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SECTION 1
EXECUTIVE SUMMARY

This report represents a description of the activities and a discussion of the results of a Phase II State Superfund Investigation completed at the Wellsville-Andover Landfill located near the Town of Andover, Alleghany County, New York (See Figure 1). The results of this Phase II Investigation are summarized below:

- The landfill is approximately 120 acres in size. It is situated on a hillside with approximately 160 feet of relief from north to south.

- The site was utilized by the Towns of Andover and Wellsville and the Villages of Andover and Wellsville for the disposal of a variety of industrial and municipal wastes. The site has a leachate collection system along its southern and western boundaries.

- The Phase II Investigation included the following:

  - Literature Review;
  - Air Survey;
  - Drilling and Sampling of Soil;
  - Construction of Monitoring Wells; and
  - Collection and Analysis of Leachate, Groundwater, Drinking Water, Surface Water and Sediment Samples.

- The Phase II Investigation did not confirm the presence of cyanide or chromium which were suspected to be present based upon the previously completed Phase I Investigation.

- Six volatiles (viz. methylene chloride, acetone, trans-1,2-dichloroethene, 2-butanone, toluene and ethyl benzene) were detected above background groundwater levels in the leachate. In addition, two metals (viz. cadmium and manganese) were detected above background levels and in excess of Class "GA" Groundwater Quality Standards in the leachate.

- While six volatiles were detected in the leachate at the landfill site, only three of those (viz. methylene chloride, acetone and trans-1,2-dichloroethene) were detected in downgradient groundwater monitoring well, residential water well and spring samples. Test results showed that only one potable residential water source (viz. LaDue Spring) contained volatiles (viz. trans-1,2-dichloroethane and trichloroethane) at a level which exceeded USEPA National Primary Drinking Water proposed or recommended maximum contaminant levels. In addition, one groundwater monitoring well showed an elevated pH value.

- Iron was detected above the Class "GA" Groundwater Quality Standard in both the upgradient seep and downgradient groundwater and residential water well and spring samples and is believed to be naturally occurring. Manganese was detected above the Class "GA" Groundwater Quality Standard in downgradient groundwater and residential well water samples. No other metals were detected in excess of Class "GA" Groundwater Quality or National Primary Drinking Water Standards.

- Although iron was detected in excess of the Class D Surface Water Standard in the on-site drainage pond and in the Duffy Hollow Creek Downstream samples, these elevated levels are believed to be naturally occurring.

- An air survey of the landfill utilizing a photovac tip demonstrated normal air quality at the site with the exception of three readings which were above background levels in the following confined spaces:

  - the leachate manhole near the leachate pond;
  - the leachate collection sump; and
  - the leachate pump house.

- The Hazard Ranking System (HRS) scores for the site are as follows:

  - Groundwater (S_{gw} = 45.52)
  - Surface Water (S_{sw} = 8.39)
  - Air (S_a = 0)
  - Migration (S_M = 26.75)
  - Fire and Explosion (S_{FE} = 5.6)
  - Direct Contact (S_{DC} = 0.56)

SECTION 2

INTRODUCTION

2.1 General

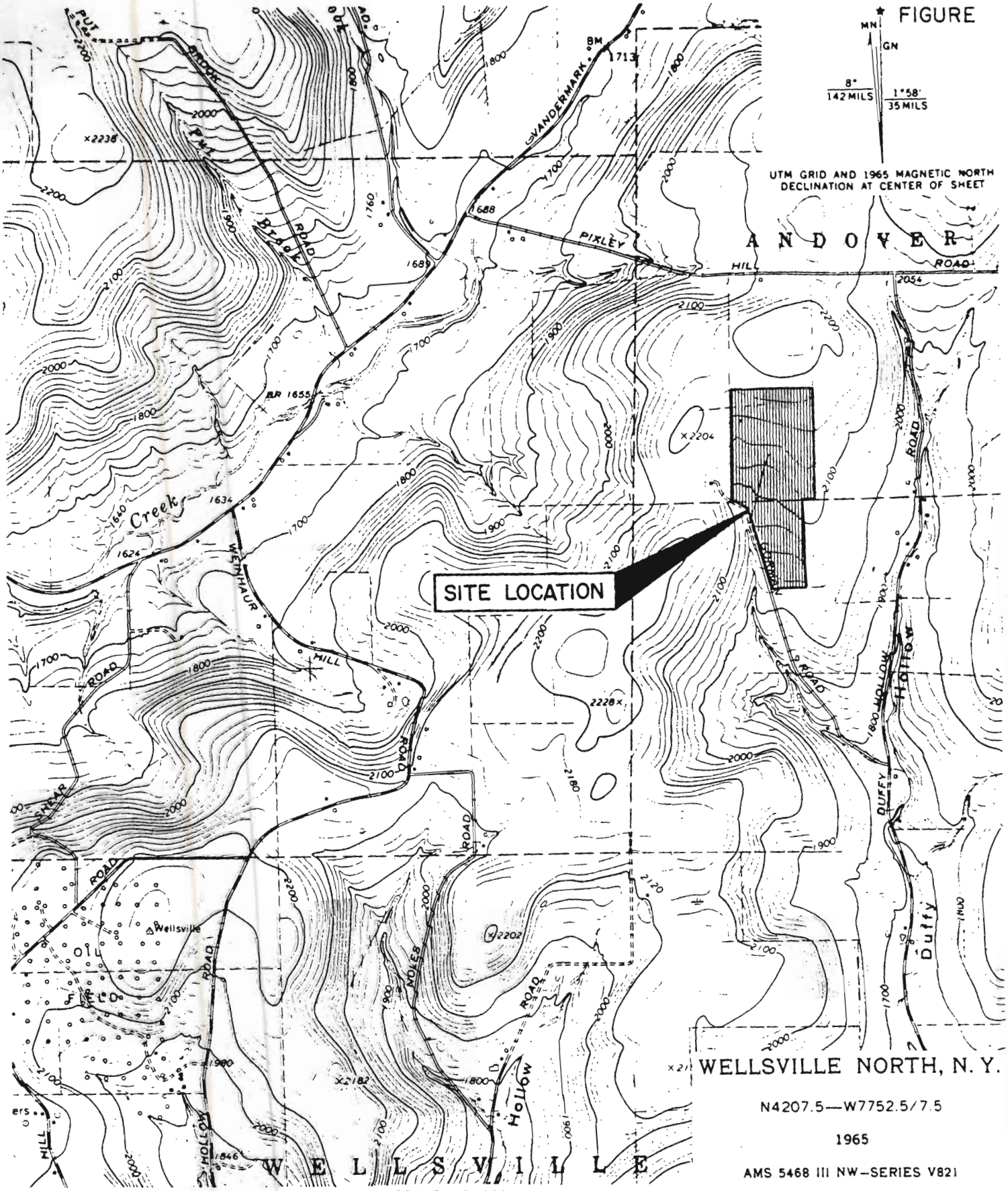
This report presents a description of the activities and a discussion of the results of a Phase II State Superfund Investigation completed at the Wellsville/Andover Landfill located near the Town of Andover, Alleghany County, New York (See Figure 1). The investigation was carried out in accordance with the Phase II Investigation Work Plan which were approved by the New York State Department of Environmental Conservation (NYSDEC). A copy of the Work Plan and revisions are included as Appendix 1 to this report.

The Village of Wellsville retained the services of Malcolm Pirnie, Inc. to perform the investigation which was done in accordance with a Consent Order dated October 24, 1985 (See Appendix 2). A representative of the Department of Public Works (DPW), Village of Wellsville, the owner of the site, monitored the work throughout.

2.2 Purpose

The purpose of the Phase II investigation, as defined by the Work Plan, was to obtain additional data in order to make preliminary hydrogeologic and contamination assessments of the site and to prepare a final, documented, and defensible Hazard Ranking System (HRS) Score. Specific goals of the program included:

- Definition of the geologic, hydrogeologic, and topographic characteristics of the site;
- Assessment of quality of air, groundwater, surface water and sediment and their relationship with the environment; and
- Preparation of a final HRS Score.



MALCOLM PIRNIE

SITE LOCATION MAP

SECTION 3
SCOPE OF WORK

3.1 General

The scope of work associated with this investigation included specific desk, field and laboratory activities as follows:

- Literature review;
- Air survey;
- Drilling and sampling of soil (viz. soil borings);
- Construction of groundwater monitoring wells;
- Collection and analysis of groundwater and drinking water samples; and
- Collection and analysis of surface water and sediment samples.

A detailed discussion of the work associated with each of these activities is presented in the Phase II work Plan and revisions included in Appendix 1. A summary of the work associated with each activity is presented below:

3.2 Literature Review

Several sources of historical information were reviewed, as part of the Phase II Investigation, including:

- The 1983 NYS Superfund Phase I Report for the site prepared by Engineering Science, Inc./Dames and Moore;

- The 1980 Recra Research, Inc. Report, "Leachate Migration Investigation";
- The 1975 USDA Soil Conservation Service Report, "Village of Wellsville Sanitary Landfill Soils Report"; and
- The 1942 New York State Museum Report, "Geology of the Wellsville Quadrangle".

3.3 Air Survey

An air survey utilizing a photoionization (photovac) tip was performed on May 7, 1986. Its purpose was to confirm the adequacy of air quality and Level D protection. On the day of the survey, the sky was clear, temperature was in the seventies, and a variable southerly wind with gusts was present. Prior to walking on-site, the photovac tip was adjusted to a background reading north of the site. The site was traversed north to south, west to east, and then back to north.

3.4 Soil Borings

A total of eight exploratory borings were completed to define subsurface conditions (See Plate 2 for locations). The drilling activities began on May 8, 1986 and were completed on May 15, 1986. The drilling and sampling was conducted by Rochester Drilling Company of Rochester, New York. The field work was carried out under Level D protection, and a photovac tip was utilized to screen split spoon soil samples during drilling operations.

A NYSDEC representative was frequently present at the site during the investigations. A Village of Wellsville representative was also present during the investigation. The depths of the borings were determined by auger refusal. A lithologic log

was prepared for each boring including standard penetration test values, sample recoveries soil descriptions and photovac tip readings. The boring logs are presented in Appendix 3. Upon completion of sampling, the borings were completed as a groundwater monitoring well or backfilled with augered material.

3.5 Monitoring Well Installation

Four (4) of the above-discussed borings were completed as groundwater monitoring wells for use in sampling groundwater and measurement of groundwater elevations (See Plate 2 for locations). The four monitoring wells (viz. CW3A, CW3B, CW4A, CW4B) are located hydraulically downgradient of the site based on topographic relief. The depths of monitoring wells CW3A, CW3B, CW4A, CW4B are 26', 38.5', 18', and 30.5', respectively. The well construction details are illustrated on the boring logs presented in Appendix 3. All wells were surveyed to determine their location as well as top of PVC casing elevations based on a referenced datum.

