resistivity survey was performed at various locations within the area of the site and beyond the perimeter of the site to define the geological stratigraphy and locate any potential contaminant plume. The magnetometer survey was conducted around the areas where the installation of wells was anticipated to ensure the proper placement of the wells. The field procedures for this survey are presented in Appendix A, and the results are presented in Appendix C.

Monitoring Well Installation

Three monitoring wells were installed around the perimeter of the site (see Figure III-1). Well CW-1 was placed upgradient (south) of the site, and wells CW-2B and CW-3 were placed downgradient of the site. Table III-2 summarizes the well locations and specifications. A fourth well, CW-2 was drilled and later grouted in because of potentially inadequate well construction procedures.

Soil was drilled and sampled from the ground surface to a maximum depth of 49.2 feet. PVC wells were installed with filter sand packs, and primary and secondary bentonite seals.

Each well was logged visually during drilling and later with a down hole gamma logging unit. Additionally, aquifer characteristics were evaluated by means of in-situ falling head permeability tests and routine water level measurements. To further characterize the lithology of the site soils, a grain size analysis of each soil unit was performed in the laboratory according to ASTM D-422-63.

All field procedures are detailed in Appendix A. Boring logs, well schematics, and grain size analyses are included in Appendix B.

Groundwater Sampling and Analysis

Groundwater samples were taken from each of the three monitoring wells and the on-site production well in October of 1985. These samples were analyzed for organic constituents by a complete gas chromatography and mass spectroscopy scan (GC/MS scan). NUS Corporation in Pittsburgh, PA performed the analytical testing and reported the results in accordance with the NYSDEC Superfund and Contract Protocols, January 1985. The chemical analytical results are discussed in Section IV and listed in Appendix D. The field procedures are outlined in Appendix A.

Surface Water and Sediment Sampling and Analysis

Three surface water and sediment samples were collected. The upgradient sample (S-1) was collected from the Osborne Creek east of the site (see Figure III-1). The downgradient samples (S-3 and S-2) were collected from a small tributary running from the site to the Osborne Creek, and from the Osborne Creek downstream of the point where the surface water from the site drains into the creek.

These samples were collected in November, 1985 and were analyzed for metals (ICPES) and organic constituents (GC/MS) by NUS Corporation in accordance with NYSDEC protocols. The field procedures are outlined in Appendix A. The chemical analytical results are summarized in Section IV and detailed in Appendix D.

Soil Sampling and Analysis

Three soil samples were collected from the site area and analyzed for metals (ICPES) and organic constituents (GC/MS) by NUS Corporation in accordance with NYSDEC protocols. A background sample (SS-1) was collected from the area south of the barrel reprocessing area (see Figure III-1). The other two samples (SS-2 and SS-3) were collected from the area where the lagoons were suspected of being located. The SS-1 and SS-2 samples were surface soil samples. The SS-3 sample was collected from a 4 foot deep auger hole.

The field procedures for collecting the soil samples are outlined in Appendix A. The chemical analytical results are summarized in Section IV and detailed in Appendix D.

Air Survey

An HNU meter was used to analyze the air above the site for organic contaminants. Additionally, the air above the borings was monitored using an HNu meter during drilling operations to examine for potential release of organic contaminants to the environment.

TABLE III-1
WORK PLAN - TASK DESCRIPTION(1)
TRI-CITIES BARREL

Tasks	Description of Task
TASK	
II-A Update Work Plan	Reviewed the information in the Phase I report, conducted a site visit, examined aerial photography and revised the Phase II work plan.
II-B Conduct Geophysical Studies	Performed an electrical resistivity survey to define the subsurface stratigraphy and locate potential plume. A magnetometer survey was conducted to ensure the proper placement of the wells.
II-C Conduct Boring/ Install Monitoring Wells	Installed three monitoring wells constructed of PVC. The depth of the wells ranged from 34.15 to 49.2 feet; the upgradient well was drilled to bedrock.
II-D Construct Test Pits/ Auger Holes	One auger hole was constructed at the SS-3 soil sampling location.
II-E Perform Sampling and Analysis	
Soil samples from borings	Soil samples collected at intervals of 5-ft or less during drilling. One grain size analysis and permeability test was conducted per subsurface lithology change.
Soil samples from surface soils	Two surface soil samples were collected and analyzed for organic constituents (GC/MS) and metals (ICPES).
Soil samples from test pits and auger holes	One soil sample from a 4' deep auger hole was collected.
Sediment samples from surface waters	Three sediment samples were analyzed for organics using a GC/MS scan and metals (ICPES).

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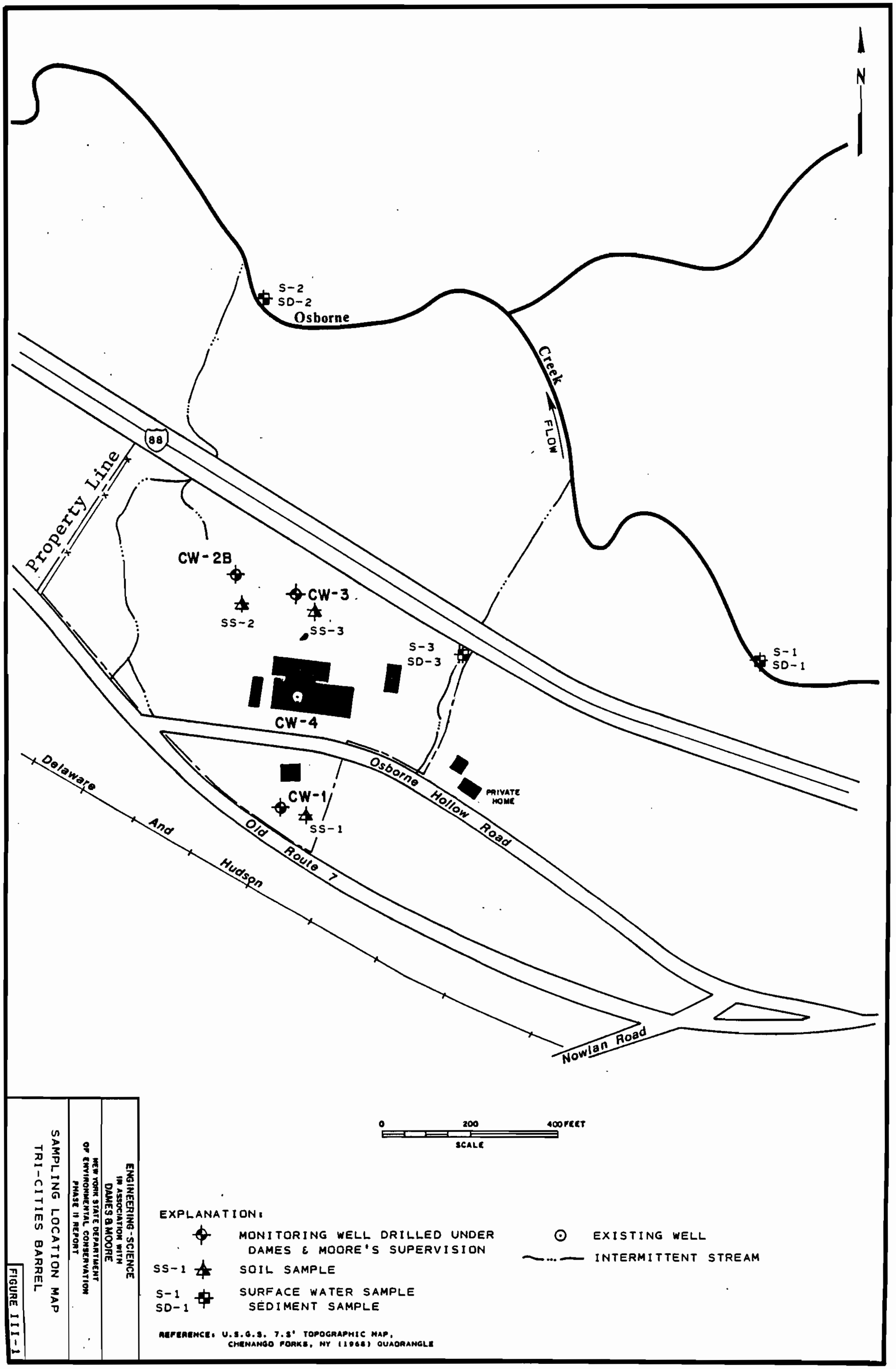
(1) As implemented during the Phase II investigation.

TABLE III-1 (Continued)
WORK PLAN - TASK DESCRIPTION
TRI-CITIES BARREL

Tasks	Description of Task
Groundwater samples	Three groundwater samples from the monitoring wells, and one groundwater sample from the on-site water supply well were collected and analyzed for organics using a GC/MS scan.
Surface water samples	Three surface water samples were analyzed for organics using a GC/MS scan.
Air samples	Using the HNu, the presence of organic vapors were monitored.
Waste samples	No sampling conducted.
II-F Calculate Final HRS	Based on the field data collected in Tasks IIB - IIE, the HRS form was completed.
II-G Conduct Site Assessment	A final report containing significant Phase I information, additional field data, final HRS score and HRS documentation records, and site assessments was written. The site assessment consisted of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.
II-H Project Management	Project coordination, administration and reporting.

TABLE III-2
MONTORING WELL LOCATIONS AND SPECIFICATIONS
TRI-CITIES BARREL

Well Number	Upgradient/ Downgradient	Depth (ft)	Depth of Screening (ft)
1	Upgradient	34.15	24.15 - 34.15
2B	Downgradient	49.2	39.2 - 49.2
3	Downgradient	49.0	39.0 - 49.0



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SAMPLING LOCATION MAP
TRI-CITIES BARREL

FIGURE III-1

SECTION IV

SITE ASSESSMENT

SITE TOPOGRAPHY

The Tri-Cities Barrel site is located approximately 5 miles northeast of Binghamton, adjacent to Old Route 7, in the Town of Fenton, Broome County, New York (see Figure IV-1). The site is approximately 3-acres in size and has an elevation of about 1,015 feet above sea level. Interstate 88 borders the site to the north, while the rest of the site is bordered by rural residential areas and farmland (Figure IV-2).

The surface of the site is relatively flat. Beyond the northern boundary the ground surface slopes steeply to the north. Prior to 1980, there were three lagoons (3 to 4 feet deep) on-site used for the collection and evaporation of waste water. In 1980, these were filled in with approximately 7,000 cubic yards of fill from property owned by Mr. Warner south of Old Route 7 (Warner, 11/14/85). Over the years the site has been filled in to build a new yard for storage and operations. The original ground surface was 4 to 8 feet below the current ground surface (Warner, 11/19/85 and Phase II Boring Logs). A large portion of the site is now used as a storage area for 55-gallon drums awaiting processing (Site Inspection, 1985).

A drainage ditch is located on the eastern edge of the site. Also a small, intermittent drainage feature crosses the middle of the site (see Figure IV-2). Both features flow to the north, eventually reaching Osborne Creek, which drains to the west into the Chenango River. The site is also spotted with many small areas of ponded, stagnant water. Several of these puddles have some discoloration in the water (ES/D&M Site Visit, 1985). The nearest registered wetland is approximately 3 miles northeast of the site (Cotterill, 11/14/85).

SITE HYDROLOGY

Regional Geology and Hydrology

This summary of regional geology and hydrology is based on information obtained from the USDA Soil Survey of Broome County; the Reappraisal of the Glaciated Appalachian Plateau, D. R. Coates, 1974; NYSGA Guidebook, 46th Annual Meeting, 1974; NYSGA Guidebook, 32nd Annual Meeting, 1960; and the Phase II investigation.

The Tri-Cities Barrel site is located in the Appalachian Highlands physiographic province. The geology of the province is characterized by thick accumulations of clastic sedimentary rocks of the Devonian Period. These deposits originated in the Catskill delta-alluvial plain type of sedimentation. Layered sequences of sedimentary rocks extend thousands of feet deep, and dip gently to the south. Tectonic activity resulted in fractures and joint-sets with a general northeast trend. Movement of water in bedrock is largely restricted to bedding planes and fracture systems and regional flow is expected to be generally southward.

In the recent geologic past, most of New York State, including the site, was repeatedly covered by a series of continental ice sheets. Glacial activity played a significant role in re-forming the existing landforms. Preferential erosion widened existing valleys and lowered upland surfaces, while glacial deposition resulted in widespread accumulations of till. The Appalachian Highlands is also characterized by an assortment of stratified meltwater sediments; including glaciofluvial and glaciolacustrine deposits, as a result of the rapid melting of the ice which ended approximately 12,000 years ago.

At the present time, the land surface is being shaped largely by subaerial erosion. Frequently, streams flow in valleys previously shaped by larger rivers and cut into former lake or meltwater channel deposits. In these valleys, granular deposits frequently act as shallow aquifers, whereas lacustrine clays and tills often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement in otherwise low permeability materials. This was prominent at the Tri-Cities Barrel site and may account for the unexpected high permeabilities associated with the monitoring wells (Phase II Boring Logs).

Recharge of shallow aquifers generally occurs in the uplands, whereas discharge has been noted to occur in hillside springs and stream valleys such as Osborne Creek, which is just north of the site. Also, water from shallow aquifers may be hydraulically connected to underlying bedrock aquifers. This is consistent with the site, as no known continuous confining layer exists in the area of concern.

Site Geology

This summary of site geology is based on information from USGS Topographic Maps, NYS Museum and Science Service Bedrock Geology Map, the Phase I and Phase II Investigations, and the USDA Soil Survey of Broome County.

The subsurface geology of the site is shown on Figure IV-3. Based on the site geophysics, bedrock beneath the site is expected to be between 66 and 82 feet below ground surface. Bedrock was encountered at the upgradient location during the Phase II investigation at a depth of 38.5 feet, however, no bedrock was encountered at the downgradient locations, where its depth was greater than 50 feet. Although bedrock dips regionally to the south, the bedrock surface below the site slopes more than 4.5% to the north due to localized glacial erosion. Bedrock is a light gray, moderately fissile shale of the Sonyea Group.

Overlying the bedrock is a thick unit of glacial till, interlayered with sands, silts, clays, and small amounts of gravel. The upper portion of this unit is dominated by silts with very fine sands and grades downward to a more sandy silt-mixture. The upper 4 to 8 feet of the site is fill material of similar composition from a borrow area adjacent to the site.

Groundwater Hydrology

The aquifer of concern at the site is a soil aquifer in the glacial till. The groundwater surface at the site occurs at a depth less than 30 feet. Based on topography and site geology, local groundwater flow is to the north. A piezometric surface map (Figure IV-4) illustrates the groundwater gradient, which generally parallels the local topographic and bedrock gradient.

No known confining layer was found to exist between the soil aquifer and the bedrock aquifer. Based on information obtained from the Phase II investigation and regional geologic and hydrologic conditions, we have the opinion that the soil and bedrock are hydraulically connected, allowing a vertical exchange of groundwater.

In-situ, variable head permeability tests (slug tests) were performed in each of the three wells installed on this site. The permeability values are summarized in Table IV-1. This test provides an estimate of permeability, calculated from the rate at which the water level inside a well will equilibriate with the hydraulic head in the surrounding water.

The slug test data was analyzed by the Hvorslev method for data reduction (Freeze, 1979). For the well geometries used at this site, the method calculates horizontal hydraulic conductivity (K_h). K_h has units of a velocity and is an estimate of the capability of a saturated soil to transmit groundwater in a horizontal direction. To use the Hvorslev method, a semi-log plot of recovery data (normalized to the initial change in water level) versus time (arithmetic scale) was prepared. K_h was calculated according to the following equation:

$$K = \frac{r^2 \ln ({}^{L}/R)}{2\ L\ T_o}$$

Where: K = horizontal hydraulic conductivity
r = radius of the well casing
L = length of the well screen
R = radius of the well intake (well casing plus sand pack)
T_o = basic time lag (=value of t at recovery of 0.37)

In most cases, two tests were done on each well; one where the water level was initially lowered in the well (depletion mode) and the other where the water level was initially raised in the well.

Surface Water Hydrology

The major surface water feature on this site is the drainage ditch bordering the site to the east. Water in this ditch flows north under I-88 into Osborne Creek, which eventually empties into the Chenango River. There is also a small, intermittent drainage feature that flows north across the middle of the site (see Figure IV-2). It is expected that the water from this feature also reaches Osborne Creek via highway ditches. Many small areas of ponded stagnant water were observed. Discoloration was noted in several of these puddles (Site Inspection, 1985).

SITE CONTAMINATION ASSESSMENT

Potential contamination of the environment within the site boundary was evaluated by a review of the character and quantity of wastes suspected at the site, chemical analysis of the groundwater, surface water, sediment and soil samples, and a survey of the air quality with an HNu meter. In addition to the results of the Phase II investigation, sampling and analysis results from drinking water supply wells in the vicinity of Tri-Cities Barrel by the NYSDOH in 1985, and results from a sample of the caustic rinse water used by Tri-Cities Barrel were also considered in the site contamination assessment.

Waste Characteristics

The Tri-Cities Barrel facility has been used for the reclamation of used barrels since 1955. The barrels are rinsed with a 10% sodium hydroxide solution during the cleaning process (Branagh, 1979). From before 1973 to 1980, the rinse solution was disposed of in an unlined lagoon and allowed to evaporate (Warner, 1985). An analysis of the caustic waste water sampled by the USEPA in 1983 showed that the rinse water contained several trace metals (see Table IV-2) and had a pH of 13. Based on this analysis, the rinse water was designated as a hazardous waste due to corrosivity (Cosentino, 1984). Another sample of the rinse tank waste water and a sample of the lagoon water was sent to O'Brien & Gere for analysis in 1979. This sample was analyzed for chlorides, cyanides, PCB's and pH (Hill, 1979). Table IV-2 summarizes the results. A sample of the caustic rinse water collected by the NYSDEC was analyzed for organic constituents (GC/MS) by RECRA Research in 1982. This analysis showed the rinse water to contain several organic compounds that are classified as hazardous compounds due to their toxicity or ignitability (see Table IV-2) (Baker, 1982).

The caustic rinse water is currently stored in drums and shipped to CECOS International (Warner, 1983). During two separate site inspections made in 1983, it was noted that barrels containing this waste water were leaking onto the ground and dissolving the ground's surface (Lepak, 1983).

Another by-product of the barrel reclamation process is blaster dust which is collected in a baghouse. EP toxicity analysis of this dust (see Table IV-2) by the USEPA in 1983 indicated that the blaster dust exceeded the maximum allowable lead concentration (NYSDEC, 1984), and should be classified as an EP toxic waste (Cosentino, 1984). The blaster dust is normally collected and stored in 55-gallon drums (Cosentino, 1984), although in July, 1983, Mr. Warner reported that he had a backlog of the blaster dust and that he would like to dispose of the dust in the North Fenton landfill facility (Warner, 1983). The ultimate disposal of the blaster dust is unknown.

The drums that are reprocessed at the facility have previously been used for storage of methylene chloride, freon, dichloroethylene, toluene, xylene, styrene, methyl ether, phenol, and various other oils and industrial chemicals (Warner, F., 1979). The quantity of these chemicals remaining in the drums is unknown, although the drums are basically empty when they arrive at Tri-Cities Barrel (Warner, G., 1985).

Contamination from waste oil is also a potential problem at this site. In August, 1982, approximately 200 gallons of oil were spilled onto the ground and into Osborne Creek at the rear of the Tri-Cities Barrel property. The creek was dammed to recover the oil and a Department of Transportation representative was on hand to advise Mr. Warner on the appropriate clean-up procedures (Warner, F., 1982).

Groundwater Contamination Assessment

Groundwater samples were collected from three monitoring wells, and the Tri-Cities Barrel water supply well in October, 1985, as part of the Phase II investigation. These samples were analyzed for organics (GC/MS scan). The results of drinking water wells in the vicinity of the site collected by the NYSDOH in 1985 were also considered in the assessment of groundwater contamination.

The on-site water supply well (CW-4) is approximately 120 feet deep and is drilled into bedrock (Warner, 1985). No organic contaminants were found in this well at levels above the instrument detection limit (see Table IV-3).

The downgradient well, CW-3, was the only monitoring well with contamination levels significantly above the upgradient levels (see Table IV-3). Trans-1,2-dichloroethylene (17 ug/l), Trichloroethylene (10 ug/l), Bis(2-ethylhexyl)phthalate (24 ug/l), 1,1-Dichloroethane (9.2 ug/l), 1,1,1-Trichloroethane (12 ug/l), and Toluene (6.8 ug/l) were detected in the CW-3 sample, but at levels below the New York State drinking water quality standards for groundwater (NYSDEC, 1985). Aroclor 1242 (2.9 ug/l) and Chlorodane (3.8 ug/l) were detected in the sample at levels above the water quality standards. Other constituents including Vinyl Chloride (6.5 ug/l), 1,1-Dichloroethane (1.7 ug/l), Tetrachloroethene (3.4 ug/l), Phenol (5.3 ug/l) and Benzo(a)pyrene (1.9 ug/l) were also detected in the sample at levels above the water quality standards, but at values less than the instrument detection limit.

The other groundwater sample that was collected from a downgradient well (CW-2B) had levels of Trichloroethylene (5.5 ug/l) and Bis(2-ethylhexyl)phthalate (7.6 ug/l) below the water quality standards for these constituents and an estimated value of 6.5 ug/l of Vinyl Chloride which is greater than the water quality standard of 5 ug/l.

The five water supply wells sampled by the NYSDOH in 1985 were analyzed for organic and inorganic priority pollutants. The Stahl residence on Osborn Hollow Road was the only well with detectable concentrations of organic constituents. Ethylbenzene (6 ug/l), Betaxylene (12 ug/l), and Orthoxylene (5 ug/l) were found in this sample (NYSDOH, 1985). These concentrations are less than the drinking groundwater quality guidance values set by NYSDEC for these constituents (NYSDEC, 1985).

Surface Water Contamination Assessment

Three surface water samples were collected in November, 1985 as part of the Phase II investigation and were analyzed for metals (ICPES) and organic constituents (GC/MS). Sodium was the only constituent found in the downgradient sample (S-2) at a concentration greater than the upgradient sample (S-1) (see Table IV-4). None of the samples detected were at concentrations greater than the NYSDEC Class A, A-S, AA, AA-S Drinking Water Quality Standards (NYSDEC, 1985). No organic compounds were detected in any of the surface water samples.

Sediment Contamination Assessment

Three sediment samples were collected in November, 1985 as part of the Phase II investigation. These samples were analyzed for metals (ICPES) and organic constituents (GC/MS). Several metals (see Table IV-5) including Calcium (1,630 mg/kg), Chromium (16.1 mg/kg), Manganese (1,200 mg/kg), Potassium (547 mg/kg), Tin (7.8 mg/kg), Zinc (130 mg/kg), and Lead (34.8 mg/kg) were found in the SD-3 downgradient sample at concentrations greater than the background (SD-1) concentration level. Manganese was the only one of these metals that exceeded the typical range of metallic elements in surface soils (Friberg, 1979). Potassium (650 mg/kg), Lead (16.1 mg/kg), and Tin (4.2 mg/kg) were the only metals in the SD-2 downgradient sample that exceeded the concentration levels in the SD-1 upgradient sample. No organic constituents were detected in any of the sediment samples.

Soil Contamination Assessment

Two surface soil samples (SS-1 and SS-2) and one soil sample from an auger hole (SS-3) were collected in November, 1985 by ES/D&M as part of the Phase II investigation. These samples were analyzed for metals (ICPES) and organic constituents (GC/MS) scan.

Manganese and sodium were found in the SS-3 auger hole sample at concentrations greater than the background concentration found in the SS-1 sample (see Table IV-5). The typical value of manganese in soil samples (Friberg, 1979) was exceeded in the SS-3 sample. Several organic constituents including Tetrachloroethene (76 ug/kg), 1,1-Dichloroethene (6.3 ug/kg), Trans-1,2-dichloroethene (20 ug/kg), 1,1,1-Trichloroethane (17 ug/kg), and Trichloroethene (14 mg/kg) were also found in the SS-3 auger hole. HNU meter readings as high as 150 ppm, recorded while augering this hole, substantiate these results. Tetrachloroethene (20 ug/kg) was also found in the SS-2 surface soil sample. No volatile organics were found in the background soil sample (SS-1).

Polycyclic aromatic hydrocarbon compounds were detected in the SS-1 surface soil sample at concentrations much higher than the typical concentration of these compounds in soil samples (Edwards, 1983). However, since the area from which this sample was collected was used as a junkyard several years ago (ES/D&M Site Visit, 1985), the junkyard could be the source of these contaminants.

Air Contamination Assessment

The air quality at the Tri-Cities Barrel site was monitored with an HNU meter. No significant readings greater than 1 ppm were recorded either upgradient or downgradient.

TABLE IV-1

PERMEABILITY OF SOIL UNITS

Well No.	Permeability (cm/sec)
CW-1	8.93×10^{-3}
CW-2B	1.79×10^{-2}
CW-3	1.89×10^{-3}

TABLE IV-2
ANALYSIS OF WASTE MATERIALS

Constituent(1)	Lagoon(3) (ug/l)	Rinse Water Tank (ug/l)	Discharge(2) From Skimmer (ug/l)	Blaster(2) Dust (ug/l)	Max. Conc. For(4) Hazardous Waste (ug/l)
pH	10.5	13.0(3)	13	NA	< 12.5
Chloride	50,000	800,000(3)	NA	NA	NM
Cyanide	720	1,100(3) 4,200(5)	NA	NA	NM
PCB	< 1.0	< 1,600(3)	NA	NA	50,000 (7)
Arsenic	NA	NA	20J	8K	5,000 (6)
Barium	NA	NA	60	3,500	100,000 (6)
Cadmium	NA	NA	40	90	1,000 (6)
Chromium	NA	NA	280	130	5,000 (6)
Lead	NA	NA	290	6,500	5,000 (6)
Mercury	NA	NA	0.5J	0.2K	200 (6)
Selenium	NA	NA	7K	7	1,000 (6)
Silver	NA	NA	20	8J	5,000 (6)
Benzene	NA	44(5)	NA	NA	(7)(8)
1,1-Dichloroethane	NA	11(5)	NA	NA	NM
1,1-Dichloroethylene	NA	18(5)	NA	NA	(7)
Ethylbenzene	NA	2,600(5)	NA	NA	NM
Tetrachloroethylene	NA	4,500(5)	NA	NA	(7)
Toluene	NA	5,600(5)	NA	NA	(7)
1,1,1-Trichloroethane	NA	200(5)	NA	NA	(7)
Trichloroethylene	NA	27,000(5)	NA	NA	(7)
Total Recoverable Phenolics	NA	1,300,000(5)	NA	NA	(7)

(1) All constituents analyzed for in the two studies are listed.
(2) Samples analyzed by the USEPA, November 17, 1983 (Cosentino, 1984).
(3) Samples analyzed by O'Brien & Gere Engineers, October 15, 1979 (Hill,1979).
(4) NYSDEC (1984), "Regulations Relating to the Identification and Listing of Hazardous Wastes".
(5) Samples collected by NYSDEC in May, 1982, analyzed by RECRA Research (Baker, 1982).
(6) Maximum allowable concentration (ug/l) from EP Toxicity test before waste is designated as a hazardous waste.
(7) Compound listed as a hazardous waste due to toxicity.
(8) Compound identified as a hazardous waste due to ignitability.
NA Not analyzed.
K Actual value known to be less than the given value.
J Estimated Value.
< Actual value known to be greater than given value.
NM No maximum concentration - not listed as a hazardous or toxic compound.

TABLE IV-3
ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES(1)

Constituent(2)	Sample Location CW-1	CW-2B	CW-3	CW-4	Water(3) Quality Standards
Di-n-butylphthalate	1.7J	10u	10u	3.0J	770
Vinyl Chloride	10u	6.5J	6.5J	10u	5.0
Trans-1,2-dichloroethene	5u	2.2J	17	5u	50 (4)
Trichloroethene	5u	5.5	10	5u	10
Bis(2-ethylhexyl)phthalate	10u	7.6	24	2.6J	4,200
Acetone	10u,B	10u,B	20B	10u,B	NS
1,1-Dichloroethene	5u	5u	1.7J	5u	0.07 (4)
1,1-Dichloroethane	5u	5u	9.2	5u	50 (4)
1,1,1-Trichloroethane	5u	5u	12	5u	50 (4)
Tetrachloroethene	5u	5u	3.4J	5u	0.7 (4)
Toluene	5u	5u	6.8	5u	50 (4)
Phenol	10u	10u	5.3	10u	1
Butylbenzylphthalate	10u	10u	4.6J	10u	50 (4)
Benzo(a)pyrene	10u	10u	1.9J	10u	ND
Chlordane	0.5u	0.5u	3.8	0.5u	0.1
Aroclor 1242	0.5u	0.5u	2.9	0.5u	0.1 (5)

(1) Samples collected and analyzed by ES/D&M as part of Phase II investigation, October, 1985.

(2) Only constituents that were detected in one or more samples are presented.

(3) "Groundwater Quality Standards and Effluent Standards and/or Limitations", 6 NYCRR Part 703, NYSDEC, 9/1/78. Amended Version in "Ambient Water Quality Standards and Guidance Criteria", NYSDEC, July, 1985.

(4) Guidance value, not regulatory standard.

(5) Standard for polychlorinated biphenyl (PCB).

u Concentration in sample is less than listed instrument detection limit.

J Concentration is less than instrument detection limit. Listed value is an estimate.

B Constituent also found in method blank and wash blank, concentrations listed are corrected for contamination level in the method blank. Acetone - Method Blank (8.0 ug/l), Wash Blank (350 ug/l).

NS No Standard.

ND Not Detectable.

TABLE IV-4
ANALYTICAL RESULTS OF SURFACE WATER SAMPLES(1)

Constituent(2)	Sample Location S-1 (ug/l)	S-2 (ug/l)	S-3 (ug/l)	NYSDEC(3) Water Quality Criteria (ug/l)
Calcium	13,600	13,300	10,200	NS
Iron	220	150	210	300
Lead	[4]	6	17	50
Manganese	132	118	23	35,000
Sodium	8,000	13,000	9,000	NS
Zinc	20	20u	20u	300

(1) Samples collected as part of ES/D&M Phase II investigation, November, 1985.

(2) Only metal constituents detected in one or more samples are listed. No organic contaminants were detected at levels above the detection limits.

(3) NYSDEC (1985). "Ambient Water Quality Standards and Guidance Values", Memorandum 85-W-38, Class A, A-S, AA, AA-S, July 24, 1985.

NS No Standard.

u Concentration is less than listed detection limit.

[ ] Concentration measured is less than contract required detection limit.

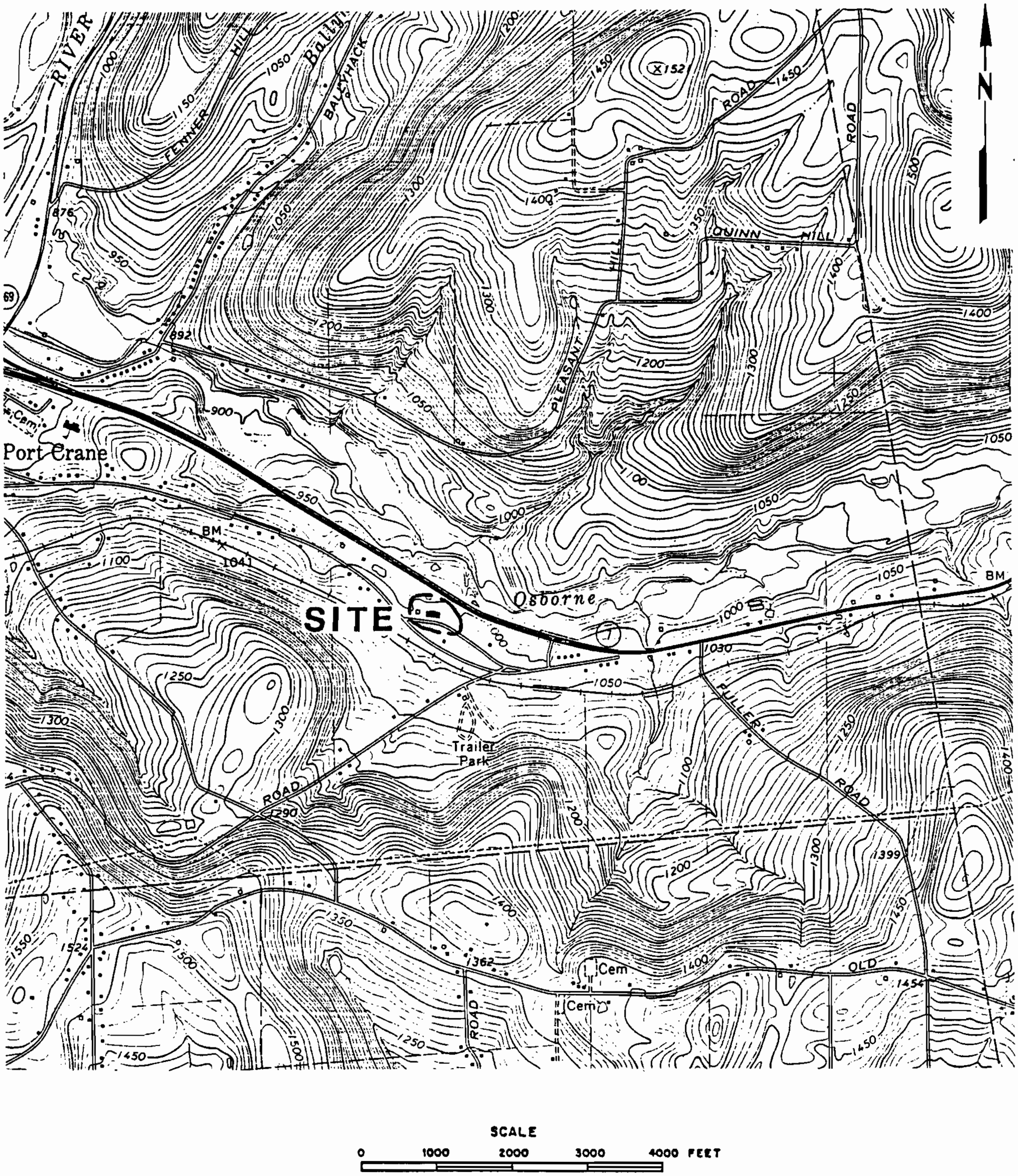
TABLE IV-5

ANALYTICAL RESULTS OF SEDIMENT AND SOIL SAMPLES(1)

	Sampling Location						Typical Values	
Constituent(2)	SS-1 (mg/kg)	SS-2 (mg/kg)	SS-3 (mg/kg)	SD-1 (mg/kg)	SD-2 (mg/kg)	SD-3 (mg/kg)	in Soil Samples (mg/kg)	
Aluminum	16100	12200	12400	13000	13800	11700	150000-600000	(3)
Arsenic	14	10	8.9	10.7	9.5	8.2	< 40	(3)
Barium	79	74.3	95.1	62	57.9	74.3	1-1000	(3)
Beryllium	0.65	1.1	0.65	0.58u	0.52u	0.70	< 1	(3)
Calcium	2150	1220	1110	817	932	1630	NA	
Chromium	18.3	17.6	17.3	15.7	15.7	16.1	< 250	(3)
Cobalt	15.6	22.9	19.4	19.9	19.6	20.1	0.1-13	(3)
Copper	18.4	24.9	21.0	23.4	21.8	21.8	10-80	(4)
Iron	36000	36500	33900	39600	36800	40000	10000-100000	(4)
Magnesium	3050	3890	3700	3690	3910	3820	NA	
Manganese	798	756	1230	921	674	1200	600-900	(3)
Nickel	27.2	36.6	30.2	33.9	26.9	29.1	3-1000	(3)
Potassium	732	760	704	[557]	650	547	NA	
Tin	6.0	6.0	[3.5]	[3.3]	4.2	7.8	2-300	(3)
Vanadium	25.8	17.0	16.2	19.8	19.7	17.4	5-140	(3)
Zinc	127	97.2	109	92.5	95.2	130	10-300	(4)
Lead	45.5	27.6	12.3	8.5	16.1	34.8	2-200	(3)
Tetrachloroethene	0.006u	0.020	0.076	0.007u	0.008u	0.007u	NA	
1,1-Dichloroethane	0.006u	0.005u	0.0063	0.007u	0.008u	0.007u	NA	
Trans-1,2-dichloroethene	0.006u	0.0042J	0.020	0.007u	0.008u	0.007u	NA	
1,1,1-Trichloroethane	0.006u	0.005J	0.017	0.007u	0.008u	0.007u	NA	
Trichloroethene	0.006u	0.005u	0.014	0.007u	0.008u	0.007u	NA	
Fluoranthene	1.300	22u	22u	0.924u	1.056u	0.350J	NA	
Pyrene	1.300	22u	22u	0.924u	1.056u	0.260J	NA	
Chrysene	0.890	22u	22u	0.924u	1.056u	0.99J	NA	
Total PAH's	3.490					1.60J	1-10	(5)

(1) Samples collected by ES/D&M for Phase II investigation, 1985.
(2) Only those constituents that were detected in one or more samples are listed.
(3) Friberg, et.al, (1979) Handbook of Toxicology of Metals.
(4) Davies (1980), Applied Soil Trace Elements.
(5) Edwards (1983). "Polycyclic Aromatic Hydrocarbons (PAH's) in the Terrestrial Environment - A Review", Journal of Environmental Quality.

NA Not available.
J Concentration is less than instrument detection limit, value listed is estimate.
u Concentration is less than listed detection limit.
[ ] Concentration is less than contract required detection limit.
SS Soil Samples
SD Sediment Samples



Latitude = 42° 09' 45.4"
Longitude = 75° 50' 29.6"

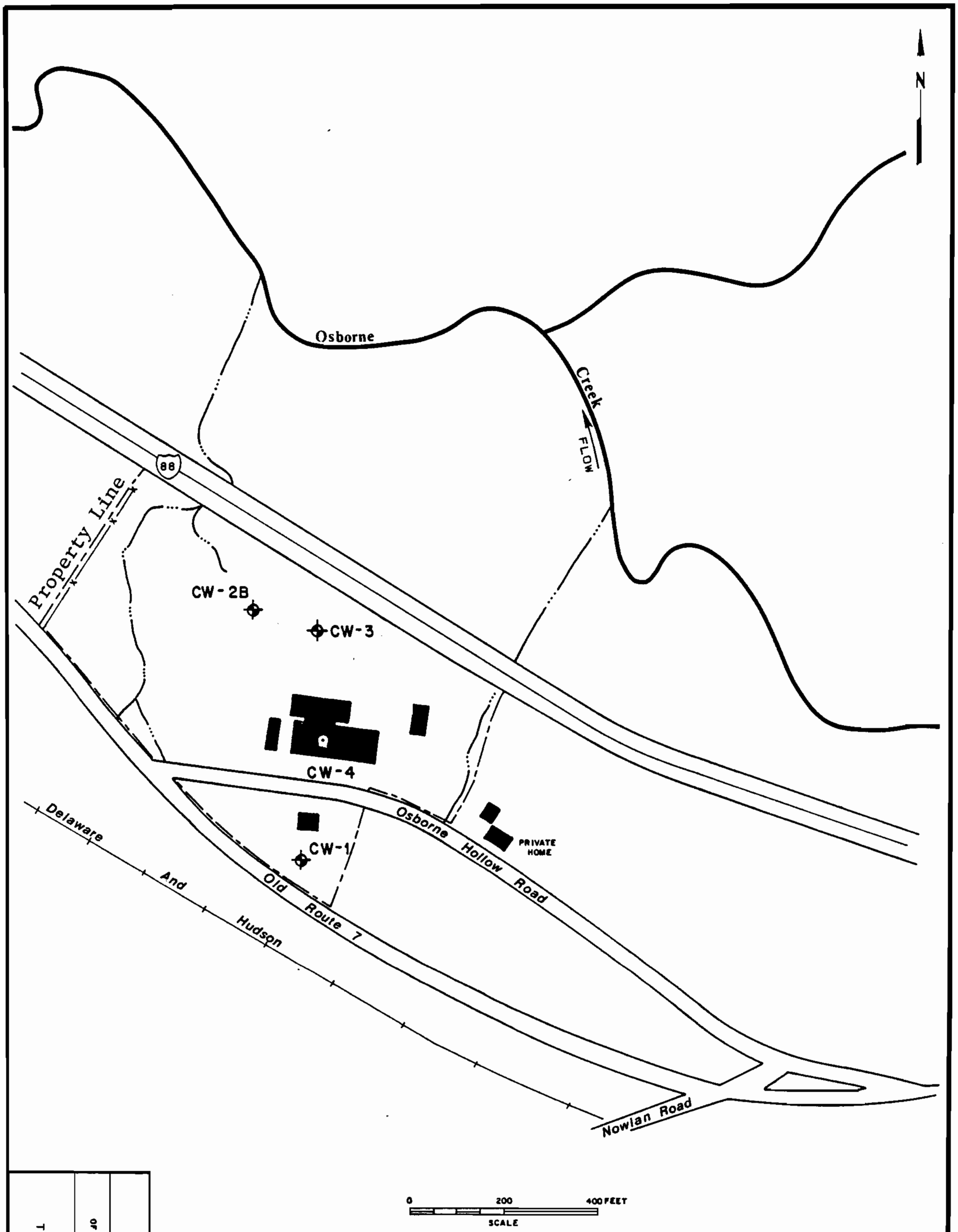
ENGINEERING-SCIENCE
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

SITE LOCATION MAP
TRI-CITIES BARREL

FIGURE IV-1

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP,
CHENANGO FORKS, NY (1968) QUADRANGLE



EXPLANATION:

⌖	MONITORING WELL DRILLED UNDER DAMES & MOORE'S SUPERVISION
⊙	EXISTING WELL
—··· —	INTERMITTENT STREAM

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP, CHENANGO FORKS, NY (1968) QUADRANGLE

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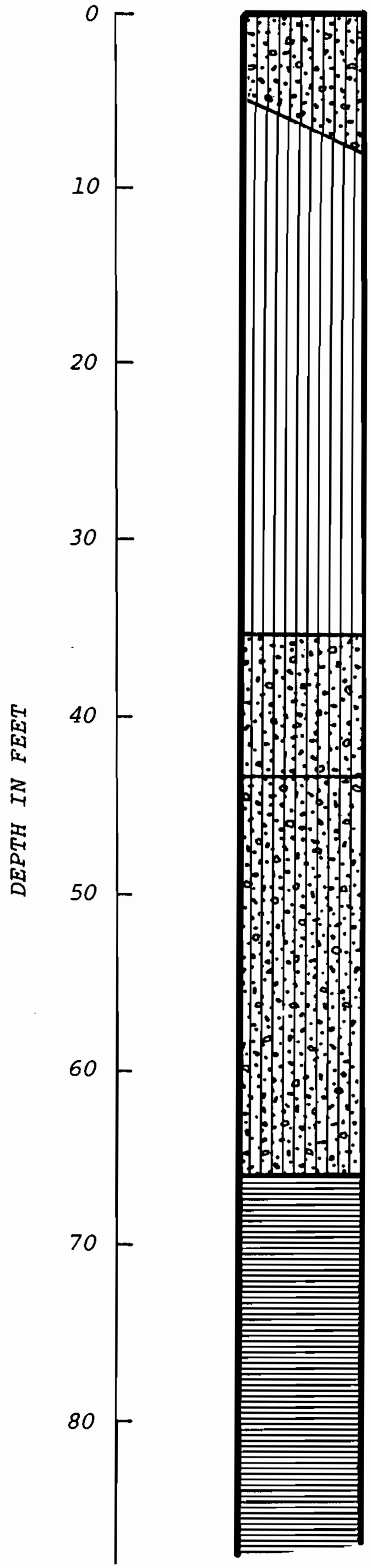
PLOT PLAN
TRI-CITIES BARREL

FIGURE IV-2



FILL (SILTY SANDS WITH SOME CLAYEY FINE SANDS, LITTLE FINE TO MEDIUM GRAVEL)

INORGANIC SILTS AND VERY FINE SANDS, LITTLE FINE TO MEDIUM GRAVEL

FINE SAND AND SILT MIXTURES WITH LITTLE CLAYEY SILTS AND TRACE FINE TO MEDIUM GRAVEL

FINE SAND AND SILT MIXTURES WITH LITTLE CLAYEY SILTS, GRADING TO SOME FINE TO MEDIUM GRAVEL

TOP OF BEDROCK
(OCCURS BETWEEN 66-82' BELOW GROUND SURFACE)

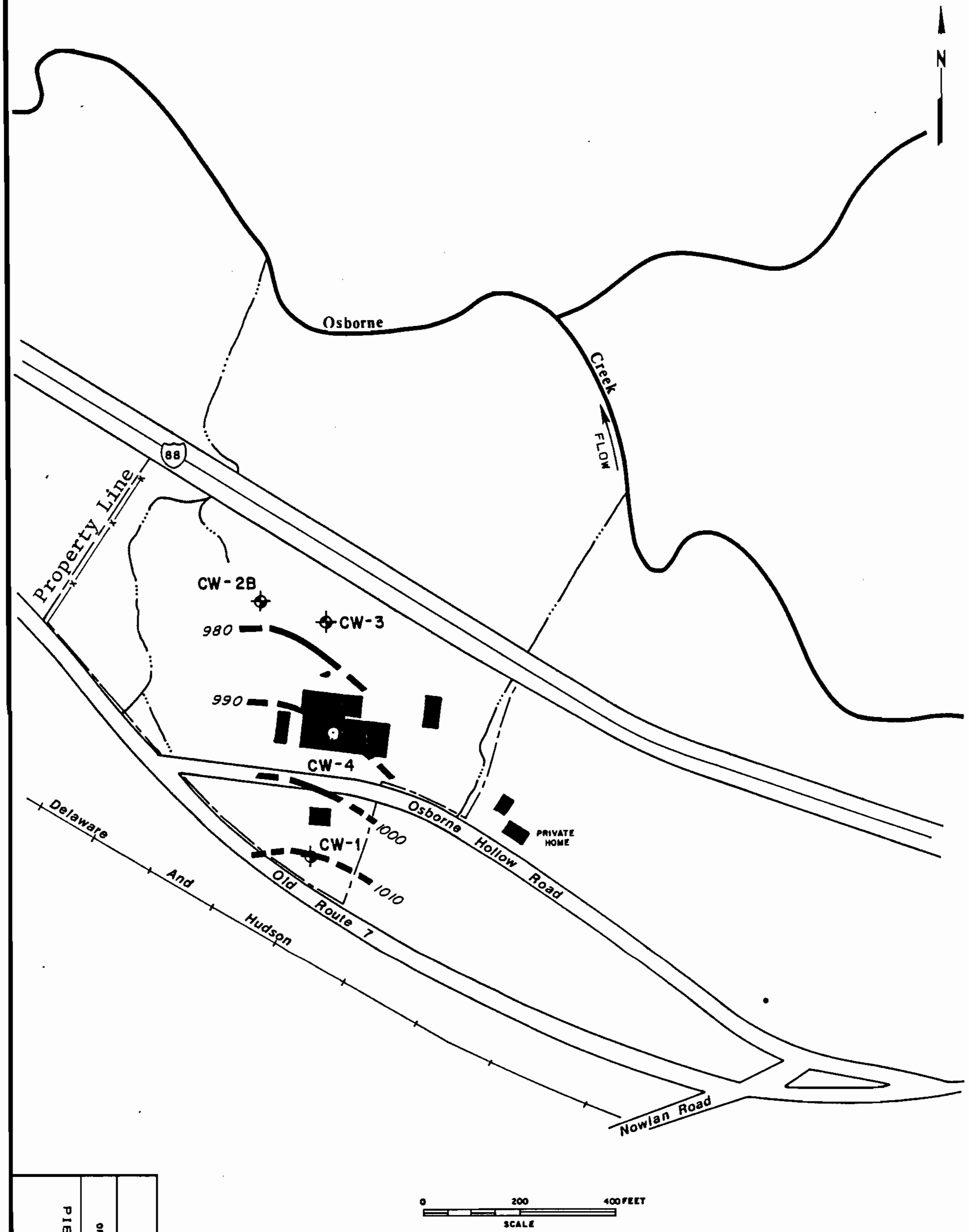
MODERATELY FISSILE, GRAY SHALE

ENGINEERING-SCIENCE
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

GENERALIZED STRATIGRAPHIC COLUMN
TRI-CITIES BARREL

FIGURE IV-3



EXPLANATION:

⌖	MONITORING WELL DRILLED UNDER DAMES & MOORE'S SUPERVISION
▬ 980 ▬	PIEZOMETRIC SURFACE CONTOUR (ELEVATIONS ABOVE SEA LEVEL)
⊙	EXISTING WELL
— ··· —	INTERMITTENT STREAM

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP, CHENANGO FORKS, NY (1968) QUADRANGLE

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PIEZOMETRIC SURFACE MAP
TRI-CITIES BARREL

FIGURE IV-4

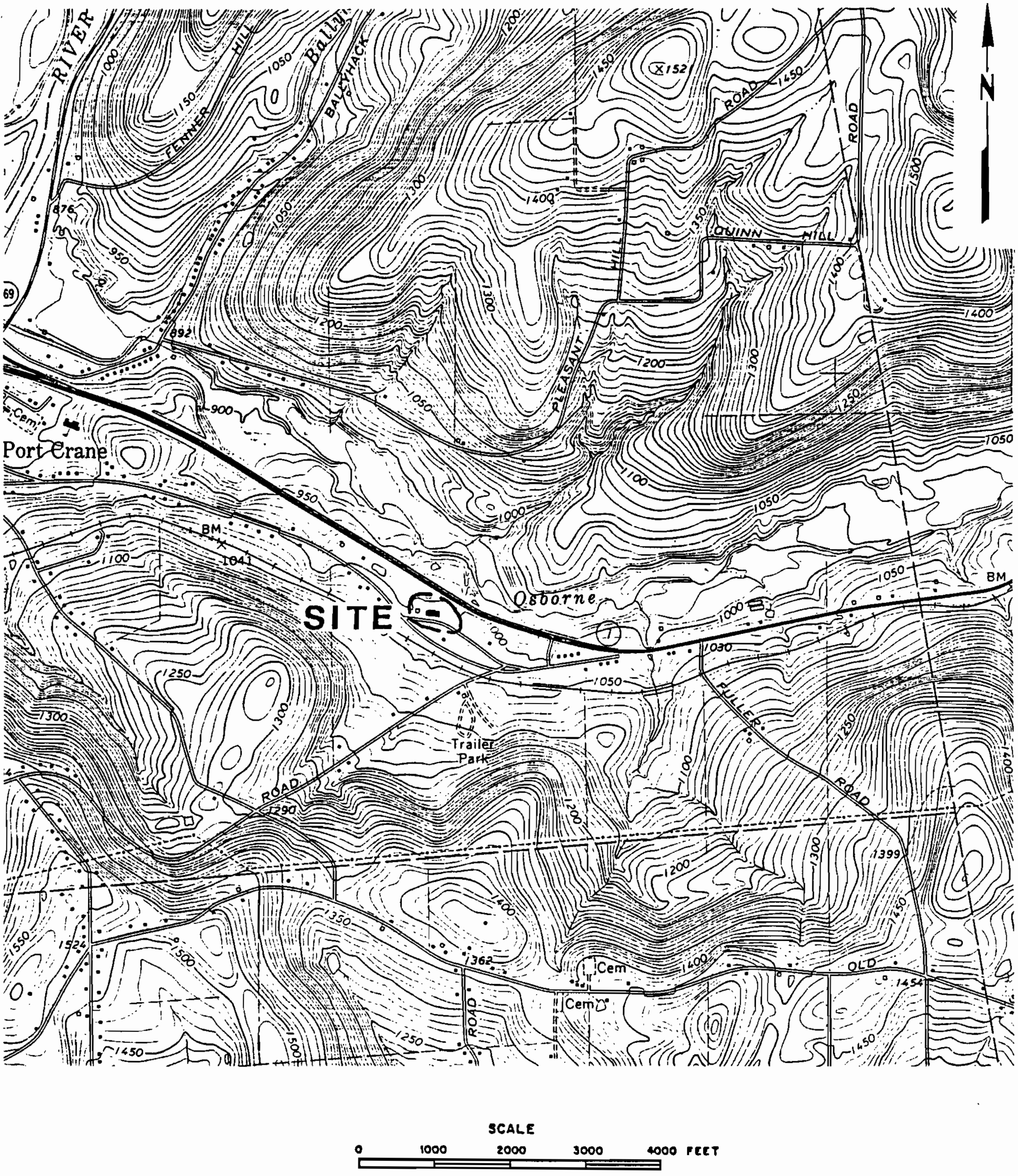
NARRATIVE SUMMARY

The Tri-Cities Barrel site is a 3.5 acre site located near the Hamlet of Port Crane, Town of Fenton, Broome County, New York State. The Tri-Cities Barrel Company, owned and operated by Mr. Gary Warner of Port Crane, New York, has been in the business of reconditioning used barrels since 1955. Until 1980, waste water from the reconditioning process was discharged into unlined lagoons and allowed to evaporate. Under a consent order with the NYSDEC, this practice was discontinued and the lagoons were pumped out and backfilled in 1981. Waste water from the washing process is currently pumped into a holding tank and hauled off-site for disposal.

It is believed that waste water contaminated with the previous contents of the barrels has seeped through the unlined lagoons and contaminated the surface water and groundwater. The residents of Port Crane draw their water from private wells.

Several surface water, sediment, and soil samples were collected and analyzed for organics and metals. Groundwater samples were collected and analyzed for organics only. Groundwater, surface water, sediment, and soil samples were collected and analyzed in October-December, 1985. These results indicated that one of the groundwater samples had concentrations of Aroclor 1242 (2.9 ug/l) and Chlorodane (3.8 ug/l) above NYSDEC Drinking Water Standards. A soil sample taken from an auger hole also had high concentrations of several organic compounds. No contamination was found in the surface water samples.

No remedial or enforcement measures have been taken other than the consent order requiring the emptying and backfilling of the lagoons in 1981.



Latitude = 42° 09' 45.4"
Longitude = 75° 50' 29.6"

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP,
CHENANGO FORKS, NY (1968) QUADRANGLE

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PHASE II REPORT

SITE LOCATION MAP
TRI-CITIES BARREL

FIGURE V-1

HRS COVER SHEET

Facility name: Tri-Cities Barrel

Location: Port Crane, New York

EPA Region: II

Person(s) in charge of the facility: Gary Warner

Francis Warner

Name of Reviewer: J. C. Brod

Date: 12/20/85

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

This facility is used to clean and recondition 55-gallon drums. Three unlined lagoons were used at this facility for the storage of contaminated caustic rinse water. Several nearby homes have private drinking water wells. Chlordane and Aroclor 1242 were found in a groundwater sample at levels higher than the NYSDEC Class GA Standards from a monitoring well at the site.

Scores: $S_M = 48.33$ ($S_{gw} = 82.89$ $S_{sw} = 10.91$ $S_a = 0.00$)

$S_{FE} = 0.00$

$S_{DC} = 25.00$

Facility Name: Tri-Cities Barrel Date: 12/2/85

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 [✓ 45]	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 [✓ 3]	2	6	6	
Net Precipitation	0 1 [✓ 2] 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 [✓ 2] 3	1	2	3	
Physical State	0 1 2 [✓ 3]	1	3	3	
Total Route Characteristics Score			13	15	
3 Containment	0 1 2 [✓ 3]	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 [✓ 18]	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 [✓ 6] 7 8	1	6	8	
Total Waste Characteristics Score			24	26	
5 Targets					3.5
Ground Water Use	0 1 2 [✓ 3]	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 [✓ 35] 40	1	35	40	
Total Targets Score			44	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			47,520	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 82.89		

GROUND WATER ROUTE WORK SHEET

Facility Name: Tri-Cities Barrel   Date: 12/2/85

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	[✓ 0] 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 [✓ 2] 3	1	2	3	
1-yr. 24-hr. Rainfall	0 1 [✓ 2] 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 [✓ 3]	2	6	6	
Physical State	0 1 2 [✓ 3]	1	3	3	
Total Route Characteristics Score			13	15	
3 Containment	0 1 2 [✓ 3]	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 [✓ 12] 15 18	1	12	18	
Hazardous Waste Quantity	0 1 2 3 4 5 [✓ 6] 7 8	1	6	8	
Total Waste Characteristics Score			18	26	
5 Targets					4.5
Surface Water Use	0 1 [✓ 2] 3	3	6	9	
Distance to a Sensitive Environment	[✓ 0] 1 2 3	2	0	6	
Population Served/ Distance to Water Intake Downstream	0 [✓ 4] 6 8 10 12 16 18 20 24 30 32 35 40	1	4	40	
Total Targets Score			10	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			7,020	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 10.91		

SURFACE WATER ROUTE WORK SHEET

Facility Name: Tri-Cities Barrel

Date: 12/2/85

Air Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	[✓ 0] 45	1	0	45	5.1
Date and Location: 9/9/85 - Tri-Cities Barrel Facilities					
Sampling Protocol: HNu photoionization meter					
If line 1 is 0, the S_a = 0. Enter on line 5 . If line 1 is 45, then proceed to line 2 .					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 [✓ 1] 2 3	1	1	3	
Toxicity	0 1 2 [✓ 3]	3	9	9	
Hazardous Waste	0 [✓ 1] 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			11	20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 [✓ 15] 18 21 24 27 30	1	15	30	
Distance to Sensitive Environment	[✓ 0] 1 2 3	2	0	6	
Land Use	0 1 2 [✓ 3]	1	3	3	
Total Targets Score			18	39	
4 Multiply 1 x 2 x 3			0	35,100	
5 Divide line 4 by 35,100 and multiply by 100			S_a = 0		

AIR ROUTE WORK SHEET

Facility Name: Tri-Cities Barrel

Date: 12/2/85

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

FIRE AND EXPLOSION WORK SHEET

Facility Name: Tri-Cities Barrel   Date: 12/2/85

Direct Contact Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Observed Incident	[✓ 0] 45	1	0	45	8.1
If line $\boxed{1}$ is 45, proceed to line $\boxed{4}$ If line $\boxed{1}$ is 0, proceed to line $\boxed{2}$					
$\boxed{2}$ Accessibility	0 1 2 [✓ 3]	1	3	3	8.2
$\boxed{3}$ Containment	0 [✓ 15]	1	15		8.3
$\boxed{4}$ Waste Characteristics Toxicity	0 1 2 [✓ 3]	5	15	15	8.4
$\boxed{5}$ Targets					8.5
Population Within 1-Mile Radius	0 1 [✓ 2] 3 4 5	4	8	20	
Distance to a Critical Habitat	[✓ 0] 1 2 3	4	0	12	
Total Targets Score			8	32	
$\boxed{6}$ If line $\boxed{1}$ is 45, multiply $\boxed{1}$ x $\boxed{4}$ x $\boxed{5}$ If line $\boxed{1}$ is 0, multiply $\boxed{2}$ x $\boxed{3}$ x $\boxed{4}$ x $\boxed{5}$			5,400	21,600	
$\boxed{7}$ Divide line $\boxed{6}$ by 21,600 and multiply by 100			S_{DC} = 25.0		

DIRECT CONTACT WORK SHEET

Facility Name: Tri-Cities Barrel Date: 12/2/85

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	82.89	6,870.75
Surface Water Route Score (S_{sw})	10.91	119.01
Air Route Score (S_a)	0.00	0.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$	▨	6,989.76
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$	▨	83.60
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$	▨	48.33

WORK SHEET FOR COMPUTING S_M

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

FACILITY NAME: Tri-Cities Barrel

LOCATION: Port Crane, Town of Fenton, Broome County, New York

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum):

Chlordane (3.8 ug/l), Aroclor 1242 (2.9 ug/l) (Phase II Investigation Sampling and Analysis, 1985).

Score = 45.

Rationale for attributing the contaminants to the facility:

These contaminants were found in the downgradient sample during the Phase II investigation.

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) in concern:

Soil aquifer in glacial sediments (Phase II Investigation, 1985).

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

Approx. 27 feet (Site Visit, 11/25/85).

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

Estimate approximately 10 feet. The original depth of the lagoon was 3 to 4 feet; 4 to 8 feet of fill has been added to the site (Site Visit, 1985).

Net Precipitation

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

Mean annual precipitation is 36.3 inches (USDA Soil Conservation Service, Soil Survey of Broome County, New York) (Climatic Atlas of the United States, U.S. Dept. of Commerce, National Climatic Center, 1979).

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

Mean annual lake evaporation is 27.0 inches (Climatic Atlas of the United States, U.S. Dept. of Commerce, National Climatic Center, 1979).

Net precipitation (subtract the above figures):

9.3 inches. Score = 2.

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Fill, sandy silt mixtures, clay and gravel (NYSDEC Phase II Boring Logs, 1985).

Permeability associated with soil type

10^{-4} cm/sec (Freeze and Cherry, 1979). Score = 2.

Physical State

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

Liquid (Warner, G., 1985). Score = 3.

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Wastes contained in an unlined lagoon (Warner, G., 1985).

Method with highest score:

Unlined lagoon - score = 3.

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Chlordane and Aroclor 1242 (Phase II Investigation Sampling and Analysis, 1985).

Compound with highest score:

Chlordane - combined score = 18.
Aroclor 1242 - combined score = 18.

Hazardous Waste Quantity

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

1,064 Tons - score = 6.

Basis of estimating and/or computing waste quantity:

Rinse water consisted of 5-10% sodium hydroxide. Amount of NaOH used was 20,000 lb/yr. Assuming an average concentration of 7.5% NaOH, then the total waste quantity is:

20,000 lb/yr ÷ 0.075 lb/lb NaOH x 8 yrs. = 1,064 tons.

5. TARGETS

Groundwater Use

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

All residents in the vicinity of the facility draw water from private wells (Baker, B., 11/26/85).

Distance to Nearest Well

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

There is a private well on-site used for drinking water (Site Visit, 1985; Warner, G., 1985).

Distance to above well or building:

0.0 mile.

Population Served by Groundwater Wells Within a 3-Mile Radius

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

Water supply wells drawing from the aquifer of concern serve approximately 3,550. (Total population in 3 mile radius is 6,620 people (USGS Topographic Maps: Chenango Forks and Binghamton East), minus those people west of Chenango River within this 3 mile radius who do not obtain water from the aquifer of concern (USGS Open File Report 82-268), equals 3,550 people. All of these people obtain their drinking water from private wells (Schimpff, 1985; Oliver, 1986; Finch, 1986; Baker, 1985; NYS Atlas of Community Water System Sources, 1982)).

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

0 acres (D. Bradstreet, Broome County Cooperative Extension, 5/27/86).

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

3,550 people (NYS Atlas of Community Water Systems Sources, 1982; USGS Topographic Maps - Chenango Forks and Binghamton East Quads; Schimpff, 12/4/85; Oliver, 1986; Finch, 1986; Baker, 1985; USGS Open File Report 82-268).

SURFACE WATER ROUTE

1. OBSERVED RELEASE

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

No contaminants detected (Phase II Investigation Sampling and Analysis, 1985).

Rationale for attributing the contaminants to the facility:

Not applicable.

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Approx. 3-4% (USGS Topographic Map: Chenango Forks Quad).

Name/description of nearest downslope surface water:

Osborne Creek to the north and a drainage ditch, which borders the site to the east (USGS Topographic Map: Chenango Forks Quad; Site Visit, 1985).

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

Approx. 7-8% (USGS Topographic Map: Chenango Forks Quad).

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

No.

Is the facility completely surrounded by areas of higher elevation?

No (USGS Topographic Map: Chenango Forks Quad).

1-Year 24-Hour Rainfall in Inches

2.4" (U.S. Department of Commerce Technical Paper No. 40). Score = 2.

Distance to Nearest Downslope Surface Water

Approximately 800 feet (USGS Topographic Map: Chenango Forks Quad). Score = 3.

Physical State of Waste

Presently, no waste is found on-site. Waste was in a liquid state at time of disposal. (Site Visit, 1985; Warner, G., 1985). Score = 3.

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Leaking lagoons with inadequate freeboard and no runon/off diversion. The containment could not prevent the flooding and overflow of the lagoons during a storm in 1976, and it has been observed that the lagoons have leaked (Branagh, 1979; Warner, 1985).

Method with highest score:

Leaking lagoons - score = 3.

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

Tetrachloroethene (found in surface soil sample, Phase II Investigation Sampling and Analysis, 1985).

Compound with highest score:

Tetrachloroethene - score = 12.

Hazardous Waste Quantity

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

1,064 tons - score = 6.

Basis of estimating and/or computing waste quantity:

Rinse water consisted of 5-10% sodium hydroxide. Amount of NaOH used was 20,000 lb/yr. Assuming an average concentration of 7.5% NaOH, then the total waste quantity is:

$$20{,}000 \text{ lb/yr} \div 0.075 \text{ lb/lb NaOH} \times 8 \text{ yrs.} = 1{,}064 \text{ tons.}$$

* * *

5. TARGETS

Surface Water Use

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

Transportation and recreation (Site Visit, 1985; NYS Atlas of Community Water Systems Sources, 1982). Score = 2.

Is there tidal influence?

No

Distance to a Sensitive Environment

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

None within 2 miles

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

None within 1 mile (Cotterill, NYSDEC, 11/14/85).

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

None within 1 mile (Trent, 1985).

Population Served by Surface Water

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

Approx. 1 mile north of the intersection of Rt. 88 and Rt. 369 are two berry farms that use surface water for irrigation. Total irrigated land is 30-40 acres (Bradstreet, 1986).

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

45 to 60 people.

Total population served:

45 to 60 people.

Name/description of nearest of above water bodies:

Chenango River.

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

Approx. 2.7 miles.

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

None detected (Air Survey, Site Visit, 9/9/85).

Date and location of detection of contaminants:

Not applicable.

Methods used to detect the contaminants:

HNU photoionization meter.

Rationale for attributing the contaminants to the site:

Not applicable.

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

No reactive compounds detected during Phase II investigation - score = 0.

Most incompatible pair of compounds:

Spent caustic rinse water is incompatible with halogenated hydrocarbons. No areas of high concentration - do not expect this pair to represent a hazard - score = 1.

Toxicity

Most toxic compound:

Chlordane - score = 3
Aroclor 1242 - score = 3

Hazardous Waste Quantity

Total quantity of hazardous waste:

Unknown quantity of volatile organics in drums and lagoons at this site. Assign lowest non-zero score (Warner, F., 1979).

Basis of estimating and/or computing waste quantity:

See above.

* * *

3. TARGETS

Population Within 4-Mile Radius

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

0 to 4 mi (0 to 1 mi) 0 to 1/2 mi 0 to 1/4 mi

460 people (USGS Topographic Map: Chenango Forks Quad, 1979. House Count: 121 houses x 3.8 persons per dwelling).

Distance to a Sensitive Environment

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

None within 2 miles.

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

None within 1 mile (Cotterill, NYSDEC, 11/14/85).

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

None within 1 mile (Trent, 1985).

Land Use

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

0.0 mile (the site is currently an industrial area) (ES/D&M Site Visits, 1985).

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

Chenango Valley State Park is 3.1 miles northwest of the site (USGS Topographic Map: Chenango Forks Quad).

Distance to residential area, if 2 miles or less:

0.1 mile (USGS Topographic Map: Chenango Forks Quad).

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

0.3 mile (Site Visit, 1985).

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

None within 2 miles (USDA Soil Survey of Broome County, NY, 1971).

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

No.

FIRE AND EXPLOSION

1. CONTAINMENT

Hazardous substances present:

No hazardous substances present that could result in a fire or explosion (Phase II Investigation Sampling and Analysis).

Type of containment, if applicable:

Not applicable.

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable.

Ignitability

Compound used:

Not applicable.

Reactivity

Most reactive compound:

Not applicable.

Incompatibility

Most incompatible pair of compounds:

Not applicable.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

* * *

3. TARGETS

Distance to Nearest Population

Not applicable.

Distance to Nearest Building

Not applicable.

Distance to Sensitive Environment

Distance to wetlands:

Not applicable.

Distance to critical habitat:

Not applicable.

Land Use

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

Not applicable.

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

Not applicable.

Distance to residential area, if 2 miles or less:

Not applicable.

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

Not applicable.

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

Not applicable.

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

Not applicable.

Population Within 2-Mile Radius

Not applicable.

Buildings Within 2-Mile Radius

Not applicable.

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No known observed incident.

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Site is not fenced (ES/D&M Site Visit, 1985) - score = 3.

* * *

3. CONTAINMENT

Type of containment, if applicable:

Unlined lagoons - score = 15.

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Chlordane and Arochlor 1242 (Phase II Sampling and Analysis, 1985).

Compound with highest score:

Chlordane and Arochlor 1242 both have a score of 3.

5. TARGETS

Population within 1-Mile Radius

460 people (USGS Topographic Map: Chenango Forks Quad, 1978).

Distance to critical habitat (of endangered species)

More than 1 mile (Trent, 1985).

HRS REFERENCES
TRI-CITIES BARREL

1. Baker, B. (1985), Town Clerk Town of Fenton. Telephone Interview, November 26, 1985.

2. Bradstreet, D. (1986), Broome County Cooperative Extension Service. Telephone Interview, May 27, 1986.

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7. Finch, J. (1986). Telephone Conversation. June 6, 1986.

8. Freeze, R. A., and Cherry, J. A. (1979). Groundwater.

9. NYS Atlas of Community Water System Sources, 1982.

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11. Schimpff (1985), Town of Fenton. Interview for Phase II Investigation. December 4, 1985.

12. Trent (1985), NYSDEC. Letter to J. Brod. December 5, 1985.

13. Warner, F. (1979). List of Chemical Substances Used, Stored, or Disposed of on Property. March 13, 1979.

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18. USDOC (1979). "Climatic Atlas of the United States".

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20. USDOI (1983). "National Register of Historic Places".

21. USDOI (1983). "National Register of Natural Landmarks".

22. USEPA (1984). "HRS User's Manual".

23. USGS (1979). Topographic Map: Chenango Forks Quadrangle.

24. USGS (1979). Topographic Map: Binghamton East Quadrangle.

25. USGS (1982). "Geohydrology of the Valley-Fill Aquifer in the Endicott-Johnson City Area, Broome County, New York", Sheet 3 of 5.. Open File Report 82-268.

①

INTERVIEW FORM

INTERVIEWEE/CODE Barbara Parker /

TITLE - POSITION Town Clerk, Town of Fenton.

ADDRESS P.O. Box 246, Town Hall

CITY Port Crane STATE NY ZIP 13833

PHONE 607-648-4800 RESIDENCE PERIOD TO

LOCATION Telephone Conversation INTERVIEWER J.C. Bird

DATE/TIME 11/26/85 4:45 pm

SUBJECT: Population - Town of Fenton / residential water supply.

REMARKS: Population : Town of Fenton : 7,400

Port Crane < 800

Hamlets of Port Crane and North Fenton - residents all use private wells

Hamlet of Hillcrest is on a municipal water district.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE

COMMENTS:

②

INTERVIEW FORM

INTERVIEWEE/CODE Dave Bradstreet /

TITLE - POSITION Broome County Cooperative Extension

ADDRESS 840 Front St.

CITY Binghampton STATE NY ZIP 13905

PHONE (607) 772-8953 RESIDENCE PERIOD TO

LOCATION Telephone conversation INTERVIEWER JCBrod

DATE/TIME 5/27/86 / 4:15 pm

SUBJECT: Irrigation near Port Crane.

REMARKS: There are 2 berry farms about a mile north of the intersection of Rts. 88 & 369 on Rt. 369. Water for irrigation is drawn from the river (Chenango River) Total irrigated land is approximately 30-40 Acres.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE

COMMENTS:

XC: 13305-014
IN

③

NOV 21 1985

INTERVIEW FORM

INTERVIEWEE/CODE Jean Cotterill /

TITLE - POSITION NYSDEC Cortland

ADDRESS P.O. Box 5170

CITY Cortland STATE NY ZIP 13045

PHONE (607) 753-3095 RESIDENCE PERIOD TO

LOCATION Phone Convers. / D&M office INTERVIEWER JCBrod

DATE/TIME 2:20 pm / 11/14/85

SUBJECT: Wetlands near Tri-City Barrel site (Port Crane)

REMARKS: The nearest registered wetland to Port Crane and the Tri-City Barrel site is approx. 2 miles north of Port Crane and 3 miles north-east of the site, in the ~~town~~ hamlet of Kattellville near the intersection of Rts. 27 & 28.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

Jean W. Cotterill
SIGNATURE

COMMENTS: See attached map.

④

FIELD MEMORANDUM

ACTION	INFO	
To:	AMS	File: 13305-008
	EDG	TRI-CITY BARREL
		X-Ref:
		Date: 9-9-85 MON

From: JCBrod

Reply Required By:

Subject: Daily Field Activities CW-1

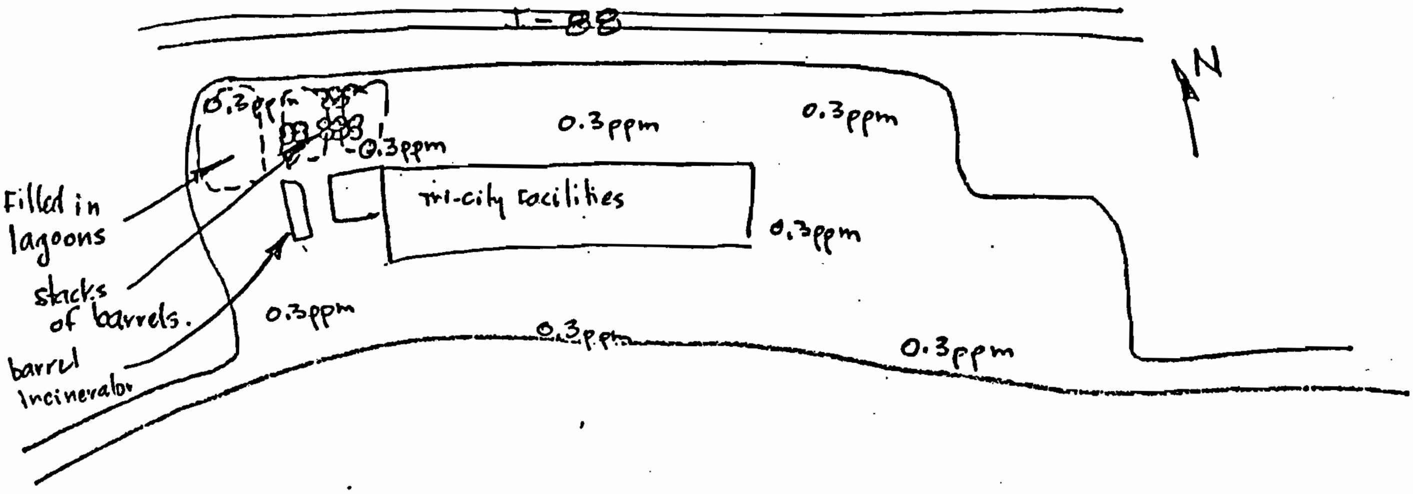
Page 1 of 2

Reference(s):

6:45AM: Leave Site. office.

9:30AM: Arrive site. Met by Tri-City employee. He pointed out where the lagoons were. Walked site, noticed several full barrels - ran HNu over them, no reading.

Upwind and downwind air survey was done as follows:



10:45AM George arrives. Walk site - select downgradient well locations.

Called Art about placement of upgradient well - said to go by geophysical maps. Located upgradient (CW-1) across the street to the south of the Tri-City facilities on Tri-City property.

12:00pm: Called Barrett Wolff - said drillers had left @ ~11:00AM.

ROUTING

12:00 - 12:30pm Lunch

12:30pm Drillers arrive site.

Set up staging area, started steam cleaning dirty equipment. I told drillers about tremying bentonite and sand. He said that they didn't get any special instructions from Stephan Wolff - Driller will call Stephan to clear up any problems.

④

FIELD MEMORANDUM

	ACTION	INFO	
To:		AMS	File: 13305-008
			X-Ref:
			Date: 11/14/85

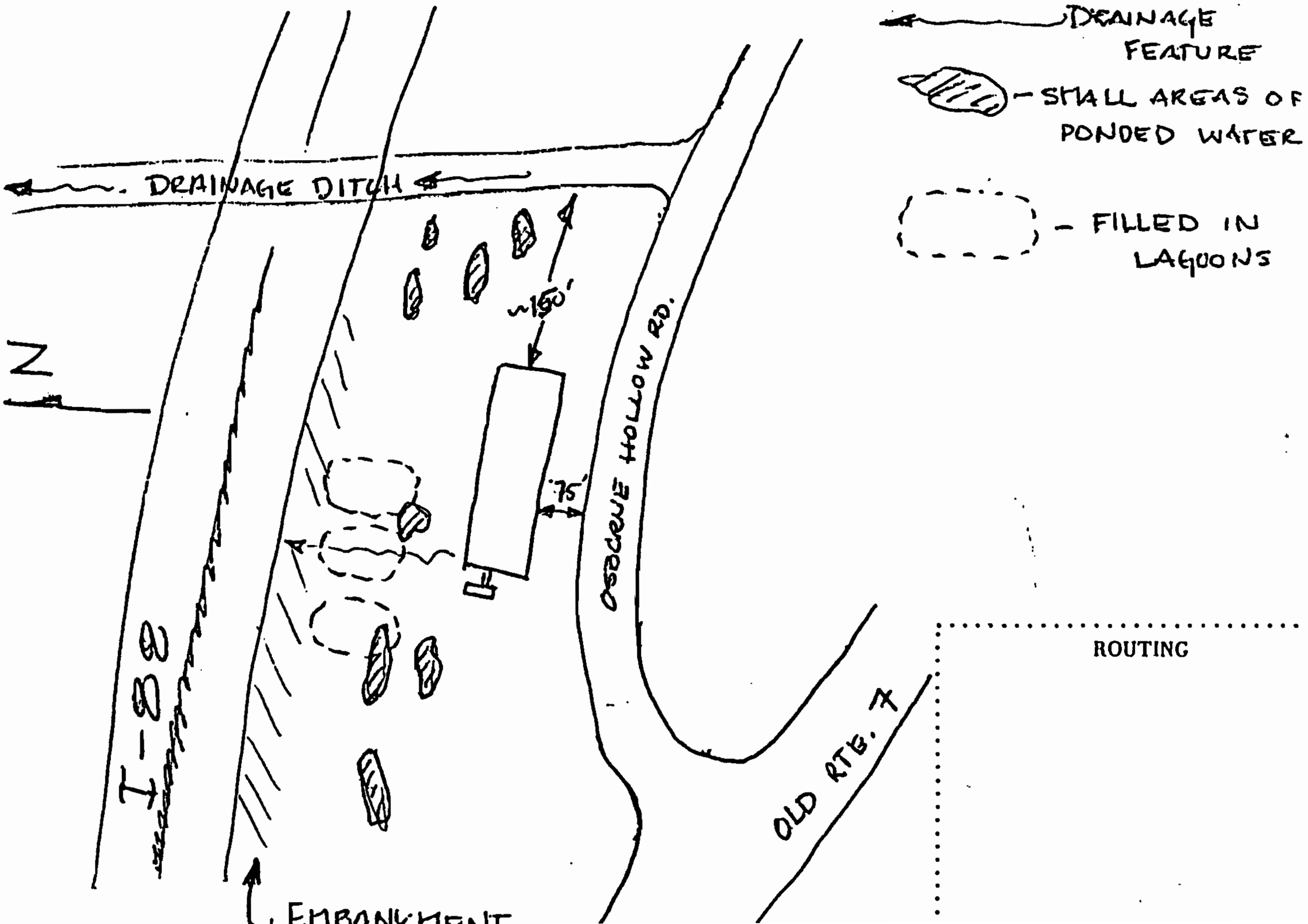
From: JCBroc

Reply Required By:

Subject: Tri-City Barrel

Reference(s):

The following is a rough sketch indicating surface water and drainage features @ the Tri-City Barrel Facilities.