3.6 Collection and Analysis of Leachate, Groundwater and Residential Water Samples

One set of water samples was collected from wells CW3B, CW4A, CW4B, the upgradient seep, three springs [viz. LaDue, Miller (not used for drinking water), and Fitzgibbons], three residential wells (viz. Kelley, Teller, and Rosini), the trench located on the east side of the landfill and the leachate sump (See Figure 2 for locations). The depths of the residential wells are presented in Appendix 5. An attempt to sample monitoring well CW-3A was unsuccessful due to inability to collect sufficient sample volume (viz. the well recovered too slowly). Groundwater elevations within the monitoring wells were measured on June 10, 1986 (See Table 1). After the elevations were taken, the wells were evacuated with a Keck S-83 submersible pump (See Table 1 for volumes evacuated). The wells were sampled with dedicated teflon bailers in order to avoid cross contamination of the samples.

FIGURE 2

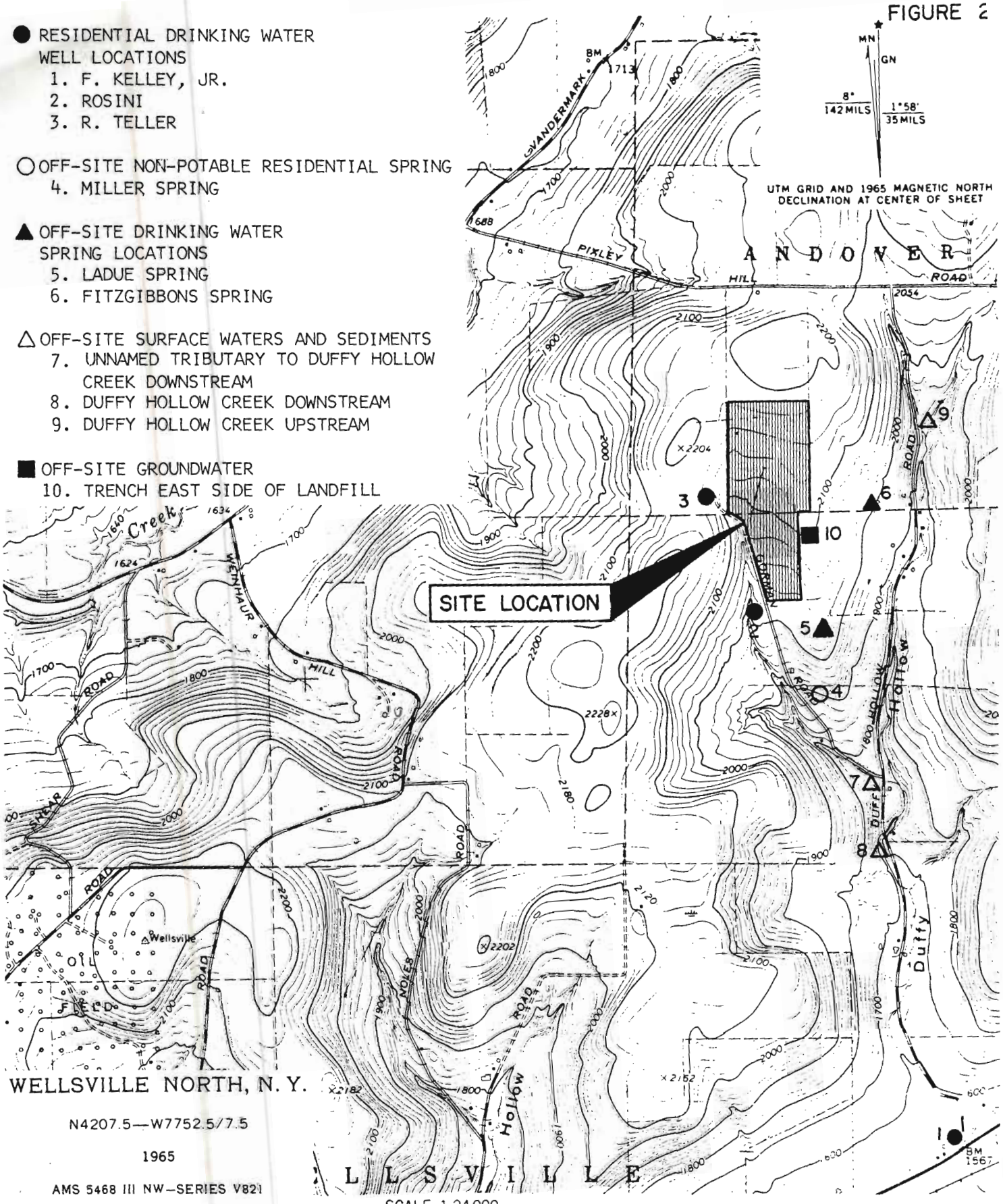
● RESIDENTIAL DRINKING WATER WELL LOCATIONS
1. F. KELLEY, JR.
2. ROSINI
3. R. TELLER

○ OFF-SITE NON-POTABLE RESIDENTIAL SPRING
4. MILLER SPRING

▲ OFF-SITE DRINKING WATER SPRING LOCATIONS
5. LADUE SPRING
6. FITZGIBBONS SPRING

△ OFF-SITE SURFACE WATERS AND SEDIMENTS
7. UNNAMED TRIBUTARY TO DUFFY HOLLOW CREEK DOWNSTREAM
8. DUFFY HOLLOW CREEK DOWNSTREAM
9. DUFFY HOLLOW CREEK UPSTREAM

■ OFF-SITE GROUNDWATER
10. TRENCH EAST SIDE OF LANDFILL



WELLSVILLE NORTH, N. Y.

N4207.5—W7752.5/7.5

1965

AMS 5468 III NW—SERIES V821

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MALCOLM PIRNIE

OFF SITE SAMPLING LOCATIONS

VILLAGE OF WELLSVILLE NOV. 1986

TABLE 1
PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

GROUNDWATER MONITORING WELLS ELEVATION DATA ON 6/10/86

WELL ID#	GROUND ELEVATION*	WELL DEPTH FROM GROUND SURFACE	TOP OF PVC ELEVATION*	DEPTH TO WATER	ONE WELL VOLUME (gallons)	VOLUME WATER REMOVED (gallons)
CW3A	2032'	26'	2034.7	12.72'	2.16	4.0 (evacuated to dryness)
CW3B	2032'	38.5'	2034.5	9.90'	4.64	13.5 (evacuated to dryness)
CW4A	2026'	18'	2028.4	3.40'	2.37	3.0 (evacuated to dryness)
CW4B	2026'	30.5'	2029.1	3.10'	4.45	6.5 (evacuated to dryness)

* LOCAL DATUM APPROXIMATE TO USGS DATUM

All samples were placed on ice in coolers in the field. Samples were shipped in packages provided by CompuChem Laboratories under chain-of-custody control by Federal Express. All laboratory analyses were performed by CompuChem Laboratories, P.O. Box 12652, 3308 Chapel Hill/Nelson Highway, Research Triangle Park, North Carolina, 27709.

The leachate, ground and residential water samples were collected and handled as described in the Phase II Work Plan. The samples were analyzed in accordance with New York State Department of Environmental Conservation Contract Laboratory Protocol (DECCLP) for the following parameters:

- Priority Pollutant Metals (unfiltered);
- Priority Pollutant Organics;
- Cyanide;
- pH (field measurement); and
- Conductivity (field measurement).

3.7 Collection and Analysis of Surface Water and Sediment Samples

3.7.1 Surface Water

Surface water samples were collected from the following locations on June 10 and 11, 1986 (See Plate 2 and Figure 2 for locations):

- Two locations in Duffy Hollow Creek:
  - upstream: 0.04 miles south of Pixley Hill Road
  - downstream: 1000 feet south of the intersection of Snyder and Duffy Hollow Roads;

- Two locations in the unnamed tributary to Duffy Hollow Creek:
  - upstream: 150 feet southwest of Pump Station No. 1
  - downstream: 30 feet northwest of Duffy Hollow Road bridge;

- The Drainage Pond: The first samples were collected on June 10, 1986; samples were recollected on July 2, 1986 based upon a laboratory request.

The surface water samples were collected and handled as described in the Phase II Work Plan (Appendix 1). The samples were tested for the following:

- Priority Pollutant Metals (unfiltered samples);
- Priority Pollutant Organics;
- Cyanide;
- pH (field measurement);
- Conductivity (field measurement);
- Temperature (field measurement);
- Dissolved oxygen (field measurement).

3.7.2 Sediment

Sediment samples were obtained from the following locations on June 10, 1986 (See Plate 2 and Figure 2 for locations):

- Two locations in Duffy Hollow Creek:
  - upstream: 0.04 miles south of Pixley Hill Road
  - downstream: 1000 feet south of intersection of Snyder and Duffy Hollow Roads;

- Two locations in the unnamed tributary to Duffy Hollow Creek:
  - upstream: 150 feet southwest of Pump Station No. 1
  - downstream: 30 feet northwest of Duffy Hollow Road bridge;

- The drainage pond.

The samples were collected and handled as described in the Phase II Work Plan (Appendix 1).. The samples were analyzed for the following:

- Priority Pollutant Metals;
- Priority Pollutant Organics; and
- Cyanide.

SECTION 4
SITE ASSESSMENT

4.1 Surface Features and Topography

The Wellsville-Andover landfill site is located on Snyder Road (formerly known as Gorman Road) in a sparsley populated, rural area (See Figure 1 and Plate 1). The approximately 120 acre site is rectangular in shape with a width of approximately 1,500 feet and a length of approximately 4,000 feet. The landfill is situated on a hillside with approximately 160 feet of relief from north to south. Duffy Hollow Creek (a Class "D" stream) is located to the east of the site. An unnamed tributary to Duffy Hollow Creek runs near the site on the west side. A man-made trench is located near the eastern edge and the drainage pond is located near the center of the landfill site.

4.2 Geology

The Wellsville/Andover landfill site is located within the physiographic province known as the Appalachian highlands. The region is underlain by sedimentary rock, consisting of sandstones, shales and siltstones of Devonian Age (Woodruff, 1942). On-site geology has been reviewed by Malcolm Pirnie and others in previous studies (RECRA 1980)(Dames and Moore, 1983). The bedrock on-site appears to be part of the Conneaut Group, Whitesville formation. As expected, the bedrock is of sedimentary origin consisting of shales, siltstones and sandstones. It appears to be dipping to the south-southwest.