ROUTING

④

FIELD MEMORANDUM

ACTION	INFO	
To:	AMS	File: 13305-008
		X-Ref:
		Date: 12/3/85

From: J.C.Brod

Reply Required By:

Subject: Surface water use – Chenango River

Reference(s):

During the drilling operations at Tri-City Barrel, several fisherman and boaters were noted in the Chenango River, down stream of the Tri-City Barrel Facility.

JCBrod

ROUTING

5

DAMES & MOORE
BORING LOG

Page 1 of 3

CLIENT: NYSDEC
LOCATION: TRI-CITIES BARREL

BORING NO.: CW-3
SURFACE ELEV: 1001.8'

DRILLING METHOD: 4 1/4" Augers

SAMPLING METHOD: 2" Standard split spoon

DATE STARTED: 9/17/85

DATE FINISHED: 9/17/85

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
1	32	SS	0		Olive tan, slightly moist to dry fine sand silt, some pieces of cobble, little fine gravel Hnu=0.3ppm
			1	SM	
			2		
			3		
			4		Greenish gray, slightly moist, silt and clay, little fine gravel, trace of fine sand Hnu=22ppm wood chips in cuttings at 4.0 feet
2	7	SS	5		
			6		
			7		
			8		
			9		
3	27	SS	10		grayish brown, moist, fine sand and silt, little gravel, trace of clay (strong chemical odor) Hnu=180ppm
			11		
			12		
			13		
			14	ML	
4	33	SS	15		grading slightly moist, medium tan in color Hnu=0.8ppm
			16		
			17		
			18		
			19		
			20		

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: TRI-CITY BARREL

BORING NO.: CW-3

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
5	22	SS	20	ML	grading to brown in color Hnu=2.2ppm
			21		
			22		
			23		
			24		
6	12	SS	25		grading to olive gray in color Hnu=0.8ppm
			26		
			27		
			28		
			29		
7	20	SS	30		grading moist, no fine sand
			31		
			32		
			33		
			34		
8	21	SS	35		grading to very moist with some fine sand, trace clay Hnu=0.4ppm
			36		
			37		
			38		
			39	SM	Olive gray fine sand, silt, fine gravel, wet
9	19	SS	40		

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: TRI-CITY BARREL

BORING NO.: CW-3

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
			40		
			41		
			42		
			43		
			44		
10	36	SS	45		grading moist, some gravel
			46		
			47		
11	28	SS	48		grading to very moist
			49		
			50		Boring terminated at a depth of 50.0 feet on 9/17/85. Hnu=0.4ppm

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: BINGHAMTON, NY

BORING NO.: CW-2B

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
9	63	SS	40	ML	Hnu=0
			41		
			42		
			43		
			44	GM	Gray, moist, fine to coarse gravel, sand and silt
10	30	SS	45		Hnu=2ppm
			46		
			47		
			48		
			49		
11	50	SS	50		Wet gravel and sand, little silt Boring terminated at a depth of 50.0 feet on 10/9/85.
			51		

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: BINGHAMTON, NY

BORING NO.: CW-2B

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
5	34	SS	20	ML	Hnu=0ppm in auger brown mud oozing from hole with some gas bubbles
			21		
			22		
			23		
			24		
6	17	SS	25		grading gray, trace of gravel
			26		
			27		
			28		
			29		
7	12	SS	30		grading moist
			31		
			32		
			33		
			34	SM	Light brown, slightly moist, fine sand, some silt, little gravel
8	54	SS	35		
			36		
			37		
			38		
			39		Brown and gray, slightly moist, silt with some fine to medium gravel and sand
			40		

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: TRI-CITIES BARREL

BORING NO.: CW-2B
SURFACE ELEV: 1001.3'

DRILLING METHOD: 4 1/4" Hollow stem auger

SAMPLING METHOD: Standard split spoon

DATE STARTED: 10/9/85

DATE FINISHED: 10/9/85

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
1	16	SS	0	ML	Light brown, mottled, slightly moist silt, some fine sand, little fine to medium gravel, few organics
			1		
			2		
			3		
			4	SM -- ML	Brown and gray, mottled, slightly moist sand and silt, fine to medium gravel, few organics Hnu=0ppm
2	29	SS	5		
			6		
			7		
			8		
			9	ML	Light brown and gray, slightly moist silt with little fine to medium gravel, little fine sand Hnu=1ppm
3	33	SS	10		
			11		
			12		
			13		
			14		
4	35	SS	15		grading brown with some fine to medium gravel
			16		
			17		
			18		
			19		
			20		

5

DAMES & MOORE
BORING LOG

CLIENT: NYSDEC
LOCATION: TRI-CITY BARREL

BORING NO.: CW-1

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
11	16	SS	20		Olive gray, moist to extremely moist silt, little cobble, little fine gravel
			21	ML	
12	24	SS	22		grading without cobble
			23		
13	16	SS	24	SM	Olive gray, wet fine sand with some gravel and coarse sand, little to trace of silt Hnu=0.3ppm
			25		Olive gray, moist silt, some fine sand, little gravel
14	27	SS	26		
			27		
15	19	SS	28		
			29	ML	
16	21	SS	30		
			31		
17	27	SS	32		
			33		
18	80	SS	34	SM	Olive gray, moist fine sand and silt, little coarse sand and gravel
			35		Wet, cobble and gravel, some olive gray fine sand, some silt
19	95	SS	36		
			37	GM	
20		SS	38		moist, shale and gravel, little gray silt
			39		Continuous sampling completed at 38.5 ft.; auger refusal
			40		(Bedrock core) Dark gray, thinly bedded shale grading from highly fractured at 38.5 to 41.5 ft. to moterately fractured 41.5 to 43.5 ft. Upper portion of core contains thin lenses (1/2 to 1 inch thick) of silty clay with traces of fine gravel. Lower 2 to 3 feet appeared fresh. (showed little to no signs of weathering)
			41		
			42		
			43		
			44		Coring terminated at a depth of 43.5 feet on 9/10/85.
			45		

5

DAMES & MOORE
BORING LOG

Page 1 of 2

CLIENT: NYSDEC
LOCATION: TRI-CITIES BARREL

BORING NO.: CW-1
SURFACE ELEV: 1024.2'

DRILLING METHOD: 4 1/4" Augers

SAMPLING METHOD: 2" Split spoon

DATE STARTED: 9/10/85

DATE FINISHED: 9/10/85

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT.	SOIL GRAPH	MATERIAL DESCRIPTION
1	19	SS	0		Tan, slightly moist silt, trace of gravel
			1		
2	55	SS	2		grading to brown in color
			3		
3	34	SS	4		fragmented rock
			5		
4	63	SS	6		olive brown, moist silt with little to trace of gravel, occasional cobble
			7		
5	45	SS	8		
			9		
6	16	SS	10	ML	Hnu=0.4ppm
			11		
7	42	SS	12		
			13		
8	22	SS	14		grading to light brown soil
			15		
9	21	SS	16		olive gray , moist to very moist silt, little fine gravel, trace of clay
			17		
10	17	SS	18		
			19		
			20		

Sample Number
CW-3

85 - Phase II Sampling & Analysis (1985) Groundwater
Sample CW-3

⑥

Organics Analysis Data Sheet
(Page 5)

Pesticide/PCBs

Concentration: Low
Date Extracted/Prepared: 10/18/85
Date Analyzed: 10/24/85
Conc/Dil Factor: 1

CAS Number		ug/l ***************	
319-84-6	Alpha-BHC	0.05	u
319-85-7	Beta-BHC	0.05	u
319-86-8	Delta-BHC	0.05	u
58-89-9	Gamma-BHC(lindane)	0.05	u
76-44-8	Heptachlor	0.05	u
309-00-2	Aldrin	0.05	u
1024-57-3	Heptachlor Epoxide	0.05	u
959-98-8	Endosulfan I	0.05	u
60-57-1	Dieldrin	0.10	u
72-55-9	4,4'-DDE	0.10	u
72-20-8	Endrin	0.10	u
33213-65-9	Endosulfan II	0.10	u
72-54-8	4,4'-DDD	0.10	u
7421-93-4	Endrin Aldehyde	0.10	u
1031-07-8	Endosulfan Sulfate	0.10	u
50-29-3	4,4'-DDT	0.10	u
72-43-5	Methoxychlor	0.50	u
53494-70-5	Endrin Ketone	0.10	u
57-74-9	Chlordane	3.8	
8001-35-2	Toxaphene	1.00	u
12674-11-2	Aroclor-1016	0.50	u
11104-28-2	Aroclor-1221	0.50	u
11141-16-5	Aroclor-1232	0.50	u
53469-21-9	Aroclor-1242	2.9	
12672-29-6	Aroclor-1248	0.50	u
11097-69-1	Aroclor-1254	1.00	u
11096-82-5	Aroclor-1260	1.00	u

Vi = Volume of extract injected (ul)
Vs = Volume of water extracted (ml)
Ws = Weight of sample extracted (g)
Vt = Volume of total extract (ul)

Vs 1000 or Ws Vt 10000 Vi 4

ES- Phase II investigation
Sampling & Analysis (1985)
Sample SS-3

⑥

Sample Number
SS-3

Organics Analysis Data Sheet
(Page 2)

Volatile Compounds (continued)

Case Number		ug/kg
		*************
79-34-5	1,1,2,2-Tetrachloroethane	5 u
78-87-5	1,2-Dichloropropane	5 u
10061-02-6	Trans-1,3-Dichloropropene	5 u
79-01-6	Trichloroethene	14
124-48-1	Dibromochloromethane	5 u
79-00-5	1,1,2-Trichloroethane	5 u
71-43-2	Benzene	0.73 J,B
10061-01-5	cis-1,3-Dichloropropene	5 u
110-75-8	2-Chloroethylvinylether	11 u
75-25-2	Bromoform	5 u
591-78-6	2-Hexanone	11 u
108-10-1	4-Methyl-2-Pentanone	11 u
127-18-4	Tetrachlorethene	76
108-88-3	Toluene	5 u
108-90-7	Chlorobenzene	5 u
100-41-4	Ethylbenzene	5 u
100-42-5	Styrene	5 u
	Total Xylenes	5 u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explained.

alue - If the result is a value greater than or equal to the detection limit, report the value

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the indicated detection limit but greater than zero (e.g. 10J).

C - This flag applies to pesticide parameters where the identification has been comfirmed by GC/MS. Single component pesticides>=10ng/ul in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

[illegible] - Spiked compound.

NR - No value required.

INTERVIEW FORM

⑦

INTERVIEWEE/CODE John Finch /

TITLE - POSITION Water Superintendent Town of Kirkwood

ADDRESS Box 62 Crescent Dr

CITY Kirkwood STATE NY ZIP 13795

PHONE (607) 775-1616 RESIDENCE PERIOD TO

LOCATION Phone Conversation INTERVIEWER John Bond

DATE/TIME 6/6/86

SUBJECT: Water Supply in the Town of Kirkwood.

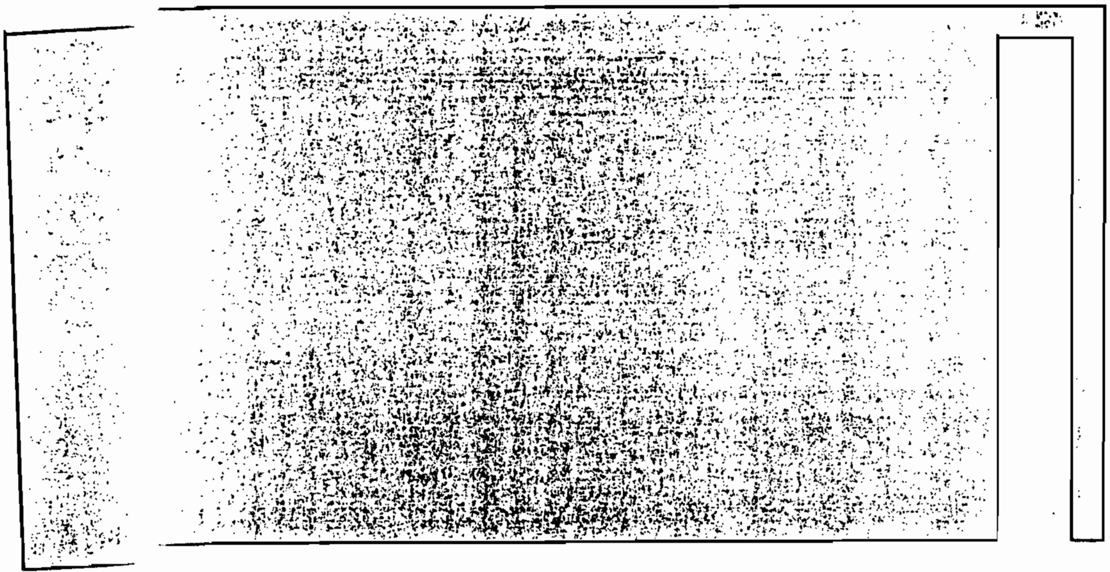
REMARKS: There are no municipal water supplies in the north western portion of the Town of Kirkwood within 3 miles of the Tri-City Barrel facility. This area includes Old State Rd, Stratmill Rd, Fox Hollow Rd, Duell Rd, and part of Colesville Rd near the village of Brookvale. The residents in this area are supplied by private wells.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE

COMMENTS:

Freeze, 1979 ⑧



R. Allan Freeze

Department of Geological Sciences
University of British Columbia
Vancouver, British Columbia

John A. Cherry

Department of Earth Sciences
University of Waterloo
Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

uid-free conductance
all, so petroleum
(2.28) is substituted

(2.29)

y that will lead to
cp under a hydraulic
darcy is approxi-

ly used for hydraulic
uched in terms of Eq.

ey with regard to this
coefficient. However,
d arded this formal
nperature of measure-
ronment can influence
q 2.28). The effect is
still makes good
nts have been carried
surement are very
dependent on the
tical rather than con-

n ctivity and perme-
f geological materials.
is' (1969) review. The
h raulic conductivity
arameters that take on
property implies that
ty an be very useful.
it value probably has

various common units
m an be converted to
conversion from ft² to

Freeze, 1979

⑧

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

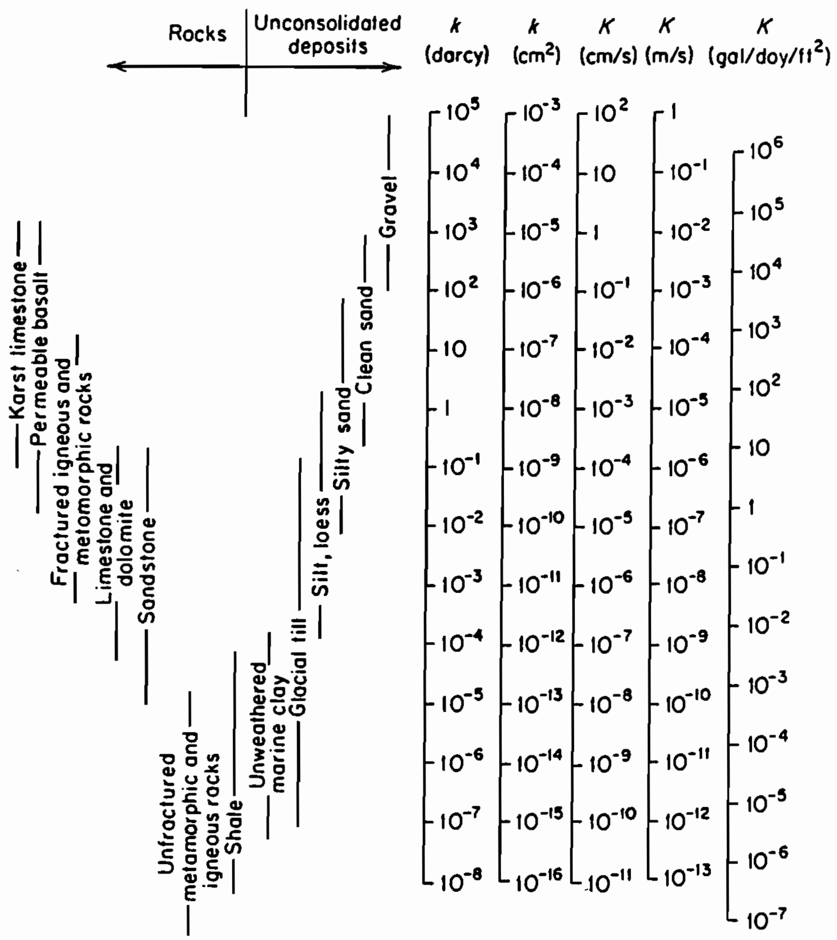


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm²	ft²	darcy	m/s	ft/s	U.S. gal/day/ft²
cm²	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft²	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal/day/ft²	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain k in ft², multiply k in cm² by 1.08×10^{-3}.

New York State Atlas of Community Water System Sources

1982

NEW YORK STATE
DEPARTMENT OF HEALTH

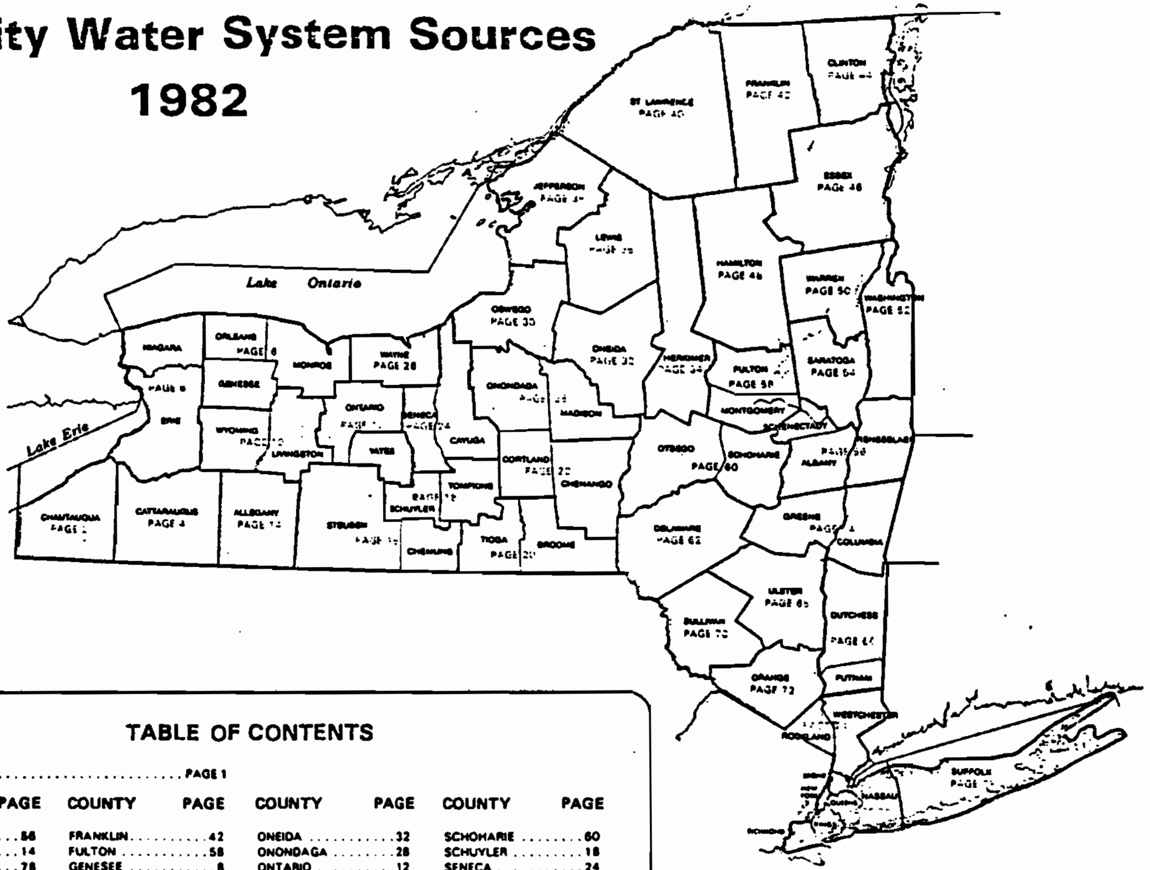


TABLE OF CONTENTS

LEGEND

BOUNDARIES AND PLACES

International
State
County
Town
Indian Reservation
City .... Village ....
Unincorporated Place ..... ● Federal Reservation ....
Built-up Area (Over 25,000 population including any contiguous city or village) ....

CLASSIFICATION OF POPULATED PLACES

100,000 or more	YONKERS
50,000 to 100,000	Levittown
12,500 to 50,000	Poughkeepsie
2,500 to 12,500	Hampton Bays
250 to 2,500	Boiceville
250 or less	Canaan

TRANSPORTATION

Highways
  Divided Highways
    Full Control of Access
    Partial or No Control of Access
  Undivided Highway
  Interchange
  Touring Route (State, U.S., Interstate) or State Parkway
  Touring Route Markers
    State; U.S.; Interstate
Railroads
  Operating Line .... Service Discontinued ...
  Operator .... DELAWARE AND HUDSON
  Owner (If Other than Operator) .... (PENN CENTRAL)
  Company Having Trackage Rights .... (CONRAIL)
Airports (Open to the Public, Military)
  Runway under 4000' .... Runway over 4000' ......
Rest Areas
  Food, Gas, Rest Rooms .... Rest Rooms ....
  Gas, Rest Rooms .... Parking Only ....

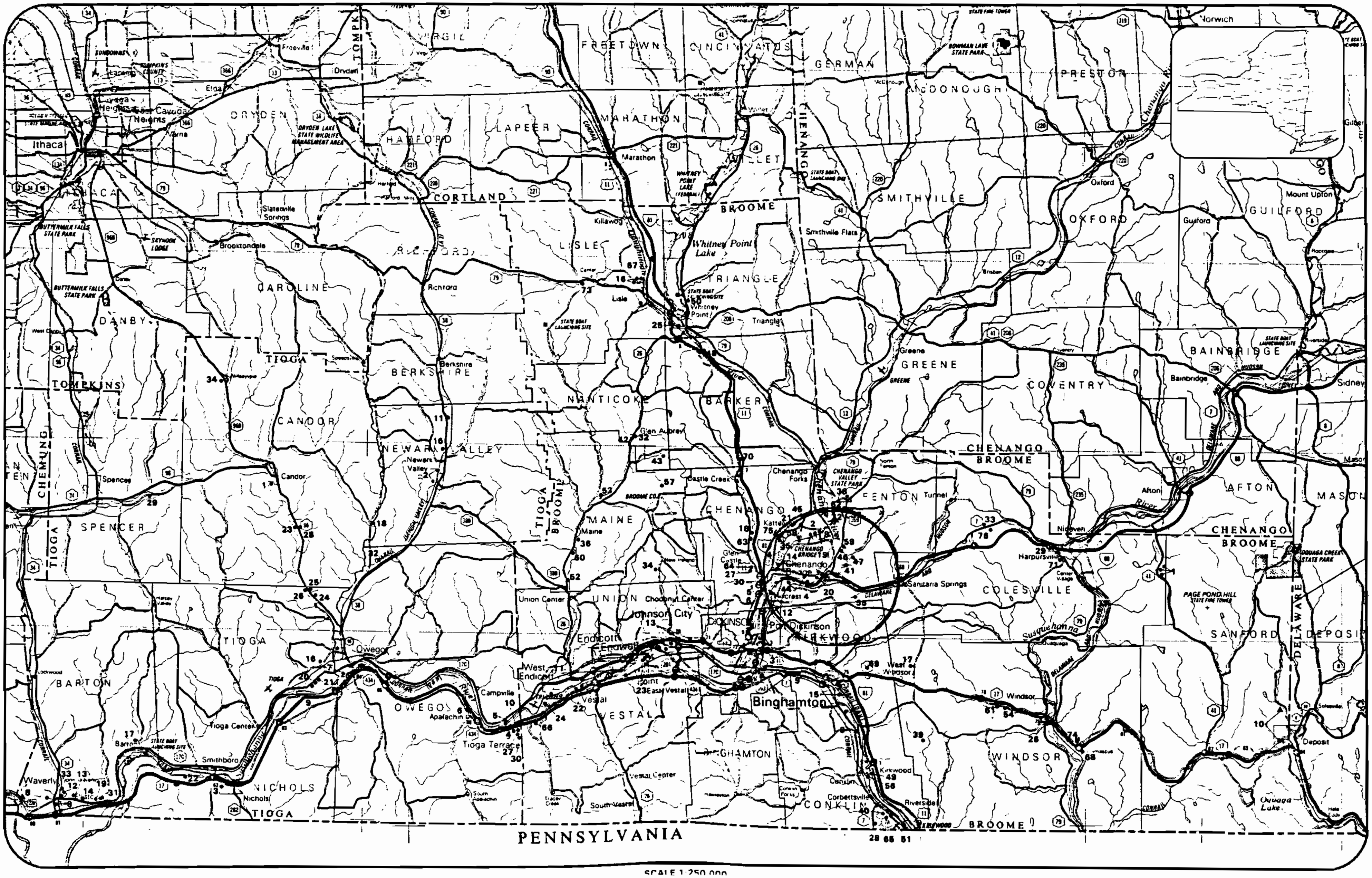
RECREATION FACILITIES

State or National Recreation Area
State Campground ▲
State Boat Launching Site ■
State Canal Park ■
State Fish Hatchery
Other State Recreation Site ●

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

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

BROOME and TIOGA COUNTIES



BROOME COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
1	Afton Village (Chenango Co, Page 22)		Wells (Springs)
2	Applewood Acres	280	Wells
3	Binghamton City	60000	Susquehanna River, Wells
4	Chenango Water District #1	2072	Wells
5	Chenango Water District #3	680	Wells
6	Chenango Water District #7	NA	Wells
7	Chenango Water District #14	272	Wells
8	Chenango Water District #14 (Woodland Park)	225	Wells
9	Conklin Water District #2	1868	Wells
10	Deposit Village	1897	Big Hollow Brook Reservoir, Wells
11	Endicott Municipal Water Works	45000	Wells
12	Hillcrest Water District #1	3356	Wells
13	Johnson City Water Works	17126	Wells
14	Keeler Avenue Water Association	104	Wells
15	Kirkwood Water District #4	256	Wells
16	Lisle Village	500	Wells (Springs)
17	Masler Water Supply	90	Wells
18	Pennview (Chenango Water District #10)	35	Wells
19	River Road Water Association	40	Wells
20	Riverside Co-op Water Association	110	Wells
21	Runacre Estates (Chenango Water District #11)	180	Wells
22	Vestal Water District #1	8760	Wells
23	Vestal Water District #4	3700	Wells
24	Vestal Water District #5	900	Wells
25	Whitney Point Village	1100	Wells
26	Windsor Village	1400	Wells
	Non-Municipal Community		
27	Binghamton Mobile Estates	250	Wells
28	Blue Ridge Mobile Home Park	75	Wells
29	Blue Stone Mobile Home Park	30	Spring
30	Bolebruchs Mobile Home Park	25	Wells
31	Country Court Mobile Home Park	NA	Wells
32	Country Estates Mobile Home Court	170	Wells
33	Country Manor	60	Wells
34	D & G Trailer Park	25	Wells
35	Deluxe Mobile Park	60	Wells
36	Edison Road Mobile Court	150	Wells
37	Fenton Mobile Estates	210	Wells
38	Forest Manor Residential Development	200	Wells
39	Forestview Mobile Homes Park	150	Wells
40	Fountain Bleau Court	360	Wells
41	Glendale Court	30	Wells
42	Green Valley Mobile Lodge	120	Wells
43	Haist Mobile Home Park	80	Wells
44	Hayes Service Court	36	Wells
45	Heaths Trailer Park	150	Wells
46	Hickory Ridge Trailer Park	46	Wells
47	Hillside Park	NA	Wells
48	Hust Trailer Park	NA	Wells
49	Kirkwood Trailer Park	60	Wells
50	Lakeside Lodge	NA	Wells
51	Lillian Diamond Trailer Park	NA	Wells
52	Maine Mobile Court	NA	Wells
53	Manns Mobile Community	NA	Wells
54	Maple Run Mobile Home Park	NA	Wells
55	MBM Mobile Home Court	NA	Wells
56	Meadows Mobile Home Park	NA	Wells
57	Mount Ettrick Terrace	NA	Wells
58	Mount Mobile Home Community	63	Wells
59	Mountain View Mobile Home Park	NA	Wells
60	Nanticoke Valley Mobile Court	270	Wells
61	Occanum Falls Court	NA	Wells
62	Orshals	1000	Wells
63	Pennview Apartments	68	Wells
64	Perts Mobile Home Park	NA	Wells
65	Pride Manor Mobile Home Park	NA	Wells
66	Rush Trailer Park	NA	Wells
67	Shady Maple Trailer Park	60	Wells
68	Tuscarora Mobile Village	40	Wells
69	Twin Acre Terrace	34	Wells
70	Valley Vista	44	Wells
71	Village Court	NA	Wells
72	Virginia City Mobile Home Court	NA	Wells
73	Wal Mar	24	Wells
74	Westview Trailer Park	NA	Wells
75	Whispering Pines Mobile Home Court	NA	Wells
76	Wooded Estates	NA	Wells

10

INTERVIEW FORM

INTERVIEWEE/CODE Ethel Oliver /

TITLE - POSITION Town Clerk Town of Colesville

ADDRESS Box 27

CITY Harpersville STATE NY ZIP 13787

PHONE (607)693-1174 RESIDENCE PERIOD TO

LOCATION Phone Convers. INTERVIEWER J.C. Brod

DATE/TIME 6/5/86 3:40pm

SUBJECT: Municipal Water in the Town of Colesville.

REMARKS: There is no municipal water in the Town of Colesville. All residents use private wells for water supply

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE

COMMENTS:

INTERVIEW FORM

INTERVIEWEE/CODE Donald Schimpff /

TITLE - POSITION Town of Fenton Water Supervisor

ADDRESS Town of Fenton Town Hall, P.O. Box 246

CITY Port Crane STATE NY ZIP 13833

PHONE (607) 724-3786 RESIDENCE PERIOD TO

LOCATION Phone conversation INTERVIEWER John C. Brod.

DATE/TIME 12/4/85 10:30 AM

SUBJECT: Tri-City Barrel

REMARKS: Population of the Town of Fenton - 7,400

Everyone in the Town of Fenton is on private wells, except the Hamlet of Hillcrest. There are 837 water accounts in the Hillcrest water district, serving approximately 3,000 people. This is 1980 Data

The wells supplying the Hillcrest water district are greater than 3 miles from the Village of Port Crane.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

Donald A Schimpff
SIGNATURE

COMMENTS:

New York State Department of Environmental Conservation
Region 7 Binghamton Sub-Office
Rt. 11, R.D.#1
Kirkwood, New York 13795
(607) 775-2545

Henry G. Williams
Commissioner

(12)

RECEIVED DEC 9 1985
FILE 13305-008
INCOMING ☒
FILED
COPY TO ARS
CIRCULATE TO

December 5, 1985

Mr. John Brod
Dames & Moore
2996 Belgium Road
Baldwinsville, New York 13027

Re: Phase II Investigation at
Tri-City Barrel.

Dear John:

The NYSDEC Bureau of Wildlife has informed me that there are neither any Critical Habitats to Endangered Species, nor any National Wildlife Refuges within one mile of the Tri-City Barrel site.

Sincerely,

Frank Trent

Frank Trent
Ass't. Eng. Geologist

FT:kr

TRI. Barrel

SUBSTANCES OF CONCERN
(Refer to attached TABLE I)

(Warner, F., 1979) (13)

Complete all information for those substances your facility has used, produced, stored, distributed or otherwise disposed of since January 1, 1971. D include chemicals used only in analytical laboratory work. Enter the name and code from Table I. If facility uses a substance in any of the Classes A which is not specified in the list, enter it as code class plus 99, e.g. B99 with name, usage, etc.

NAME OF SUBSTANCE	CODE	AVERAGE ANNUAL USAGE	AMOUNT NOW ON HAND	(✓) GAL.	LB.	PURPOSE OF USE (State whether produced, reacted, ble packaged, distributed, no longer used
We recondition steel drums that have had following substances in them, drums are empty quantity of substance unknown						
Methylene Chloride	A02					
Freon	A05					
Dichlorethylene	A11					
Toluene	D02					
Xylene	D03					
Styrene	D07					
Methyl Ether	B02					
Phenol	F01					
Various Oils, Motor, industrial (etc)						
Sodium Hydroxide		20,000	1500		x	Used to wash drums 5 10% solution

I you use chemicals of unknown composition, list trade name or other identification, name of supplier and complete information.

NAME OF SUBSTANCE	AVERAGE ANNUAL USAGE	AMOUNT NOW ON HAND	(✓) GAL.	LB.	SUPPLIER	PURPOSE OF USE (State whether produced, re blended, packaged, distrib no longer used, etc.)

I hereby affirm under penalty of perjury that information provided on this form is true to the best of my knowledge and belief. False statements made h e punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

ATURE (Owner, Partner, or Officer) Francis Warner	DATE 3-13-79
E (Printed or Typed) FRANCIS WARNER	TITLE Owner

(Warner, F., 1985)

14

INTERVIEW FORM

INTERVIEWEE/CODE FRANCIS WARNER /

TITLE - POSITION OWNER - TRI-CITY BARREL

ADDRESS BOX 88

CITY PORT CRANE STATE NY ZIP 13833

PHONE (607) 648-5507 RESIDENCE PERIOD TO

LOCATION PHONE CONVERS. / DH OFFICE INTERVIEWER J.C. BROD

DATE/TIME 11/14/85 : 8:50 AM

SUBJECT: PHASE II REPORT

REMARKS: When the lagoons were filled, the fill material (approx. 7,000 yds) was taken from property owned by Mr. Warner south of old Rte. 7. Most of the site is at the original level, except the area where the newest ~~build~~ building was built. This area received approx. 3-4 ft. of fill. The area in the N-W. corner of the site has always dropped off sharply, and some fill has been added there.

While in existence, the lagoons were 3-4' deep.

The site is 3-3½ ACRES IN SIZE

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE

COMMENTS:

ES ENGINEERING-SCIENCE

(Warner, G., 1985)

(15)

INTERVIEW FORM

INTERVIEWEE/CODE Mr. Gary Warner 607/648-9482

TITLE - POSITION PRESIDENT TRI CITY BARREL

ADDRESS Route 7

CITY North Fenton STATE New York ZIP 13833

PHONE (607) 648-9482 RESIDENCE PERIOD ____ TO ____

LOCATION on site INTERVIEWER Baker/Goodman

DATE/TIME 8/13/85 1100 hrs

SUBJECT: Operation practices at Tri City Barrel facility

REMARKS: Facility operated from 1955 to present as a barrel reclaimation facility. During this time three lagoons were utilized to dispose of wastewater from the drum cleaning operation. The period of operation of these lagoons is not certain, however a 1973 ~~and~~ aerial photograph shows three lagoons in operation at that time. Therefore, it is assumed the lagoons were utilized for more than 8 years. The lagoons were operated in a series such that the first lagoon acted as an oil and water seperater (Primative). Lagoon 2 received sodium hydroxide solution. The third lagoon contained essentially clean rinse water. Lagoons 1 and 2 were approximately 2 to 4 feet in depth. Lagoon 3 may have been as deep as 6 to 8 feet. The lagoons were closed in 1981 by backfilling with material from a borrow area across the road from the site once the wastewaters were pumped from the lagoons.

One on-site well exists at the Tri City Barrel site. Approximate depth of the well is 120'. Water samples collected were free of contamination (no record of results). Junkyard off SE corner of site

Storm drainage ditch located @ NW corner of building runs to NW just south of where ponds were (@ request of DEC).

Discussed original grade on site and addition of fill - tried
to determine the depth of slowly permeable fragipan in Volusia soil
and whether or not waste ponds were through the pan. ⑮

Discussed torrent in ≈ 1976 - washed out RR tracks above
plant - . flooded the site - carrying drums down I-88 .....

Planting of trees on the site @ or near 1968 Red Pine plantation

Excavation for I-88 · slope cut

Area across I-88 and onto site was swampy @ one
time - * this may affect ER ie. clay ?

Discussed his problems w/ barrels partially filled w/ H-wastes

Also - sewage disposal system . .

(Warner, G., 1985)

15

MANES, RIFKEN, FRANKEL & GREENMAN, P. C.
ATTORNEYS AT LAW
507 EAST FAYETTE STREET
SYRACUSE, NEW YORK 13202

SIDNEY MANES
RICHARD E. RIFKEN
JOSEPH A. GREENMAN
PHILIP I. FRANKEL
CAROL M. TUCKER

TELEPHONE
(315) 476-2121

March 7, 1986

REC'D MAR 1 [illegible]

Glenn S. Goodman, Hydrogeologist
ENGINEERING-SCIENCE
290 Elwood Davis Road
Liverpool, New York 13088

Re: Tri-Cities Barrel Company
Our File No. M-8215
Your Code No. 607/648-9482

Dear Mr. Goodman:

I am in receipt of your revised edition of the Interview Summary dated January 13, 1986. I would like to correct and/or contribute to your remarks with regard to the three lagoons at the Tri-Cities facility.

Your Interview states that in 1973, aerial photographs show the three lagoons in operation. You then indicate that the lagoons were in operation for a period of eight years, closing in 1981. On July 11, 1979, a letter was sent by Eric V. Turki to Tri-Cities Barrel Company based upon a July 5, 1979 inspection. That letter indicates that an agreement was reached that "the lagooning system will be abandoned," and that the hauling of the waste water to a State approved site by a certified hauler would be initiated by October 1, 1979.

Subsequent to the July 5, 1979 letter, Tri-Cities Barrel Company immediately contacted a number of waste haulers for the purpose of closing out the lagoons in order to meet the time frame set forth in Mr. Turki's letter.

On or about June 18, 1980, I wrote a letter to Mr. Brickwedde of the NYS DEC, Region 7, advising him that Tri-Cities had eliminated the sewer outlets into the lagoons and that Tri-Cities was in the process of purchasing equipment to incinerate the sludge.

It seems fairly clear that Tri-Cities was the in process of meeting the requirements prior to November of 1980, so that it would not subject to the November, 1980 Regulations dealing with lagoons. Under the circumstances, your Interview indicates the continued existence of the lagoons in 1981, and unless there is some justification or documentation substantiating your belief, I must assume that my dates are more accurate than your assumptions.

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This is an extremely important issue, Mr. Goodman, and I would ask you to please review your Interview and make the appropriate corrections and/or modifications thereto.

Thank you very much.

Respectfully,

MANES, RIFKEN, FRANKEL & GREENMAN, P.C.

Sidney Manes

Sidney L. Manes

SLM:cd
cc: Gary Warner, President
William S. Carter, Ph.D.

(Warner, G., 1985) ⑯

RECORD OF TELEPHONE CONVERSATION

DATE 11/19/85 JOB NO.: 13305-008

RECORDED BY: JC Brod OWNER/CLIENT: NYSDEC

TALKED WITH: Gary Warner OF Tri-City Barrel.

NATURE OF CALL: INCOMING ☒ OUTGOING ☐

ROUTE TO:	INFORMATION	ACTION
	AMS	
		/

MAIN SUBJECT OF CALL:

ITEMS DISCUSSED:

Gary Warner called to tell me that he refuses to give either the state of New York or Dames and Moore any more information. He said that ~~[illegible]~~ we could take any information we've gotten so far, either from our investigation or from him, and go ~~with~~ from there. This telephone call was prompted by an interview form I sent to Francis Warner for approval and signature. He said he would not sign anything else. He also said that he is the senior operating partner, not Francis Warner, and if we need to make any further contact, we must do it through him.

He did say that the entire site has received between 4 and 8 feet of fill, in attempts to build a new yard [for storage and operations].

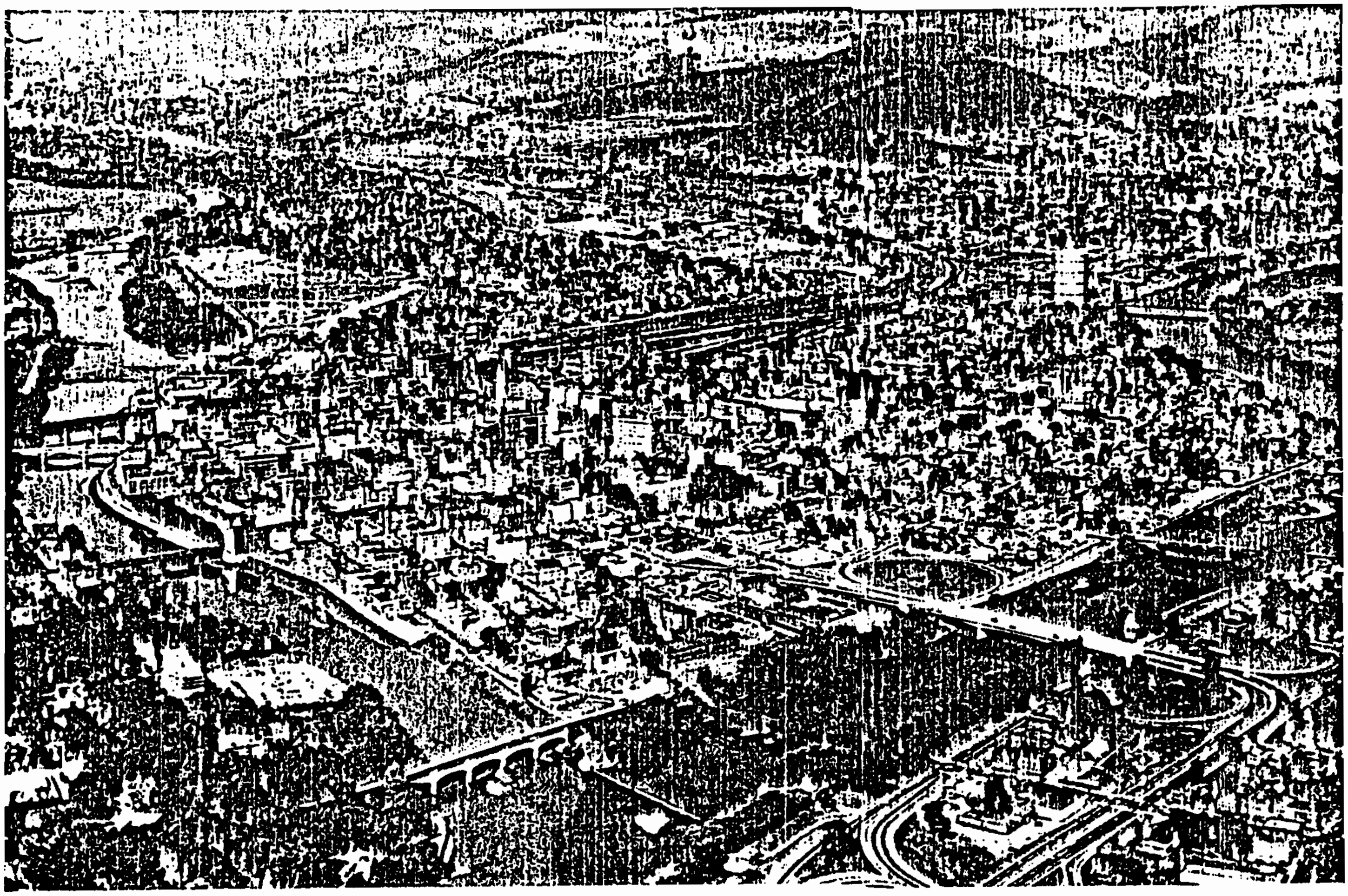
John C. Brof

Issued March 1971

(17)

SOIL SURVEY

Broome County, New York



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

(USDA, 1971)

17

TABLE 10.—*Temperature and precipitation at Broome County Airport, Binghamton*

[Elevation 1,590 feet]

Month	Temperature					Precipitation						
	Average daily maximum [1]	Average daily minimum [1]	7 years in 10 will have—		Average heating degree days [1] [2]—	Average total [1]—	Record minimum [1]	3 years in 10 will have—		Average number of days with 0.10 inch or more [3]	Snow	
			Maximum equal to or higher than [1]—	Minimum equal to or lower than [1]—				More than [1]—	Less than [1]—		Average total [1]	7 years in 10 will have more than [1]
	°F.	°F.	°F.	°F.		In.	In.	In.	In.		In.	In.
January	30	17	46	−2	1, 280	2. 5	1. 2	2. 9	1. 9	6	22	16
February	31	17	47	0	1, 150	2. 2	1. 2	3. 3	1. 7	6	21	16
March	39	24	59	9	1, 050	2. 9	1. 5	3. 0	2. 3	7	16	13
April	53	34	73	23	650	3. 0	2. 0	3. 6	2. 8	9	6	2
May	65	45	80	33	310	3. 5	. 8	3. 6	2. 8	7	(4)	(5)
June	73	54	86	44	100	3. 8	1. 2	3. 9	2. 6	7	0	----------
July	78	59	88	49	20	3. 7	. 8	4. 3	2. 5	7	0	----------
August	76	57	86	47	70	3. 6	. 6	4. 3	2. 6	7	0	----------
September	69	50	84	36	200	2. 9	. 7	3. 2	2. 4	6	0	----------
October	59	41	76	29	470	3. 1	. 3	3. 0	1. 4	5	(6)	(5)
November	45	31	62	19	810	2. 5	1. 0	2. 8	1. 9	7	7	3
December	33	21	52	2	1, 180	2. 6	. 9	3. 2	1. 7	6	17	15
Year	54	37	89	−5	7, 290	36. 3	30. 4	37. 5	32. 6	80	89	74

[1] Based on 16-year record.
[2] Base of 65° F. daily mean temperature.
[3] Based on 10-year record.
[4] Less than 0.5 but more than 0.
[5] 1 year in 10 will have more than 1 inch.
[6] Trace.

Temperature

Temperatures at the airport reach 90°F. or higher on an average of 2 to 4 days each year. The number of such days varies, however, from as many as 8 days or more in an unusually hot summer to none in about four summers out of 10. At the high elevations in the county, temperatures in the 90's occur almost entirely during the months of July and August. In the lower valleys, temperatures in the 90's occur on an average of 10 to 14 days each year. Temperatures in the county seldom reach 100° or higher.

A temperature of 0° or lower can be expected on 6 to 10 days in most winters. Such a temperature occurs on not more than 2 or 3 days in mild winters but ranges up to 15 days or more in abnormally cold winters. A temperature of —15° or lower occurs in about 1 year out of 5, but temperatures of −20° unusual. Temperatures of 0° or lower can be expected from early in December through the middle of March. In both the river valleys and on upland where the air drainage is good, the lowest temperature in most winters is between −5° and −15°. In areas where air movement is poor, or in cold pockets, lower temperatures are more common.

Temperatures do not exceed 32° on 60 to 70 days each year at the higher elevations and on 45 to 55 days in the main river valleys. Such cold days may be expected from late in November through March and occasionally in April. Continuous periods of subfreezing temperatures seldom last for more than 4 or 5 days.

Table 11 gives the probability of the last freezing temperature in spring and the first in fall. At the higher elevations in the county, where air drainage is good, and in the Susquehanna River valley, the average date for the last freeze in spring is about May 5, and the average date for the first freeze in fall is about October 5. It is unlikely that freezing temperatures will occur later than May 25 or earlier than September 20. In most years, the last freeze in spring is likely to occur between April 21 and May 16, and the first freeze in fall between September 26 and October 20. The occurrence of freezing temperatures may differ considerably within short distances because of the differences in elevation, aspect of slope, and air drainage.

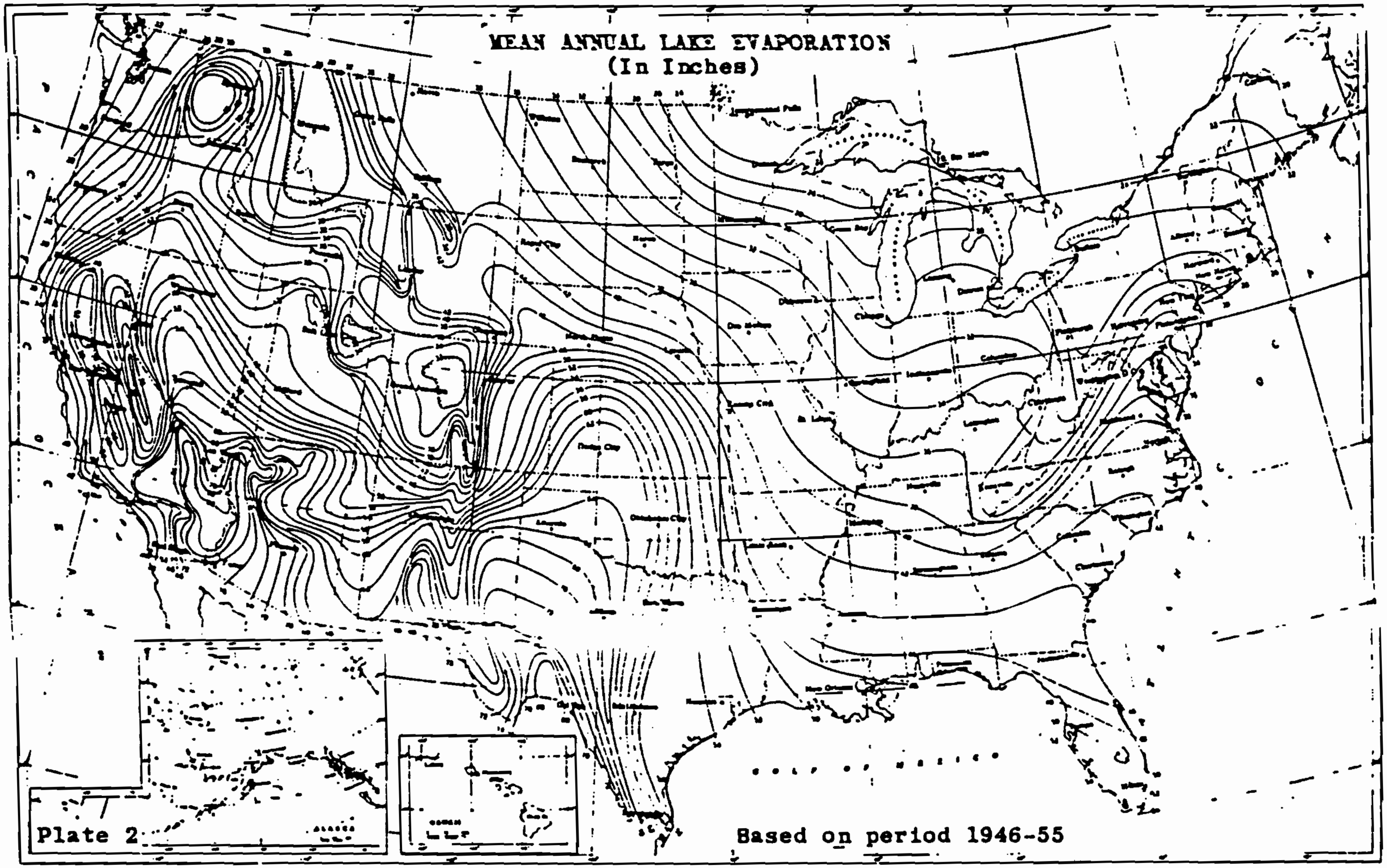
The length of the freeze-free season on the uplands where air drainage is good, and in the principal river valleys, is commonly about 150 to 155 days. In about 7 years out of 10, the freeze-free season ranges from 140 to 165 days.

Additional information on freezing temperatures in Broome County and other sections of New York State can be found in literature citations (*7*) and (*8*).

Precipitation

The annual precipitation varies as much as 4 inches throughout the county. It ranges from 35 to 36 inches in the river valleys in the southwestern part to 39 to 40 inches near the Chenango and Delaware County lines in the northeastern and eastern parts. It is about 38 inches in the northern panhandle. Unless otherwise stated, the statistics given in this subsection are based on data compiled since 1951 at the Broome County Airport, an area of lighter precipitation.

The annual precipitation ranges from 31.5 to 39 inches in 7 years out of 10. The annual precipitation in a 30-year period has ranged from a minimum of 27.7 to a maximum of 45.5 inches. The climate is known to bring

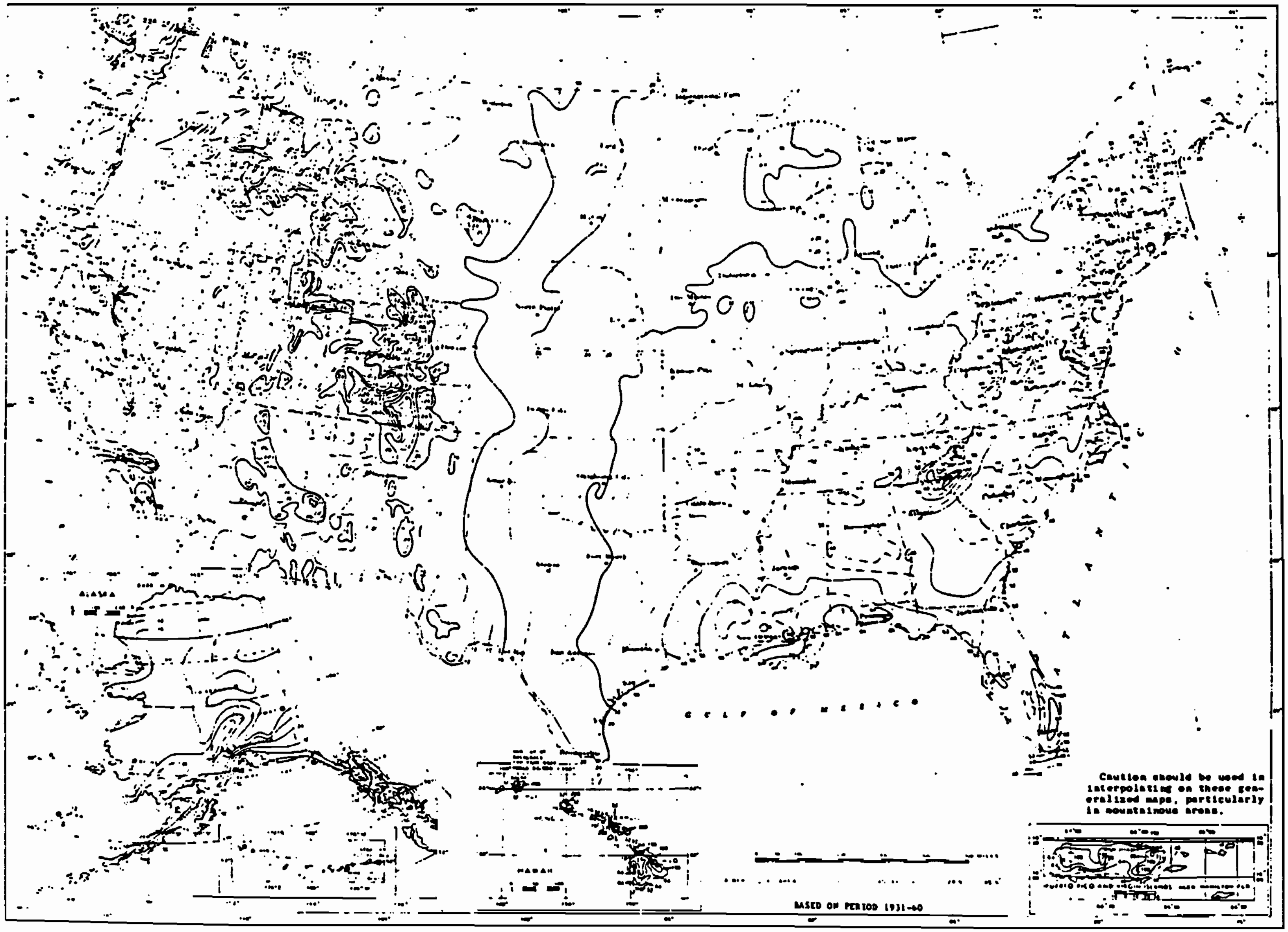


Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

Figure 4

Mean Annual Lake Evaporation (In Inches)

(USDOC, 1979) (18)



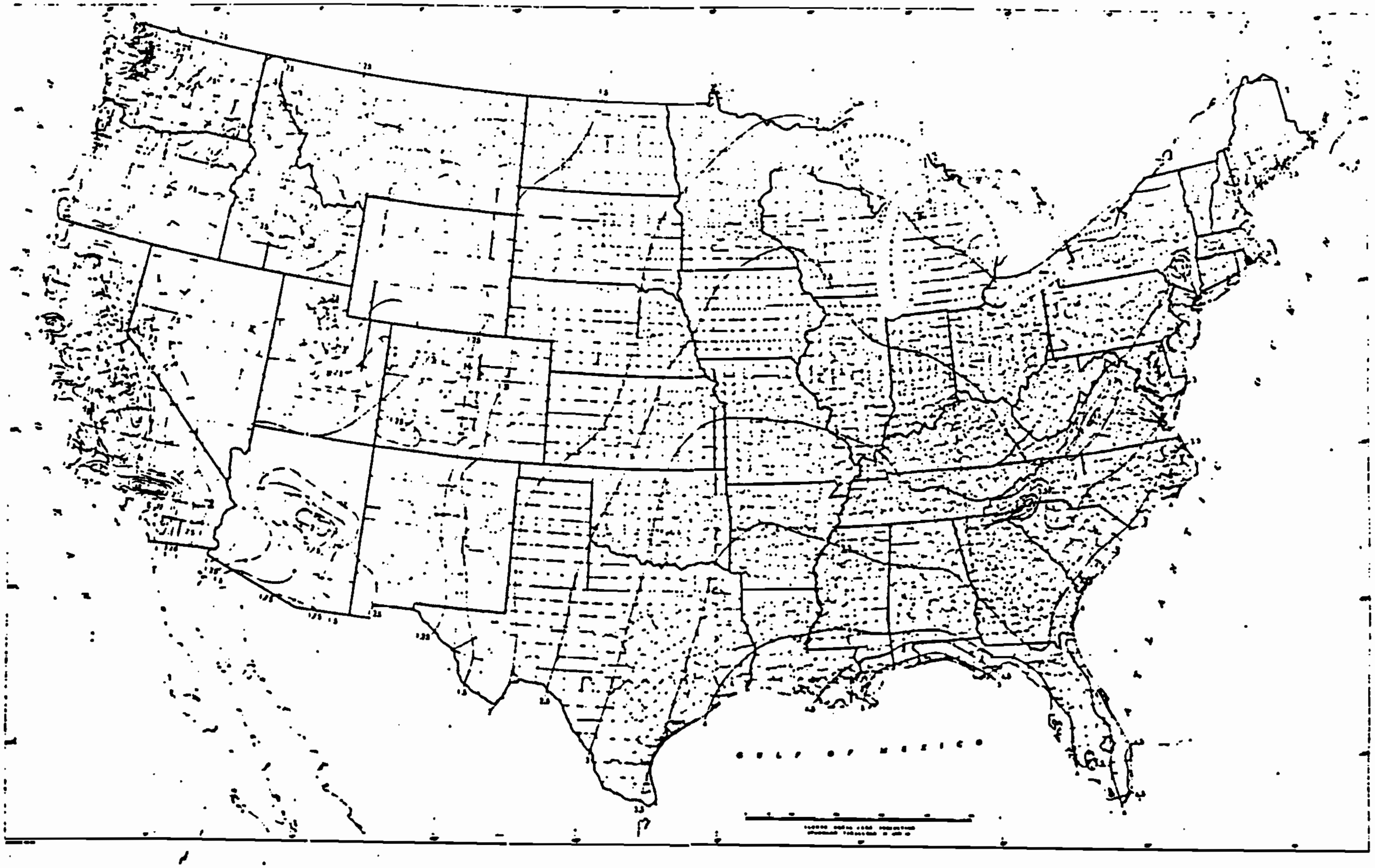
Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

Figure 5

Normal Annual Total Precipitation (inches)

(USDOC, 1963)

19



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

Figure 8

1-Year 24-Hour Rainfall (Inches)

20.

NATIONAL REGISTER OF HISTORIC PLACES

ANNUAL LISTING OF PROPERTIES

JANUARY 1979 THROUGH DECEMBER 1982

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

JULY 1983

federal register

Tuesday
March 1, 1983

21

Part III

Department of the Interior

National Park Service

National Registry of Natural Landmarks

[illegible]

G.C.

㉒

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual

(HW-10)

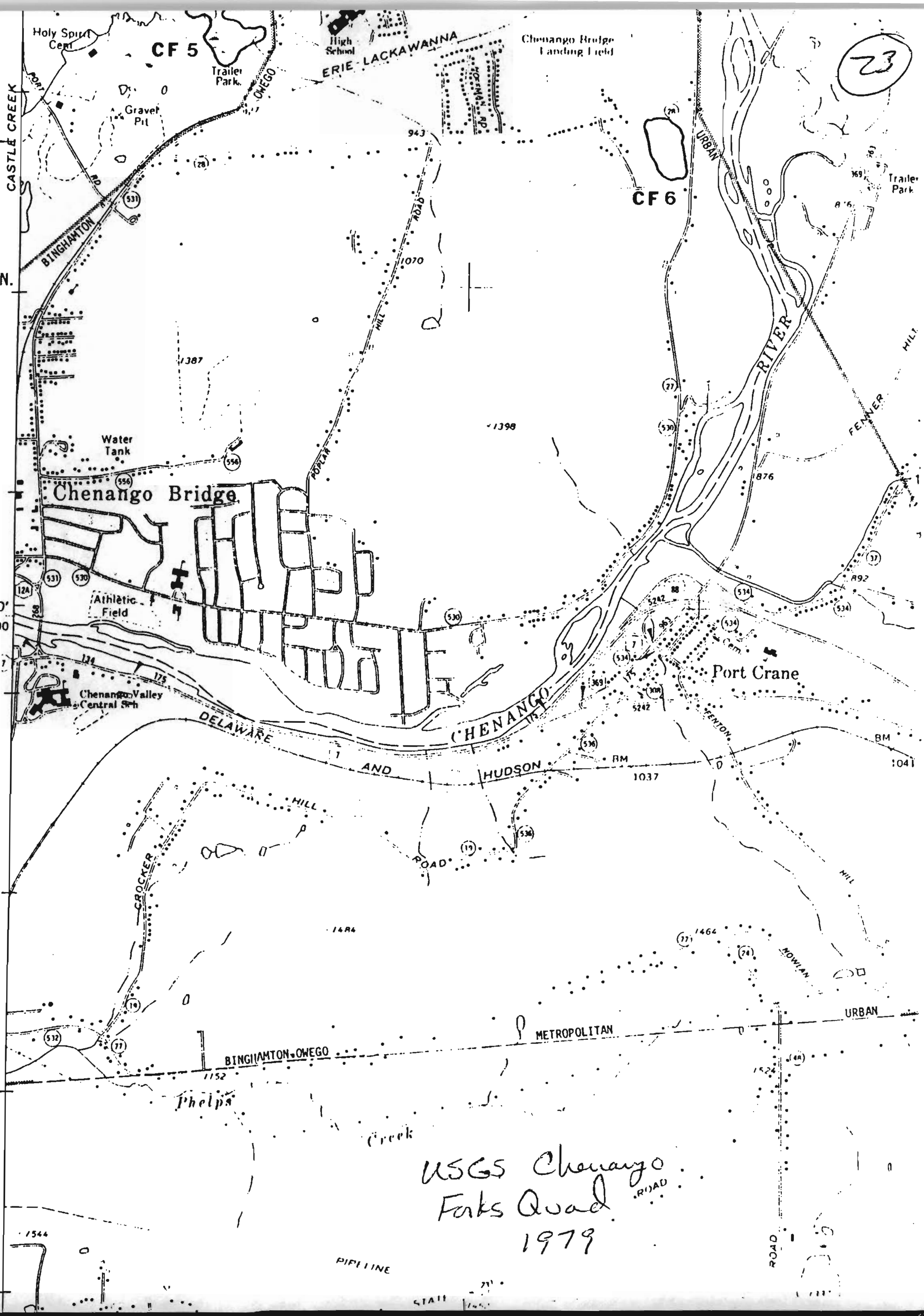
Originally Published in
the July 16, 1982, *Federal Register*

Tim Sl[illegible]

United States
Environmental Protection
Agency

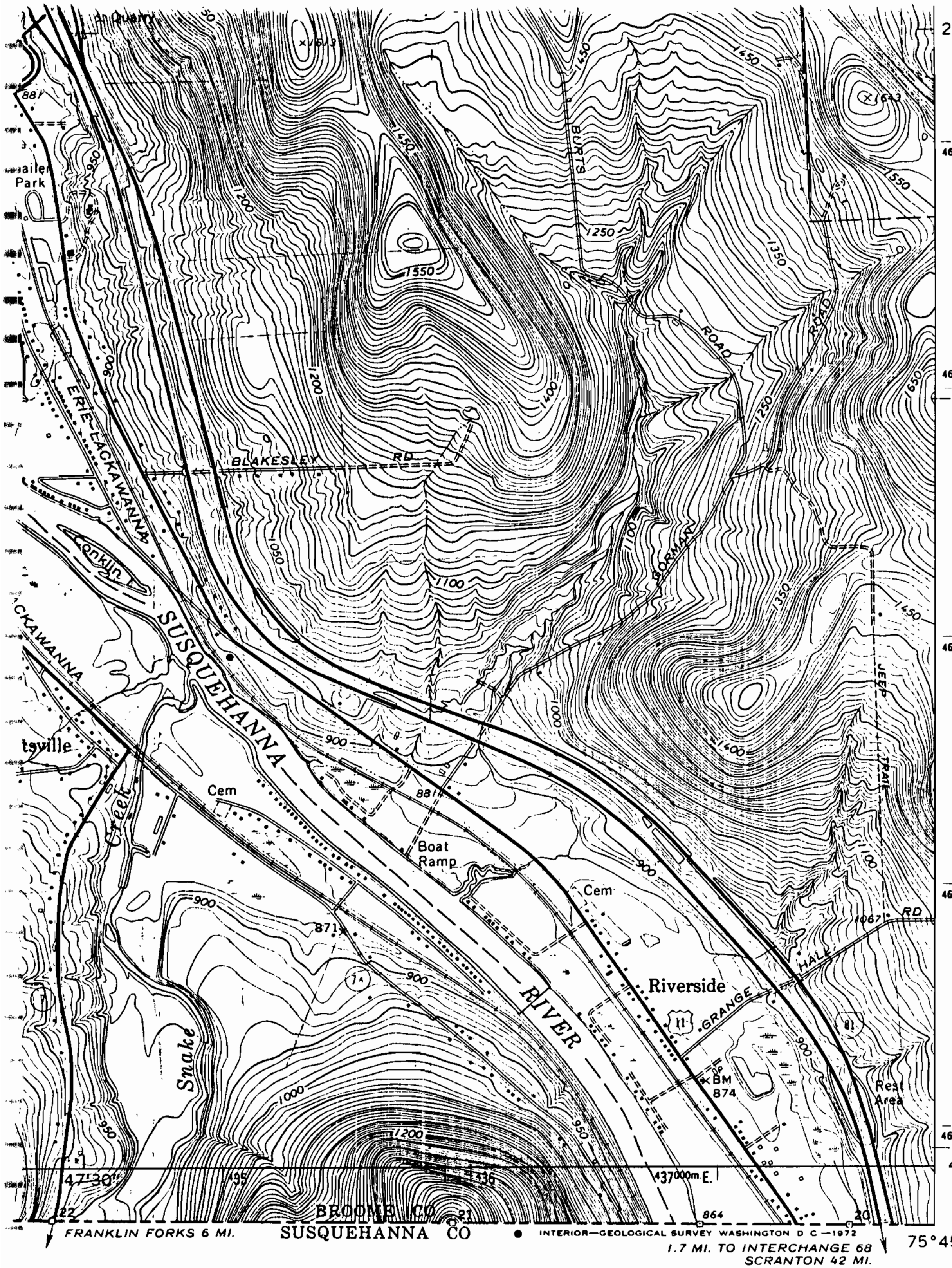
1984

23



USGS Chenango Forks Quad 1979

24



ROAD CLASSIFICATION

Primary highway, hard surface	Light-duty road, hard or improved surface
Secondary highway, hard surface	Unimproved road

○ Interstate Route ○ U. S. Route ○ State Route

QUADRANGLE LOCATION

BINGHAMTON EAST, N. Y.

N4200—W7545/7.5

1968

AMS 5868 III SE—SERIES V821

GEOHYDROLOGY OF THE VALLEY-FILL AQUIFER IN THE ENDICOTT-JOHNSON CITY AREA, BROOME COUNTY, NEW YORK

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF HEALTH

OPEN-FILE REPORT 82-268
(SHEET 3 OF 5)

25

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Site Inspection Report

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID# 704005

II. SITE NAME AND LOCATION

01 SITE NAME *(Legal, common, or descriptive name of site)* Tri-Cities Barrel	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Route 7				
03 CITY Fenton	04 STATE NY	05 ZIP CODE 13833	06 COUNTY Broome	07 COUNTY CODE 007	08 CONG DIST 27

09 COORDINATES LATITUDE 42° 09' 45.4" LONGITUDE 75° 50' 29.6"

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

III. INSPECTION INFORMATION

01 DATE OF INSPECTION 10, 11 85 (MONTH DAY YEAR)

02 SITE STATUS ☒ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION 1956 | Present (BEGINNING YEAR, ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION *(Check all that apply)*
☐ A. EPA ☐ B. EPA CONTRACTOR ______ *(Name of firm)* ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ______ *(Name of firm)*
☒ E. STATE ☐ F. STATE CONTRACTOR Engineering-Science *(Name of firm)* ☐ G. OTHER ______ *(Specify)*

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jean Neubeck	Geologist	ES	(518) 459-0810
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
J. Baker	Geologist	ES	(315) 451-9560
J. Brod	Geologist	D&M	(315) 638-2572
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Francis Warner	Vice President	Port Crane	(607) 648-9482
Gary Warner	Owner	Port Crane	(607) 648-9482
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY *(Check one)*	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	13:00	Overcast, Breezy

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF *(Agency/Organization)*		03 TELEPHONE NO.
W. G. Christopher	Engineering-Science		(315) 451-9560
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.
Same			

08 DATE 10, 11, 85 (MONTH DAY YEAR)

EPA

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

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: D980509285
NYS ID #704005

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES *(Check all that apply)*

☐ A. SOLID
☐ B. POWDER, FINES
☐ C. SLUDGE
☐ D. OTHER ________ *(Specify)*
☐ E. SLURRY
☑ F. LIQUID
☐ G. GAS

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

TONS 1064 (est.)
CUBIC YARDS ________
NO. OF DRUMS ________

03 WASTE CHARACTERISTICS *(Check all that apply)*

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES	20,000	pounds	NaOH
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Sodium Hydroxide	1310732	LG		
SOL	Methylenechloride	75092	LG	In Barrels which	
SOL	Freon	76131	LG	were processed	
OCC	Dichloroethylene	25323302	LG		
SOL	Toluene	10883	LG		
OCC	Xylene	1330-20-7	LG		
OCC	Styrene	100-420-5	LG		
OCC	Methyl ether	999	LG		
OCC	Phenol	108-95-2	LG		
PSD	Chlordane	57749	LG	3.8 ug/l	in groundwater
PSD	Aroclor 1242	12672296	LG	2.9 ug/l	in groundwater
OCC	Tetrachloroethene	127184	LG	76 ug/l	in soil

V. FEEDSTOCKS *(See Appendix for CAS Numbers)*

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

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

Site Inspection, NYSDEC 4/17/79
Site Inspection, ES 10/11/85
Phase II Investigation Sampling and Analysis, ES/D&M, 1985
Warner, E., 1979

EPA

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

I. IDENTIFICATION
01 STATE: NY
02 SITE NUMBER: D980509285
NYS ID #704005

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION
02 ☑ OBSERVED (DATE: 10/85) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 3,550
04 NARRATIVE DESCRIPTION

Chlordane (3.8 ug/l) and Aroclor 1242 (2.9 ug/l) detected in downgradient groundwater samples. Tetrachloroethene, Trans-1,2-dichloroethene, 1,1,1-Trichloroethane and Trichloroethylene found in one subsurface soil sample. Potential exists in this material to reach into groundwater.

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

No contamination detected in surface water during Phase II Investigation.

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

No air contamination detected with an HNu meter during the Phase II investigation.

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

None known.

01 ☑ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE:) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

12 workers on-site, potential for contact with hazardous wastes in rinse water or in drums.

01 ☑ F. CONTAMINATION OF SOIL
02 ☑ OBSERVED (DATE: 12/85) ☐ POTENTIAL ALLEGED
03 AREA POTENTIALLY AFFECTED: 3.5 (Acres)
04 NARRATIVE DESCRIPTION

Several halogenated organic compounds, including Tetrachloroethene, Trans-1,2-dichloroethene, 1,1,1-Trichloroethane, and Trichloroethylene were found in one auger hole soil sample.

01 ☑ G. DRINKING WATER CONTAMINATION
02 ☑ OBSERVED (DATE: 10/85) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 3,550
04 NARRATIVE DESCRIPTION

Groundwater is used for drinking water. On-site monitoring well showed contamination with Chlordane and Aroclor 1242. Nearby private drinking water wells did not show any contamination.

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

None known

01 ☑ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE:) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 12+
04 NARRATIVE DESCRIPTION

12 on-site workers and potential for direct contact of neighbors with contaminated soil. Site is not fenced.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

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

None apparent

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

None apparent

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

None apparent

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

Unlined lagoons previously existed on the site.

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

Unknown

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

Unknown

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

Unknown

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

III. TOTAL POPULATION POTENTIALLY AFFECTED: 3,550

IV. COMMENTS

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

ES/D&M Site Visit 10/11/85
Phase II Investigation Sampling and Analysis

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☑ A. NPDES	10NYD0D2245264			
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☑ G. STATE (Specify)	Incinerate and Haul Drums			
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☑ A. SURFACE IMPOUNDMENT	3	Lagoons
☐ B. PILES		
☑ C. DRUMS, ABOVE GROUND	25,000	Drums
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER ______ (Specify)		

04 TREATMENT (Check all that apply)

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

05 OTHER

☑ A. BUILDINGS ON SITE

06 AREA OF SITE

3.5 (Acres)

07 COMMENTS

Three unlined lagoons on the site were used to store contaminated sodium hydroxide rinse water. These lagoons were used from before 1973 to 1980 at which point they were filled with indigeneous soil.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

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

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

Lagoons were covered with fill, backpan and shale on top.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☑ YES ☐ NO

02 COMMENTS

No fences.

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

ES/D&M Site Inspection 10/11/85

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

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY *(Check as applicable)*

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

02 STATUS

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

03 DISTANCE TO SITE

A. More than 3 (mi)

B. 0.0 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY *(Check one)*

☐ A. ONLY SOURCE FOR DRINKING

☑ B. DRINKING *(Other sources available)* COMMERCIAL, INDUSTRIAL, IRRIGATION *(No other water sources available)*

☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION *(Limited other sources available)*

☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 3,550

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.0 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
22 (ft)	North	22 (ft)	Unknown (gpd)	☑ YES ☐ NO

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

Homeowner drinking water wells (uphill from site). On-site process water well - 120 feet deep.

10 RECHARGE AREA

☑ YES
☐ NO

COMMENTS

11 DISCHARGE AREA

☐ YES
☑ NO

COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE *(Check one)*

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE

☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES

☐ C. COMMERCIAL, INDUSTRIAL

☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Osborne Creek	☐	0.2 (mi)
Chenango River	☐	1.9 (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 460 NO. OF PERSONS	B. 789 NO. OF PERSONS	C. 6623 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 300 feet ~~xxx~~ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 207

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0 (mi)

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

Rural area with the village of Port Crane approximately 1 mile west. Interstate 88 runs adjacent to the northern edge of the site.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE *(Check one)*

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

02 PERMEABILITY OF BEDROCK *(Check one)*

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

03 DEPTH TO BEDROCK 66-82 (ft)	04 DEPTH OF CONTAMINATED SOIL ZONE More than 4 (ft)	05 SOIL pH 5.0-6.5	

06 NET PRECIPITATION 9.3 (in)	07 ONE YEAR 24 HOUR RAINFALL 2.4 (in)	08 SLOPE SITE SLOPE 3-4 %	DIRECTION OF SITE SLOPE N	TERRAIN AVERAGE SLOPE 7-8 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS *(5 acre minimum)*

ESTUARINE	OTHER
A. Unknown (mi)	B. More than 2 (mi)

12 DISTANCE TO CRITICAL HABITAT *(of endangered species)*

More than 2 (mi)

ENDANGERED SPECIES:

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AGRICULTURAL LANDS AG LAND
A. 0.0 (mi)	B. 300' (mi)	C. (mi)	D. Approx 0.5 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is approximately 3-acres in size and has an elevation of about 1,015 feet above seal level. Interstate 88 borders the site to the north, while the rest of the site is bordered by rural residential areas and farmland.