The unconsolidated deposits overlying the bedrock are primarily the result of pleistocene glaciation when repeated activity of ice sheets caused resculpturing of preexisting land forms. The soils beneath the site are predominately ablation (glacial) till, colluvial and alluvial in nature. Colluvial refers to unconsolidated recent sediments, which are common to

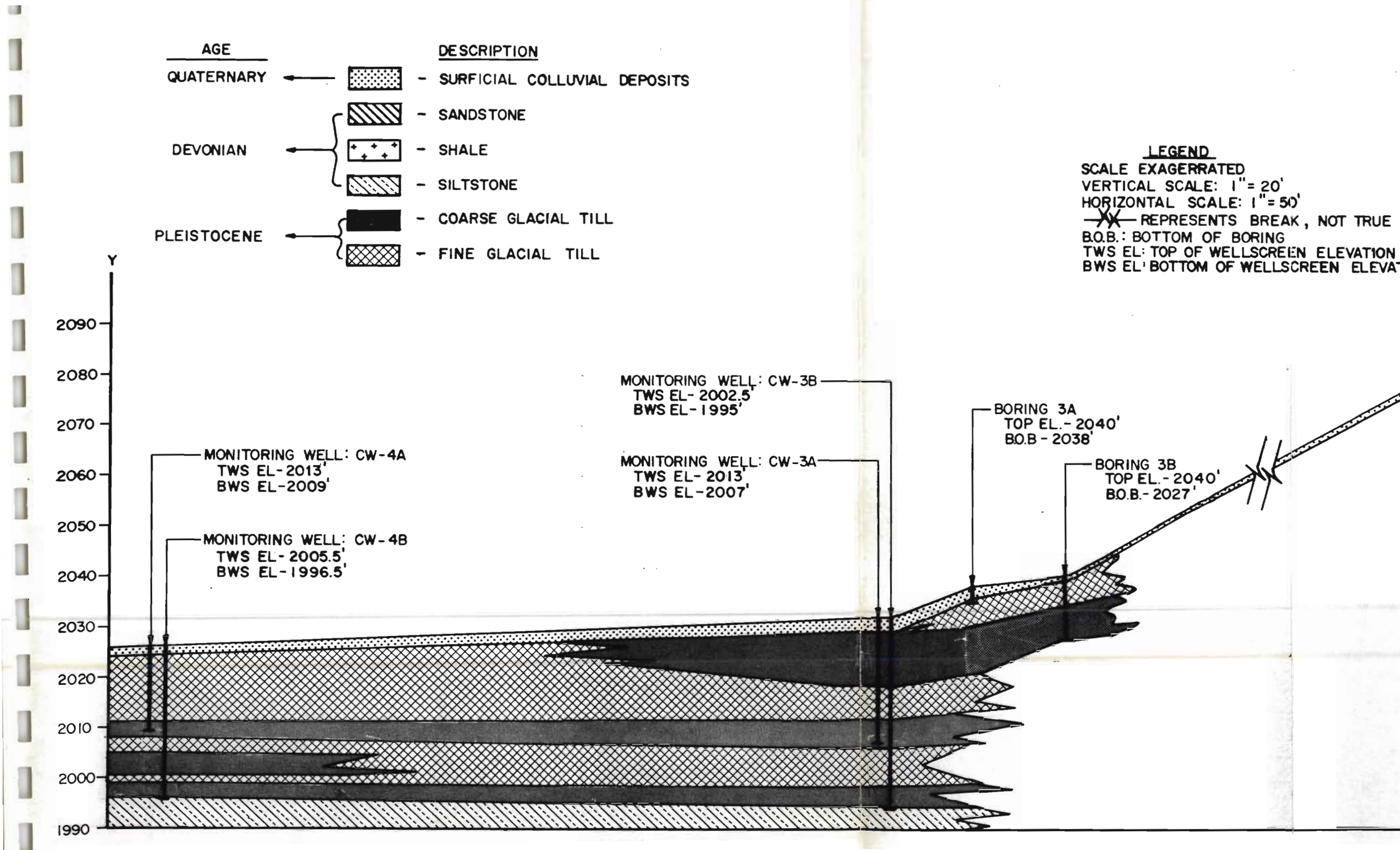
the area. The ablation tills were lain as a result of waning glaciation. Alluvial deposits were water lain from streams formed by the glaciers.

Examination of the logs for borings (See Appendix 3) completed as part of the Phase II Investigation indicates that the depth to bedrock is variable across the site. The depth to bedrock on the north side of the site is quite shallow (viz. less than four to five feet in some areas) while the depth to bedrock on the southern end of the site appears to be between 25 to 37 feet. The stratigraphy for the southern portion of the site is illustrated on Figure 3. As illustrated on Figure 3, the overburden consists of glacial till overlain by a shallow colluvial surface layer. Although the glacial till layer is characterized by a high clay content, the layer also contains lenses with a high sand and silt content.

4.3 Hydrogeology

The flow of groundwater, within the unconsolidated soils (viz. shallow groundwater system) is controlled by the glacial till layer which appears to be acting as an aquitard. Within this layer are lenses of fine sand, silt and sedimentary rock fragments which allow groundwater to move predominantly in a lateral direction. These water-bearing "perched" zones are likely affected by seasonal precipitation patterns.

The higher topography (viz. approximately 2,200 feet) to the north of the site is considered the recharge area and primary factor controlling the direction of groundwater flow (viz. southward from higher topography toward lower topography) within the unconsolidated sediments or shallow groundwater system. Groundwater movement is vertically restricted by the glacial till aquitard. There has been no attempt to monitor the direction of flow within the bedrock groundwater system.


AGE
DESCRIPTION
QUATERNARY
- SURFICIAL COLLUVIAL DEPOSITS
DEVONIAN
- SANDSTONE
- SHALE
- SILTSTONE
PLEISTOCENE
- COARSE GLACIAL TILL
- FINE GLACIAL TILL
LEGEND
SCALE EXAGERRATED
VERTICAL SCALE: 1" = 20'
HORIZONTAL SCALE: 1" = 50'
REPRESENTS BREAK, NOT TRUE
B.O.B.: BOTTOM OF BORING
TWS EL: TOP OF WELLSCREEN ELEVATION
BWS EL: BOTTOM OF WELLSCREEN ELEVA
Y
2090
2080
2070
2060
2050
2040
2030
2020
2010
2000
1990
MONITORING WELL: CW-4A
TWS EL-2013'
BWS EL-2009'
MONITORING WELL: CW-4B
TWS EL-2005.5'
BWS EL-1996.5'
MONITORING WELL: CW-3B
TWS EL-2002.5'
BWS EL-1995'
MONITORING WELL: CW-3A
TWS EL-2013'
BWS EL-2007'
BORING 3A
TOP EL.-2040'
B.O.B-2038'
BORING 3B
TOP EL.-2040'
B.O.B.-2027'

4.4 Contamination Assessment

4.4.1 Site History and Previous Sampling Programs

The site is located in a rural setting and is owned by the Village of Wellsville and was utilized by the Towns of Andover and Wellsville and the Villages of Andover and Wellsville. The landfill is composed of four (4) distinct sections (See Plate 1) identified in the order of their operating chronology as follows: South Fill Area, South Central Fill Area, Northwest Fill Area - operating period 1964 to 1978 and finally the Northeast Fill Area which operated from 1978 to 1983. The trench method of landfilling was the primary method of operation. The Northeast Fill Area was fitted with a leachate collection system which serviced each of the trenches utilized for waste disposal. The trenches were not constructed with liners because they were not required by statutes/regulatory policies in effect at that time.

In 1983, the Village decided to design and install a more comprehensive leachate collection system to capture as much of the leachate as possible because leachate was surfacing as breakouts and entering the nearby stream as surface runoff. The design recognized past geological surveys which indicated relatively shallow bedrock (viz. approximately 5 feet) in existance on the northern portion of the landfill with increasing depth to bedrock toward the southwest. The direction of groundwater flow was assumed to be from northeast to southwest based on the bedrock contours. Therefore, the main collection pipes were located on the south and west sides of the landfill. The leachate collection system was installed in 1984-85 and encompasses 5,475 feet of main collection lines with 1,750

feet of laterals and feed pipes. The details of the leachate collection system, are illustrated on Plate 1. Leachate flows by gravity from the northern and central portions of the landfill to buried holding tanks in the vicinity of Pump Station #1. The leachate from the southern portion of the landfill flows by gravity to Pump Station #2 where it is pumped to the aforementioned holding tanks. An 80,000 gallon unlined overflow lagoon is used for temporary storage in the event the collected flow exceeds the storage tank capacity. Leachate is transported daily to the Wellsville Municipal Wastewater Treatment Plant for treatment.

All leachate collection lines are 6" perforated PVC pipe with 2 rows of continuous perforations (unless otherwise noted) located at the bottom third of the pipe. The pipes were installed in trenches filled with 6 inches of #2 round stone upon which the perforated pipe was bedded. The trench was then filled with #2 round stone to within 3 feet of the surface. A compacted clay subsoil was placed over this stone to within 0.5 feet of the surface with topsoil placed to surface level. The pipes were accurately set to line and grade with the use of laser instrumentation. The pipe trench depth varied from 9 to 14 feet with the majority at the 14-foot level. This leachate collection system were designed so that the bottom of the solid waste cells would be above the bottom of the pipe trench.

Nineteen (19) manholes were installed as part of the leachate collection system spaced at distances not exceeding 300 feet for cleaning, inspection and flow observation. In areas where known leachate breakouts existed, a system of lateral take-offs were installed to facilitate leachate collection and to eliminate the breakouts. These laterals (6" perforated PVC pipe) ran 90 degrees to the main collection pipe and at the same elevation. The off-set from the main line varied depending upon the section to be covered.

In some instances, feeder lines off the lateral were used to broaden the area covered. The laterals and feeders were bedded in a trench with 6" of #2 round stone and were covered with another three feet of #2 round stone. Compacted clay soil was used to fill the trench to the surface. At the end of each lateral and feeder pipe, the perforated pipe was turned 90 degrees upward through a surrounding sheath of #2 round stone extending to a point about 3 feet above the ground. Compacted clay soil surrounding these pipes was mounded to promote surface water run-off away from the pipe. In total, twenty-five (25) of these pipes (called risers) were installed to facilitate maintenance/ cleaning of the leachate collection systems. Each riser is equipped with a PVC cap.

At several locations in the main collection system, headwalls were constructed to effectively trap and divert any water that might flow within the stone bedding rather than the collection pipe. These headwalls were constructed of concrete running from the bottom of the trench to ground surface. They are located upstream of manholes as shown on Plate 1. They are approximately 4 feet in width ending in angled outer tips so as to effectively dam off the collection trench. The collection pipes were sealed as they passed through the barrier and are of solid wall construction for approximately 20 feet prior to connection to the manhole. This insured that any backed up water in the trench would be forced to enter the immediately preceeding perforated collection pipe.

In any instance where a leachate collection line crosses beneath a drainage ditch, the collection pipe is of solid wall construction for 20 feet on each side of the

drainage ditch. In addition, culverts are installed in the drainage ditches where they pass over buried collection pipes.

A discussion of operational practices including waste types and quantities disposed at the site was presented in the Phase I Investigation Report prepared by Engineering Science, Inc. in association with Dames and Moore, June 1983. In summary, the older section (viz. South, South-central, and Northwest Fill Areas) was operated from 1964 to 1978 and was a disposal site for industrial and municipal wastes. Rochester Button Company disposed of unknown amounts of methylene chloride and possibly trichloroethylene between 1964 and 1968. Rochester Button Company also allegedly disposed of plastics, polyester scraps, talc pumice and detergents totaling approximately 480,000 pounds. The Village of Wellsville is not aware of records documenting the types and volumes of wastes disposed at the site and seriously questions the waste volumes presented in the Phase I Investigation Report.