The surface of the site is relatively flat. Beyond the northern boundary the ground surface slopes steeply to the north. A drainage ditch is located on the eastern edge of the site. Also, a small, intermittent drainage feature crosses the middle of the site. Both features flow to the north, eventually reaching Osborne Creek, which drains to the west into the Chenango River. The site is also spotted with many small areas of ponded, stagnant water. Several of these puddles have some discoloration in the water (ES/D&M, 1985). The nearest registered wetland is approximately 3 miles north west of the site.

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

USGS.
ES/D&M Site Visits, 1985; Phase II Investigation Well Boring Logs.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	4	NUS Analytical Laboratories	10/85
SURFACE WATER	3	NUS Analytical Laboratories	12/85
WASTE	None		
AIR	None		
RUNOFF	None		
SPILL	None		
SOIL	3	NUS Analytical Laboratories	12/85
VEGETATION	None		
OTHER - Sediment	3	NUS Analytical Laboratories	12/85

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNu Meter	No readings above background levels
Electrical Resistivity	
Magnetometer	Areas of 3 lagoons were defined.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Engineering-Science
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Dames & Moore

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

ES/D&M Site Visits and Phase II investigation, 1985.

EPA

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

I. IDENTIFICATION	
01 STATE NY	02 SITE NUMBER D980509285

NYS ID #704005

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

01 NAME Gary Warner		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* RD 1, Box 88		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY Port Crane	06 STATE NY	07 ZIP CODE 13833	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

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

01 NAME Francis Warner		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* RD 1 Box 88		04 SIC CODE	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY Port Crane	06 STATE NY	07 ZIP CODE 13833	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	08 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

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

NYS Tax Records

EPA

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

I. IDENTIFICATION

01 STATE NY	02 SITE NUMBER D980509285

NYS ID #704005

II. CURRENT OPERATOR *(Provide if different from owner)*		**OPERATOR'S PARENT COMPANY** *(If applicable)*	
01 NAME Tri-Cities Barrel	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* P.O. Box 88	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE
05 CITY Port Crane	06 STATE NY	07 ZIP CODE 13833	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION 1955-Present	09 NAME OF OWNER Francis then Gary Warner		

III. PREVIOUS OPERATOR(S) *(List most recent first; provide only if different from owner)*		**PREVIOUS OPERATORS' PARENT COMPANIES** *(If applicable)*	
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	14 CITY	15 STATE 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	14 CITY	15 STATE 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	14 CITY	15 STATE 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		

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

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. ON-SITE GENERATOR

01 NAME Tri-Cities Barrel		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) P.O. Box 88		04 SIC CODE
05 CITY Port Crane	06 STATE NY	07 ZIP CODE 13833

III. OFF-SITE GENERATOR(S)

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

IV. TRANSPORTER(S)

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

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

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ D. SPILLED MATERIAL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ E. CONTAMINATED SOIL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ F. WASTE REPACKAGED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☑ G. WASTE DISPOSED ELSEWHERE 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
CECOS hauls contaminated rinse water off-site, awaiting permit for solids

01 ☐ H. ON SITE BURIAL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ I. IN SITU CHEMICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ J. IN SITU BIOLOGICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ K. IN SITU PHYSICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ L. ENCAPSULATION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ M. EMERGENCY WASTE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ N. CUTOFF WALLS 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ P. CUTOFF TRENCHES/SUMP 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

01 ☐ Q. SUBSURFACE CUTOFF WALL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☑ S. CAPPING/COVERING 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
Lagoons covered with indigeneous soil

01 ☐ T. BULK TANKAGE REPAIRED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ U. GROUT CURTAIN CONSTRUCTED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ V. BOTTOM SEALED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ W. GAS CONTROL 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ X. FIRE CONTROL 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ Y. LEACHATE TREATMENT 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ Z. AREA EVACUATED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ 1. ACCESS TO SITE RESTRICTED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ 2. POPULATION RELOCATED 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
No

01 ☐ 3. OTHER REMEDIAL ACTIVITIES 02 DATE ________ 03 AGENCY ________
04 DESCRIPTION
None

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

ES/D&M Site Visits, 1985
Warner, 11/14/85

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980509285

NYS ID #704005

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☑ YES ☐ NO

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

1979 DEC issued consent order for lagoon closure.

State agencies have issued "Uniform Appearance Tickets" in past (failure to perform physical analysis) failure to properly label hazardous wastes. A $2,000 fine was collected from Tri-Cities Barrel for these RCRA violations.

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

Site owner, Gary Warner.
Investigator Layman, NYSDEC-DEE.

SECTION VI

PRELIMINARY REMEDIAL ALTERNATIVES AND COST

INTRODUCTION

The purpose of this conceptual remedial alternative evaluation is to identify potential remedial action technologies and prepare a conceptual cost estimate for the most likely remedial alternative for the Tri-Cities Barrel site. Due to the preliminary nature of the data available, any remedial alternative evaluation must be considered very preliminary and, hence, would be conservative. A more detailed remedial investigation and feasibility study would be required to better define the extent of groundwater and sediment contamination and determine if the soil and bedrock aquifers are hydraulically connected, in order to determine the design criteria and costs for remedial alternatives.

IDENTIFICATION OF REMEDIAL METHODS (FIRST SCREENING)

The conceptual remedial alternatives considered for the Tri-Cities Barrel site were subjected to a three-tiered screening process. First, remedial action methods were screened to determine applicability to the site. The methods were selected to conform with the on-site actions for remediation of hazardous material releases, as presented in the National Contingency Plan. Three broad criteria were used in the initial screening: (1) cost of installing or implementing the remedial action, (2) the effectiveness of the action to minimize the threat of harm to public health and the environment, and (3) the feasibility of the remedial action from an engineering standpoint. The initial screening process and rationale for selection of engineering methods is summarized in Table VI-1. Based on the initial screening, groundwater controls, excavation and removal, and treatment technologies were retained for consideration in the secondary screening process.

IDENTIFICATION OF REMEDIAL ACTIONS (SECOND SCREENING)

In the second screening process, the engineering methods identified in the first screening process were further evaluated. The results of the second screening of remedial actions are presented in Table VI.2.

Groundwater Controls

Groundwater controls applicable to the site include monitoring, capping (including grading, revegetation, and perimeter fence), slurry walls, water table adjustment, and leachate interceptor trenches.

Capping, grading, and revegetation of the contaminated soil area would prevent infiltration of surface water and subsequent mobilization of contaminants. The installation of a perimeter fence would minimize direct contact with the site. Groundwater pumping to lower the water table or installation of an upgradient slurry wall could potentially lessen contaminant migration by preventing groundwater contact with contaminated areas. The installation of a leachate interceptor trench downgradient of the contaminated area would minimize the migration of contaminants downgradient in the soil aquifer. Collected leachate would have to be treated for organic contaminants or transported to an approved disposal site.

Treatment Technologies

The soil aquifer is contaminated with Aroclor 1242, Chlordane, and possibly Vinyl Chloride at levels above water quality standards. Several other organic and chlorinated organic compounds have also been detected in the soil aquifer at levels below water quality standards. Physical treatment technology is retained after the secondary screening as a method to reduce these contaminant levels. Biological treatment is not easily amenable to the treatment of halogenated organic compounds.

Excavation and Removal

Soil samples from an auger hole near the area of the former lagoons showed high levels of several chlorinated organic compounds. The areal extent of this soil contamination should be defined in a further study. Excavation of the contaminated soil was retained as a remedial action after the secondary screening process.

EVALUATION OF REMEDIAL ALTERNATIVES (THIRD SCREENING)

Screening Methodology

The third screening process involved a more detailed evaluation of several combinations of remedial actions that had passed the first two screening steps. Seven alternatives were considered for the Tri-Cities Barrel site, ranging from monitoring alone, to containment and removal. Containment alternatives included capping, grading, revegetation, and/or a slurry wall, groundwater pumping or a leachate interceptor trench. Contaminant removal would be accomplished by soil excavation. Alternatives were scored in a general sense (unfavorable, fair, favorable) in each of four categories: technical feasibility, environmental impact, public health risk, and regulatory compliance. The alternatives are listed and ranked in each of these four categories in Table VI.3.

The total score for an alternative is not necessarily an indication of overall acceptability. For example, alternatives may score high in all categories except regulatory compliance, and therefore would be eliminated. Conversely, the monitoring alternative is retained throughout, regardless of its rating, to act as the baseline (i.e., lowest) level of effort for comparison.

The basic elements of each of the four criteria are as follows:

Technical Feasibility

The technical applicability of a remedial action refers to its ability to achieve performance standards (i.e., containment, meet air or water discharge requirements, etc.), constructability and ease of implementation. In addition, the ease of implementation is important. This criterion provides an effective means of reducing a very large number of alternatives to only those that are applicable from an engineering standpoint.

Environmental Impact

The most important environmental impacts are the potentials for surface water, groundwater and air emission contamination. Each alternative was screened in consideration of its ability to prevent contamination of these three media.

Public Health Risk

The key concern of the Superfund Program is protection of the public health. Potential areas of risk are: contamination of groundwater supplies and surface water supplies, emissions of volatile hazardous compounds to the atmosphere, spills of hazardous substances during transportation to acceptable disposal sites, exposure of the public or workers to toxic substances during cleanup operations, accidental or purposeful entry by unauthorized personnel into the sites and subsequent contact with hazardous wastes.

Regulatory Compliance/Acceptability

The involved regulatory agencies and their means of responsibility are as follows:

- New York State Department of Environmental Conservation (Albany)
- New York State Department of Environmental Conservation, Region 7 (Binghamton)

- o New York State Department of Health
- o U.S. Environmental Protection Agency, Region II (New York)

Prefered alternatives must comply with all regulatory requirements and have regulatory agency support.

RESULTS OF SCREENING

The simplest alternative is groundwater monitoring at the Tri-Cities Barrel site. This alternative will not control the present contamination or prevent further migration of the contaminant plume.

The second alternative considered included capping, grading, and revegetation to reduce groundwater contamination by rain water infiltration; excavation of contaminated soil to remove the source of groundwater contamination; and installation of a perimeter fence to reduce the public health risk by direct contamination. This alternative would eliminate the main source of groundwater contamination, but pollutants may still be mobilized by fluctuating sole aquifer groundwater levels and corresponding leaching of site contaminants through the soil aquifer.

Alternative 3, groundwater pumping, capping, and excavation would accomplish the same results as alternative 2. However, lowering the localized water table by pumping upgradient and/or downgradient of the facility would assure that groundwater would not come in contact with the contaminated zone and mobilize pollutants. This alternative might be prohibitively expensive since pumped groundwater may have to be treated for organic contaminants.

A fourth alternative would be the construction of a leachate trench to intercept subsurface contaminants migrating from the site. The trench would be constructed downgradient along the northern perimeter of the site, perpendicular to the localized groundwater flow. Leachate entering the trench would be collected in a drain and pumped to storage for subsequent treatment. This action along with capping, monitoring and excavation would lessen the chances of downgradient private well and surface water contamination. However, if the bedrock and soil are hydraulically connected the drainage system could not effectively contain all potential pollutant migration.

Treatment of contaminated groundwater would be accomplished by the physical treatment technologies of activated carbon adsorption and/or air stripping. Treatment was not included in any of the cost estimates due to the lack of remedial investigation data required to calculate those estimates.

CONCEPTUAL COST ANALYSIS

The conceptual costs were determined for the alternative remedial actions developed. It should be recognized that these costs are very preliminary and can be more precisely estimated once a feasibility study is conducted at the Tri-Cities Barrel site. The costs presented herein include an allowance of 20 percent for engineering and 30 percent contingency. An example of the conceptual cost analysis for one of the most likely alternatives is presented in Table VI-4.

The most inexpensive remedial action alternative is groundwater and surface water monitoring. The total cost for semi-annual sampling and analyses for a five year period (minimum time period) of three groundwater samples and two surface water samples is estimated to be $69,000. Because monitoring is not a capital cost, no allowances of contingency and engineering were included in this cost estimate.

Alternative 2 includes monitoring, capping and excavation of contaminated soil. The areal surface to be capped and volume of soil to be excavated at the Tri-Cities Barrel site is dependent upon the findings of a complete RI/FS investigation. For the purpose of this preliminary cost estimate, it was assumed that the area of highly contaminated soils was restricted to the area of the former wastewater lagoons. The total surface area of the lagoons were estimated to be 1.5 acres with a contaminated plume of 14,500 cubic yards of soil. Capping and revegetation would consist of a 3 feet compacted clay cap covered by 6 inches of topsoil seeded with native grasses. A fence 6 feet tall would be installed around the perimeter of the entire Tri-Cities Barrel facility (approximately 3.5 acres). The final step in Alternative 2 would be the removal of an estimated 14,500 cubic yards of contaminated soil in and around the areas of the former lagoons. The contaminated soil would be shipped to a secure landfill. The entire capital cost for this alternative is estimated to be $4.2 million. The itemized cost for this alternative is presented in Table VI-4.

TABLE VI-1
IDENTIFICATION OF REMEDIAL ACTION METHODS (FIRST SCREENING)

Method	Applicable	Non-Applicable	Comments
No Action		X	Contamination found in groundwater and soil.
Air Emission Controls		X	No air contamination found.
Surface Water Controls		X	No surface water contamination found.
Groundwater Controls	X		Soil aquifer contaminated with organics.
Contaminated Sewer and Water Lines		X	No known sewer or water lines affected.
Excavation and Removal	X		Excavation and disposal of contaminated soils in a secure landfill.
Treatment	X		Treatment of groundwater for organic pollutants may be prudent.

TABLE VI-2
PRELIMINARY SCREENING OF REMEDIAL ACTIONS (SECOND SCREENING)

Action	Applicable	Non-Applicable	Comments
<u>Groundwater Controls</u>			
Monitoring	X		Monitoring of on-site wells and private well (Stahl residence, Osborne Hollow Road) as well as Osborne Creek to determine contaminant plume migration.
Capping (including grading, revegetation and perimeter fence)	X		Capping will prevent water infiltration through contaminated area.
Impermeable Barriers			
Slurry Walls	X		Slurry wall or grout curtain to bedrock would contain contamination and prevent contact with groundwater.
Grout Curtain	X		
Permeable Treatment Beds		X	Organic contamination would require an activated carbon permeable bed to a depth of at least 60 feet. High cost and short treatment life renders this option non-applicable.
Groundwater Pumping	X		Upgradient and/or downgradient groundwater pumping would lower water table and prevent groundwater contact with contaminants. Initial pumped water may require treatment.
Leachate Controls			
Subsurface Drains	X		A subsurface trench constructed perpendicular to downgradient groundwater flow would capture leachate in the soil aquifer for subsequent treatment.
Liners		X	Extensive excavation required to install liner.

TABLE VI-2 (Continued)
PRELIMINARY SCREENING OF REMEDIAL ACTIONS (SECOND SCREENING)

Action	Applicable	Non-Applicable	Comments
<u>Treatment</u>			
In-situ Treatment		X	Solution mining not applicable for the contaminants at this site. In-situ microbial treatment not effective on chlorinated hydrocarbons.
Groundwater and Leachate Treatment	X		Leachate can be collected and toxic organics can be removed by activated carbon adsorption and/or air stripping.
Physical Treatment	X		
Chemical Treatment		X	Precipitation not effective for organic contamination.
Biological Treatment		X	Halogenated organics of concern not readily biodegradable.
Contaminated Soil Treatment	X		Soil sample (SS3) shows contamination with several organics. More extensive analyses of soil borings should be conducted to determine extent of soil contamination. Contaminated soil should be removed.
<u>Excavation and Removal</u>			
Contaminated Soil Removal	X		After the extent of soil contamination is determined by further study, excavation of contaminated soil will remove the source of future contamination.
Contaminated Sediment Removal		X	No sediment contamination found in nearby surface water.

TABLE VI-3
EVALUATION OF POTENTIAL REMEDIAL ALTERNATIVES (THIRD SCREENING)

Alternative No.	Description	Technical Feasibility	Eviron. Impact	Public Health Risk	Regulatory Compliance/ Acceptance	Comments
1	Monitoring	2*	2	2	2	Soil aquifer will remain contaminated resulting in contamination of groundwater, Osborne Creek and Chenango River.
2	Capping, Grading, Revegetation, Perimeter Fencing, Soil Excavation and Monitoring.	3	2	2	2	Removes main source of contamination. Prevents rainfall infiltration.
3	Groundwater Pumping and Alternative #2	3	3	3	3	Hydraulic connection between soil aquifer and bedrock aquifer must be confirmed. Further RI/FS work is needed to determine an adequate groundwater recovery system.

LEGEND:

1 = Unfavorable (i.e., severe environmental impact, high health risk, poor regulatory compliance or unproven or difficult technology)

2 = Fair

3 = Favorable

* = Favorable from an ease of implementation standpoint, but not adequate for reducing aquifer contamination.

TABLE VI-4
SUMMARY OF CONCEPTUAL REMEDIAL COST ESTIMATE FOR ALTERNATIVE 2 AT THE TRI-CITIES BARREL SITE

Item No.	Description	Approximate Cost(1)(2)
I	Preliminary Site Work (Grubbing and Grading)	$ 14,500 (3)
II	Surface Sealing (3' Thick Clay Cap)	72,600 (4)
III	Revegetation (6" Topsoil, Hydroseeding)	18,500 (4)
IV	Perimeter Fence	20,000
V	Excavation of Contaminated Soil	2,700,000 (4)
	Subtotal	2,825,600
	Contingency (30%)	847,680
	Engineering (20%)	565,120
	TOTAL CAPITAL COSTS	$4,238,400

(1) Costs in December 1985 $.

(2) These costs are considered preliminary conceptual costs.

(3) Rishel, et.al (1981).

(4) Environmental Law Institute (1984).

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Letter From L. Alden, NYSDEC
to W.G. Christopher, ES.
April 18, 1986

②

- EPA forms 2070-13 are lacking much information. The EPA ID for this site is NYD980509285.

- Updated Registry forms should be included in the report.

Mr. Lawrence Lepak, from Region 7, has the following comments:

- On page I-1, the company is reported as cleaning barrels by a caustic rinse process. Regional files also indicate that the company also cleans barrels by incineration in an incineration unit, fabricated by the firm. The incinerator produces ash, which has not been historically well managed at the facility. The ash has been observed spilled on the ground in the vicinity of the incinerator. The incinerator is permitted under the Air Program, Permit No. 03320037300001. This incinerator is located adjacent to the main building on-site. The current level of useage of this incinerator unit is unknown by Regional staff.

  As far as I know, the firm is now managing this ash properly by placing it in drums for permitted ultimate disposal. I feel the consultant must describe the firm's use of the incinerator in his Phase II narrative as this incinerator could be the source of some on-site contamination. Some soil sampling, adjacent to the incinerator, should be done in the Remedial Investigation, when completing the evaluation of the site. The use of the incinerator was mentioned in the site's Phase I report.

  Another reason I feel that it is important to review use of this barrel cleansing incinerator is that emissions from this incinerator could have possibly caused some environmental contamination. On-site groundwater contamination was found by the Phase II consultant for PCBs and chlordane. If barrels containing residuals of these type chemicals were incinerated, it is possible that the incinerator could have produced exotic chemical by-products as a result of the incineration. I have no information or data that a problem exists in this regard, but I wish to point it out for possible consideration during the site's Remedial Investigation.

- In Section V-Part II entitled Enforcement Information, the consultant should contact Investigator Layman in DEE (457-7102) to determine the outcome of enforcement action against the firm for RCRA violations and list this summary under this section. I am not completely sure on the outcome, but I believe the firm paid a fine of two thousand or more dollars.

The following comments refer to the QA/QC package submitted to the DEC:

- The data package does not include any reagent blanks summary for the groundwater samples.

- The quality assurance/quality control data does not provide any information on surrogate recoveries, method blank, matrix spike and matrix spike duplicates for the sediment samples. It is our recommendation that this must be done and submitted to the Department.

②

REC

NOV 2 1984

SYRACUSE

TABLE III

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 6/2/82

caustic solution vats goes to Secure landfill after finishes using

dumps barrells in to clean

VOLATILES

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION Tri-City Barrel Co R-134-01
acrolein	ug/kg wet	<400
acrylonitrile	ug/kg wet	<400
benzene	ug/kg wet	44 ★
bromodichloromethane	ug/kg wet	<10
bromoform	ug/kg wet	<10
bromomethane	ug/kg wet	<10
carbon tetrachloride	ug/kg wet	<10
chlorobenzene	ug/kg wet	<30
chloroethane	ug/kg wet	<10
2-chloroethylvinyl ether	ug/kg wet	<10
chloroform	ug/kg wet	<10
chloromethane	ug/kg wet	<10
dibromochloromethane	ug/kg wet	<10
dichlorodifluoromethane	ug/kg wet	<10
1,1-dichloroethane	ug/kg wet	11 ★
1,2-dichloroethane	ug/kg wet	<10
1,1-dichloroethylene	ug/kg wet	18 ★
trans-1,2-dichloroethylene	ug/kg wet	<10
1,2-dichloropropane	ug/kg wet	<10
cis-1,3-dichloropropene	ug/kg wet	<10
trans-1,3-dichloropropene	ug/kg wet	<10
ethylbenzene	ug/kg wet	2,600 ★
methylene chloride	ug/kg wet	<10

(Continued)

(Baker, 1982)

②

TABLE III (cont'd.)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 6/2/82

VOLATILES

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION TRI-City BARREL Co. R-134-01
1,1,2,2-tetrachloroethane	ug/kg wet	<10
tetrachloroethylene	ug/kg wet	4,500 ☆
toluene	ug/kg wet	5,600 ☆
1,1,1-trichloroethane	ug/kg wet	200 ☆
1,1,2-trichloroethane	ug/kg wet	<10
trichloroethylene	ug/kg wet	27,000 ☆
trichlorofluoromethane	ug/kg wet	<10
vinyl chloride	ug/kg wet	<10

COMMENTS: Refer to text

total cyanide	4.2 mg/L
total recoverable phenolics	1,300. mg/L

FOR RECRA RESEARCH, INC. Timothy R Baker

DATE 6/2/82

Jim Baker (3)

INSTRUCTION MANUAL

BISON INSTRUMENTS EARTH RESISTIVITY SYSTEMS

MODEL 2350 B

BISON

S/N 4-8430

Tri City

④

April 23, 1979

Mr. McCarthy - Syracuse Area Office of P.H. Services

Mr. Branagh - S.A.O.P.H.S.

Tri-City Barrel Co. - Broome County

On April 17, 1979 Mr. LePack, Mr. David Leemhuis and I visited the Tri-City Barrel Company near Port Crane, New York

Tri-City Barrel buys empty used drums, washes or burns out the interiors, and repaints the exterior before resale. The washing solution is 10% caustic soda. The wash water is dumped once a month into holding lagoons. Three unlined lagoons are connected in series and the liquid is left for evaporation. The first lagoon, shown in Photos 2, 3, & 4, showed evidence of past leakage over its banks into an adjacent highway ditch. The highway ditch eventually enters Osborne Creek. The nearest homes are between 400 and 750 feet distant and at the same elevation or uphill from the site. These homes are served by private wells.

A small drainage creek downstream of the highway ditch showed an oily rainbow-colored substance on the rocks.

Photos 1, 3, and 6 show the empty barrels on the site awaiting processing. A list of substances that were previously stored in the barrels is attached.

Tri-City Barrel has a drilled well on the site which I belive should be sampled so groundwater contamination may be assessed. Visually examining the potable water supply revealed no colors or odors.

CJB/bv

Attachment

(CARRINGTON, 1981)

(5)

Preliminary Evaluation of an Alternate Electrode Array for Use in Shallow-Subsurface Electrical Resistivity Studies

by Thomas J. Carrington[a] and Don A. Watson[b]

ABSTRACT

Nine electrode arrays were examined under controlled laboratory conditions to evaluate their relative efficiency with regard to time and space requirements, and with regard to effective prediction of subsurface conditions in electrical resistivity surveys. Of the nine investigated, the Wenner and a modification thereof ("Modified Wenner") were selected for field testing and comparison. To a limited extent the Schlumberger array also was compared.

Field testing of the three chosen arrays suggested the superiority of the Modified Wenner over the Wenner array in reliability of data obtained under most conditions examined, speed of completion of a survey and minimal straight-line distance required for a 100-foot (30.5-meter) depth survey. Insufficient data were gathered with the Schlumberger array for proper comparison with the other two arrays.

Subsurface conditions predicted by resistivity data were confirmed by subsurface projections of geological features suggested by previous surficial mapping, by drillers' records and by seismic refraction data.

INTRODUCTION

Background and Purpose of the Research

During the Summer of 1974, shallow subsurface electrical resistivity exploration was conducted about 5 miles (8 km) south of Auburn, Lee County, Alabama. The study area included 3.25 square miles (5.23 sq km) within the poorly-defined boundary between the Alabama Piedmont and the Gulf Coastal Plain. Initial objectives of the study were (1) to study the subsurface configuration of the major angular unconformity between presumed Precambrian metamorphic rocks and overlying, unconsolidated Cretaceous sediments of the Tuscaloosa Group, (2) to identify the types of metamorphic rocks underlying the unconformity, (3) to construct a subsurface contour map of equal resistivities (Schwartz and McClymont, 1977) of the metamorphic rocks and (4) to construct a map of the subsurface topography of the permament water table.

Metamorphic rocks cropping out in the study area (Figure 1) include moderately thick sequences of dolomitic marble, chloritic schist, quartzite, augen gneiss and a feldspathic gneiss. The overlying, fluvial sediments of the Tuscaloosa Group consist of clayey, poorly-sorted, coarse-grained sands and scattered lenses and beds of gravel. Irregularly and locally interfingered with the sands and gravels are red, bioturbated clays and associated light gray-green, locally clayey and medium- to fine-grained sands. The angular unconformity separating the metamorphic rocks from the overlying Tuscaloosa sediments is an erosional surface of more than 250 feet (76 m) of relief as suggested by surficial exposures of the contact.

The resistivity surveys were conducted with a Soiltest R-40C Strata Scout electrical resistivity unit. The instrument is powered by a 6-volt gel-cell battery, and is designed to produce a 65-cycle square-wave alternating current. The manufacturer

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[a] Department of Geology, Auburn University, Alabama 36849.

[b] Dixie Well Boring Company, Inc., LaGrange, Georgia 30240.

Discussion open until July 1, 1981.

(6)

GLACIAL
GEOMORPHOLOGY

Donald R. Coates,
Editor

A proceedings volume of the Fifth Annual Geomorphology
Symposia Series, held at Binghamton New York
September 26-28, 1974

Publications in Geomorphology
State University of New York
Binghamton, New York 13901

(Coates, 1974)
⑥

CHAPTER 8

REAPPRAISAL OF THE GLACIATED APPALACHIAN PLATEAU

Donald R. Coates

ABSTRACT

This chapter provides a partial literature review and an updating of ideas of the Glaciated Appalachian Plateau. This is a very diverse region containing many differences when compared with non-glaciated areas to the south. For clarity the Plateau is divided into 11 sections, each with its own characteristic suite of geomorphic features. In the United States the Plateau is unsurpassed in many landforms such as the Finger Lakes, through valleys, glens, sluiceways, hanging deltas etc. There is a variety of depositional features, but a surprising absence of well-defined morainic systems except for the western part.

The Plateau contains four major rivers and reaches elevations of 4,200 ft in the Catskill Mountains. Contrary to some views the region is not homogeneous, but contains many areas of non-dendritic terrain. Glaciation had a profound impact, leaving thick drift deposits, selectively eroding troughs 1,000 ft, reducing uplands and notching cols,. and greatly altered many drainage patterns. When considering the total topographic fabric of the Plateau it is important to use a multicyclic model of landscape denudation. Not only are glacial episodes of erosion-deposition important, but the remodeling that occurs by the fluvial-gravity system during inter and intra-glacial events is also of major importance.

INTRODUCTION

The Glaciated Appalachian Plateau is a 30,000 sq mi area that covers parts of New York, Pennsylvania, and Ohio. This chapter emphasizes the New York part, and space does not permit treatment of Ohio. Obviously such a large and diverse region cannot be discussed in great depth within a few pages. So much recent work has been done, however, that the time is now appropriate to provide a status report and to compare such work with earlier and traditional reports that have become entrenched in the literature of the region. Another rationale for this chapter is that these symposiums have been held in Binghamton, the heart of the glaciated plateaus, and such a review can hopefully provide participants with an increased level of geomorphic understanding in the area of their visit.

It is important that the reader understand the nature of the material covered in the review chapter, as well as the limitations in topical matters. This is primarily a geomorphic study with concentration on landforms. For example the stratigraphy and correlation of various glacial units is only minimally referenced and the dynamics of the glacial ice and associated processes is discussed only briefly. Very little attention is devoted to the usual and more or less ubiquitous glacial forms

Cosentino, 1984

(7)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: February 16, 1984

SUBJECT: Results of RCRA Sampling Inspection at Tri Cities Barrel and Drum, Port Crane, New York (NYD002245264)

FROM: Joseph Cosentino Joseph V. Cosentino
Source Monitoring Section

TO: Catherine Massimino, Environmental Engineer
Solid Waste Branch

THRU: John Ciancia, Chief
Source Monitoring Section

Richard D. Spear, Chief
Surveillance and Monitoring Branch

The data from samples collected at Tri Cities Barrel and Drum, Port Crane, New York (NYD002245264) on November 17, 1983 are summarized in the attached table.

As requested, the following samples were collected:

- Sample #68676 was collected from drums containing blaster dust. The dust is generated by a baghouse used in conjunction with the facility's open head drum reconditioning operations.
- Sample #68677 contained separator skimmings from the facility's wastewater treatment system. The wastewater is generated by the flushing and rinsing of closed head drums. Except for the oil-water separator skimmings, the facility claims to recycle its wastewater.

Both samples were analyzed for the characteristic of EP toxicity (metals) as defined in Subpart C of RCRA. Sample #68677 was also analyzed for the characteristics of corrosivity and ignitability. Analyses were performed at EPA's Edison, New Jersey laboratory.

The results indicate that sample #68676 (blaster dust) displayed the characteristic of an EP toxic waste and sample #68677 (separator skimmings) displayed the characteristic of corrosivity.

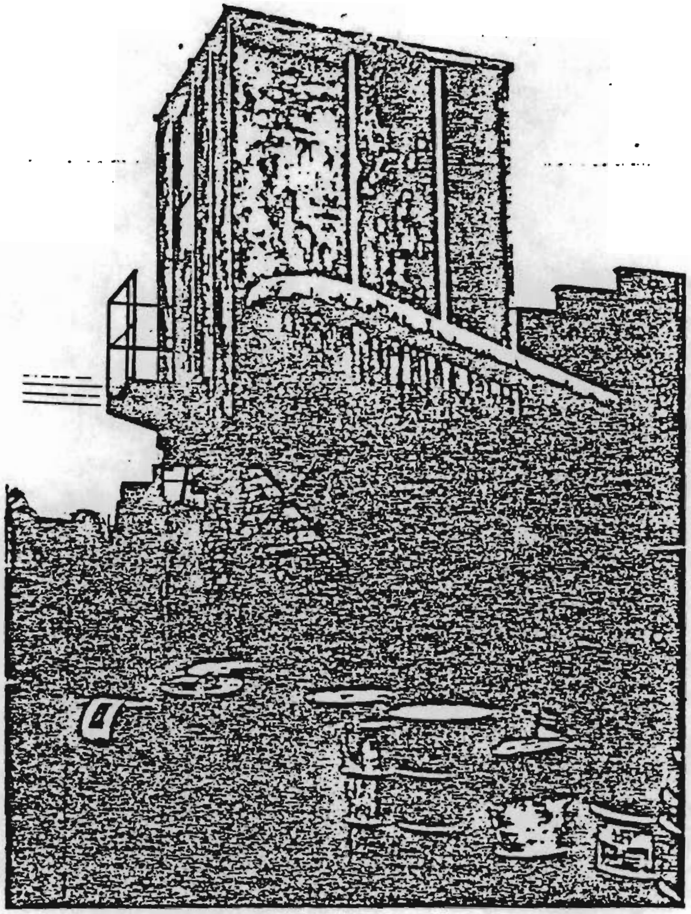
Attachments:

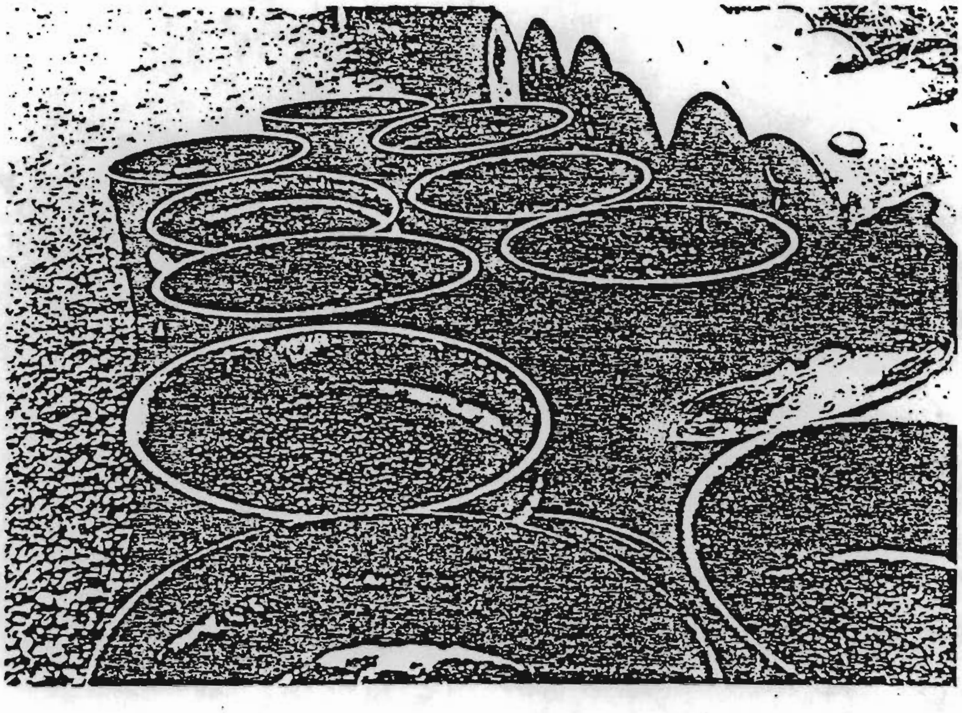
Table I - Analytical Results
Attachment 1 - Receipt for samples

Cosentino, 1984

Photograph #1 - Shows baghouse that collects blaster dust.

(7)





Photograph #2 - Shows drums containing blaster dust, sample #68676 was a composite from three of these drums.

Cosentino, 1984.

⑦

Table I

Comparison of Waste Analysis to Characteristics of EP toxicity, Corrosivity and Ignitability

Parameter	Maximum Allowable Concentration	#68676 Blaster Dust	#68677 Discharge from Skimmer
arsenic mg/l	5.0	.008^K	.02^J
barium mg/l	100.0	3.5	.06
cadium mg/l	1.0	.09	.04
chromium mg/l	5.0	.13	.28
lead mg/l	5.0	6.5	.29
mercury mg/l	0.2	.0002^K	.0005^J
selenium mg/l	1.0	.007	.007^K
silver mg/l	5.0	.008^J	.02
corrosivity	<12.5	-	13
flash point °F	140°	-	140^L

J = estimated value
K = actual value known to be less than value given
L = actual value known to be greater than value given

⑧

Applied Soil Trace Elements

Edited by

Brian E. Davies

Department of Geography, University College of Wales, Aberystwyth, Wales

A Wiley-Interscience Publication

1980

JOHN WILEY & SONS
Chichester · New York · Brisbane · Toronto

8

Applied Soil Trace Elements
Edited by B. E. Davies

CHAPTER 8

Essential Micronutrients IV: Copper, Iron, Manganese, and Zinc

BERNARD D. KNEZEK AND BOYD G. ELLIS

I. INTRODUCTION

The addition of 4 kg/ha zinc (Zn) to pea beans (*Phaseolus vulgaris*) increased the yield from 590 to 2230 kg/ha. (Judy *et al.*, 1964). Such spectacular increases are also common with the micronutrients manganese (Mn), iron (Fe), and copper (Cu). The concentrations in soils vary from a few ppm Cu or Zn to very large quantities of Fe (see Table 8.1). In general the Cu content of soils varies from 10 to 80 ppm, Zn from 10 to 300 ppm, Mn from 20 to 3000 ppm, and Fe from 10,000 to 100,000 ppm (Mitchell, 1964). Thus, from the soil content view only Zn and Cu would be considered micronutrients. But the low solubility and availability and the small requirement of most plants for these four elements places them in the category of micronutrients (Table 8.1).

The soil chemistry of micronutrients is complex. Few 'pure' compounds exist

Table 8.1. Concentration Range of Mn, Fe, Cu, and Zn in Soils and Plants

Element	Soil content	Plant content
	Range (mg/kg)	Range (mg/kg)
Mn	20–3000	31–100
Fe	10,000–100,000	25–500
Cu	10–80	7–30
Zn	10–300	21–70

(Edwards, 1983)

⑨

Journal of
Environmental Quality

VOLUME 12 • OCTOBER-DECEMBER 1983 • NUMBER 4

REVIEWS AND ANALYSES

Polycyclic Aromatic Hydrocarbons (PAH's) in the Terrestrial Environment—A Review[1]

NELSON T. EDWARDS[2]

ABSTRACT

This review, while touching on sources of polycyclic aromatic hydrocarbons (PAH's) and their degradation, emphasizes research that addresses their fate in the terrestrial environment. Typical endogenous concentrations of PAH's in soil and vegetation range from 1 to 10 µg/kg and from 10 to 20 µg/kg, respectively. Endogenous PAH's are due to plant synthesis, forest and prairie fires, volcanoes, etc. Anthropogenic sources are primarily from fossil fuel burning. Estimated annual release of benzo(a)pyrene (BaP) from fossil fuel combustion is 4.6 × 10^6 kg. Concentrations of PAH's in air, soil, and vegetation vary with distances from known sources. Reported BaP concentrations in air of nonurban areas of the United States ranged from 0.01 to 1.9 µg/m^3; concentrations in urban areas ranged from 0.1 to 61.0 µg/m^3. Concentrations of BaP in soil may typically reach 1000 µg/kg, and values exceeding 100 000 µg/kg have been reported near known sources. Typically, concentrations for total PAH's (usually the sum of 5 to 20 PAH's) exceed BaP concentrations by at least one order of magnitude. The maximum PAH concentration in vegetation growing near a known source was 25 000 µg/kg, but values more typically range from 20 to 1000 µg/kg. Reported BaP concentrations in vegetation ranged from 0.1 to 150 µg/kg. Concentrations in vegetation were generally less than those in soil where the plants were growing. Concentration ratios (concentration in vegetation/concentration in soil) ranged from 0.0001 to 0.33 for BaP and from 0.001 to 0.18 for the sum of 17 PAH's tested. However, laboratory experiments demonstrated that plants can concentrate PAH's above those found in their environment. Controlled experiments with a few PAH's demonstrated uptake by both leaves and roots and subsequent translocation to other plant parts. Washing leaves of vegetation contaminated with PAH's removes no more than 25% of the contamination. There is some evidence that plants can catabolize PAH's, but metabolic pathways have not been defined well.

Additional Index Words: Benzo(a)pyrene, carcinogens, vegetation, soil plant uptake, sources.

Edwards, N. T. 1983. Polycyclic aromatic hydrocarbons (PAH's) in the terrestrial environment—a review. J. Environ. Qual. 12:427-441.