The results of previous sampling programs at the site were also discussed in the Phase I Investigation Report. The sampling performed on these previous programs concentrated on; residential wells in the vicinity of the landfill; leachate, and; Duffy Hollow Creek. The residential wells showed low-level cyanide (viz. 0.006 to 0.012 mg/l) and zinc contamination and Duffy Hollow Creek sample showed low-level zinc (viz. 0.04 to 0.06 mg/l) contamination. Analyses of the leachate indicated phenol, cadmium, chromium and lead contamination. No analyses for toxic organics were performed. The accuracy of this reported data is questionable since appropriate DECCLP was not followed. In any case, the values reported for zinc and cyanide are below surface water quality standards for a Class D stream (See Appendix 4).

The New York State Department of Environmental Conservation (NYSDEC) sampled a number of private wells/springs in the vicinity of the Wellsville-Andover Landfill in 1984. The samples were tested for oil and grease, phenols, volatile organics and metals. The results of the sample analyses are presented in Appendix 5 along with depth information for the residential wells. Examination of these data indicate that:

- Phenols were not detected in any of the samples;
- No metals were detected above the Class "GA" Groundwater Quality Standards;
- The samples were free from volatile organics with the exception of the LaDue Spring which showed 150.0 ppb trans-1,2-dichloroethene and 9.0 ppb trichloroethene; and
- All of the samples with the exception of the LaDue Spring showed low level oil and grease contamination.

4.4.2 Phase II Sampling Results

The Phase II sampling results are summarized in Tables 2 through 21. The raw analytical and associated quality assurance/quality control data is not included in this report due to its voluminous nature; however, it will be made available upon request.

4.4.2.1 Leachate

The analytical data for the Phase II leachate sample are summarized in Tables 2 through 6. Examination of these tables indicates the following:

TABLE 2
PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR VOLATILE COMPOUNDS IN GROUND AND RESIDENTIAL WATERS

	GROUNDWATER MONITORING WELLS			UPGRADIENT		LEACHATE	RESIDENTIAL SPRINGS			RESIDENTIAL WELLS		
PARAMETER	3B	4A	4B	SEEP	TRENCH	SUMP	MILLER	LaDUE	FITZGIBBONS	KELLEY	TELLER	ROSSINI
Chloromethane	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Bromomethane	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Vinyl Chloride	ND/33	ND/380	ND/10	ND/10	670	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Chloroethane	ND/33	ND/380	ND/10	ND/10	ND.130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Methylene Chloride	19	ND/190	ND/5	ND/5	ND/66	J/310	24	ND/5	ND/5	ND/5	22	ND/5
Acetone	470	5100	ND/10	ND/10	ND/130	2,100	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Carbon Disulfide	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,1-Dichloroethene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,1-Dichloroethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
trans-1,2-Dichloroethene	ND/17	ND/190	ND/5	ND/5	1,400	8,300	32	72	ND/5	ND/5	ND/5	ND/5
Chloroform	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,2-Dichloroethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
2-Butanone	ND/33	ND/380	ND/10	ND/10	ND/130	3,200	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
1,1,1-Trichloroethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Carbon Tetrachloride	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Vinyl Acetate	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Bromodichloromethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,2-Dichloropropane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
trans-1,3-Dichloropropene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Trichloroethene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	21	34	ND/5	ND/5	ND/5	ND/5
Dibromochloromethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,1,2-Trichloroethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Benzene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
cis-1,3-Dichloropropene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
2-Chloroethyl Vinyl Ether	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Bromoform	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
4-Methyl-2-pentanone	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
2-Hexanone	ND/33	ND/380	ND/10	ND/10	ND/130	ND/830	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Tetrachloroethene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
1,1,2,2-Tetrachloroethane	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Toluene	ND/17	ND/190	ND/5	ND/5	ND/66	540	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Chlorobenzene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Ethyl Benzene	ND/17	ND/190	ND/5	ND/5	ND/66	950	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Styrene	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Total Xylenes	ND/17	ND/190	ND/5	ND/5	ND/66	ND/420	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5

Values reported in ug/l (PPB)

TABLE 3
PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN GROUND AND RESIDENTIAL WATERS

	GROUNDWATER MONITORING WELLS			UPGRADIENT		LEACHATE	RESIDENTIAL SPRINGS			RESIDENTIAL WELLS		
PARAMETERS	3B	4A	4B	SEEP	TRENCH	SUMP	MILLER	LaDUE	FITZGIBBONS	KELLEY	TELLER	ROSINI
Acenaphthene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
3,4-Dinitrophenol	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
4-Nitrophenol	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
Dibenzofuran	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dinitrotoluene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,6-Dinitrotoluene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Diethylophthalate	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	J/22	ND/20	ND/20	ND/20	ND/20	ND/20 - J/2.2
4-Chlorophenyl Phenyl ether	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Fluorene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
4-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
4,6-Dinitro-2-methylphenol	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
N-nitrosodiphenylamine (1)	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
4-Bromophenyl Phenyl ether	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Pentachlorophenol	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
Phenanthrene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Anthracene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Di-n-butylphthalate	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Fluoranthene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Pyrene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Butyl Benzyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
3,3'-Dichlorobenzidine	ND/40	ND/40	ND/40	ND/40	ND/40	ND/40	ND/400	ND/40	ND/40	ND/40	ND/40	ND/40
Benzo(a)anthracene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-ethylhexyl)phthalate	ND/20	J/3-ND/20	J/2.8	J/3	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Chrysene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Di-n-octyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(b)fluoranthene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(k)fluoranthene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(a)pyrene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Indeno(1,2,3-cd)pyrene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Dibenz(a,h)anthracene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(g,h,i)perylene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20

Values reported in ug/l (ppb)

TABLE 4

PHASE II - STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN GROUND AND RESIDENTIAL WATERS

	GROUNDWATER MONITORING WELLS			UPGRADIENT		LEACHATE	RESIDENTIAL SPRINGS			RESIDENTIAL WELLS		
	3B	4A	4B	SEEP	TRENCH	SUMP	MILLER	LaDUE	FITZGIBBONS	KELLEY	TELLER	ROSINI
Phenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	J/150	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-Chloroethyl) ether	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2-Chlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
1,3-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
1,4-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzyl Alcohol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
1,2-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2-Methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-Chloroisopropyl) ether	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
4-Methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	1,900	ND/20	ND/20	ND/20	ND/20	ND/20
N-Nitroso-Dipropylamine	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachloroethane	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Nitrobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Isophorone	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2-Nitrophenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dimethylphenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Benzoic Acid	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
bis(2-Chloroethoxy) methane	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dichlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
1,2,4-Trichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Naphthalene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
4-Chloroaniline	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorobutadiene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
4-Chloro-3-methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2-Methylnaphthalene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorocyclopentadiene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,4,6-Trichlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2,4,5-Trichlorophenol	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
2-Chloronaphthalene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
2-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100
Dimethyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
Acenaphthylene	ND/20	ND/20	ND/20	ND/20	ND/20	ND/20	ND/200	ND/20	ND/20	ND/20	ND/20	ND/20
3-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100	ND/100	ND/1000	ND/100	ND/100	ND/100	ND/100	ND/100

Values reported in ug/l (ppb)

TABLE 5

PHASE II STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR PESTICIDES/PCB'S IN GROUND AND RESIDENTIAL WATERS

	WELLS			UPGRADIENT		LEACHATE	RESIDENTIAL SPRINGS			RESIDENTIAL WELLS		
PARAMETER	3B	4A	4B	SEEP	TRENCH	SUMP	MILLER	LaDUE	FITZGIBBONS	KELLEY	TELLER	ROSINI
Alpha - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Beta - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Delta - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Gamma - BHC(Lindane)	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Heptachlor	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Aldrin	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Heptachlor Epoxide	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Endosulfan I	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Dieldrin	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4' - DDE	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endrin	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endosulfan II	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4' - DDD	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endosulfan Sulfate	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4' - DDT	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Methoxychlor	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Endrin Ketone	ND/.10	ND/.10	ND.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Chlordane	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Toxaphene	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0
Aroclor - 1016	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1221	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1232	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1242	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1248	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1254	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0
Aroclor - 1260	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0

Values reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 6

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR METALS AND CYANIDE IN GROUND AND RESIDENTIAL WATERS

	GROUNDWATER MONITORING WELLS			UPGRADIENT		LEACHATE	RESIDENTIAL SPRINGS			RESIDENTIAL WELLS		
PARAMETER	3B	4A	4B	SEEP	TRENCH	SUMP	MILLER	LaDUE	FITZGIBBONS	KELLEY	TELLER	ROSINI
Aluminum	7170	5210	8730	716	592	382(E)	602	99(E)	62(E)	ND/200	ND/200	ND/200
Antimony	ND/60	ND/60	ND/60	ND/60	ND/60	ND/60	ND/60	ND/60	ND/6-	ND/60*	ND/60*	ND/60*
Arsenic	5.5(E)	4.2(E)	7.7(E)	ND/10	ND/10	ND/10	9.4(E)	ND/10	ND/10	ND/10	ND/10	ND/10
Barium	88(E)	148(E)	305	12(E)	17(E)	946(E)	34(E)	46(E)	16(E)	70	68	47
Beryllium	1.5(E)	1.5(E)	1.5(E)	ND/5	ND/5	1.4	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5
Cadmium	6.4	5.2	4.3(E)	ND/50	ND/5	47	ND/5	2.0(E)	ND/5	ND/5	ND/5	ND/5
Calcium	68900	38,800	45,500	3,960	15,500	295(E)	10,500	19,000	3,630	23,900	43,300	40,600
Chromium	20	ND/10	ND/10	5(E)	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Cobalt	17(E)	15(E)	10(E)	5.3(E)	ND/50	111	ND/50	ND/50	ND/50	ND/50	ND/50	ND/50
Copper	3.2	30	60	10(E)	10(E)	40	10(E)	10(E)	9.9(E)	68**	22**	28**
Cyanide	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
Iron	17,400	10,200	18,500	735	914	529(E)	1,130	117	79(E)	224	ND/100	650
Lead	6.1	4.2(E)	12*	ND/5	3.3(E)	ND/5	2.0(E)	1.2(E)	ND/5	1.2*	ND/5*	ND/5
Magnesium	34,100	20,400	19,000	2,150(E)	12,000	114(E)	5,980	6,550	1,770(E)	10,270	13,500	12,300
Manganese	707	4,240	4,110	15	689	22,900(E)	283	11(E)	7.3(E)	4.7	132	508
Mercury	ND/.2	ND/.2	N/.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2
Nickel	47	30(E)	55	14(E)	12(E)	253	13(E)	12(E)	ND/40	22	11	ND/40
Potassium	6,000	2,900(E)	10,600	1500(E)	1600(E)	45,300	ND/5000	1300(E)	ND/5000	ND/5000	ND/5000	1800
Selenium	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5	ND/5*	ND/5*	ND/5
Silver	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10*	ND/10*	ND/10
Sodium	25,600	20,900	45,500	40,400	5140	135,000(E)	2900(E)	3130	1350(E)	18,500	6,800	6,300
Thallium	ND/10	ND/10	ND/10	ND/10	2.9(E)	ND/10	ND/10	ND/10	ND/10	ND/10*	2.8	ND/10
Tin	ND/40	Nd/40	ND/40	ND/40	ND/40	ND/40	ND/40	ND/40	ND/40	ND/40*	ND/40*	ND/40
Vanadium	17(E)	8.9(E)	12(E)	3.0(E)	1.0(E)	1.1(E)	ND/50	ND/50	ND/50	ND/50	ND/50	ND/50
Zinc	59	45	78	24	25	211	33	23	12(E)	45**	92**	36**

Values reported in ug/l (ppb)
SEE TABLE 17 FOR NOTES

- Several volatile compounds were detected including:

  - methylene chloride [viz. 310 ppb (estimated)],
  - acetone (viz. 2,100 ppb),
  - trans-1,2-dichloroethene (viz. 8,300 ppb),
  - 2-butanone (viz. 3,200 ppb),
  - toluene (viz. 540 ppb), and
  - ethyl benzene (viz. 950 ppb);

- No semi-volatile, pesticides, PCB's or cyanide were detected; and

- Cadmium (viz. 47 ppb) and manganese, (viz. 22,900 estimated) were detected above background levels and in excess of Class "GA" Groundwater Quality Standards (See Appendix 4). No other metals were detected above the Class "GA" Groundwater Standards.

The contact of leachate with groundwater and its subsequent escape from the site is considered the primary mechanism for pollutant migration from the site. Therefore, the above-specified contaminants detected in the leachate are considered the primary pollutants of concern. However, since the landfill is unlined, there is a remote possibility that leachate could be generated which would not be captured by the leachate collection system resulting in different leachate characteristics.

4.4.2.2 Groundwater and Residential Water

The analytical data for the Phase II ground and residential (i.e. wells and springs) water samples are summarized in Tables 2 through 6. Examination of these tables indicates the following:

- Three volatile compounds were detected but at levels which did not exceed New York State Ambient Water Quality Standards for Class "GA" Groundwater (see Appendix 4),
  - methylene chloride in monitoring well 3B (viz. 19 ppb), the Miller spring (viz. 24 ppb) and the Teller well (viz. 22 ppb),
  - trans-1,2-dichloroethene in the Miller spring (viz. 32 ppb),
  - acetone in monitoring wells 3B (viz. 470 ppb) and 4A (viz. 5,100 ppb)[1],

- Three volatile compounds were detected at levels which exceeded New York State Ambient Water Quality Standards for Class "GA" Groundwater:
  - vinyl chloride in the trench on the east side of the landfill (viz. 670 ppb),
  - trans-1,2-dichloroethene in the trench on the east side of the landfill (viz. 1,400 ppb) and the LaDue spring (viz. 72 ppb),
  - trichloroethene in the Miller spring (viz. 21 ppb) and the LaDue spring (viz. 34 ppb)[2],

- o No volatile compounds were detected in excess of National Primary Drinking Water proposed or recommended maximum contaminant levels (See Appendix 6) as established by the U.S. Environmental Protection Agency (USEPA) with the exception of the LaDue Spring which showed:

  - trans-1,2-dichloroethane (viz. 72 ppb) in excess of the 70 ppb proposed recommended maximum contaminant level,

  - trichloroethene (viz. 34 ppb) in excess of the 5 ppb proposed maximum contaminant level,

- o No semi-volatile compounds were detected with the exception of 1,900 ppb of 4-methyl phenol in the Miller spring. Since 4-methyl phenol was not detected in the leachate sample or in any of the other ground/drinking water samples the detection of 4-methylphenol in the Miller spring is in question;

- o No pesticides, PCB's or cyanide were detected in any of the samples tested;

(1) No Class "GA" standard established.
(2) The source of the trichloroethene detected in these springs is in question since it was not detected in the leachate at the landfill or in any of the test wells near the landfill.

- Comparison of the analytical results for metals to Class "GA" Groundwater Standards (See Appendix 4) indicates that iron was present in all three groundwater monitoring wells, the upgradient seep, the trench, the leachate sump, the Miller spring and the Rosini well in excess of the 300 ppb standard. The comparison also indicated that manganese was present in all three monitoring wells, the trench and the Rosini well in excess of the 300 ppb standard. Since the upgradient (background) sample showed a high iron content, iron is believed to be naturally occurring. No other metals were detected in excess of the Class "GA" Groundwater Quality Standards or National Primary Drinking Water Standards.

4.4.2.3 Surface Water

The analytical data for the Phase II surface water samples are summarized in Tables 7 through 11. Examination of these tables and comparison to Class D Stream Surface Water Standards (See Appendix 4) indicated the following:

- No volatiles, semi-volatiles, pesticides, PCB's or cyanide were detected in any of the samples tested;

- Iron was detected in the Duffy Hollow Creek tributary downstream sample (viz. 419 ppb) and in the Drainage Pond (viz. 777 ppb) in excess of the surface water standard for a

TABLE 7

PHASE II - STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR VOLATILE COMPOUNDS IN SURFACE WATERS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Chloromethane	ND/10	ND/10	ND/10	ND/10	ND/10
Bromomethane	ND/10	ND/10	ND/10	ND/10	ND/10
Vinyl Chloride	ND/10	ND/10	ND/10	ND/10	ND/10
Chloroethane	ND/10	ND/10	ND/10	ND/10	ND/10
Methylene Chloride	ND/5	ND/5	ND/5	ND/5	ND/5
Acetone	ND/10	ND/10	ND/10	ND/10	ND/10
Carbon Disulfide	ND/5	ND/5	ND/5	ND/5	ND/5
1,1-Dichloroethene	ND/5	ND/5	ND/5	ND/5	ND/5
1,1-Dichloroethane	ND/5	ND/5	ND/5	ND/5	ND/5
trans-1,2-Dichloroethene	ND/5	ND/5	ND/5	ND/5	ND/5
Chloroform	ND/5	ND/5	ND/5	ND/5	ND/5
1,2-Dichloroethane	ND/5	ND/5	ND/5	ND/5	ND/5
2-Butanone	ND/10	ND/10	ND/10	ND/10	ND/10
1,1,1-Trichloroethane	ND/5	ND/5	ND/5	ND/5	ND/5
Carbon Tetrachloride	ND/5	ND/5	ND/5	ND/5	ND/5
Vinyl Acetate	ND/10	ND/10	ND/10	ND/10	ND/10
Bromodichloromethane	ND/5	ND/5	ND/5	ND/5	ND/5
1,2-Dichloropropane	ND/5	ND/5	ND/5	ND/5	ND/5
trans-1,2-Dichloropropene	ND/5	ND/5	ND/5	ND/5	ND/5
Trichloroethene	ND/5	ND/5	ND/5	ND/5	ND/5
Dibromochloromethane	ND/5	ND/5	ND/5	ND/5	ND/5
1,1,2-Trichloroethane	ND/5	ND/5	ND/5	ND/5	ND/5
Benzene	ND/5	ND/5	ND/5	ND/5	ND/5
cis-1,3-Dichloropropene	ND/5	ND/5	ND/5	ND/5	ND/5
2-Chloroethyl Vinyl Ether	ND/10	ND/10	ND/10	ND/10	ND/10
Bromoform	ND/5	ND/5	ND/5	ND/5	ND/5
4-Methyl-2-pentanone	ND/10	ND/10	ND/10	ND/10	ND/10
2-Hexanone	ND/10	ND/10	ND/10	ND/10	ND/10
Tetrachloroethene	ND/5	ND/5	ND/5	ND/5	ND/5
1,1,2,2-Tetrachloroethane	ND/5	ND/5	ND/5	ND/5	ND/5
Toluene	ND/5	ND/5	ND/5	ND/5	ND/5
Chlorobenzene	ND/5	ND/5	ND/5	ND/5	ND/5
Ethyl Benzene	ND/5	ND/5	ND/5	ND/5	ND/5
Styrene	ND/5	ND/5	ND/5	ND/5	ND/5
Total Xylenes	ND/5	ND/5	ND/5	ND/5	ND/5

Values reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 8
PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN SURFACE WATERS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Phenol	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-Chloroethyl) ether	ND/20	ND/20	ND/20	ND/20	ND/20
2-Chlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20
1,3-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
1,4-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
Benzyl Alcohol	ND/20	ND/20	ND/20	ND/20	ND/20
1,2-Dichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
2-Methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-Chloroisopropyl) ether	ND/20	ND/20	ND/20	ND/20	ND/20
4-Methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20
N-Nitroso-Dipropylamine	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachloroethane	ND/20	ND/20	ND/20	ND/20	ND/20
Nitrobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
Isophorone	ND/20	ND/20	ND/20	ND/20	ND/20
2-Nitrophenol	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dimethylphenol	ND/20	ND/20	ND/20	ND/20	ND/20
Benzoic Acid	ND/100	ND/100	ND/100	ND/100	ND/100
bis(2-Chloroethoxy) methane	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dichlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20
1,2,4-Trichlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
Naphthalene	ND/20	ND/20	ND/20	ND/20	ND/20
4-Chloroaniline	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorobutadiene	ND/20	ND/20	ND/20	ND/20	ND/20
4-Chloro-3-methylphenol	ND/20	ND/20	ND/20	ND/20	ND/20
2-Methylnaphthalene	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorocyclopentadiene	ND/20	ND/20	ND/20	ND/20	ND/20
2,4,6-Trichlorophenol	ND/20	ND/20	ND/20	ND/20	ND/20
2,4,5-Trichlorophenol	ND/100	ND/100	ND/100	ND/100	ND/100
2-Chloronaphthalene	ND/20	ND/20	ND/20	ND/20	ND/20
2-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100
Dimethyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20
Acenaphthylene	ND/20	ND/20	ND/20	ND/20	ND/20
3-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100

Values reported in ug/l (ppb)

TABLE 9

PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN SURFACE WATER

PARAMETERS	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Acenaphthene	ND/20	ND/20	ND/20	ND/20	ND/20
3,4-Dinitrophenol	ND/100	ND/100	ND/100	ND/100	ND/100
4-Nitrophenol	ND/100	ND/100	ND/100	ND/100	ND/100
Dibenzofuran	ND/20	ND/20	ND/20	ND/20	ND/20
2,4-Dinitrotoluene	ND/20	ND/20	ND/20	ND/20	ND/20
2,6-Dinitrotoluene	ND/20	ND/20	ND/20	ND/20	ND/20
Diethylophthalate	ND/20	ND/20	ND/20	ND/20	ND/20
4-Chlorophenyl Phenyl ether	ND/20	ND/20	ND/20	ND/20	ND/20
Fluorene	ND/20	ND/20	ND/20	ND/20	ND/20
4-Nitroaniline	ND/100	ND/100	ND/100	ND/100	ND/100
4,6-Dinitro-2-methylphenol	ND/100	ND/100	ND/100	ND/100	ND/100
N-nitrosodiphenylamine(1)	ND/20	ND/20	ND/20	ND/20	ND/20
4-Bromophenyl Phenyl ether	ND/20	ND/20	ND/20	ND/20	ND/20
Hexachlorobenzene	ND/20	ND/20	ND/20	ND/20	ND/20
Pentachlorophenol	ND/100	ND/100	ND/100	ND/100	ND/100
Phenanthrene	ND/20	ND/20	ND/20	ND/20	ND/20
Anthracene	ND/20	ND/20	ND/20	ND/20	ND/20
Di-n-butylphthalate	ND/20	ND/20	ND/20	ND/20	ND/20
Flouranthene	ND/20	ND/20	ND/20	ND/20	ND/20
Pyrene	ND/20	ND/20	ND/20	ND/20	ND/20
Butyl Benzyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20
3,3'-Dichlorobenzidine	ND/40	ND/40	ND/40	ND/40	ND/40
Benzo(a)anthracene	ND/20	ND/20	ND/20	ND/20	ND/20
bis(2-ethylhexyl)phthalate	ND/20	ND/20	ND/20	ND/20	ND/20
Chrysene	ND/20	ND/20	ND/20	ND/20	ND/20
Oi-n-octyl Phthalate	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(b)fluoranthene	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(k)fluoranthene	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(a)pyrene	ND/20	ND/20	ND/20	ND/20	ND/20
Indeno(1,2,3-od)pyrene	ND/20	ND/20	ND/20	ND/20	ND/20
Dibenz(a,h)anthracene	ND/20	ND/20	ND/20	ND/20	ND/20
Benzo(g,h,i)perylene	ND/20	ND/20	ND/20	ND/20	ND/20