Polycyclic aromatic hydrocarbons (PAH's) occur naturally in the environment, primarily as a result of synthesis by some plants and formation during natural forest and prairie fires. However, by far the greatest amounts of PAH's released into the environment are formed during fossil fuel combustion and during anthropogenic forest and agricultural fires. The carcinogenic nature of some PAH's led to considerable research into their behavior in the aquatic environment, but relatively little research has been conducted on their fate in the terrestrial environment. Results of research on the movement of PAH's into vegetation directly from the atmosphere and indirectly from soil is somewhat contradictory. However, recent findings indicate that there is a potential for their accumulation in the terrestrial food chain. Most of the research has been on benzo(a)pyrene (BaP), a known carcinogen. The need for more research on a number of carcinogenic PAH's in the environment and an evaluation of research already conducted becomes increasingly important as the combustion of fossil fuel increases to keep pace with

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[1] Research sponsored by the Ecological Research Division, Office of Health & Environmental Research, U.S. Department of Energy, under contract W-7405-eng-26 with Union Carbide Corp. Publication no. 2192, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830. Received 7 Mar. 1983.

[2] Research staff, Environ. Sci. Div., Oak Ridge Natl. Lab.

⑨

These collection and extraction problems have implications for all the data presented in this review. Also, the use of BaP as a model PAH has been so prevalent that BaP and PAH are often thought of synonymously. Suess (1976) emphasized that BaP constitutes only 1-20% of the total carcinogenic PAH's. We must be careful about general implications concerning PAH's, based on interpretations of BaP data. Katz and Chan (1980) pointed out that the use of BaP as an index of airborne PAH's may be subject to problems, especially in areas where motor vehicle traffic is one of the primary sources of air pollution. In Los Angeles, for example, the dominant PAH is benzo(ghi)perylene, a PAH with carcinogenic potential.

CONCENTRATIONS IN AIR

Concentrations of PAH's in air vary greatly, both spatially and temporally. Sawicki et al. (1960) examined the BaP content of air in 131 urban and nonurban areas of the United States. In nine large cities, the highest levels of BaP occurred during winter months and the lowest levels occurred during summer. Concentrations of BaP in the air of nonurban areas ranged from 0.01 to 1.9 ng/m^3, while concentrations in urban areas ranged from 0.1 to 61.0 ng/m^3. Pierce and Katz (1975) sampled five locations in the Toronto, Ontario, Canada area and found concentrations of BaP in air to range from 0.11 to 0.83 ng/m^3, with the highest concentrations in urban and suburban areas and the lowest concentrations in suburban-rural and rural areas. Lunde and Bjorseth (1977) and Bjorseth et al. (1979) analyzed air from a sampling station in southern Norway for 22 PAH's and determined the origins of air masses containing the PAH's from trajectories calculated from meteorological data. They found that concentrations were higher in air samples originating in England/France and northern England/Scotland (32 and 28 ng/m^3, respectively) than in air pollutants originating in northern and southern Norway (1.1 and 2.4 ng/m^3, respectively). Values for BaP ranged from 3 to 7% of the total PAH. Gordon (1976) reported the annual geometric mean concentration of 15 PAH's in air samples collected from 13 areas in Los Angeles County, Calif., to be 10.9 ng/m^3. Concentrations of BaP accounted for only 4.2% of the total. Bombaugh et al. (1981) reported maximum ambient concentrations of BaP downwind from a coal gasification plant in Yugoslavia to be $\approx$80 ng/m^3. The EPA's ambient multimedia environmental goal for BaP is 0.05 ng/m^3 (Bombaugh et al., 1981).

CONCENTRATIONS IN SOIL AND VEGETATION

Relatively few studies quantitied PAH concentrations in soil and vegetation at various distances from known sources. Most of the studies examined concentrations in soil or vegetation, but not both.

Typical concentrations of BaP in soils of the world ranged from $\approx$100 to 1000 μg/kg. A typical range for total PAH's (i.e., those quantified in the papers examined) was about 10 times the value for BaP alone. The actual measured range of BaP concentrations, including data from very highly polluted areas and from protected remote regions, is 0.4 μg/kg (Shabad et al., 1971) to 650 000 μg/kg (Fritz, 1971). However, BaP concentrations exceeding 1300 μg/kg were very close to known sources (Shabad, 1968; Shabad et al., 1971; Fritz, 1971). These investigators did not analyze the soil for total PAH's. Only 10-15 PAH's were known or suspected to be present in soils in the late 1960's, but with recently developed analytical techniques, these numbers have increased by at least two orders of magnitude (Blumer, 1976). The highest total PAH concentration reported was 300 000 μg/kg for a soil near a highway in Switzerland (Blumer et al., 1977). Shabad et al. (1971) suggest that endogenous BaP concentrations in soil are 1-3 μg/kg and never exceed 10 μg/kg.

The first reported PAH compounds isolated from vegetation was by Guddal (1959), who extracted a mixture of PAH from roots of *Chrysanthemum vulgare* Bernh. grown in the vicinity of a gas works facility in Norway. Three PAH's were identified in the mixture as pyrene, fluoranthene, and anthracene. The concentration of the PAH (12 300 μg/kg of root tissue) was much too great to have been accounted for by plant synthesis. The only concentration reported in the literature that exceeded 12 300 μg/kg was 25 000 μg anthracene/kg orange rind collected near a heavily traveled highway in California (Gunther et al., 1967).

Concentrations of PAH's in vegetation are generally less than concentrations in the soil where they grow. Concentration ratios (conc in vegetation/conc in soil) ranged from 0.002 to 0.33 for BaP. Concentrations of BaP in vegetation ranged from 0.1 (Kolar et al., 1975) to 150 μg/kg (Fritz, 1971), with typical concentrations of 1-10 μg/kg. Only one paper reported PAH data (other than just BaP data) for both plants and soil from the same location. Wang and Meresz (1981) analyzed onions, beets, tomatoes, and soil for 17 PAH's, including BaP. They found most of the PAH contamination in the "peels." Their vegetation/soil concentration ratios ranged from 0.0001 to 0.085 for BaP and 0.001 to 0.183 for total PAH's. Graf and Diehl (1966) suggested that actively growing green plant material has an endogenous concentration of BaP of about 10-20 μg/kg and that plant storage tissues usually contain only 1-10% of that found in the green portions of the plant. Both BaP and total PAH concentrations appeared to be higher in oils extracted from plants (Stevcevska & Jovanovic-Kolar, 1974; Grimmer & Hildebrandt, 1967) than from plant tissues. This finding, if true, would have implications for certain crops growing near PAH sources, because plant organs such as seeds are important in the human diet and also contain relatively high concentrations of oils.

The amounts and kinds of PAH's ingested by humans and other animals from vegetation are partially dependent on whether particular PAH's are absorbed vs. adsorbed and how easily they are rinsed off with water. Kveseth et al. (1981) suggested that lower molecular weight PAH's are adsorbed on leaves, while higher molecular weight particulated compounds are washed off by rain. Kolar et al. (1975) found that washing vegetables removed a maximum of 25% of PAH contamination and generally less. More detailed data on concentrations of PAH's in soil and vegetation are pre-

(Edwards)

(Engineering Science, 1985)

⑩

PHASE II WORK PLANS
ENGINEERING INVESTIGATIONS AND EVALUATIONS AT INACTIVE HAZARDOUS WASTE DISPOSAL SITES

PREPARED FOR

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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Henry G. Williams, Commissioner

DIVISION OF SOLID AND HAZARDOUS WASTE
Norman H. Nosenchuck, P.E.
Director

MARCH 1985

ENGINEERING -SCIENCE
in association with
DAMES & MOORE

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COMPENDIUM OF COST OF REMEDIAL TECHNOLOGIES AT HAZARDOUS WASTE SITES

DRAFT

FEBRUARY 1984

A Report to the Office of Emergency and Remedial Response
U.S. Environmental Protection Agency

Project Officer:
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FROM EPA IN WASHINGTON
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ENVIRONMENTAL PROTECTION AGENCY NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN UNDER THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT OF 1980

(40 CFR 300; 47 FR 31203, July 16, 1982, Effective December 10, 1982; Amended by 48 FR 40669, September 8, 1983; 49 FR 19482, May 8, 1984; 49 FR 29197, July 18, 1984; 49 FR 37082, September 21, 1984; 50 FR 6321, February 14, 1985)

[*Editor's note:* This plan was made effective by EPA on December 10, 1982 (47 FR 55488).

It supersedes the plan (40 CFR 1510) originally mandated by Section 311 (c)(2) of the Clean Water Act, which was prepared by the Council on Environmental Quality.]

[*Editor's note:* EPA October 15, 1984 (49 FR 40341), included in its proposal to add 238 new sites to the National Priorities List (Appendix B), a republication of the 128 sites added to the list September 21 (49 FR 37082). This action did not further amend the September 21 listing but did include more detailed status codes for response and cleanup activities at the sites.]

PART 300—NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN

Authority: Sec. 105, Pub. L. 96-510, 94 Stat. 2764, 42 U.S.C. 9605 and sec. 311(c)(2), Pub. L. 92-500, as amended; 86 Stat. 865, 33 U.S.C. 1321 (c)(2); E. O. 12316, 47 FR 42237; E.O. 11735, 38 FR 21243.

[Amended by 49 FR 29197, July 18, 1984]

Subpart A—Introduction

§ 300.1 Purpose and objectives.

The purpose of the National Oil and Hazardous Substances Pollution Contingency Plan (Plan) is to effectuate the response powers and responsibilities created by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERLA) and the authorities established by section 311 of the Clean Water Act (CWA), as amended.

§ 300.2 Authority.

The Plan is required by section 105 of CERCLA, 42 U.S.C. 9605, and by section 311(c)(2) of the CWA, as amended, 33 U.S.C. 1321(c)(2). In Executive Order 12316 (46 FR 42237) the President delegated to the Environmental Protection Agency the responsibility for the amendment of the NCP and all of the other functions vested in the President by section 105 of CERCLA. Amendments to the NCP shall be coordinated with members of the National Response Team prior to publication for notice and comment. Amendments shall also be coordinated with the Federal Emergency Management Agency and the Nuclear Regulatory Commission in order to avoid inconsistent or duplicative requirements in the emergency planning responsibilities of those agencies.

§ 300.3 Scope.

(a) The Plan applies to all Federal agencies and is in effect for:

(1) The navigable waters of the United States and adjoining shorelines, for the contiguous zone, and the high seas beyond the contiguous zone in connection with activities under the Outer Continental Shelf Lands Act or the Deep Water Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Fishery Conservation and Management Act of 1976). (See sections 311(b)(1) and 502(7) of the Clean Water Act.)

(2) Releases or substantial threats of releases of hazardous substances into the environment, and releases or substantial threats of releases of pollutants or contaminants which may present an imminent and substantial danger to public health or welfare.

(b) The Plan provides for efficient, coordinated and effective response to discharges of oil and releases of hazardous substances, pollutants and contaminants in accordance with the authorities of CERCLA and the CWA. It provides for:

(1) Division and specification of responsibilities among the Federal, Stat

information gathering as appropriate. These efforts shall be undertaken jointly by the Federal or State officials responsible for providing Fund-financed response and those responsible for enforcing legal requirements.

(2) A major objective of an inspection is to determine if there is any immediate danger to persons living or working near the facility. In general, the collection of samples should be minimized during inspection activities; however, situations in which there is an apparent risk to the public should be treated as exceptions to that practice. Examples of apparent risk include use of nearby wells for drinking water, citizen complaints of unusual taste or odor in drinking water, or chemical odors or unusual health problems in the vicinity of the release. Under those circumstances, a sampling protocol should be developed for the inspection to allow for the earliest possible detection of any human exposure to hazardous substances. The site inspection may also address:

(i) Determining the need for immediate removal action;

(ii) Assessing amounts, types and location of hazardous substances stored;

(iii) Assessing potential for substances to migrate from areas where they were originally located;

(iv) Determining or documenting immediate threats to the public or environment.

(d) *Methods for Establishing Priorities.* (1) States that wish to submit candidates for the National Priorities List must use the Hazard Ranking System (included in Appendix A) to rank the releases.

(2) EPA will notify States at least thirty days prior to the deadline for submitting candidate releases for the National Priorities List or any subsequent revisions.

(3) Each State may designate a facility as the State's highest priority release by certifying, in writing signed by the Governor or the Governor's designee, that the facility presents the greatest danger to public health, welfare or the environment among known facilities in the State.

(e) *National Priorities List.* (1) Compiling the National Priorities List—EPA Regional Office will review State hazard rankings to ensure uniform application of the Hazard Ranking System and may add, in consultation with the States, any additional priority releases known to EPA. The States' priorities will be reviewed and consolidated by EPA Headquarters into a National Priorities List pursuant to section 105(8) of CERCLA. To the extent practicable, each State's designated top priority facility will be included among the one hundred highest priority facilities.

(2) No facilities presently owned by the Federal Government will be included on the National Priorities List.

(3) EPA will submit the recommended National Priorities List to the NRT for review and comment.

(4) EPA will publish a proposed National Priorities List for public comment.

(5) The National Priorities List is presented in Appendix B.

(6) Ranking of Releases—Similar hazard ranking scores assigned to releases cannot accurately differentiate among risks represented by the releases. Thus, in order to avoid misleading the public that real differences in risk exist, similar scores may be grouped on the National Priorities List.

(7) EPA will revise and publish the National Priorities List at least once annually. In addition, revisions will give notice of the deletion (if any) of releases previously listed.

§ 300.67 Phase V—Planned removal.

(a) Planned removal may be undertaken pursuant to a contract or cooperative agreement when the lead agency determines that:

(1) There would be a substantial cost savings by continuing a response action with the equipment and resources mobilized for an immediate removal action taken pursuant to § 300.64, but terminate pursuant to § 300.64(c); or

(2) The public and/or environment will be at risk from exposure to hazardous substances if response is delayed at a release not on the National Priorities List.

(b) Planned removal must be requested by the Governor of the affected State or his designee. Requests must include:

(1) A description of the nature and extent of the release;

(2) A description of actions taken or underway at the site;

(3) A description of the proposed planned removal; and

(4) Assurances that the State will pay at least 10 percent of the costs of the action, including all future maintenance, or at least 50 percent or such greater amount as EPA may determine appropriate, taking into account the degree of responsibility of the State or political subdivision, of any sums expended in response to a release at a facility that was owned at the time of any disposal of hazardous substances therein by the State or a political subdivision thereof.

(c) Among the factors that EPA will use to determine whether a planned removal is appropriate under § 300.67(a)(2) are the following:

(1) Actual or potential direct contact with hazardous substances by nearby population;

(2) Contaminated drinking water at the tap;

(3) Hazardous substances in drums, barrels, tanks, or other bulk storage containers, that are known to pose a serious threat to public health or the environment;

(4) Highly contaminated soils largely at or near surface, posing a serious threat to public health or the environment;

(5) Serious threat of fire or explosion; or

(6) Weather conditions that may cause substances to migrate and pose a serious threat to public health or the environment.

(d) Planned removal actions shall be terminated when the lead agency determines that the risk to the public health or the environment has been abated. In making this determination, the lead agency shall consider whether the factors listed in § 300.66(c) continue to apply to the release and whether any contaminated waste materials transported off-site have been treated or disposed of properly.

(e) Unless the EPA finds that (1) continued response actions are immediately required to prevent, limit or mitigate an emergency, (2) there is an immediate risk to public health or welfare or the environment, and (3) such assistance will not otherwise be provided on a timely basis, obligations from the Fund, other than those authorized by section 104(b) of CERCLA, shall not continue after $1 million has been obligated for response actions or six months has elapsed from the date of initial response to the release.

§ 300.68 Phase VI—Remedial action.

(a) Remedial actions taken pursuant to this section (other than responses at Federal facilities) are those responses to releases on the National Priorities List that are consistent with permanent remedy to prevent or mitigate the migration of a release of hazardous substances into the environment.

(b) States are encouraged to undertake Fund-financed remedial actions in accordance with § 300.62 of this Plan.

(c) As an alternative or in addition to Fund-financed remedial action, the lead agency may seek, through voluntary agreement or administrative or judicial process, to have those persons

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responsible for the release clean up in a manner that effectively mitigates and minimizes damage to. and provides adequate protection of. public health. welfare. and the environment. The lead agency shall evaluate the adequacy of clean-up proposals submitted by responsible parties or determine the level of clean-up to be sought through enforcement efforts. by consideration of the factors discussed in paragraphs (e) through (j) of this section. The lead agency will not. however. apply the cost balancing considerations discussed in paragraph (k) of this section to determine the appropriate extent of responsible party clean-up.

(d)(1) The lead agency. in cooperation with State(s). will examine available information and determine. based on the factors in paragraph (g) of this section. the type or types of remedial response that may be needed to remedy the release. This scoping will serve as the basis for requesting funding for a remedial investigation and feasibility study:

(i) In the case of initial remedial measures. a single request may be made by a State for funding the remedial investigation. feasibility study. design and implementation. in order that such measures may be expedited while continuing the remainder of the remedial planning process.

(ii) In the case of source control or off-site remedial action. the initial funding request should be for the remedial investigation and feasibility study. Requests for funding of design and implementation should be made after the completion of the feasibility study.

(2) As a remedial investigation progresses. the project may be modified if the lead agency determines that. based on the factors in 300.68(e). such modifications would be appropriate.

(e) In determining the appropriate extent of remedial action. the following factors should be used to determine the type or types of remedial action that may be appropriate:

(1) In some instances. initial remedial measures can and should begin before final selection of an appropriate remedial action if such measures are determined to be feasible and necessary to limit exposure or threat of exposure to a significant health or environmental hazard and if such measures are cost-effective. Compliance with § 300.67(b) is a prerequisite to taking initial remedial measures. The following factors should be used in determining whether initial remedial measures are appropriate:

(i) Actual or potential direct contact with hazardous substances by nearby population. (Measures might include fences and other security precautions.)

(ii) Absence of an effective drainage control system (with an emphasis on run-on control). (Measures might include drainage ditches.)

(iii) Contaminated drinking water at the tap. (Measures might include the temporary provision of an alternative water supply.)

(iv) Hazardous substances in drums. barrels. tanks. or other bulk storage containers. above surface posing a serious threat to public health or the environment. (Measures might include transport of drums off-site.)

(v) Highly contaminated soils largely at or near surface. posing a serious threat to public health or the environment. (Measures might include temporary capping or removal of highly contaminated soils from drainage areas.)

(vi) Serious threat of fire or explosion or other serious threat to public health or the environment. (Measures might include security or drum removal.)

(vii) Weather conditions that may cause substances to migrate and to pose a serious threat to public health or the environment. (Measures might include stabilization of berms. dikes or impoundments.)

(2) Source control remedial actions may be appropriate if a substantial concentration of hazardous substances remain at or near the area where they were originally located and inadequate barriers exist to retard migration of substances into the environment. Source control remedial actions may not be appropriate if most substances have migrated from the area where originally located or if the lead agency determines that the substances are adequately contained. Source control remedial actions may include alternatives to contain the hazardous substances where they are located or eliminate potential contamination by transporting the hazardous substances to a new location. The following criteria should be assessed in determining whether and what type of source control remedial actions should be considered:

(i) The extent to which substances pose a danger to public health. welfare. or the environment. Factors which should be considered in assessing this danger include:

(A) Population at risk;

(B) Amount and form of the substance present;

(C) Hazardous properties of the substances;

(D) Hydrogeological factors (e.g. soil permeability depth to saturated zone. hydrologic gradients. proximity to a drinking water aquifer); and

(E) Climate (rainfall. etc.).

(ii) The extent to which substances have migrated or are contained by either natural or man-made barriers.

(iii) The experiences and approaches used in similar situations by State and Federal agencies and private parties.

(iv) Environmental effects and welfare concerns.

(3) In some situations it may be appropriate to take action (referred to as offsite remedial actions) to minimize and mitigate the migration of hazardous substances and the effects of such migration. These actions may be taken when the lead agency determines that source control remedial actions may not effectively mitigate and minimize the threat and there is a significant threat to public health. welfare. or the environment. These situations typically will result from contamination that has migrated beyond the area where the hazardous substances were originally located. Offsite measures may include provision of permanent alternative water supplies. management of a drinking water aquifer plume or treatment of drinking water aquifers. The following criteria should be used in determining whether and what type of offsite remedial actions should be considered:

(i) Contribution of the contamination to an air. land or water pollution problem.

(ii) The extent to which the substances have migrated or are expected to migrate from the area of their original location and whether continued migration may pose a danger to public health. welfare or environment.

(iii) The extent to which natural or man-made barriers currently contain the hazardous substances and the adequacy of the barriers.

(iv) The factors listed in paragraph (e)(2)(i) of this section.

(v) The experiences and approaches used in similar situations by State and Federal agencies and private parties.

(iv) Environmental effects and welfare concerns.

(f) A remedial investigation should be undertaken by the lead agency (or responsible party if the responsible party will be developing a clean-up proposal) to determine the nature and extent of the problem presented by the release. This includes sampling and monitoring. as necessary. and includes the gathering of sufficient information to determine the necessity for and proposed extent of remedial action. During the remedial investigation. the original scoping of the project may be modified based on the factors in § 300.68(e). Part of the remedial investigation involves assessing whether the threat can be mitigated and minimized by controlling the source of the contamination at or near the area where the hazardous substances were originally located (source control remedial actions) or whether additional actions will be necessary because the hazardous substances have migrated from the area of their original location (offsite remedial actions).

(g) *Development of Alternatives.* A limited number of alternatives should be developed for either source control or offsite remedial actions (or both) depending upon the type of response that has been identified under paragraphs (e) and (f) of this section as being appropriate. One alternative may be a no-action alternative. No-action alternatives are appropriate, for example, when response action may cause a greater environmental or health danger than no action. These alternatives should be developed based upon the assessment conducted under paragraphs (e) and (f) of this section and reflect the types of source control or offsite remedial actions determined to be appropriate under paragraphs (e) and (f) of this section.

(h) *Initial Screening of Alternatives.* The alternatives developed under paragraph (g) of this section will be subjected to an initial screening to narrow the list of potential remedial actions for further detailed analysis. Three broad criteria should be used in the initial screening of alternatives:

(1) *Cost.* For each alternative, the cost of installing or implementing the remedial action must be considered, including operation and maintenance costs. An alternative that far exceeds (e.g. by an order of magnitude) the costs of other alternatives evaluated and that does not provide substantially greater public health or environmental benefit should usually be excluded from further consideration.

(2) *Effects of the Alternative.* The effects of each alternative should be evaluated in two ways: (i) Whether the alternative itself or its implementation has any adverse environmental effects; and (ii) for source control remedial actions, whether the alternative is likely to achieve adequate control of source material, or for offsite remedial actions, whether the alternative is likely to effectively mitigate and minimize the threat of harm to public health, welfare or the environment. If an alternative has significant adverse effects, it should be excluded from further consideration. Only those alternatives that effectively contribute to protection of public health, welfare, or the environment should be considered further.

(3) *Acceptable Engineering Practices.* Alternatives must be feasible for the location and conditions of the release, applicable to the problem, and represent a reliable means of addressing the problem.

(i) *Detailed Analysis of Alternatives.*

(1) A more detailed evaluation will be conducted of the limited number of alternatives that remain after the initial screening in paragraph (h).

(2) The detailed analysis of each alternative should include:

(A) Refinement and specification of alternatives in detail, with emphasis on use of established technology;

(B) Detailed cost estimation, including distribution of costs over time;

(C) Evaluation in terms of engineering implementation, or constructability;

(D) An assessment of each alternative in terms of the extent to which it is expected to effectively mitigate and minimize damage to, and provide adequate protection of, public health, welfare, and the environment, relative to the other alternatives analyzed; and

(E) An analysis of any adverse environmental impacts, methods for mitigating these impacts, and costs of mitigation.

(3) In performing the detailed analysis of alternatives, it may be necessary to gather additional data in order to complete the analysis.

(j) The appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective (i.e. the lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).

(k) Section 104(c)(4) of CERCLA requires that the need for protection of public health, welfare and the environment at the facility under consideration be balanced against the amount of money available in the Fund to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into consideration the need for immediate action. Accordingly, in determining the appropriate extent of remedy for Fund-financed response, the lead agency also must consider the need to respond to other releases with Fund monies.

§ 300.69 Phase VII—Documentation and cost recovery.

(a) During all phases, documentation shall be collected and maintained to support all actions taken under this Plan, and to form the basis for cost recovery. In general, documentation should be sufficient to provide the source and circumstances of the condition, the identity of responsible parties, accurate accounting of Federal costs incurred, and impacts and potential impacts to the public health, welfare and environment.

(b) The information and reports obtained by the lead agency for Fund-financed response action should be transmitted to the RRC. Copies can then be forwarded to the NRT, members of the RRT, and others as appropriate.

§ 300.70 Methods of remedying releases.

(a) The following section lists methods for remedying releases that may be considered by the lead agency in taking response action. This list of methods should not be considered inclusive of all possible methods of remedying releases.

(b) *Engineering Methods for On-Site Actions.*—(1)(i) *Air emissions control*—The control of volatile gaseous compounds should address both lateral movement and atmospheric emissions. Before gas migration controls can be properly installed, field measurements to determine gas concentrations, pressures, and soil permeabilities should be used to establish optimum design for control. In addition, the types of hazardous substances present, the depth to which they extend, the nature of the gas and the subsurface geology of the release area should, if possible, be determined. Typical emission control techniques include the following:

(A) Pipe vents;

(B) Trench vents;

(C) Gas barriers;

(D) Gas collection systems;

(E) Overpacking.

(ii) *Surface water controls*—These are remedial techniques designed to reduce waste infiltration and to control runoff at release areas. They also serve to reduce erosion and to stabilize the surface of covered sites. These types of control technologies are usually implemented in conjunction with other types of controls such as the elimination of ground water infiltration and/or waste stabilization, etc. Technologies applicable to surface water control include the following:

(A) Surface seals;

(B) Surface water diversion and collection systems:

(*1*) Dikes and berms;

(*2*) Ditches, diversions, waterways;

(*3*) Chutes and downpipes;

(*4*) Levees;

(*5*) Seepage basins and ditches;

(*6*) Sedimentation basins and ponds;

(*7*) Terraces and benches.

(C) Grading;

(D) Revegetation.

(iii) *Ground water controls*—Ground water pollution is a particularly serious problem because, once an aquifer has been contaminated, the resource cannot usually be cleaned without the expenditure of great time, effort and resources. Techniques that can be applied to the problem with varying degrees of success are as follows:

(A) Impermeable barriers:

(*1*) Slurry walls;

(*2*) Grout curtains;

(*3*) Sheet pilings.

(B) Permeable treatment beds;

(C) Ground water pumping:

(*1*) Water table adjustment;

(*2*) Plume containment.

(D) Leachate control—Leachate control systems are applicable to control of surface seeps and seepage of leachate to ground water. Leachate collection systems consist of a series of drains which intercept the leachate and channel it to a sump, wetwell, treatment system, or appropriate surface discharge point. Technologies applicable to leachate control include the following:

(*1*) Subsurface drains;

(*2*) Drainage ditches;

(*3*) Liners.

(iv) *Contaminated water and sewer lines*—Sanitary sewers and municipal water mains located down gradient from hazardous waste disposal sites may become contaminated by infiltration of leachate or polluted ground water through cracks, ruptures, or poorly sealed joints in piping. Technologies applicable to the control of such contamination to water and sewer lines include:

(A) Grouting;

(B) Pipe relining and sleeving;

(C) Sewer relocation.

(2) *Treatment technologies.* (i) *Gaseous emissions treatment*—Gases from waste disposal sites frequently contain malodorous and toxic substances, and thus require treatment before release to the atmosphere. There are two basic types of gas treatment systems:

(A) Vapor phase adsorption;

(B) Thermal oxidation.

(ii) *Direct waste treatment methods*—In most cases, these techniques can be considered long-term permanent solutions. Many of these direct treatment methods are not fully developed and the applications and process reliability are not well demonstrated. Use of these techniques for waste treatment may require considerable pilot plant work. Technologies applicable to the direct treatment of wastes are:

(A) Biological methods:

(*1*) Treatment via modified conventional wastewater treatment techniques;

(*2*) Anaerobic, aerated and facultative lagoons;

(*3*) Supported growth biological reactors.

(B) Chemical methods:

(*1*) Chlorination;

(*2*) Precipitation, flocculation, sedimentation;

(*3*) Neutralization;

(*4*) Equalization;

(*5*) Chemical oxidation.

(C) Physical methods:

(*1*) Air stripping;

(*2*) Carbon absorption;

(*3*) Ion exchange;

(*4*) Reverse osmosis;

(*5*) Permeable bed treatment;

(*6*) Wet air oxidation;

(*7*) Incineration.

(iii) *Contaminated soils and sediments*—In some cases where it can be shown to be cost-effective, contaminated sediments and soils will be treated on the site. Technologies available include:

(A) Incineration;

(B) Wet air oxidation;

(C) Solidification;

(D) Encapsulation;

(E) In situ treatment:

(*1*) Solution mining, (soil washing or soil flushing);

(*2*) Neutralization/detoxification;

(*3*) Microbiological degradation.

(c) *Offsite Transport for Storage, Treatment, Destruction or Secure Disposition.*—(1) *General*—Offsite transport or storage, treatment, destruction, or secure disposition offsite may be provided in cases where EPA determines that such actions:

(i) Are more cost-effective than other forms of remedial actions;

(ii) Will create new capacity to manage, in compliance with Subtitle C of the Solid Waste Disposal Act, hazardous substances in addition to those located at the affected facility; or

(iii) Are necessary to protect public health, welfare, or the environment from a present or potential risk which may be created by further exposure to the continued presence of such substances or materials.

(2) *Contaminated soils and sediments may be removed from the site.* Technologies used to remove contaminated sediments on soils include:

(i) Excavation;

(ii) Hydraulic dredging;

(iii) Mechanical dredging.

(d) *Provision of Alternative Water Supplies*—Alternative water supplies can be provided in several ways:

(1) Provision of individual treatment units;

(2) Provision of water distribution system;

(3) Provision of new wells in a new location or deeper wells;

(4) Provision of cisterns;

(5) Provision of bottled or treated water;

(6) Provision of upgraded treatment for existing distribution systems.

(e) *Relocation*—Permanent relocation of residents, businesses, and community facilities may be provided where it is determined that human health is in danger and that, alone or in combination with other measures, relocation would be cost-effective and environmentally preferable to other remedial response. Temporary relocation may also be taken in appropriate circumstances.

§ 300.71 Worker health and safety.

Lead agency personnel should be aware of hazards, due to a release of hazardous substances, to human health and safety and exercise great caution in allowing civilian or government personnel into an affected area until the nature of the release has been ascertained. Accordingly, the OSC or responsible official must conform to applicable OSHA requirements and other guidance. All private contractors who are working at the scene of a release must conform to applicable provisions of the Occupational Safety and Health Act and any other requirements deemed necessary by the lead agency.

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Handbook on the Toxicology of Metals

edited by
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Alloys with other metals are used in electrical industry and for ship propellers. Manganese dioxide is used for dry cell batteries. The chemical industry uses manganese compounds for many different purposes. The organic compound MMT has been suggested as a substitute for lead in gasoline.

5 Environmental levels and exposure

5.1 *General environment*

5.1.1 *Food and daily intake*

Daily intake of manganese from food varies considerably in different areas of the world. Intakes from 5.8 to 12.4 mg have been reported from various regions in India (Soman et al., 1969), whereas in New Zealand (Guthrie and Robinson, 1977), the U.S. (Schroeder et al., 1966; Greger et al., 1978), Canada (Méranger and Smith, 1972; Srivastava et al., 1978) and West Germany (Schelenz, 1977) average intake by adults has been estimated from 2.7 to 4.1 mg/day. In West Germany the daily intake for children 3–5 years old averaged 1.4 mg and for children 9–13 years old 2.18 mg/day (Schlage and Wortberg, 1972).

The highest manganese concentrations are found in some foods of plant origin, especially wheat and rice, where concentrations between 10 and 100 mg/kg have been reported (Schroeder et al., 1966; Guthrie, 1975). Polished rice and wheat flour contain less since most manganese is in the bran. High concentrations have also been found in tea leaves. Eggs, milk, fruits and meat generally contain less than 1 mg/kg. Peas and beans contain a few mg/kg (Guthrie, 1975). In a Canadian study by Méranger and Smith (1972) it was estimated that of a total intake of 4.1 mg, 2.2 mg (54%) came from cereals. The second largest source was potatoes, which gave 0.6 mg (14%), whereas meat, fish and poultry only provided 0.1 mg (2%). Thus, variations in manganese intake can to a large extent be explained by differences in nutritional habits. In populations with cereals and rice as main sources of food, the intake will be higher compared to areas where meat and dairy products take up a larger part of the diet. The manganese intake can also be higher in populations with a high tea consumption. WHO (1973) has estimated an intake of 2–3 mg of manganese per day to be adequate.

5.1.2 *Water, soil and ambient air*

Concentrations of about 2 μg/l have been reported in sea water (Goldberg, 1965; Shigematsu et al., 1975), whereas concentrations in fresh water vary from less than one to several hundred μg/l (Durum and Haffty, 1961; NAS, 1973; Shigematsu et al., 1975). Drinking water generally contains less than 100 μg/l. In 100 cities in the U.S. the median level was 5 μg/l (Durfor and Becker, 1964).

In soil the average manganese content has been reported to be 600–900 mg/kg, with variations from 1 to 7000 mg/kg depending on geological background, mining activities, etc. (NAS, 1973; WHO, 1979).

In ambient air, background corrections of 0.05 to 5.4 ng/m^3 over the Atlantic Ocean

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exceeded 50 μg/l, the U.S. Public Health Service standard (NAS, 1972). This is supported by Durfor and Becker (1964) who found that lead in water supplies in about 100 large American cities ranged from trace amounts to about 60 μg/l. However, when lead pipes or tanks are used and the water is soft, lead concentrations may be so high (up to 3000 μg/l, Goldberg, 1974) as to cause lead poisoning (Beattie et al., 1972). Plastic pipes containing lead stearate may also contaminate drinking water (WHO, 1977).

Surface water usually contains lead in concentrations below 100 μg/l (Kopp and Kroner, 1970) and in unpolluted areas in the range of about 1 μg/l (Zukovickaja et al., 1966). A recent survey of the rivers in the Midi-Pyrenees region, France, showed mean dissolved lead concentrations of about 7–10 μg/l (Servant, 1973). Lead concentration in deep ocean water is about 0.01–0.02 μg/l, but in surface ocean water 0.3 μg/l (Chow and Patterson, 1966).

5.1.3 *Soil and plants*

The natural concentration of lead in soil is in the range of 2–200 mg/kg (NAS, 1972) with mean values of about 16 mg/kg, but the variation from one location to another is considerable (Waldron and Stöfen, 1974). The concentration of lead in street dust and surface soil may sometimes be extremely high and represents a hazard to children. For example, the mean lead concentration in street dust from residential and commercial areas in 77 Mid-Western cities in the U.S.A. amounted from about 1600 to 2400 mg/kg (NAS, 1972), and Kennedy (1969) reported that lead in soil near a lead mining area in Idaho reached 20 000 mg/kg.

Grass samples may show high lead concentrations near roads with heavy traffic, the mean values ranging from about 250 mg/kg at the roadside to about 100 mg/kg at a distance of 25 m (NAS, 1972). This is mostly due to external contamination, because the uptake of lead by plants from soil does not seem to be influenced much by the concentration of lead in soil (Ter Haar, 1970).

5.1.4 *Ambient air*

The lead concentrations in ambient air range from about 0.02 μg/m^3 to about 10 μg/m^3 (means of 24-h samples) (Waldron and Stöfen, 1974; Tepper and Levin, 1975; Tsuchiya et al., 1975). These figures do not necessarily indicate the exposure throughout the entire year and the sampling sites were not all at the same distance from the ground. A good picture of lead concentration in ambient air is obtained from the data collected in 1971–1972 in a number of European cities, as shown in Table 1. In contrast, the lead concentrations in air above the north-central Pacific Ocean and south Indian Ocean are on the order of 0.001 μg/m^3 (Chow and Bennet, 1969; Egorov et al., 1970).

5.1.5 *Special exposures*

Concentrations of lead in whiskey illicitly distilled using old car radiators ('Moonshine') may be above 1 mg/l, and there are reports of chronic poisoning from this source (Patterson and Jernigan, 1969; Whitfield et al., 1972). Wine is another possible source of lead intake for some people. In some wines the average concentrations ranged from 130 to 190 μg/l (Boudène et al., 1975).

(Friberg, 1977)

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5 Environmental levels and exposures

5.1 *Food and daily intake*

The daily intake of copper from food generally varies from about 1 to about 3 mg, corresponding to about 15–45 μg/kg b.w. in adults (Adelstein and Vallee, 1961; Schroeder et al., 1966; Tipton et al., 1966, 1969; Robinson et al., 1973; Alexander et al., 1974; Klevay, 1975). Some low-protein and low-calorie diets may give less than 1 mg (Klevay, 1975). The daily requirements have been estimated to be about 30 μg/kg b.w. for adults, 40 μg/kg b.w. for older children and 80 μg/kg b.w. for infants (WHO, 1973). Meat, internal organs, fish and green vegetables are good sources of copper.

Cereals contain less copper and milk is relatively poor in copper (WHO, 1973). Concentrations in food are generally around 1 mg/kg. Copper-poor items such as milk usually contain less than 0.1 mg/kg.

5.2 *Water, soil and ambient air*

In seawater, most reports have indicated concentrations from 1–5 μg/l (Abdullah et al., 1972; Rojahn, 1972; Preston et al., 1972). In American rivers concentrations ranging from 0.83 to 105 μg/l (median 5.3) have been reported (Durum et al., 1971). In drinking water very large variations may occur depending on type of water, e.g. hardness and pH, and types of pipes and taps. Concentrations from a few μg to more than 1 mg/l have been reported (Schroeder et al., 1966; Stegavik, 1975), meaning that drinking water may sometimes add a considerable amount of copper to the daily intake obtained via food. Natural copper concentrations in soil vary from 2 to 100 mg/kg dry weight (Bowen, 1966). Air levels of copper in the U.S. have been reported to vary from 10–570 ng/m^3, the highest values being found in urban areas (Schroeder, 1970; Kneip et al., 1970). At the South Pole the average copper concentration in air was 0.036 ng/m^3 (Zoller et al., 1974).

6 Metabolism

6.1 *Absorption*

6.1.1 *Inhalation*

There are no data on absorption rates of copper compounds after inhalation from animal or human studies.

6.1.2 *Ingestion*

The gastrointestinal absorption is normally regulated by the copper status in the body. Studies using radioactive copper on rats indicated that small doses (<1 μg) were absorbed to more than 50%, but that increasing doses were absorbed to a relatively lesser extent (Owen, 1964). In contrast to most other metals copper seems to be absorbed to a large extent in the stomach, as shown in rats (Van Campen and Mitchell, 1965).

(Friberg, 1979)

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intake of cobalt is 5–45 µg (Harp and Scouler, 1952; Ripak, 1961; Hubbard et al., 1966; Wester, 1974a; Schleutz, 1977). Whilst there is reason to believe that these values represent an average normal daily intake, some contradictory data, showing considerably higher values, have emerged in some studies employing emission spectroscopy and AAS (Tipton et al., 1966; Schroeder et al., 1967). Certain seafoods contain higher than average concentrations of cobalt (Schroeder et al., 1967).