Value reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 10

PHASE II STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR PESTICIDES/PCB'S IN SURFACE WATERS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Alpha - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Beta - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Delta - BHC	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Gamma - BHC(Lindane)	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Heptachlor	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Aldrin	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Heptachlor Epoxide	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Endosulfan I	ND/.05	ND/.05	ND/.05	ND/.05	ND/.05
Dieldrin	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4" - DDE	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endrin	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endosulfan II	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4' - DDD	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Endosulfan Sulfate	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
4-4' - DDT	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Methoxychlor	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Endrin Ketone	ND/.10	ND/.10	ND/.10	ND/.10	ND/.10
Chlordane	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Toxaphene	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0
Aroclor - 1016	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1221	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1232	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1242	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1248	ND/.50	ND/.50	ND/.50	ND/.50	ND/.50
Aroclor - 1254	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0
Aroclor - 1260	ND/1.0	ND/1.0	ND/1.0	ND/1.0	ND/1.0

Values reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 11

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDVILL

ANALYTICAL RESULTS FOR METALS AND CYANIDE IN SURFACE WATERS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Aluminum	203	112	17	20	308
Antimony	ND/60*	ND/60*	ND/60*	ND/60*	ND/60
Arsenic	ND/10	ND/10	ND/10	ND/10	ND/10
Barium	53	14	21	20	17
Beryllium	ND/5	ND/5	ND/5	ND/5	ND/5
Cadmium	ND/5	ND/5	ND/5	ND/5	4
Calcium	10,000	6,130(E)	8,280	9,740	5,510
Chromium	ND/10	ND/10	ND/10	ND/10	ND/10
Cobalt	ND/50	ND/50	ND/50	ND/50	ND/50
Copper	71**	15**	58**	43**	13
Cyanide	ND/10	ND/10	ND/10	ND/10	ND/10
Iron	243	193	144	419	777
Lead	ND/5*	2.3*	ND/5*	1.8*	10
Magnesium	2,950	2,860	2,720	3,170	2,310
Manganese	14	23	26	129	164
Mercury	ND/0.2	ND/0.2	ND/0.2	ND/0.2	ND/0.2
Nickel	ND/40	ND/40	ND/40	ND/40	14
Potassium	ND/5000	ND/5000	ND/5000	ND/5000	1,600
Selenium	ND/5*	ND/5*	ND/5*	ND/5*	ND/5
Silver	ND/10*	ND/10*	ND/10*	ND/10*	ND/10*
Sodium	ND/5000	ND/5000	1,490	1,510	2,140
Thallium	4*	ND/10*	ND/10*	ND/10*	ND/10
Tin	ND/40*	ND/40*	ND/40*	ND/40*	ND/40
Vanadium	ND/50	ND/50	ND/50	ND/50	ND/50
Zinc	56**	21**	49**	30**	34

Values reported in ug/l (ppb)
SEE TABLE 17 FOR NOTES

Class D Stream (viz. 300 ppb). As discussed previously, the upgradient groundwater seep showed an iron concentration (viz. 735 ppb) in excess of the Class "GA" Groundwater Standard and may be naturally occurring in the area. No other metals were detected in the stream samples above the Class D Surface Water quality standards. However, several of the Class D Standards are dependent on hardness and since hardness was not measured, a standard could not be established.

4.4.2.4 Sediment

The analytical data for the Phase II sediment samples are summarized in Tables 12 through 16. Examination of these tables indicated the following:

- Methylene chloride and acetone were detected at low concentrations in all the samples. However, since methylene chloride and acetone were also detected in the laboratory blank and these compounds are common laboratory and field decontamination solvents, it is not likely that these compounds were actually present in the sediment samples. No other volatile compounds were detected;

- No semi-volatile compounds or pesticide/PCB's were detected;

- Cyanide was not detected; and

TABLE 12

PHASE II - STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR VOLATILE COMPOUNDS IN SEDIMENTS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Chloromethane	ND/12	ND/13	ND/12	ND/13	ND/16
Bromomethane	ND/12	ND/13	ND/12	ND/13	ND/16
Vinyl Chloride	ND/12	ND/13	ND/12	ND/13	ND/16
Chloroethane	ND/12	ND/13	ND/12	ND/13	ND/16
Methylene Chloride	B/15	JB/5	B/13	B/15	B/10
Acetone	B/22	JB/12	B/19	B/69	B/20
Carbon Disulfide	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,1-Dichloroethene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,1-Dichloroethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
trans-1,2-Dichloroethene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Chloroform	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,2-Dichloroethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
2-Butanone	ND/12	ND/13	ND/12	ND/13	ND/16
1,1,1-Trichloroethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Carbon Tetrachloride	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Vinyl Acetate	ND/12	ND/13	ND/12	ND/13	ND/16
Bromodichloromethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,2-Dichloropropane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
trans-1,2-Dichloropropene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Trichloroethene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Dibromochloromethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,1,2-Trichloroethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Benzene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
cis-1,3-Dichloropropene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
2-Chloroethyl Vinyl Ether	ND/12	ND/13	ND/12	ND/13	ND/16
Bromoform	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
4-Methyl-2-pentanone	ND/12	ND/13	ND/12	ND/13	ND/16
2-Hexanone	ND/12	ND/13	ND/12	ND/13	ND/16
Tetrachloroethene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
1,1,2,2-Tetrachloroethane	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Toluene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Chlorobenzene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Ethyl Benzene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2
Styrene	ND/6	ND/6.6	ND/6	ND/6.4	ND/8.2

Values reported in ug/l (ppb)

TABLE 13

PHASE II STATE SUPERFUND INVESTIGATION

WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN SEDIMENTS

PARAMETERS	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Phenol	ND/400	ND/440	ND/410	ND/430	ND/560
bis(2-Chloroethyl) ether	ND/400	ND/440	ND/410	ND/430	ND/560
2-Chlorophenol	ND/400	ND/440	ND/410	ND/430	ND/560
1,2-Dichlorobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
1,4-Dichlorobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
Benzyl Alcohol	ND/400	ND/440	ND/410	ND/430	ND/560
1,2-Dichlorobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
2-Methylphenol	ND/400	ND/440	ND/410	ND/430	ND/560
bis(2-Chloroisopropyl) ether	ND/400	ND/440	ND/410	ND/430	ND/560
4-Methylphenol	ND/400	ND/440	ND/410	ND/430	ND/560
N-Nitroso-Dipropylamine	ND/400	ND/440	ND/410	ND/430	ND/560
Hexachloroethane	ND/400	ND/440	ND/410	ND/430	ND/560
Nitrobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
Isophorone	ND/400	ND/440	ND/410	ND/430	ND/560
2-Nitrophenol	ND/400	ND/440	ND/410	ND/430	ND/560
2,4-Dimethylphenol	ND/400	ND/440	ND/410	ND/430	ND/560
Benzoic Acid	ND2000	ND/2200	ND/2000	ND/2100	ND/2800
bis(2-Chloroethoxy) methane	ND/400	ND/440	ND/410	ND/430	ND/560
2,4-Dichlorophenol	ND/400	ND/440	ND/410	ND/430	ND/560
1,2,4-Trichlorobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
Naphthalene	ND/400	ND/440	ND/410	ND/430	ND/560
4-Chloroaniline	ND/400	ND/440	ND/410	ND/430	ND/560
Hexachlorobutadiene	ND/400	ND/440	ND/410	ND/430	ND/560
4-Chloro-3-methylphenol	ND/400	ND/440	ND/410	ND/430	ND/560
2-Methylnaphthalene	ND/400	ND/440	ND/410	ND/430	ND/560
Hexachlorocyclopentadiene	ND/400	ND/440	ND/410	ND/430	ND/560
2,4,6-Trichlorophenol	ND/400	ND/440	ND/410	ND/430	ND/560
2,4,5-Trichlorophenol	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
2-Chloronaphthalene	ND/400	ND/440	ND/410	ND/430	ND/560
2-Nitroaniline	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
Dimethyl Phthalate	ND/400	ND/440	ND/410	ND/430	ND/560
Acenaphthylene	ND/400	ND/440	ND/410	ND/430	ND/560
3-Nitroaniline	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800

Values reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 14

PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR SEMI-VOLATILE COMPOUNDS IN SEDIMENTS

PARAMETERS	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Acenaphthene	ND/400	ND/440	ND/410	ND/430	ND/560
3,4-Dinitrophenol	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
4-Nitrophenol	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
Dibenzofuran	ND/400	ND/440	ND/410	ND/430	ND/560
2,4-Dinitrotoluene	ND/400	ND/440	ND/410	ND/430	ND/560
2,6-Dinitrotoluene	ND/400	ND/440	ND/410	ND/430	ND/560
Diethylophthalate	ND/400	ND/440	ND/410	ND/430	ND/560
4-Chlorophenyl Phenyl ether	ND/400	ND/440	ND/410	ND/430	ND/560
Fluorene	ND/400	ND/440	ND/410	ND/430	ND/560
4-Nitroaniline	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
4,6-Dinitro-2-methylphenol	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
N-nitrosodiphenylamine(1)	ND/400	ND/440	ND/410	ND/430	ND/560
4-Bromophenyl Phenyl ether	ND/400	ND/440	ND/410	ND/430	ND/560
Hexachlorobenzene	ND/400	ND/440	ND/410	ND/430	ND/560
Pentachlorophenol	ND/2000	ND/2200	ND/2000	ND/2100	ND/2800
Phenanthrene	ND/400	ND/440	ND/410	ND/430	ND/560
Anthracene	ND/400	ND/440	ND/410	ND/430	ND/560
Di-n-butylphthalate	ND/400	ND/440	ND/410	ND/430	ND/560
Fluoranthene	ND/400	ND/440	ND/410	ND/430	ND/560
Pyrene	ND/400	ND/440	ND/410	ND/430	ND/560
Butyl Benzyl Phthalate	ND/400	ND/440	ND/410	ND/430	ND/560
3,3'-Dichlorobenzidine	ND/790	ND/880	ND/810	ND/860	ND/1100
Benzo(a)anthracene	ND/400	ND/440	ND/410	ND/430	ND/560
bis(2-ethylhexyl)phthalate	ND/400	ND/440	ND/410	ND/430	J/100
Chrysene	ND/400	ND/440	ND/410	ND/430	ND/560
01-n-ootyl Phthalate	ND/400	ND/440	ND/410	ND/430	ND/560
Benzo(b)fluoranthene	ND/400	ND/440	ND/410	ND/430	ND/560
Benzo(k)fluoranthene	ND/400	ND/440	ND/410	ND/430	ND/560
Benzo(a)pyrene	ND/400	ND/440	ND/410	ND/430	ND/560
Indeno(1,2,3-od)pyrene	ND/400	ND/440	ND/410	ND/430	ND/560
Dibenz(a,h)anthracene	ND/400	ND/440	ND/410	ND/430	ND/560
Benzo(g,h,i)perylene	ND/400	ND/440	ND/410	ND/430	ND/560

Values reported in ug/l (ppb)

SEE TABLE 17 FOR NOTES

TABLE 15

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR PESTICIDES/PCB'S IN SEDIMENT

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Alpha - GHC	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Beta - BHC	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Delta - BHC	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Gamma - BHC(Lindane)	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Heptachlor	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Aldrin	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Heptachlor Epoxide	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Endosulfan I	ND/9.4	ND/10	ND/9.6	ND/10	ND/13
Dieldrin	ND/19	ND/21	ND/19	ND/20	ND/26
4-4' - DDE	ND/19	ND/21	ND/19	ND/20	ND/26
Endrin	ND/19	ND/21	ND/19	ND/20	ND/26
Endosulfan II	ND/19	ND/21	ND/19	ND/20	ND/26
4-4' - DDD	ND/19	ND/21	ND/19	ND/20	ND/26
Endosulfan Sulfate	ND/19	ND/21	ND/19	ND/20	ND/26
4-4' - DDT	ND/19	ND/21	ND/19	ND/20	ND/26
Methoxychlor	ND/94	ND/100	ND/96	ND/100	ND/130
Endrin Ketone	ND/19	ND/21	ND/19	ND/20	ND/26
Chlordane	ND/94	ND/100	ND/96	ND/100	ND/130
Toxaphene	ND/190	ND/210	ND/190	ND/200	ND/260
Aroclor - 1016	ND/94	ND/100	ND/96	ND/100	ND/130
Aroclor - 1221	ND/94	ND/100	ND/96	ND/100	ND/130
Aroclor - 1232	ND/94	ND/100	ND/96	ND/100	ND/130
Aroclor - 1242	ND/94	ND/100	ND/96	ND/100	ND/130
Aroclor - 1248	ND/94	ND/100	ND/96	ND/100	ND/130
Aroclor - 1254	ND/190	ND/210	ND/190	ND/200	ND/260
Aroclor - 1260	ND/190	ND/210	ND/190	ND/200	ND/260

Values reported in ug/l (ppb)
SEE TABLE 17 FOR NOTES

TABLE 16

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

ANALYTICAL RESULTS FOR METALS AND CYANIDE IN SEDIMENTS

PARAMETER	DUFFY HOLLOW CREEK UPSTREAM	DUFFY HOLLOW CREEK TRIBUTARY UPSTREAM	DUFFY HOLLOW CREEK DOWNSTREAM SEDIMENT	DUFFY HOLLOW CREEK TRIBUTARY DOWNSTREAM	DRAINAGE POND
Aluminum	7,300**	15,400**	8,080**	7,470**	13,100**
Antimony	ND/6	ND/6	ND/6	ND/6	ND/6
Arsenic	8.9**	7.7**	11	13.5**	4.9**
Barium	187	152	133**	89	101
Beryllium	0.38(E)	.93	0.49(E)	.56	.86
Cadmium	1.6(E)	3.5	2.0(E)	2.2(E)	3.0
Calcium	1,920	2,580	12,500	2,590	1,210
Chromium	7.4**	18**	9.1**	8.5**	18**
Cobalt	12	26	12	15	24
Copper	7.9	33	12	17	25
Cyanide	ND/1	ND/1	ND/1	ND/1	ND/1
Iron	16,600**	39,200**	20,200**	25,800**	35,400**
Lead	21**	21**	3.8**	15**	15**
Magnesium	2,640**	5,450**	3170**	2320**	4210**
Manganese	591	1,400	525	920	717
Mercury	ND/0.1	ND/0.1	ND/0.1	ND/0.1	ND/0.1
Nickel	24**	79**	27**	29**	45**
Potassium	529	827	573	637	1680
Selenium	ND/2.5	ND/2.5	ND/2.5	ND/2.5	ND/0.5
Silver	ND/1	ND/1	ND/1	ND/1	ND/1
Sodium	350(E)	3,600(E)	289(E)	1,210	445(E)
Thallium	ND/5	ND/5	ND/5	ND/5	ND/5
Tin	ND/4	44	ND/4	ND/4	ND/20
Vanadium	8.8	18	9.7	11	20
Zinc	56**	106**	52**	59**	78**

Values reported in ug/l (ppb)
SEE TABLE 17 FOR NOTES

TABLE 17

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL
NOTES FOR TABLES 2 THROUGH 16 AND 21

ND/10	-	Indicates parameter was not detected at a detection limit of 10 ppb.
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 indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero.
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.
(E)	-	Indicates a value estimated due to the presence of interference.
*	-	Indicates spike sample recovery not within control limits.
**	-	Indicates duplicate analysis not within control limits.

- Although various metals were detected in the sediment samples, there does not appear to be a significant change from upstream to downstream. However, it should be noted that iron concentrations appear to be relatively high in all samples. This could explain the occasional red staining of the various stream beds. As discussed previously, iron is believed to be naturally occurring.

4.4.2.5 Field Measurements

Field measurements taken during the Phase II sampling program included: pH, conductivity, temperature and dissolved oxygen. These field measurements were taken on three different dates due to suspected/actual malfunctions of field sampling equipment. Dissolved oxygen measurements were only recorded for the surface water sampling locations, the upgradient seep and the trench on the east side of the site in accordance with the revised work plan (See Appendix 1). Summaries of the field measurement data are presented in Tables 18 through 20. Examination of these data indicated the following:

- The pH of monitoring well 3A (viz. 11.4) was elevated above the recommended range for drinking water (viz. 6-9).

- The low conductivity and consistent (viz. upstream to downstream) dissolved oxygen measurements indicate a lack of gross inorganic and organic contamination respectively. However, the turbulent nature of flow within the creek beds in question would

TABLE 18
PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE-ANDOVER LANDFILL

FIELD MEASUREMENTS ON 6/2/86

LOCATION	pH	CONDUCTIVITY (umhos)	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/1)
Rosini Well	9.7**	600 umhos	14°C	*
Kelley Well	6.8	330 umhos	17°C	*
Teller Well	7.1	330 umhos	14°C	*
Duffy Hollow Creek Downstream	6.6	120 umhos	18.5°C	9.8 mg/1
Duffy Hollow Creek Upstream	6.4	90 umhos	22°C	9.0 mg/1
Duffy Hollow Creek Tributary Downstream	8.7	125 umhos	17°C	9.4 mg/1
Duffy Hollow Creek Tributary Upstream	6.4	75 umhos	12°C	10.6 mg/1

* Pumped sample, dissolved oxygen reading not taken.

** Elevated pH, sample collected after filtering and softener system; sample retaken on 7/2/86 for pH before filtering and softener system; pH recorded at 6.7.

TABLE 19
PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE-ANDOVER LANDFILL

FIELD MEASUREMENTS ON 7/2/86

LOCATION	pH	TEMPERATURE (°C)	CONDUCTIVITY (umhos)
CW4A	6.7	16°C	340 umhos
CW4B	6.7	17°C	500 umhos
CW3A	11.4	11°C	900 umhos
CW3B	7.9	11°C	450 umhos
Teller Well	6.8	11°C	600 umhos
Duffy Hollow Creek Upstream	6.9	8°C	365 umhos
Duffy Hollow Creek Downstream	6.7	9°C	290 umhos
Duffy Hollow Creek Tributary Downstream	6.2	10°C	350 umhos
Duffy Hollow Creek Tributary Upstream	7.1	11.5°C	145 umhos
Ladue Spring	6.6	14°C	140 umhos
Upgradient Seep	6.7	11°C	700 umhos
Drainage Pond	6.9	19°C	300 umhos
Trench East of Site	6.0	12°C	200 umhos
Fitzgibbons Spring	6.9	11.5°C	230 umhos
Leachate Sump	6.0	12°C	290 umhos

TABLE 20
PHASE II - STATE SUPERFUND INVESTIGATION
WELLSVILLE-ANDOVER LANDFILL
FIELD MEASUREMENTS ON 7/30/86

LOCATION	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
Rosini Well	18°C	*
Duffy Hollow Creek Upstream	17°C	8.2 mg/l
Duffy Hollow Creek Downstream	18°C	9.1 mg/l
Duffy Hollow Creek Tributary Downstream	18°C	9.2 mg/l
Duffy Hollow Creek Tributary Upstream	11°C	8.5 mg/l
Upgradient Seep	14°C	7.6 mg/l
Trench, East of Site	16°C	4.0 mg/l**
Drainage Pond	22°C	7.0 mg/l

NOTES:

* Pumped sample, dissolved oxygen reading not taken.
** Low dissolved oxygen is probably result of high algal content of water contained in the trench.

tend to result in reaeration even if biological degradation were occurring. Therefore, the usefulness of dissolved oxygen as a indicator of contamination is questionable.

4.4.2.6 Tentatively Identified Compounds

As specified in the work plan, additional GC/MS scan peaks, present above 10% of the calibrating standard were identified for each of the samples. These tentatively identified compounds are tabulated in Table 21. The list of tentatively identified compounds for each sample matrix is developed through a computer library search. Since standards for these compounds were not analyzed and quality assurance/-quality control data was not developed, the actual presence/concentration of these compounds is in question.

4.4.2.7 Air Monitoring

There were no readings detected above background during the site walkover with the photovac tip. However, the photovac tip readings for three confined spaces associated with the leachate collection system indicated that the following locations showed readings above background:

- The leachate manhole (viz. 2000 ppm) near the leachate holding pond;
- The leachate sump (viz. 20 to 30 ppm) southwest of the landfill; and
- The leachate pump house (5 to 10 ppm).