In 15 commercial beers analyzed by Stone (1965) using a colorimetric method, cobalt usually measured well below 0.1 mg/l unless the metal had been added in processing, up to 1.1 mg/l being recorded in such cases.

5.1.2 *Water, soil and ambient air*

Drinking water has shown low concentrations of cobalt, usually between 0.1–5 µg/l (Schroeder et al., 1967; Punsar et al., 1975). In inland waters, about the same concentrations will be found (Nix and Goodwin, 1970; Paus, 1971). Sea water has been shown to contain less cobalt than fresh water (Vinogradova and Prokhorova, 1968; Piper and Goles, 1969).

In U.S. soil, cobalt ranges from 0.1 to 13 mg/kg (Schroeder et al., 1967).

In ambient air the concentration of cobalt is usually low. Tabor and Warren (1958) found detectable amounts of cobalt (>0.3 ng/m^3) in only 90 out of 750 air samples taken from 28 sampling stations in the U.S., using a semiquantitative spectrographic method. Using neutron activation, Brar et al. (1970) found cobalt in Chicago air ranging from 0.3 to 23 ng/m^3.

5.1.3 *Tobacco*

Cobalt in cigarettes has been studied by means of neutron activation by Nadkarni and Ehmann (1970). The tobacco, on an average, contained 0.5 mg Co/kg dry weight. When the cigarettes were smoked in a standard smoking machine, 0.5% was found in the mainstream.

5.2 *Working environment*

Cobalt may be released into the air during the production of cobalt oxide and in the processing of hard metals. From the U.S.S.R., Kaplun (1963) reported occupational air concentrations reaching 10 and even 100 mg/m^3 in a cobalt oxide plant. The highest average in a tungsten carbide industry studied by Fairhall et al. (1949) was 1.7 mg/m^3.

6 Metabolism

Cyanocobalamin or vitamin B$_{12}$, a cobalt-containing tetrapyrrolic ring, is essential in mammalian nutrition. The recommended daily intake of B$_{12}$ for an adult is 3 µg, corresponding to 0.12 µg of cobalt (Food and Nutrition Board, 1974). Ruminant animals in contrast to man and some other monogastric mammals have intestinal microflora which utilize cobalt in the formation of vitamin B$_{12}$. Deficiency states among ruminants have

(Friberg, 1979)

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5 Environmental levels and exposures

5.1 *General environment*

5.1.1 *Food and daily intake*

The daily intake of chromium from food has been estimated to be in the range of 0.03–0.1 mg (Schlettwein-Gsell and Mommsen-Straub, 1973). Since other sources contribute only minor amounts in relation to these values they represent also en estimate of the total daily intake of chromium for the general population. Food items vary considerably in concentration of chromium. Among large sources are meat, vegetables and unrefined sugar, while fish, vegetable oil and fruits contain smaller amounts. Values are reported from non-detectable to about 0.5 mg/kg wet weight for various food items.

The glucose tolerance factor is predominantly found in yeast, liver and meats. Of all forms of chromium, this has the highest biological availability to man.

5.1.2 *Water, soil and ambient air*

The chromium concentration in rivers and lakes is usually between 1 and 10 μg/l, that in sea water being considerably less, from <0.1 to about 5 μg/l (NAS, 1974). Municipal drinking water has been reported to contain higher amounts of chromium than river water.

Soil content ranges from trace to 250 mg/kg with occasionally higher values. The average chromium concentration in the earth's crust is 125 mg/kg. Chromium in phosphates used as fertilizers may be an important source of chromium in soil, in water, and in some foods.

Urban air concentrations of chromium have been reported from less than 10 ng/m^3 up to about 50 ng/m^3. Annual mean values for rural stations seldom reached 10 ng/m^3 (NAS, 1974).

5.1.3 *Tobacco*

Cigarettes have been reported to contain 390 μg/kg of chromium (Schroeder et al., 1962), but no estimates of the inhaled amount from smoking have been published.

5.2 *Working environment*

Potentially hazardous exposures are incurred in the production of dichromate, in the use of chromates in the chemical industry, in the stainless steel industry, in the production and use of alloys, in refractory work, and in the chromium plating industry.

In the last-mentioned industry, the health hazard is related to the chromium-containing mist. Chromium exposure in welders may constitute a health hazard, both because chromium is an important constituent in stainless and acid-stable steel, and because chromate is extensively used in anticorrosive paints (Ruf, 1970; Gylseth et al., 1977).

Chromium levels in industry have been reported to only a limited degree. Mancuso (1951) reported exposure levels up to 1 mg/m^3 of chromium in a chromate plant. Most values were in the range of 0.26–0.51 mg/m^3. A 5-day, 8-h mean value of 1.35 mg/m^3 of chromates in air was reported for a sack-filling operation in an old chromate plant by

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1974 for 15–20-year-old males (the period of highest caloric intake) have varied between 26 and 61 μg with an average of 39 μg (Mahaffey et al., 1975). In rural 'uncontaminated' areas of Japan the daily cadmium intake has been estimated at 59–113 μg (Japanese Association of Public Health, 1970).

Measurement of cadmium in feces gives an approximate of the daily intake since 90–95% of ingested cadmium remains unabsorbed. Studies performed on this material agree with the range estimated above for daily cadmium intake (Wester, 1974; Tati et al., 1976; Kjellström et al., 1978). Daily cadmium intake varies with age in a way similar to daily caloric intake (Kjellström et al., 1978).

Cadmium

5.1.2 *Water and soil*

In natural water cadmium is found mainly in bottom sediments and suspended particles, whereas the concentration in the water phase is low. Cadmium concentrations in non-polluted natural waters usually are lower than 1 μg/l. Contamination of drinking water may occur as a result of cadmium impurities in the zinc of galvanized pipes or of cadmium-containing solders in fittings, water heaters, water coolers and taps. Leaking of cadmium to ground water from dumped cadmium oxide sludge has also occurred.

Concentrations up to 16 mg/kg have been reported in fruit juices which had been in contact with cadmium-containing parts in vending machines (Nordberg et al., 1973). Regular drinking water usually does not have concentrations of cadmium exceeding 5 μg/l. Sea water contains between 0.04 and 0.3 μg/l.

Both waterborne and airborne cadmium can cause an increased concentration of cadmium in soil. In non-polluted areas the cadmium concentrations in soil will usually be less than 1 mg/kg. In certain areas of Japan where cadmium pollution has been suspected, levels of between 1 and 69 mg/kg have been found in the top soil of ricefields. The cadmium associated with the epidemic of Itai-itai disease (see below) came mainly from ricefield soil contaminated by cadmium-polluted irrigating water. The use of cadmium-containing sewage sludge and superphosphate as fertilizers in agriculture may also contaminate the soil. Sewage sludge may contain 100 mg cadmium/kg dry weight (Berrow and Webber, 1972). Information concerning the factors determining the uptake of cadmium in plants is scarce, but it has been shown that pH and concentrations of other minerals are of importance (Linnman et al., 1973). Both rice and wheat can take up considerable quantities of cadmium from soil. Chemical treatment of soil can considerably decrease uptake (Takijima and Katsumi, 1973; Takijima et al., 1973; Kobayashi et al., 1974).

5.1.3 *Ambient air*

Cadmium in ambient air occurs in particulate form. Its exact chemical form has seldom been reported but it is probable that cadmium oxide is an important part.

Annual averages during 1969 in larger cities of the U.S.A. ranged from 0.006–0.036 μg/m^3 (National Air Sampling Network, U.S.A., see Friberg et al., 1974). In European countries, urban values of 0.002–0.05 μg/m^3 have been reported. In Tokyo, mean values over several months varied from 0.01 to 0.053 μg/m^3. In nonurban areas lower values were found, 0.001–0.003 μg/m^3. Higher values, weekly means of 0.2–0.6 μg/m^3, have been recorded around certain cadmium-emitting industries (Friberg et al., 1974). Cad-

(Friberg, 1979)

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5 Environmental levels and exposures

5.1 *General environment*

5.1.1 *Food and daily intake*

Petzow and Zorn (1974) have recently measured beryllium concentrations in food in Western Germany. They found in polished rice 0.08, in toasted bread 0.12, in potatoes 0.17, in tomatoes 0.24 and in head lettuce 0.33 mg Be/kg substance (dry weight basis). Total intake figures for beryllium have not been published, but may be estimated as around 20 μg/day of which only a minor fraction is intake by inhalation.

5.1.2 *Water, soil, plants and ambient air*

Beryllium

Beryllium occupies the 35th place in the terrestrial abundance list of elements and its overall concentration in the lithosphere is estimated at 5 mg/kg.

Ordinary agricultural soils and natural waters contain beryllium in the μg/kg or μg/l range. In birch, aspen and willow, beryllium content may rise as high as 3 mg/kg (Nikonova, 1967).

Early reports on 'neighborhood cases' of pulmonary berylliosis at a frequency of 1–3% in the general population living within about a mile of the plant (Eisenbud et al., 1949) led to investigations disclosing that beryllium was emitted in the stack gases resulting in ambient concentrations of about 100 ng/m^3 around the plant. Average beryllium content of general urban air was reported by Sterner and Eisenbud (1951) as follows: Boston 0.3, New York 0.5, Brookhaven 0.7, Cleveland 1.3, and Pittsburgh 3.0 ng Be/m^3. Much of this probably originated from the burning of bitmunious coal, which contains 0.1–3.0 mg/kg of beryllium.

5.1.3 *Tobacco*

In three brands of West German cigarettes, beryllium levels were 0.47, 0.68 and 0.74 μg/cigarette, with 4.5, 1.6 and 10.0% of the beryllium content, respectively, escaping into the smoke during smoking (Petzow and Zorn, 1974).

5.2 *Working environment*

Beryllium production in quantity commenced in the 1930's, and because of the early ignorance regarding its toxicity, no environmental controls were practiced until the late 1940's. Few measurements exist regarding the pre-1950 in-plant levels of beryllium to which workers were exposed, but they are retrospectively estimated as very high. Breslin and Harris (1959) reviewed early reports and concluded that inhalable beryllium in ore treatment rooms, around baking furnaces, in the neighborhood of lathes, or at the sites of fluorescent phosphor blending, milling, and salvaging, must have been around 1 mg/m^3.

In 1949, the U.S. Atomic Energy Commission, a major consumer of beryllium products, adopted the first occupational exposure standard at 2 μg Be/m^3 which in 1955 was adopted as the ACGIH threshold limit value. This resulted in substantial and widespread improvement of conditions, with average air concentrations in well-monitored plants dropping to below 2 and sometimes to as low as 0.1 μg Be/m^3 (Mitchell and Hyatt, 1957). In less well-monitored plants, breathing zone concentrations sometimes were

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5 Environmental levels and exposures

5.1 *General environment*

5.1.1 *Food and daily intake*

Barium content in edible crops ranges from about 10 mg/kg in wheat and corn grain to several grams per kg in brazil nuts (Beeson, 1941). Generally, barium content of food parallels calcium content, in a ratio of 1 : 10^2–10^5. Expressed as mg Ba/kg Ca, typical values in milk were 45–136; in wheat flour, 1300; and in oatmeal, 2320–8290 (Henderson et al., 1962).

In an American hospital diet the daily intake of barium was estimated at 0.375 mg while in the diet of the general population it may be as high as 1.33 mg (Schroeder et al., 1972). Grummitt (1961) estimated that average dietary barium intake originated 25% from milk, 25% from flour, 25% from potatoes and 25% from miscellaneous high-barium foods consumed in minor quantities, especially nuts.

Barium

5.1.2 *Water, soil, plants and ambient air*

Barium constitutes about 0.04% of the earth's crust, mostly confined to certain rock types. Agricultural soils contain Ba^{2+} in the mg/kg range. Concentration of the element in sea water is 0.006 mg/l and in fresh waters, 0.007–15.0 (average 0.05) mg/l (Schroeder et al., 1972). Municipal waters of the United States ranged 0.0017–0.38 (average 0.043) mg/l and of Sweden, 0.001–0.02 mg/l (Boström and Wester, 1967). In urban air, the average concentration was 5 (range 0–1500) ng per m^3 in 18 U.S. cities (Schroeder et al., 1972).

Barium has been found in all biological material where assayed. Marine animals concentrate the element 7–100 times and marine plants 1000 times from sea water. Among land plants, oak, ash, Douglas fir, walnut and particularly brazil nuts are the strongest accumulators of soil barium. Soybeans and tomatoes also accumulate soil barium 2–20 times (Robinson et al., 1950).

5.1.3 *Tobacco*

Barium content of dry tobacco leaves was found as 88–293 mg/kg by McHargue (1913); more recent measurements yielded 24–170 (average 105) mg/kg (Voss and Nicol, 1960). Most of this barium content is likely to remain in the ash during burning. There are no values reported on smoke.

5.2 *Working environment*

The industrial uses of soluble barium are such that hazardous conditions from atmospheric contamination are uncommon. Hyatt (1971) has applied a limit of 0.5 mg Ba/m^3 for a number of years at the Los Alamos Laboratories with satisfactory results for the control of exposure to barium nitrate. It is not known what degree of added safety this limit incorporates.

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The amount of arsenic ingested daily by humans via food is greatly influenced by the content of seafood in the diet. In a study in the U.S.A., a special diet excluding seafood gave an average intake of 0.04 mg arsenic per person and day, while a more typical diet gave 0.19 mg per person and day (Schroeder and Balassa, 1966). Jelinek and Corneliussen (1977) noted that foods belonging to the meat, fish and poultry group contributed most of the arsenic ingested. They estimated the average daily intake of arsenic from food in the U.S.A. in the early seventies to be 0.01–0.02 mg. This seems to be somewhat low when compared with the excretion of arsenic (see Section 7.2). The daily intake of total arsenic in Japan is reported to be 0.07–0.37 mg per person (Nakao, 1960; Ishinishi et al., 1974).

Arsenic

5.1.2 *Water and soil*

The arsenic content of the earth's crust is generally less than 2 mg/kg (NAS, 1977). Some minerals, e.g. pyrite, may contain as much as 5% arsenic. Uncontaminated soil generally contains less than 40 mg As/kg, whereas contaminated soil may contain several hundreds of milligrams per kilogram (Walsh et al., 1977).

Sea water generally contains 0.001–0.005 mg As/l (Kappanna et al., 1967; Ferguson and Gavis, 1972). The arsenic concentrations of rivers and lakes vary considerably. Most levels are well below 0.01 mg/l, but in some instances they may even be as high as about 1 mg/l (Durum et al., 1971; Sagner, 1973; Andreae, 1978).

Braman and Foreback (1973) and Crecelius (1974) noted several different forms of arsenic in natural waters: arsenate, arsenite, methylarsonic acid and dimethylarsinic acid, the methylated forms generally in lower concentrations than the inorganic ones. Andreae (1978) reported that arsenate is generally the dominant form in sea water.

Clement and Faust (1973) found that about 8% of the total arsenic in well aerated stream water was in the form of As(III), while all of the arsenic in anaerobic reservoirs appeared to be in the form of As(III).

The natural concentration of total arsenic in ground water is dependent on the arsenic content of the bed rock. About 13% of ground water samples from 800 wells in an area in Nova Scotia, Canada, where the arsenic content in the bed rock is high, had concentrations exceeding 0.05 mg As/l (Grantham and Jones, 1977). High carbonate spring waters in California, Romania, Kamchatka in the U.S.S.R., and New Zealand have been stated to contain 0.4–1.3 mg As/l (Schroeder and Balassa, 1966). In Japan concentrations of up to 1.7 mg As/l have been recorded in hot-spring water (Kawakami, 1967). In Cordoba, Argentina, ground water levels of up to 3.4 mg/l arsenic have been reported (Arguello et al., 1938), and in Taiwan, artesian well water has been shown to contain up to 1.8 mg/l (Kuo, 1968).

The chemical form of arsenic in different ground waters is largely unknown. Clement and Faust (1973) found that 25–50% of the total arsenic in a few ground waters was in the form of As(III).

The average daily intake of arsenic via drinking water can probably vary widely depending on the source of the water. McCabe et al. (1970) reported that less than 1% of more than 18 000 community water supplies in the U.S.A. had concentrations exceeding 0.01 mg/l arsenic. With an assumed daily intake of 1.5 l drinking water, a concentration

(Friberg, 1979)

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aging material. About one-third of the world production of aluminum is now used in the transport industry, and about half that amount in electrical engineering. The building industry in various industrialized countries utilizes from 10 to 20% of the world production; from 10 to 15% is utilized in packaging (Baudart, 1975). Aluminum compounds are utilized in the processing, packaging and preservation of food and as food additives for various purposes. Aluminum sulfate is widely utilized for sedimenting particles in the treatment of drinking water. Aluminum and aluminum compounds are used therapeutically to prevent hyperphosphatemia in renal disease, and in the prevention of silicosis. Other therapeutic uses of aluminum compounds are as antacid, as antidote, as antiperspirant and as adjuvant for vaccines, toxoids and for aluminum penicillin.

5 Environmental levels and exposures

5.1 *General environment*

Al

5.1.1 *Food and daily intake*

Most unprocessed food items contain less than 10 mg Al/kg. Use of aluminum in the processing and storing of food increases the aluminum content, but not to a toxicologically significant extent. Some vegetables and fruits may contain up to about 150 mg Al/kg. The daily intake of aluminum from food may thus show a considerable variation dependent on the diet (Schlettwein-Gsell and Mommsen-Straub, 1973; Sorensen et al., 1974). Total daily intake of aluminum may amount to about 80 mg/day, as reviewed by Sorensen et al. (1974).

5.1.2 *Water, soil and ambient air*

Aluminum in ocean water generally is reported up to about 1 mg/l, this value being one-tenth of the concentration reported in rivers and lakes. The activities of man increase the aluminum content in surface water, but aluminum is generally not regarded as a water pollution problem. Concentrations of aluminum as high as 150–600 g/kg have been reported in soil. Aluminum content in urban air is reported up to about 10 $\mu g/m^3$; in non-urban areas values lower than 0.5 $\mu g/m^3$ are usually reported (Sorensen et al., 1974).

5.2 *Working environment*

Occupational exposure to aluminum and aluminum compounds is widespread, but the exposure has only to a limited degree turned out to be of toxicological importance. Exposure to aluminum oxide-containing dust in the production of abrasives from bauxite has been described as a hazard (Shaver and Riddell, 1947), but exposure levels have not been reported.

file ...

new file (industrial) : Tri Cities Barrel Broome (?)

(Hill, 1979)

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O'BRIEN & GERE

December 20, 1979

Tri-Cities Barrel Co.
P. O. Box 88
Port Crane, New York 13833
Attn: Mr. Gary Warner

Re: Laboratory Data Report
File: 1146.1 7.517

Dear Mr. Warner:

Please find enclosed the results of laboratory analyses on samples received 10-15-79.

The procedure for polychlorinated biphenyl (PCB) scan involves the extraction of a sample with an organic solvent. Many organic compounds besides pesticides are soluble in this partitioning step. Therefore, upon injection into a gas chromatograph these compounds appear as an interference and are unidentifiable because they do not match our standard. For an idea of the magnitude of these compounds, the other compounds sensitive to the electron capture detector are quantitated as Aroclor 1016, however, the compound is not Aroclor 1016 and appears on the report sheet as other compounds.

Should you have questions concerning these results, please do not hesitate to call me.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

David R. Hill

David R. Hill
Laboratory Supervisor

DRH/bpp

Enclosure

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Box 4873 1304 Buckley Road Syracuse, New York 13221 Cable: [illegible] Tel 315 451-4700
Charlotte NC Chillicothe OH Dover, DE Philadelphia, PA Poughkeepsie, NY Teheran Iran

O'BRIEN & GERE ENGINEERS

(4/11, 1979) ⑭

Laboratory Data Report

Client: TRI-CITIES BARREL CO.

File No. 1146.197.517 Page No.

Date Received 10-15-79 By BPP

Sample Identification	Sample No.	TACID	CL	PH	CN	PCB	OTHER COMPOUNDS					
Pond	21108	<1.	50.	10.5	0.72	<1.	7.7					
Tank	21109	<1.	800.	13.0	1.1	<1600.	16000.					
		PPM	PPM		PPM	PPB	PPB					

File: State Superfund

(Lepak, 1983)

15 (12/75)

15

New York State Department of Environmental Conservation

MEMORANDUM

TO: Charles Goddard - Albany - Room 411
FROM: L. Lepak
SUBJECT: Draft Investigation Report - Tri-Cities Barrel Co., Inc. - Review Comments
DATE: 7-19-83

-Larry.

I have completed review of the above-mentioned report and feel that the consultant has not properly evaluated the site. Key sampling information and other correspondence available in the Binghamton Office files was not included in the report. In fact, the consultant did not review this site with key Binghamton Office personnel at all to develop a better knowledge of the site. I have attached the following listed correspondence in order to provide more information on the site:

1. Sample analysis of the caustic rinsewater from a March, 1982 sampling - This sample was secured directly from the caustic rinsewater tank reservoir inside the plant. Mr. Warner said this sample would be representative of his barrel rinsing operation and should contain small amounts of residual materials from the rinsed drums. The sample was found to contain a wide range of chemicals, including cyanide, phenols and a number of chlorinated solvents. Mr. Warner said that this sample would be representative of his previous lagoon discharge, prior to his firm going to a holding tank system.

2. RCRA inspection of the site on March 3, 1983 - During this inspection, one leaking tanker and two leaking barrels of hazardous waste were noted at the property. Also, discharges were noted at the property in a couple of areas. One of these discharges, coming out of the ground was visible again at a site visit on 5/27/83. How, the consultant missed this discharge, while both Doug Layman and myself noted this discharge both in March and May site visits, is beyond me. The consultant inspected the site on May 17, 1983.

   During the RCRA inspection, it was also noted that the contents from some drums had leaked and dissolved the ground's surface. Some frozen residue material from some drums was thawing and melting onto the ground.

3. Copy of the Broome County soils map, indicating the soils at the site are in the Mardin and Volusia hardpan series, not sands as thought by the consultant.

Since the consultant never bothered to interview me (the DEC field Engineer, who has intimate knowledge of the facility), I would like to summarize my feelings on this inactive site. Tri-Cities Barrel Co., Inc. has operated

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ENVIRONMENTAL
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(Lepak, 1983)

15

at this property since the 1950's, thus before the environmental regulatory movement began. I feel it is highly likely, that the groundwater at the site is contaminated to some unknown degree.

Possible sources of contamination at the site would be barrel residual wastes, that have leaked on the ground's surface, discharge of residual wastes in the caustic rinsewater to the unlined lagoons and/or any unknown disposal of barrel residual materials or ash from the barrel incinerator on the property. The sample analysis results of the caustic wastewater from March, 1982 give a good indication of the type and level of residuals wastes, that were discharged to the facility's lagoons. I personally saw during one inspection in the late 1970's, that the caustic rinsewater discharge had completely dissolved two inches of asphalt pavement in a DOT paved ditch, that received a portion of the discharge from the facility.

The consultant did not recommend any sampling of the existing on-site water supply well. In my mind, sampling of this well would be the first step in evaluating the site for possible contamination. I also recommend that a boring be located in the lagoon's location and a lagoon sediment sample be acquired for GC/MS analysis. I also feel that two surface water monitoring stations are adequate - one upgradient and one downgradient from the facility, rather than the three stations proposed by the consultant.

The consultant also did not report that the firm had an oil spill of approximately 200 gallons of No. 2 fuel oil at the site on August 3, 1982. A copy of the spill report is included for your information.

In closing, I recommend that you withhold a portion of the consultant's fee for preparing an inadequate report. The money withheld could be used to pay for sampling the on-site well at the property.

L. Lepak

L. Lepak

LTL:kr

cc: S. Lackey
L. Gross

⑯

MANES, RIFKEN, FRANKEL & GREENMAN, P. C.
ATTORNEYS AT LAW
507 EAST FAYETTE STREET
SYRACUSE, NEW YORK 13202

SIDNEY MANES
RICHARD E. RIFKEN
JOSEPH A. GREENMAN
PHILIP I. FRANKEL
CAROL M. TUCKER

TELEPHONE
(315) 476-2121

March 7, 1986

RECD MAR 1 [illegible]

Glenn S. Goodman, Hydrogeologist
ENGINEERING-SCIENCE
290 Elwood Davis Road
Liverpool, New York 13088

Re: Tri-Cities Barrel Company
Our File No. M-8215
Your Code No. 607/648-9482

Dear Mr. Goodman:

I am in receipt of your revised edition of the Interview Summary dated January 13, 1986. I would like to correct and/or contribute to your remarks with regard to the three lagoons at the Tri-Cities facility.

Your Interview states that in 1973, aerial photographs show the three lagoons in operation. You then indicate that the lagoons were in operation for a period of eight years, closing in 1981. On July 11, 1979, a letter was sent by Eric V. Turki to Tri-Cities Barrel Company based upon a July 5, 1979 inspection. That letter indicates that an agreement was reached that "the lagooning system will be abandoned," and that the hauling of the waste water to a State approved site by a certified hauler would be initiated by October 1, 1979.

Subsequent to the July 5, 1979 letter, Tri-Cities Barrel Company immediately contacted a number of waste haulers for the purpose of closing out the lagoons in order to meet the time frame set forth in Mr. Turki's letter.

On or about June 18, 1980, I wrote a letter to Mr. Brickwedde of the NYS DEC, Region 7, advising him that Tri-Cities had eliminated the sewer outlets into the lagoons and that Tri-Cities was in the process of purchasing equipment to incinerate the sludge.

It seems fairly clear that Tri-Cities was the in process of meeting the requirements prior to November of 1980, so that it would not subject to the November, 1980 Regulations dealing with lagoons. Under the circumstances, your Interview indicates the continued existence of the lagoons in 1981, and unless there is some justification or documentation substantiating your belief, I must assume that my dates are more accurate than your assumptions.

This is an extremely important issue, Mr. Goodman, and I would ask you to please review your Interview and make the appropriate corrections and/or modifications thereto.

Thank you very much.

Respectfully,

MANES, RIFKEN, FRANKEL & GREENMAN, P.C.

Sidney Manes

Sidney L. Manes

SLM:cd
cc: Gary Warner, President
William S. Carter, Ph.D.

(NYSDEC, 1984)

⑰

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SOLID AND HAZARDOUS WASTE

50 Wolf Road
Albany, New York
12233

PART 366

REGULATIONS RELATING TO THE IDENTIFICATION AND LISTING OF HAZARDOUS WASTES

Title 6

of the

Official Compilation

of

Codes, Rules and Regulations

(Statutory Authority: Environmental Conservation Law Section 27-0903)

Effective - April 23, 1984

(NYSDEC, 1984)

(17)

Table 1 (con't.)

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0
D012	Endrin (1,2,3,4,10,10-hexachloro-1, 7-epoxy-1,4,4a,5,6,7,8,8a-octahydor-1, 4-endo, endo-5,8-dimethano naphthalene	0.02
D013	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer	0.4
D014	Methoxychlor (1,1,1-Trichloro-2 2-bis, (p-methoexyphenyl) ethane)	10.0
D015	Toxaphene ($C_{10}H_{10}C_{18}$, technical chlorinated camphene, 67-69 percent chlorine)	0.5
D016	2,4-D, (2,4-Dichlorophenoxyacetic acid).	10.0
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	1.0

(2) A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Subdivision 366.5(b) or equivalent methods approved by the Administrator under the procedures set forth in Section 366.7,

(NYSDEC, 1984)

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(v) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(vi) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(vii) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(viii) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(2) A solid waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Section 366.4, has the EPA Hazardous Waste Number of D003.

(e) Characteristic of EP Toxicity.

(1)

Table 1 - Maximum Concentration of

Contaminants for Characteristic of EP Toxicity -

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0

(NYSDEC, 1985)

18

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

July 24, 1985

MEMORANDUM

TO: Bureau Directors, Regional Water Engineers, Section Chiefs

SUBJECT: Division of Water Technical and Operational Guidance Series (85-W-38)

Ambient Water Quality Standards and Guidance Values
(Originator: John Zambrano)

I. Purpose

The purpose of this document is to provide a compilation of water quality standards and guidance values for toxic and non-conventional pollutants to be used in the Department's regulatory programs, including the SPDES permit program.

II. Discussion

This substantial revision of TOGS 85-W-38 is the result of the promulgation of amendments to 6 NYCRR Part 701-702, effective on August 2, 1985, governing the development and use of surface water quality standards and guidance values. This revision uses a new format in the tabulation and does not include the methodologies for the development of standards and guidance values. The user is referred to the regulations for a description of the methodologies.

III. Guidance

The Quality Evaluation Section will use the attached list in developing SPDES permit water quality-based effluent limits. The Criteria and Standards Section will maintain and revise the list on a regular basis.

for Daniel M. Barolo, P.E.
Director
Division of Water

Attachments
cc: Dr. Banks
Mr. Pagano
Mr. Mt. Pleasant
Regional Engineers for Environmental Quality
Ms. Chrimes

(NYSDEC, 1985)

(19)

DEC
PUBLICATION

NYS Department of Environmental Conservation
Superfund and Contract Laboratory Protocol
January 1985

New York State/Department of Environmental Conservation

(NYSDOH, 1985)

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401 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 50325 SAMPLE RECEIVED:85/02/07 CHARGE: 24.00
PROGRAM: 126:HOUSEHOLD WATER SUPPLIES
SOURCE ID: DRAINAGE BASIN:06 GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON COUNTY:BROOME
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: OSBORNE HOLLOW ROAD (BROOME CO.)
DESCRIPTION:SINGLE RESIDENCE,BATHROOM TAP
REPORTING LAB: [illegible] FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: VOLATILES-METHOD 503.1 & F.R.METHOD 601
SAMPLE TYPE: 12:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 15:10 DATE PRINTED:85/02/25

PARAMETER		RESULT
T67009	CHLOROMETHANE	< 1. MCG/L
T61809	BROMOMETHANE	< 1. MCG/L
T41009	VINYL CHLORIDE	< 1. MCG/L
T70209	DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909	CHLOROETHANE	< 1. MCG/L
T61709	TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809	DICHLOROMETHANE	< 1. MCG/L
T50909	1,1-DICHLOROETHENE	< 1. MCG/L
T51909	1,1-DICHLOROETHANE	< 1. MCG/L
T61209	TRANS-1,2-DICHLOROETHENE	< 1. MCG/L
T39009	CHLOROFORM	< 1. MCG/L
T50809	1,2-DICHLOROETHANE	< 1. MCG/L
T23609	1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609	CARBON TETRACHLORIDE	< 1. MCG/L
T38909	BROMODICHLOROMETHANE	< 1. MCG/L
T61309	1,2-DICHLOROPROPANE	< 1. MCG/L
T61509	TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109	TRICHLOROETHYLENE	< 1. MCG/L
T44909	DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409	CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709	1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109	2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109	BROMOFORM	< 1. MCG/L
T51609	1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T11209	TETRACHLOROETHENE	< 1. MCG/L
T40909	CHLOROBENZENE	< 1. MCG/L
T49709	1,3-DICHLOROBENZENE	< 1. MCG/L
T43109	1,2-DICHLOROBENZENE	< 1. MCG/L
T44209	1,4-DICHLOROBENZENE	< 1. MCG/L
T34409	BENZENE	< 1. MCG/L
T39209	TOLUENE	< 1. MCG/L
T51009	ETHYLBENZENE	6. MCG/L
T65209	1-CHLOROCYCLOHEXENE-1	< 1. MCG/L

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HEALTH DEPARTMENT

**** CONTINUED ON NEXT PAGE ****

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DIRECTOR OF ENVIRONMENTAL SANITATION
BROOME COUNTY HEALTH DEPT.
1 WALL STREET
BINGHAMTON,N.Y. 13901

SUBMITTED BY:SVIATYLA

(NYSDOH,1985)

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402                NEW YORK STATE DEPARTMENT OF HEALTH
          WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 2               RESULTS OF EXAMINATION                 FINAL REPORT

SAMPLE ID:      50328      SAMPLE RECEIVED:85/02/07     CHARGE:   24.00
POLITICAL SUBDIVISION :[illegible]                COUNTY:BROOME
LOCATION:  [illegible] ROAD (BROOME CO.)
TIME OF SAMPLING: 85/02/05 05:10                 DATE PRINTED:85/02/25

           PARAMETER                                   RESULT
   T70309  PARA-XYLENE                                < 1.  MCG/L
   T70309  BETA-XYLENE                                 12.  MCG/L
   T51409  ORTHO-XYLENE                                 5.  MCG/L
   T85309  CUMENE                                     < 1.  MCG/L
   T85409  STYRENE                                    < 1.  MCG/L
   T85509  P-BROMOFLUOROBENZENE                       < 1.  MCG/L
   T51109  N-PROPYLBENZENE                            < 1.  MCG/L
   T85609  TERT-BUTYLBENZENE                          < 1.  MCG/L
   T85709  O/P-CHLOROTOLUENE                          < 1.  MCG/L
   T51209  BROMOBENZENE                               < 1.  MCG/L
   T50509  META-CHLOROTOLUENE                         < 1.  MCG/L
   T85809  1,3,5-TRIMETHYLBENZENE                     < 1.  MCG/L
   T85909  1,2,4-TRIMETHYLBENZENE                     < 1.  MCG/L
   T86009  P-CYMENE                                   < 1.  MCG/L
   T86109  CYCLOPROPYLBENZENE                         < 1.  MCG/L
   T86209  SEC-BUTYLBENZENE                           < 1.  MCG/L
   T86309  N-BUTYLBENZENE                             < 1.  MCG/L
   T86409  2,3-BENZOFURAN                             < 1.  MCG/L
   T52509  HEXACHLOROBUTADIENE (C-46)                 < 5.  MCG/L
   T49009  1,2,4-TRICHLOROBENZENE                     < 5.  MCG/L
   T65509  NAPHTHALENE                                < 5.  MCG/L
   T43909  1,2,3-TRICHLOROBENZENE                     < 5.  MCG/L
   T67109  PHENOL                                    < 10.  MCG/L
   T66409  2-CHLOROPHENOL                            < 10.  MCG/L
   T66809  2-NITROPHENOL                             < 10.  MCG/L
   T66609  2,4-DIMETHYLPHENOL                        < 10.  MCG/L
   T66509  2,4-DICHLOROPHENOL                        < 10.  MCG/L
   T66309  4-CHLORO-3-METHYLPHENOL                   < 10.  MCG/L
   T67209  2,4,6-TRICHLOROPHENOL                     < 10.  MCG/L
   T49609  2,4,5-TRICHLOROPHENOL                     < 10.  MCG/L
   T66709  2,4-DINITROPHENOL                         < 10.  MCG/L
   T66909  4-NITROPHENOL                             < 10.  MCG/L
   T65909  2-METHYL-4,6-DINITROPHENOL                < 10.  MCG/L
   T67009  PENTACHLOROPHENOL                         < 10.  MCG/L
                    **** END OF REPORT ****
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(NYSDOH, 1985)

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325                 NEW YORK STATE DEPARTMENT OF HEALTH
            WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

AGE 1                    RESULTS OF EXAMINATION                    FINAL REPORT

SAMPLE ID: 851000330       SAMPLE RECEIVED:85/02/08/11        CHARGE:     2.80
ROGRAM:          126:HOUSEHOLD WATER SUPPLIES
OURCE ID:                  DRAINAGE BASIN:06             GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON                             COUNTY:BROOME
ATITUDE:          .        LONGITUDE:          .         Z DIRECTION:
OCATION:   OSBORN HOLLOW RD.-IN VICINITY OF T.C. BARRELL CO.
DESCRIPTION:STAHL RESIDENCE BATHROOM TAP
REPORTING LAB:           10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
EST PATTERN:         10-067:IRON AND MANGANESE
SAMPLE TYPE:             120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 05:10                          DATE PRINTED:85/05/02

           PARAMETER                                     RESULT
    01IRON IRON                                           0.15 MG/L
  01MANGAN MANGANESE                                      0.28 MG/L
 21CADMIUM CADMIUM                                      < 2.0 MCG/L
21CHROMIUM CHROMIUM                                     < 10. MCG/L
    21LEAD LEAD                                         < 10. MCG/L
01MERCURY MERCURY                                       < 0.2 MCG/L
    01ZINC ZINC                                        < 0.05 MG/L
 03PHENOL NOT PRESERVED FOR PHENOLS                                       NA
  01PHONE LPHE PHONED MO DAY TIME                       020813.
                        **** END OF REPORT ****
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  DIRECTOR OF ENVIRONMENTAL SANITATION
  BROOME COUNTY HEALTH DEPT.
  1 WALL STREET                                   SUBMITTED BY:SVIATYLA
  BINGHAMTON,N.Y. 13901
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(NYSDOH, 1985) 1

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C 83 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 50327 SAMPLE RECEIVED:85/02/07/ CHARGE: 21.00
PROGRAM: 126:HOUSEHOLD WATER SUPPLIES
SOURCE ID: DRAINAGE BASIN:05 GAZETTEER CODE:0355
POLITICAL SUBDIVISION:FENTON COUNTY:BROOME
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: OLD ROUTE 7 (BROOME CO.)
DESCRIPTION:SMITH RESIDENCE,KITCHEN TAP
REPORTING LAB: TOX:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: VOL2:EPA METHOD 503.1 & F.R.METHOD 501
SAMPLE TYPE: 120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 10:40 DATE PRINTED:85/02/25

PARAMETER	RESULT
T62009 CHLOROMETHANE	< 1. MCG/L
T61509 BROMOMETHANE	< 1. MCG/L
T41009 VINYL CHLORIDE	< 1. MCG/L
T70209 DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909 CHLOROETHANE	< 1. MCG/L
T61709 TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809 DICHLOROMETHANE	< 1. MCG/L
T50909 1,1-DICHLOROETHENE	< 1. MCG/L
T51909 1,1-DICHLOROETHANE	< 1. MCG/L
T61209 TRANS-1,2-DICHLOROETHENE	< 1. MCG/L
T39009 CHLOROFORM	< 1. MCG/L
T50809 1,2-DICHLOROETHANE	< 1. MCG/L
T23609 1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609 CARBON TETRACHLORIDE	< 1. MCG/L
T38909 BROMODICHLOROMETHANE	< 1. MCG/L
T61309 1,2-DICHLOROPROPANE	< 1. MCG/L
T61509 TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109 TRICHLOROETHYLENE	< 1. MCG/L
T44909 DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409 CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709 1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109 2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109 BROMOFORM	< 1. MCG/L
T51809 1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T41209 TETRACHLOROETHENE	< 1. MCG/L
T40909 CHLOROBENZENE	< 1. MCG/L
T49709 1,3-DICHLOROBENZENE	< 1. MCG/L
T44109 1,2-DICHLOROBENZENE	< 1. MCG/L
T44209 1,4-DICHLOROBENZENE	< 1. MCG/L
T31409 BENZENE	< 1. MCG/L
T39209 TOLUENE	< 1. MCG/L
T51009 ETHYLBENZENE	< 1. MCG/L
T55209 1-CHLOROCYCLOHEXENE-1	< 1. MCG/L

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1 WALL STREET
BINGHAMTON, N.Y. 13901

SUBMITTED BY:SVIATYLA

(NYSDOH, 1985)

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C 84              NEW YORK STATE DEPARTMENT OF HEALTH
            WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 2                  RESULTS OF EXAMINATION                 FINAL REPORT

SAMPLE ID:      50322      SAMPLE RECEIVED:85/02/07/          CHARGE:   21.00
POLITICAL SUBDIVISION:FENTON                          COUNTY:BROOME
LOCATION:   ... ROUTE 7 (BRIDGE ST.)
TIME OF SAMPLING: 85/02/05 10:40                      DATE PRINTED:85/02/25

          PARAMETER                                   RESULT
    T70109 PARA-XYLENE                                  < 1. MCG/L
    T70309 META-XYLENE                                  < 1. MCG/L
    T51409 ORTHO-XYLENE                                 < 1. MCG/L
    T85309 CUMENE                                       < 1. MCG/L
    T85409 STYRENE                                      < 1. MCG/L
    T85509 P-BROMOFLUOROBENZENE                         < 1. MCG/L
    T51109 N-PROPYLBENZENE                              < 1. MCG/L
    T85609 TERT-BUTYLBENZENE                            < 1. MCG/L
    T85709 O/P-CHLOROTOLUENE                            < 1. MCG/L
    T51209 BROMOBENZENE                                 < 1. MCG/L
    T50509 META-CHLOROTOLUENE                           < 1. MCG/L
    T85809 1,3,5-TRIMETHYLBENZENE                       < 1. MCG/L
    T85909 1,2,4-TRIMETHYLBENZENE                       < 1. MCG/L
    T86009 P-CYMENE                                     < 1. MCG/L
    T86109 CYCLOPROPYLBENZENE                           < 1. MCG/L
    T86209 SEC-BUTYLBENZENE                             < 1. MCG/L
    T86309 N-BUTYLBENZENE                               < 1. MCG/L
    T86409 2,3-BENZOFURAN                               < 1. MCG/L
    T52509 HEXACHLOROBUTADIENE (C-46)                   < 5. MCG/L
    T44009 1,2,4-TRICHLOROBENZENE                       < 5. MCG/L
    T55609 NAPHTHALENE                                  < 5. MCG/L
    T43909 1,2,3-TRICHLOROBENZENE                       < 5. MCG/L
    T67109 PHENOL                                      < 10. MCG/L
    T66409 2-CHLOROPHENOL                              < 10. MCG/L
    T66809 2-NITROPHENOL                               < 10. MCG/L
    T66609 2,4-DIMETHYLPHENOL                          < 10. MCG/L
    T66509 2,4-DICHLOROPHENOL                          < 10. MCG/L
    T66309 4-CHLORO-3-METHYLPHENOL                     < 10. MCG/L
    T67209 2,4,6-TRICHLOROPHENOL                       < 10. MCG/L
    T49609 2,4,5-TRICHLOROPHENOL                       < 10. MCG/L
    T66709 2,4-DINITROPHENOL                           < 10. MCG/L
    T66909 4-NITROPHENOL                               < 10. MCG/L
    T68509 2-METHYL-4,6-DINITROPHENOL                  < 10. MCG/L
    T67009 PENTACHLOROPHENOL                           < 10. MCG/L
                         **** END OF REPORT ****
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557 NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH, 1985)
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

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AGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 851000326 SAMPLE RECEIVED:85/02/08/11 CHARGE: 2.80
ROGRAM: 126:HOUSEHOLD WATER SUPPLIES
OURCE ID: DRAINAGE BASIN:06 GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON COUNTY:BROOME
ATITUDE: . LONGITUDE: . Z DIRECTION:
OCATION: OLD ROUTE 7 - SMITH RESIDENCE - IN VICINITY OF T.C.BARREL CO
DESCRIPTION:KITCHEN TAP
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
EST PATTERN: 10-067:IRON AND MANGANESE
SAMPLE TYPE: 120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/06 10:40 DATE PRINTED:85/05/01

PARAMETER		RESULT	
01IRON	IRON	0.06 MG/L	
01MANGAN	MANGANESE	0.02 MG/L	
21CADMIUM	CADMIUM	< 2.0 MCG/L	
21CHROMIUM	CHROMIUM	< 10. MCG/L	
21LEAD	LEAD	< 10. MCG/L	
01MERCURY	MERCURY	< 0.2 MCG/L	
01ZINC	ZINC	< 0.05 MG/L	
03PHENOL	NOT PRESERVED FOR PHENOLS		NA
01PHONE	LPHE PHONED MO DAY TIME	020813.	

**** END OF REPORT ****

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HEALTH DEPARTMENT

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BROOME COUNTY HEALTH DEPT.
1 WALL STREET
BINGHAMTON,N.Y. 13901

SUBMITTED BY:SVIATYLA

(NYSDOH,1985)

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387                   NEW YORK STATE DEPARTMENT OF HEALTH
                WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1                       RESULTS OF EXAMINATION                    FINAL REPORT

SAMPLE ID:         50323       DATE RECEIVED:85/02/07           CHARGE:    24.00
PROGRAM:           125:NONPUBLIC WATER SUPPLIES
SOURCE ID:                 FAIRVIEW ???:06             GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON                           COUNTY:BROOME
LATITUDE:              .       LONGITUDE:         .    Z DIRECTION:
LOCATION:    OLD ROUTE 7 (BROOME CO.)
DESCRIPTION:LEE RESIDENCE,KITCHEN TAP
REPORTING LAB:         104:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN:        902:EPA METHOD 503.1 & E.P.METHOD 601
SAMPLE TYPE:           120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 10:55                        DATE PRINTED:85/02/25

          PARAMETER                                           RESULT
    T62009 CHLOROMETHANE                                      < 1. MCG/L
    T61809 BROMOMETHANE                                       < 1. MCG/L
    T41009 VINYL CHLORIDE                                     < 1. MCG/L
    T70209 DICHLORODIFLUOROMETHANE                            < 1. MCG/L
    T61909 CHLOROETHANE                                       < 1. MCG/L
    T61709 TRICHLOROFLUOROMETHANE                             < 1. MCG/L
    T23809 DICHLOROMETHANE                                    < 1. MCG/L
    T50909 1,1-DICHLOROETHENE                                 < 1. MCG/L
    T51909 1,1-DICHLOROETHANE                                 < 1. MCG/L
    T61209 TRANS-1,2-DICHLOROETHENE                           < 1. MCG/L
    T39009 CHLOROFORM                                         < 1. MCG/L
    T50809 1,2-DICHLOROETHANE                                 < 1. MCG/L
    T23609 1,1,1-TRICHLOROETHANE                              < 1. MCG/L
    T36609 CARBON TETRACHLORIDE                               < 1. MCG/L
    T38909 BROMODICHLOROMETHANE                               < 1. MCG/L
    T61309 1,2-DICHLOROPROPANE                                < 1. MCG/L
    T61509 TRANS-1,3-DICHLOROPROPENE                          < 1. MCG/L
    T41109 TRICHLOROETHYLENE                                  < 1. MCG/L
    T44909 DIBROMOCHLOROMETHANE                               < 1. MCG/L
    T61409 CIS-1,3-DICHLOROPROPENE                            < 1. MCG/L
    T51709 1,1,2-TRICHLOROETHANE                              < 1. MCG/L
    T61109 2-CHLOROETHYLVINYL ETHER                           < 1. MCG/L
    T42109 BROMOFORM                                          < 1. MCG/L
    T51809 1,1,2,2-TETRACHLOROETHANE                          < 1. MCG/L
    T41209 TETRACHLOROETHENE                                  < 1. MCG/L
    T40909 CHLOROBENZENE                                      < 1. MCG/L
    T49709 1,3-DICHLOROBENZENE                                < 1. MCG/L
    T44109 1,2-DICHLOROBENZENE                                < 1. MCG/L
    T44209 1,4-DICHLOROBENZENE                                < 1. MCG/L
    T34409 BENZENE                                            < 1. MCG/L
    T39209 TOLUENE                                            < 1. MCG/L
    T51009 ETHYLBENZENE                                       < 1. MCG/L
    T65209 1-CHLOROCYCLOHEXENE-1                              < 1. MCG/L
                  **** CONTINUED ON NEXT PAGE ****

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0388              NEW YORK STATE DEPARTMENT OF HEALTH
               WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 2                     RESULTS OF EXAMINATION                    FINAL REPORT

SAMPLE ID:       50323        SAMPLE RECEIVED:85/02/07/           CHARGE:    24.00
POLITICAL SUBDIVISION :FENTON                              COUNTY:BROOME
LOCATION:   OLD ROUTE 7 (BROOME CO.)
TIME OF SAMPLING: 85/02/06 10:55                         DATE PRINTED:85/02/25

           PARAMETER                                        RESULT
    T70409 PARA-XYLENE                                        < 1.  MCG/L
    T70309 META-XYLENE                                        < 1.  MCG/L
    T51409 ORTHO-XYLENE                                       < 1.  MCG/L
    T85309 CUMENE                                             < 1.  MCG/L
    T85409 STYRENE                                            < 1.  MCG/L
    T85509 P-BROMOFLUOROBENZENE                               < 1.  MCG/L
    T51109 N-PROPYLBENZENE                                    < 1.  MCG/L
    T85609 TERT-BUTYLBENZENE                                  < 1.  MCG/L
    T85709 O/P-CHLOROTOLUENE                                  < 1.  MCG/L
    T51209 BROMOBENZENE                                       < 1.  MCG/L
    T50509 META-CHLOROTOLUENE                                 < 1.  MCG/L
    T85809 1,3,5-TRIMETHYLBENZENE                             < 1.  MCG/L
    T85909 1,2,4-TRIMETHYLBENZENE                             < 1.  MCG/L
    T86009 P-CYMENE                                           < 1.  MCG/L
    T86109 CYCLOPROPYLBENZENE                                 < 1.  MCG/L
    T86209 SEC-BUTYLBENZENE                                   < 1.  MCG/L
    T86309 N-BUTYLBENZENE                                     < 1.  MCG/L
    T85409 2,3-BENZOFURAN                                     < 1.  MCG/L
    T52509 HEXACHLOROBUTADIENE (C-46)                         < 5.  MCG/L
    T44009 1,2,4-TRICHLOROBENZENE                             < 5.  MCG/L
    T65609 NAPHTHALENE                                        < 5.  MCG/L
    T43909 1,2,3-TRICHLOROBENZENE                             < 5.  MCG/L
    T67109 PHENOL                                            < 10.  MCG/L
    T66409 2-CHLOROPHENOL                                    < 10.  MCG/L
    T66809 2-NITROPHENOL                                     < 10.  MCG/L
    T66609 2,4-DIMETHYLPHENOL                                < 10.  MCG/L
    T66509 2,4-DICHLOROPHENOL                                < 10.  MCG/L
    T66309 4-CHLORO-3-METHYLPHENOL                           < 10.  MCG/L
    T67209 2,4,6-TRICHLOROPHENOL                             < 10.  MCG/L
    T49609 2,4,5-TRICHLOROPHENOL                             < 10.  MCG/L
    T66709 2,4-DINITROPHENOL                                 < 10.  MCG/L
    T66909 4-NITROPHENOL                                     < 10.  MCG/L
    T68509 2-METHYL-4,6-DINITROPHENOL                        < 10.  MCG/L
    T67009 PENTACHLOROPHENOL                                 < 10.  MCG/L
                              **** END OF REPORT ****
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(NYSDOH, 1955)

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558                 NEW YORK STATE DEPARTMENT OF HEALTH
           WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

AGE 1                       RESULTS OF EXAMINATION                         FINAL REPORT

AMPLE ID: 851000327        SAMPLE RECEIVED:85/02/08/11         CHARGE:     2.80
ROGRAM:          126:HOUSEHOLD WATER SUPPLIES
SOURCE ID:                  DRAINAGE BASIN:06                  GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON                                   COUNTY:BROOME
ATITUDE:          .          LONGITUDE:          .             Z DIRECTION:
OCATION:   OLD ROUTE 7-LEE RESIDENCE-IN VICINITY OF T.C. BARREL CO.
DESCRIPTION:KITCHEN TAP
EPORTING LAB:          10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
EST PATTERN:       10-067:IRON AND MANGANESE
SAMPLE TYPE:           120:PRIVATE WATER SUPPLY - DRILLED WELL
IME OF SAMPLING: 85/02/06 10:55                              DATE PRINTED:85/05/01

          PARAMETER                                            RESULT
    01IRON IRON                                                < 0.05 MG/L
  01MANGAN MANGANESE                                           < 0.02 MG/L
 21CADMIUM CADMIUM                                              < 2.0 MCG/L
21CHROMIUM CHROMIUM                                             < 10. MCG/L
    21LEAD LEAD                                                 < 10. MCG/L
 1MERCURY MERCURY                                               < 0.2 MCG/L
    01ZINC ZINC                                                < 0.05 MG/L
  03PHENOL NOT PRESERVED FOR PHENOLS                                             NA
   01PHONE LPHE PHONED MO DAY TIME                            020813.
                         **** END OF REPORT ****
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   1 WALL STREET                                          SUBMITTED BY:SVIATYLA
   BINGHAMTON,N.Y. 13901
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(NYSDOH,1985)

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391 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 5032[illegible] DATE RECEIVED:85/02/07/ CHARGE: 21.00
PROGRAM: 126:[illegible] WATER SUPPLIES
SOURCE ID: DRAINAGE BASIN:06 GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON COUNTY:BROOME
LATITUDE: LONGITUDE: Z DIRECTION:
LOCATION: OLD ROUTE 7 (BROOME CO.)
DESCRIPTION:[illegible] RESIDENCE,BATHROOM TAP
REPORTING LAB: TOX:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: VOLZ:EPA METHOD 503.1 & E.P.A.METHOD 601
SAMPLE TYPE: 124:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/06 08:55 DATE PRINTED:85/02/25

PARAMETER	RESULT
T62009 CHLOROMETHANE	< 1. MCG/L
T613[illegible] BROMOMETHANE	< 1. MCG/L
T41009 VINYL CHLORIDE	< 1. MCG/L
T70209 DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909 CHLOROETHANE	< 1. MCG/L
T61709 TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809 DICHLOROMETHANE	< 1. MCG/L
T50909 1,1-DICHLOROETHENE	< 1. MCG/L
T51909 1,1-DICHLOROETHANE	< 1. MCG/L
T61209 TRANS-1,2-DICHLOROETHENE	< 1. MCG/L
T39009 CHLOROFORM	< 1. MCG/L
T50809 1,2-DICHLOROETHANE	< 1. MCG/L
T23609 1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609 CARBON TETRACHLORIDE	< 1. MCG/L
T36909 BROMODICHLOROMETHANE	< 1. MCG/L
T61309 1,2-DICHLOROPROPANE	< 1. MCG/L
T61509 TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109 TRICHLOROETHYLENE	< 1. MCG/L
T44909 DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409 CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709 1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109 2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109 BROMOFORM	< 1. MCG/L
T51809 1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T41209 TETRACHLOROETHENE	< 1. MCG/L
T40909 CHLOROBENZENE	< 1. MCG/L
T49709 1,3-DICHLOROBENZENE	< 1. MCG/L
T44109 1,2-DICHLOROBENZENE	< 1. MCG/L
T44209 1,4-DICHLOROBENZENE	< 1. MCG/L
T34109 BENZENE	< 1. MCG/L
T34209 TOLUENE	< 1. MCG/L
T51009 ETHYLBENZENE	< 1. MCG/L
T65209 1-CHLOROCYCLOHEXENE-1	< 1. MCG/L

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[illegible]

**** CONTINUED ON NEXT PAGE ****

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392 NEW YORK STATE DEPARTMENT OF HEALTH
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AGE 2 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 50329 SAMPLE RECEIVED:85/02/07/ CHARGE: 24.00
OLITICAL SUBDIVISION:FENTON COUNTY:BROOME
OCATION: OLD ROUTE 7 (BROOME CO.)
TIME OF SAMPLING: 85/02/06 08:55 DATE PRINTED:85/02/25

	PARAMETER	RESULT
T70409	PARA-XYLENE	< 1. MCG/L
T70309	META-XYLENE	< 1. MCG/L
T51409	ORTHO-XYLENE	< 1. MCG/L
T85309	CUMENE	< 1. MCG/L
T85409	STYRENE	< 1. MCG/L
T85509	P-BROMOFLUOROBENZENE	< 1. MCG/L
T51109	N-PROPYLBENZENE	< 1. MCG/L
T85609	TERT-BUTYLBENZENE	< 1. MCG/L
T85709	O/P-CHLOROTOLUENE	< 1. MCG/L
T51209	BROMOBENZENE	< 1. MCG/L
T50509	META-CHLOROTOLUENE	< 1. MCG/L
T85809	1,3,5-TRIMETHYLBENZENE	< 1. MCG/L
T85909	1,2,4-TRIMETHYLBENZENE	< 1. MCG/L
T86009	P-CYMENE	< 1. MCG/L
T86109	CYCLOPROPYLBENZENE	< 1. MCG/L
T86209	SEC-BUTYLBENZENE	< 1. MCG/L
T86309	N-BUTYLBENZENE	< 1. MCG/L
T86409	2,3-BENZOFURAN	< 1. MCG/L
T52509	HEXACHLOROBUTADIENE (C-46)	< 5. MCG/L
T44009	1,2,4-TRICHLOROBENZENE	< 5. MCG/L
T65609	NAPHTHALENE	< 5. MCG/L
T43909	1,2,3-TRICHLOROBENZENE	< 5. MCG/L
T67109	PHENOL	< 10. MCG/L
T66409	2-CHLOROPHENOL	< 10. MCG/L
T66809	2-NITROPHENOL	< 10. MCG/L
T66609	2,4-DIMETHYLPHENOL	< 10. MCG/L
T66509	2,4-DICHLOROPHENOL	< 10. MCG/L
T66309	4-CHLORO-3-METHYLPHENOL	< 10. MCG/L
T67209	2,4,6-TRICHLOROPHENOL	< 10. MCG/L
T42509	2,4,5-TRICHLOROPHENOL	< 10. MCG/L
T66709	2,4-DINITROPHENOL	< 10. MCG/L
T66909	4-NITROPHENOL	< 10. MCG/L
T68509	2-METHYL-4,6-DINITROPHENOL	< 10. MCG/L
T67009	PENTACHLOROPHENOL	< 10. MCG/L

**** END OF REPORT ****

(NYSDOH, 1985)

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0560 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 851000328 SAMPLE RECEIVED:85/02/08/11 CHARGE: 2.80
PROGRAM: 126:HOUSEHOLD WATER SUPPLIES
SOURCE ID: DRAINAGE BASIN:06 GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON COUNTY:BROOME
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: OLD ROUTE 7-IN VICINITY OF T.C. BARRELL COMPANY
DESCRIPTION:SHARER RESIDENCE BATHROOM TAP
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
TEST PATTERN: 10-067:IRON AND MANGANESE
SAMPLE TYPE: 120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/06 08:55 DATE PRINTED:85/05/01

	PARAMETER	RESULT		
01IRON	IRON	0.13	MG/L	
01MANGAN	MANGANESE	0.15	MG/L	
21CADMIUM	CADMIUM	< 2.0	MCG/L	
21CHROMIUM	CHROMIUM	< 10.	MCG/L	
21LEAD	LEAD	< 10.	MCG/L	
01MERCURY	MERCURY	< 0.2	MCG/L	
01ZINC	ZINC	< 0.05	MG/L	
03PHENOL	NOT PRESERVED FOR PHENOLS			NA
01PHONE	LPHE PHONED MO DAY TIME	020813.		

**** END OF REPORT ****

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396 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

AGE 2 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 50325 SAMPLE RECEIVED:85/02/07 CHARGE: 24.00
OLITICAL SUBDIVISION:[illegible] COUNTY:BROOME
OCATION: [illegible] ROAD (BROOME CO.)
TIME OF SAMPLING: 85/02/05 05:20 DATE PRINTED:85/02/25

	PARAMETER	RESULT
T70109	PARA-XYLENE	< 1. MCG/L
T70309	META-XYLENE	< 1. MCG/L
T51409	ORTHO-XYLENE	< 1. MCG/L
T85309	CUMENE	< 1. MCG/L
T85409	STYRENE	< 1. MCG/L
T85509	P-BROMOFLUOROBENZENE	< 1. MCG/L
T51109	N-PROPYLBENZENE	< 1. MCG/L
T85609	TERT-BUTYLBENZENE	< 1. MCG/L
T85709	O/P-CHLOROTOLUENE	< 1. MCG/L
T51209	BROMOBENZENE	< 1. MCG/L
150509	META-CHLOROTOLUENE	< 1. MCG/L
T85809	1,3,5-TRIMETHYLBENZENE	< 1. MCG/L
T85909	1,2,4-TRIMETHYLBENZENE	< 1. MCG/L
T86009	P-CYMENE	< 1. MCG/L
T86109	CYCLOPROPYLBENZENE	< 1. MCG/L
T86209	SEC-BUTYLBENZENE	< 1. MCG/L
T86309	N-BUTYLBENZENE	< 1. MCG/L
T85409	2,3-BENZOFURAN	< 1. MCG/L
T52509	HEXACHLOROBUTADIENE (C-46)	< 5. MCG/L
T44009	1,2,4-TRICHLOROBENZENE	< 5. MCG/L
T65609	NAPHTHALENE	< 5. MCG/L
T43909	1,2,3-TRICHLOROBENZENE	< 5. MCG/L
T67109	PHENOL	< 10. MCG/L
T66409	2-CHLOROPHENOL	< 10. MCG/L
T66809	2-NITROPHENOL	< 10. MCG/L
T66609	2,4-DIMETHYLPHENOL	< 10. MCG/L
T66509	2,4-DICHLOROPHENOL	< 10. MCG/L
T66309	4-CHLORO-3-METHYLPHENOL	< 10. MCG/L
T67209	2,4,6-TRICHLOROPHENOL	< 10. MCG/L
T49609	2,4,5-TRICHLOROPHENOL	< 10. MCG/L
T66709	2,4-DINITROPHENOL	< 10. MCG/L
T66909	4-NITROPHENOL	< 10. MCG/L
T68509	2-METHYL-4,6-DINITROPHENOL	< 10. MCG/L
T67009	PENTACHLOROPHENOL	< 10. MCG/L

**** END OF REPORT ****

(NYSDOH, 1985)

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395                NEW YORK STATE DEPARTMENT OF HEALTH
                WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

AGE 1                      RESULTS OF EXAMINATION                       FINAL REPORT

SAMPLE ID:       50325        DATE RECEIVED:85/02/07/             CHARGE:    24.00
ROGRAM:          126:HOUSEHOLD WATER SUPPLIES
SOURCE ID:                 [illegible]:06                    GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON                                 COUNTY:BROOME
ATITUDE:            .          LONGITUDE:           .        Z DIRECTION:
OCATION:     OSBORNE HOLLOW ROAD (BROOME CO.)
DESCRIPTION:GANCE RESIDENCE TAP OR LINE FROM WELL
EPORTING LAB:          LOR:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
EST PATTERN:          VOL2:EPA METHOD 503.1 & F.R. METHOD 601
SAMPLE TYPE:           12:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 [illegible]                       DATE PRINTED:85/02/25

           PARAMETER                                          RESULT
    T62009 CHLOROMETHANE                                       < 1. MCG/L
    T61809 BROMOMETHANE                                        < 1. MCG/L
    T41009 VINYL CHLORIDE                                      < 1. MCG/L
    T70209 DICHLORODIFLUORO METHANE                            < 1. MCG/L
    T61909 CHLOROETHANE                                        < 1. MCG/L
    T61709 TRICHLOROFLUOROMETHANE                              < 1. MCG/L
    T23809 DICHLOROMETHANE                                     < 1. MCG/L
    T50909 1,1-DICHLOROETHENE                                  < 1. MCG/L
    T51909 1,1-DICHLOROETHANE                                  < 1. MCG/L
    T61209 TRANS-1,2-DICHLOROETHENE                            < 1. MCG/L
    T39009 CHLOROFORM                                          < 1. MCG/L
    T50809 1,2-DICHLOROETHANE                                  < 1. MCG/L
    T23609 1,1,1-TRICHLOROETHANE                               < 1. MCG/L
    T36609 CARBON TETRACHLORIDE                                < 1. MCG/L
    T38909 BROMODICHLOROMETHANE                                < 1. MCG/L
    T61309 1,2-DICHLOROPROPANE                                 < 1. MCG/L
    T61509 TRANS-1,3-DICHLOROPROPENE                           < 1. MCG/L
    T41109 TRICHLOROETHYLENE                                   < 1. MCG/L
    T44909 DIBROMOCHLOROMETHANE                                < 1. MCG/L
    T61109 CIS-1,3-DICHLOROPROPENE                             < 1. MCG/L
    T51709 1,1,2-TRICHLOROETHANE                               < 1. MCG/L
    T61109 2-CHLOROETHYLVINYL ETHER                            < 1. MCG/L
    T42109 BROMOFORM                                           < 1. MCG/L
    T51809 1,1,2,2-TETRACHLOROETHANE                           < 1. MCG/L
    T11209 TETRACHLOROETHENE                                   < 1. MCG/L
    T40909 CHLOROBENZENE                                       < 1. MCG/L
    T49709 1,3-DICHLOROBENZENE                                 < 1. MCG/L
    T44109 1,2-DICHLOROBENZENE                                 < 1. MCG/L
    T44209 1,4-DICHLOROBENZENE                                 < 1. MCG/L
    T34409 BENZENE                                             < 1. MCG/L
    T39209 TOLUENE                                             < 1. MCG/L
    T51009 ETHYLBENZENE                                        < 1. MCG/L
    T85209 1-CHLOROCYCLOHEXENE-1                               < 1. MCG/L
                   **** CONTINUED ON NEXT PAGE ****

 COPIES SENT TO: CH(1), RO(1), LPHE(2), FED( ), INFO-P( ), INFO-L( )

   DIRECTOR OF ENVIRONMENTAL SANITATION
   BROOME COUNTY HEALTH DEPT.
   1 WALL STREET                                       SUBMITTED BY:SVIATYLA
   BINGHAMTON, N.Y. 13901
```

(NYSDOH, 1985)

(20)

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0562                NEW YORK STATE DEPARTMENT OF HEALTH
              WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1                     RESULTS OF EXAMINATION                    FINAL REPORT

SAMPLE ID: 851000329        SAMPLE RECEIVED:85/02/08/11       CHARGE:     2.80
PROGRAM:         126:HOUSEHOLD WATER SUPPLIES
SOURCE ID:                  DRAINAGE BASIN:06             GAZETTEER CODE:0356
POLITICAL SUBDIVISION:FENTON                              COUNTY:BROOME
LATITUDE:          .        LONGITUDE:         .          Z DIRECTION:
LOCATION:   OSBORN HOLLOW RD.-IN VICINITY OF T.C. BARRELL CO.
DESCRIPTION:LANCE RESIDENCE TAP OFF WELL LINE
REPORTING LAB:          10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
TEST PATTERN:      10-067:IRON AND MANGANESE
SAMPLE TYPE:            120:PRIVATE WATER SUPPLY - DRILLED WELL
TIME OF SAMPLING: 85/02/05 05:20                        DATE PRINTED:85/05/01

          PARAMETER                                      RESULT
    01IRON IRON                                           0.22 MG/L
  01MANGAN MANGANESE                                      0.18 MG/L
 21CADMIUM CADMIUM                                      < 2.0 MCG/L
21CHROMIUM CHROMIUM                                     < 10. MCG/L
    21LEAD LEAD                                         < 10. MCG/L
 01MERCURY MERCURY                                      < 0.2 MCG/L
    01ZINC ZINC                                           0.07 MG/L
  03PHENOL NOT PRESERVED FOR PHENOLS                                      NA
   01PHONE LPHE PHONED MO DAY TIME                     020813.
                        **** END OF REPORT ****
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 COPIES SENT TO: CO(1), RO(1), LPHE(2), FED(0), INFO-P(0), INFO-L(0)

   DIRECTOR OF ENVIRONMENTAL SANITATION
   BROOME COUNTY HEALTH DEPT.
   1 WALL STREET                                       SUBMITTED BY:SVIATYLA
   BINGHAMTON,N.Y. 13901
```

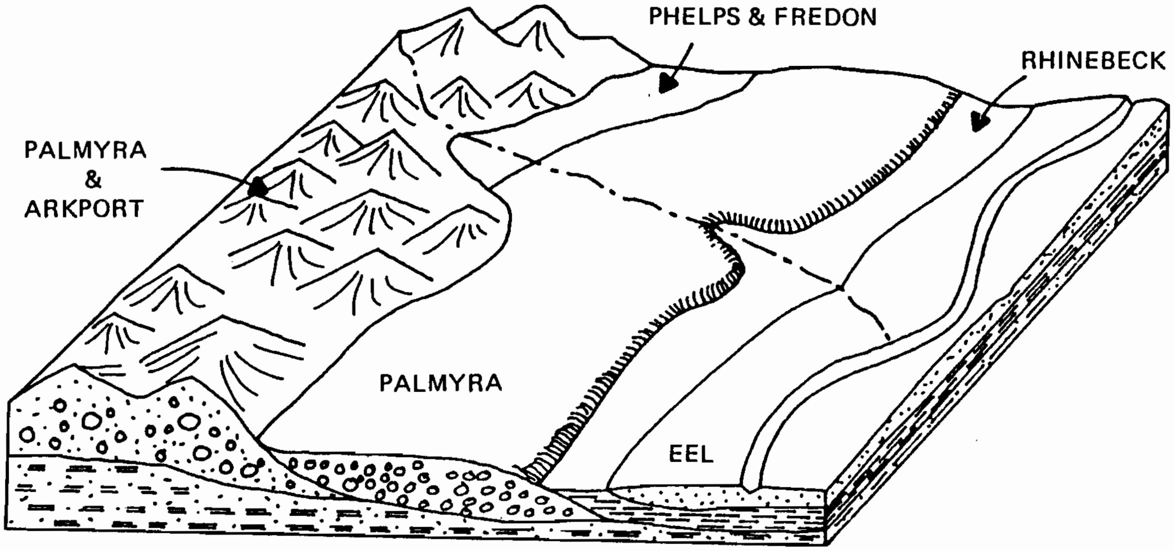
(NYSDOT, 1974)

(21)

ENGINEERING GUIDE

TO

SOIL SERIES OF NEW YORK



VOLUME II M-Z

DEPARTMENT OF TRANSPORTATION
RAYMOND T. SCHULER, Commissioner

SOIL MECHANICS BUREAU
DECEMBER 1974

Li E
1

(NYSDOT, 1974)

VOLUSIA

(21)

DESCRIPTION

Depositional Unit

Volusia soils are formed on mostly thick glacial till from siltstone, shale, and sandstone.

Occurrence and Topography

These soils occur mostly in the Glaciated Allegheny Plateau. They occupy two positions. They are either on flat or depression areas at the bottom of slopes or they occur on valley sides with higher ground above them. In both positions they receive runoff from above. Slopes range from level to around 60%.

Soil Profile

1. A 3" to 12" stony silt some sand, clay trace surface soil.
2. A 15" to 30" stony sometimes slabby and bouldery subsoil. The upper subsoil is a fragipan. It usually lies at 12" to 18" from the surface.
3. An unstratified stony, slabby, sometimes bouldery glacial till.

Drainage

Drainage is somewhat poor to poor. Mottling begins at 10" to 18" from the surface. Runoff is rapid. Runin is slow above the fragipan and very slow in the pan and in the underlying glacial till. Permeability is slow. In the spring the soils have a water table perched above the pan. In the summer the soils are generally dry except after heavy rainfall.

Remarks

ENGINEERING SIGNIFICANCE

PLANNING

Line and Grade

Line is not generally critical. Grade is not generally critical except on extensive flat areas an elevated grade may facilitate drainage.

DESIGN

Line and Grade

See planning.

Cut Slope Conditions

Seepage and sloughing is generally severe above the fragipan. Generally there is a need for intercepting runoff from higher areas. Rock may be encountered in some cuts. Special design may be necessary.

Subgrade in Cuts

The soils are seasonally wet but during the summer construction season they are usually dry. Rock may be encountered in some cuts. Seepage will occur above the rock.

Embankment Foundations

These soils generally have adequate strength for high embankments. On very steeply sloping topography consider the need for keying.

Recharge and Leaching Basins

Unsuitable

Embankment Materials

Long-graded, stony, sometimes slabby and bouldery soils occur. They are generally utilizable during the summer construction season. The soils on low areas will be wet for longer periods of the year.

Granular Materials

Unsuitable

Topsoil

Poor

(NYSGA, 1960)

22

GUIDEBOOK FOR FIELD TRIPS

32nd Annual Meeting of the
NEW YORK STATE GEOLOGICAL ASSOCIATION

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prepared by
David Hawley and Donald B. Potter

HAMILTON COLLEGE
Clinton, New York
May 13-14, 1960

(NYSGA, 1974)

23

GUIDE BOOK
GEOLOGY OF WESTERN NEW YORK STATE

46th Annual Meeting
New York State Geological Association
Oct. 19-20, 1974

STATE UNIVERSITY
COLLEGE
AT FREDONIA

GEOLOGIC MAP OF NEW YORK

1970

Finger Lakes Sheet

Scale 1:250,000

5 0 5 10 15 Statute Miles 20

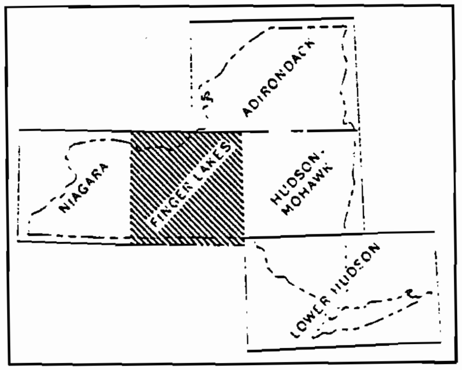
5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

Topographic Base from AMS Quadrangles 1:250,000 scale.

NEW YORK STATE MUSEUM AND SCIENCE SERVICE
MAP AND CHART SERIES NO. 15

COMPILED AND EDITED BY
Lawrence V. Rickard
Donald W. Fisher
March, 1970



(NYS Museum & Science Service, 1970)

24

25

COSTS OF REMEDIAL RESPONSE ACTIONS AT UNCONTROLLED HAZARDOUS WASTE SITES

By

Howard L. Rishel
Terence M. Boston
Curtis J. Schmidt
SCS Engineers
4014 Long Beach Boulevard
Long Beach, California 90807

Contract No. 68-01-4885

Project Officer
Oscar W. Albrecht
Solid and Hazardous Waste Research Division
Municipal Environmental Research Laboratory
Cincinnati, Ohio 45268

Municipal Environmental Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

(1981)

(Warner, F., 1982)

(26)

WATER QUALITY ACCIDENT
NOTIFICATION REPORT

DOT # 82-0798

COUNTY Broome

CTY Fenton

WATER BODY Osborne Creek

File

Call Received by:
Time and Date of Call:

Name of Person Reporting Spill: FRANCIS WARNER

Phone #:
Representing:

What Spilled; How Much? #2 Fuel oil 2000 gAL

Is Spill Continuing? NO

Time and Date of Spill: AM of 8/3/82

Exact Location of Spill: At the REAR of TRI Cities BARREL's Property

Probable Source of Spill: Fuel oil tank

Who Else Was Notified: DOT

Personnel Already on Scene: N/A

Health or Fire Hazard? N/A

Action Being Taken to Contain and/or Clean up Spill: DAM creek to Recover the oil

Any Evidence of a Fishkill? yes

Spill Log

About 200 gal of oil from the TRI Cities BARREL Property was spilled into Osborne Creek. FRANCIS WARNER of TRI Cities BARREL Co. Reported that somebody opened A VALVE with A wrench AND Caused the oil to spill onto the GROUND. GARY Roberson of D.O.T. was at the scene AND ADVISED MR WARNER on clean up procedures. The company is cleaning up the spill.

Liepak ㉗
(Warner F, 1983)

88-14-1 (4/81)

See cover sheet or instructions

PLEASE TYPE

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE MANIFEST

DOCUMENT NO. NY 232972 2

Part A:

GENERATOR NAME Tri-Cities Barrel Co., Inc.	PHONE 607-648-5507	EPA ID NO. D 0 0 2 2 4 5 2 6 4
SITE ADDRESS Rt. 7, Box 88, Port Crane, New York 13833		
TRANSPORTER NO. 1 Same as above	PHONE	
SITE ADDRESS		
TRANSPORTER NO. 2	PHONE	
SITE ADDRESS		
TREATMENT, STORAGE OR DISPOSAL (TSD) FACILITY CECOS International	PHONE 716-873-4200	D 0 8 0 3 3 6 2 4 1
SITE ADDRESS 56 & Pine Ave., Niagara Falls, New York 14304		Work Order # 58690

THIS FORM IS NO. 1 OF A TOTAL OF 1 THE FIRST MANIFEST DOCUMENT NO. IS NY

	PROPER US DOT SHIPPING NAME	US DOT HAZARD CLASS	UN/NA NUMBER	FORM	NET QUANTITY	UNITS	CONTAINERS NO.	CONTAINERS TYPE	EPA HAZ CODE	EPA WASTE TYPE
1	Corrosive Solids N.O.S.	Corrosive	1759	02	0180	01	76	01	C	D002
2										
3										
4										
5										
6										

To Be TYPED by Generator

SPECIAL HANDLING INSTRUCTIONS INCLUDING CONTAINER EXEMPTION (i.e. IDENTIFICATION OF ADDITIONAL WASTES INCLUDED IN SHIPMENT OF A NONHAZARDOUS NATURE WHICH DO NOT HAVE TO BE MANIFESTED)

GENERATOR'S CERTIFICATION. This is to certify that the herein named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA. The wastes described herein were consigned to the transporter named. The TSD Facility can and will accept the shipment of hazardous waste, and has a valid permit to do so. This shipment also conforms with all applicable State regulations. I certify that the foregoing is true and correct.

GENERATOR'S SIGNATURE Francis Warner F. Warner Please type name also	DATE SHIPPED 12 14 83 Mo. Day Yr.	EXPECTED ARRIVAL DATE 12 15 83 Mo. Day Yr.
TRANSPORTER NO. 1 SIGNATURE "To the best of my knowledge the contents of the shipment I have accepted for transport conforms with the description on this manifest."	TRANSPORTER NO. 1 PERMIT NUMBER 7A0791	DATE RECEIVED 12 14 83 Mo. Day Yr.

COPY 3 Generator—Retained by Generator

Tear at this Perforation

Region 7 Binghamton Sub-Office
c/o Flood Control Maint. Center
Rt. 11, RD #1 Kirkwood, N.Y. 13795

FROM

PHONE: 648-5507

Tri Cities Barrel Company

P.O. BOX 88 PORT CRANE 13833

STEEL DRUMS RECONDITIONED
BARRELS & DRUMS BOUGHT & SOLD

DATE: July 18, 1983

Mr. Lepak

On behalf of the Tri-Cities Barrel Co. Inc. I would like to request permission to use the North Fenton landfill facility for the disposal of our blaster dust. We do have a backlog of this material and would appreciate immediate attention concerning the same.

Enclosed you will find an analytical report on a sample of this dust material. I believe you will find this report satisfactorily non-hazardous.

Any intervention between TCB and Ready would probably be of value and we would appreciate it. If you have any more questions concerning this matter feel free to call me.

SIGNED Gary L. Warner

(Warner, G., 1983)

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