TABLE 21

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE #/ IDENTIFICATION	CAS#	COMPOUND NAME	FACTOR	SCAN NUMBER	ESTIMATED/CONC. ug/l (ppb) conc	notes[1]
(88258)						
Rosini Well	4023-39-6	Boranamine, N,N,1,1-tetraethyl	semi 2	356	18	J
(88258)						
Miller Spring	620-17-7	phenol, 3-ethyl	semi 2	592	150	J
	4536-23-6	hexanoic acid, 2-methyl	semi 2	582	2,300	J
	124-07-2	octanoic acid	semi 2	615	26,000	J
	103-82-2	benzeneacetic acid	semi 2	645	540	J
	112-05-0	Nonanoic acid	semi 2	658	4,500	J
	501-52-0	Benzene propanoic acid	semi 2	696	4,500	J
	334-48-5	Decanoic acid	semi 2	708	2,000	J
(970022MW3B)						
MW3B	30691-59-5	aziridine, 1-Hexyl	semi 2	432	18	J
(970011MW4B)						
MW4B	766-52-9	Piperidine, 1-ethyl-2-methyl	semi 2	330	12	J
	23743-26-2	phosphine, 1,2-ethanediyl-bis[dicyclohexyl]	semi 2	1137	63	J
(976011MW4A)						
MW4A	30691-59-9	Aziridine, 1-Hexyl-	semi 2	400	18	J
(970UPTR)						
Duffy Hollow						
Creek Tributary	625-06-9	2-Pentanol, 2,4-Diemthyl	semi 2	363	35,000	JB
Upstream	3074-71-3	Heptane, 2,3-Dimethyl	semi 2	375	550	JB
	2216-34-4	Octane, 4-methyl	semi 2	382	1,500	JB
	62108-23-0	Decane, 2,5,6-trimethyl	semi 2	411	370	JB
(970001RREN)						
Trench on East						
Side of Landfill	100-41-4	Benzene, ethyl	semi 2	296	100	J
	766-52-9	piperidine, 1-ethyl-2-methyl-	semi 2	339	10	J
	98-82-2	Benzene, (1-methyl ethyl)	semi 2	347	7	J

SEE TABLE 17 FOR NOTES

TABLE 21

PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE #/ IDENTIFICATION	CAS#	COMPOUND NAME	FACTOR	SCAN NUMBER	ESTIMATED/CONC. ug/l conc	notes[1]
(970TRIBSED) Duffy Hollow Creek Tributary Sediment - Downstream	3074-71-3	Heptane, 2,3-Dimethyl-	semi 2	360	250	JB
	721-47-1	Hexane, 2,3,4-Trimethyl	semi 2	366	1,300	JB
	62108-23-0	Decane, 2,5,6-Trimetnyl	semi 2	395	510	JB
	5166-53-0	3-Hexen-2-one, 5-methyl	semi 2	438	290	J
	10544-50-0	Sulfur, mol.(58)	semi 2	799	500	J
	2091-29-4	9-Hexadecenoic acid	semi 2	959	310	J
	50609-54-6	1H-Pyrimido[1,2-A] Quinoline-2-Acetic Acid 1-oxo-,E	semi 2	1013	3,100	J
(970PONDSED) On-site Drainage Pond Sediment	2216-34-4	Octane, 4-methyl-	semi 2	365	1,800	JB
	921-47-1	Hexane, 2,3,4-Trimethyl	semi 2	394	550	JB
	62108-23-0	Decane, 2,5,6-Trimethyl	semi 2	540	330	J
	2091-29-4	9-Hexadecenoic Acid	semi 2	959	230	J
	140-03-4	9-Octadecenoic Acid	semi 2	967	350	J
	13481-95-3	10-Octadecenoic Acid, Methyl ester	semi 2	1039	1,000	J
	5129-61-3	Heptadecanoic acid, 16-methyl-, methylester	semi 2	1045	510	J
	74769-11-7	Iron, tricarbonylcn-(Phen YL-2-pyridmylmethylene) Ben	semi 2	1359	400	J
(970DRFFSED) Duffy Hollow Creek Sediment - Upstream	3074-71-3	Heptane, 2,3-Demethyl	semi 2	361	480	J
	921-47-1	Hexane, 2,3,4-Trimethyl	semi 2	367	1,200	JB
	62108-23-0	Decane, 25,6-Trimethyl	semi 2	396	380	JB
	2091-29-4	9-Hexadecenoic acid	semi 2	961	230	J

SEE TABLE 17 FOR NOTES

4.4.2.8 QA/QC Plan Implementation

All activities were performed in accordance with the quality assurance/quality control (outlined in the Phase I Work Plan - See Appendix 1). All drilling and sampling was continually supervised by a qualified geologist. Drilling and sampling information was recorded on boring logs, notes and sample containers. All sampling and drilling equipment was decontaminated prior to and during the performance of work activities. All samples were collected using appropriate QA protocols and shipped under strict chain-of-custody procedures. All samples were analyzed using New York State DECCLP.

4.4.3 Extent of Possible Contamination

4.4.3.1 Pollutants of Concern

Based on the results of the Phase II sampling program, the primary pollutants of concern are as follows:

- Volatiles (viz. methylene chloride, vinyl chloride, acetone, trans-1,2-dichloroethene, 2-butanone, trichloroethene, toluene and ethyl benzene) in leachate and/or groundwater as presented in Table 2;

- 4-methyl phenol (the detection of 4-methyl phenol is in question - see Section 4.4.2.1) in groundwater as presented in Table 4; and

- Heavy metals (viz. iron, manganese and cadmium) in leachate, groundwater and surface water as presented in Tables 6 and 11.

4.4.3.2 Off-Site Migration

Information collected during the Phase II Investigation indicates that groundwater is the primary route of contaminant transport from the site. No significant contamination was detected in the air, sediment or surface water samples. Insufficient information exists to adequately define the extent of groundwater contamination beyond the site boundaries. However, examination of the Phase II data suggests that groundwater contaminated with low-level (viz. primarily below New York State Class "GA" Groundwater Quality Standards) may have migrated from the site to the Teller well, the Miller and LaDue springs and the trench on the east side of the landfill all of which are within 2000 feet of the downgradient (southern/-eastern) site boundaries. A volatile compound was detected both in the leachate and in a downgradient sample above New York State Class "GA" Groundwater Quality Standards in only one instance (viz. trans-1,2-dichloroethene in the LaDue Spring). The data also indicates that the Kelley well which is located approximately 1.75 miles downgradient of the site was determined to be free of the potential pollutants of concern.

SECTION 5

HAZARD RANKING SYSTEM SCORE

Facility name: Wellsville - Andover Landfill

Location: Wellsville, New York - Allegany Co.

EPA Region: II

Person(s) in charge of the facility: Mr. Donald MacFarquhar (DPW)
Village of Wellsville
Wellsville, New York 14895

Name of Reviewer: _____ Date: _____

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.)

Wellsville-Andover Landfill is located to the east of Snyder Road. The landfill is unlined with a leachate collection system along the southern and western boundaries of the site. Contamination route of concern is the uppermost groundwater zone.

Scores: S_M =26.75 (S_{gw} = 45.52 S_{sw} = 8.39 S_a =0.00)

S_{FE} = 5.6

S_{DC} = 0.56

FIGURE 1
HRS COVER SHEET

Ground Water Route Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 (45)	1	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	
	Net Precipitation	0 1 2 3	1		3	
	Permeability of the Unsaturated Zone	0 1 2 3	1		3	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score				15	
3	Containment	0 1 2 3	1		3	3.3
4	Waste Characteristics					3.4
	Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
	Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score			20	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	20	40	
	Total Targets Score			29	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		26,100		57,330	
7	Divide line 6 by 57,330 and multiply by 100		S_{gw} = 45.52			

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Ground Water Route Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 (45)	1	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	
	Net Precipitation	0 1 2 3	1		3	
	Permeability of the Unsaturated Zone	0 1 2 3	1		3	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score				15	
3	Containment	0 1 2 3	1		3	3.3
4	Waste Characteristics					3.4
	Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
	Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score			20	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	20	40	
	Total Targets Score			29	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			26,100	57,330	
7	Divide line 6 by 57,330 and multiply by 100		S_{gw} =	45.52		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 (45)	1	45	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		3	
	1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
	Distance to Nearest Surface Water	0 1 2 3	2		6	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score				15	
3	Containment	0 1 2 3	1		3	4.3
4	Waste Characteristics					4.4
	Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
	Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score			20	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		40	
	Total Targets Score			6	55	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5		5,400		64,350	
7	Divide line 6 by 64,350 and multiply by 100		S_{sw} = 8.39			

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	(0) 45	1	0	45	5.1
	Date and Location:	May 7, 1986 On-site walk-over from N to S, then S to N				
	Sampling Protocol:	Equipment used: Photovac tip. The photovac tip was calibrated to background air north of site.				
	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 Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score			15	20	
3	Targets					5.3
	Population Within 4-Mile Radius	0 9 12 15 (18) 21 24 27 30	1	18	30	
	Distance to Sensitive Environment	(0) 1 2 3	2	0	6	
	Land Use	(0) 1 2 3	1	0	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			

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	45.52	2072
Surface Water Route Score (S_{sw})	8.39	70
Air Route Score (S_a)	0.00	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		2142
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		46.28
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		26.75

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Containment	(1) 3	1	1	3	7.1
2	Waste Characteristics					7.2
	Direct Evidence	(0) 3	1	0	3	
	Ignitability	0 1 2 (3)	1	3	3	
	Reactivity	0 (1) 2 3	1	1	3	
	Incompatibility	0 (1) 2 3	1	1	3	
	Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score			10	20	
3	Targets					7.3
	Distance to Nearest Population	0 1 2 (3) 4 5	1	3	5	
	Distance to Nearest Building	0 (1) 2 3	1	1	3	
	Distance to Sensitive Environment	(0) 1 2 3	1	0	3	
	Land Use	(0) 1 2 3	1	0	3	
	Population Within 2-Mile Radius	0 1 (2) 3 4 5	1	2	5	
	Buildings Within 2-Mile Radius	0 1 (2) 3 4 5	1	2	5	
	Total Targets Score			8	24	
4	Multiply 1 x 2 x 3			80	1,440	
5	Divide line 4 by 1,440 and multiply by 100		S_{FE} =	5.55		

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 (2) 3	1	2	3	8.2
3 Containment	(0) 15	1	0	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 (1) 2 3 4 5	4	4	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			4	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			120	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	0.56		

FIGURE 12
DIRECT CONTACT WORK SHEET

June 29, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Wellsville-Andover Landfill

LOCATION: East of Snyder Road - Towns of Andover and Wellsville

NOTE: See Section 6 for References

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

trans-1,2, dichloroethene
trichloroethene
toluene
vinyl chloride
ethyl benzene

Rationale for attributing the contaminants to the facility:

Detected in onsite monitoring wells and/or off-site drinking supply.

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern: Groundwater occurs in both the overburden and the bedrock, which consists of shales, siltstone and sandstone. The overburden, glacial till possesses interfingerings of sand and silt which allow for the lateral movement of water. These interfingerings vary in depth from the surface. They can be found just below the surface to several feet below ground level (see Appendix 3 for boring logs). The overburden groundwater should be considered the groundwater system of concern.

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

The uppermost saturated zone occurs within 12 inches of the ground surface.

Reference 14

Score = 3

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

Waste materials are estimated to be to a depth of 12 feet, assuming trenching operations.

Net Precipitation

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

Mean annual precipitation is 36 inches per year.
Reference 1.

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

Mean annual evaporation is 28 inches per year.

Net precipitation (subtract the above figures):

8 inches per year

Score = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone: Fremont silt loam - influenced by seasonal wetness; moderately fine textured subsoil, is somewhat poorly drained, formed in firm glacial till. Mardin Channery silt loam - influenced by seasonal wetness; moderately well drained with medium texture formed in firm glacial till it has a seasonal high water table perched above a dense fragipan.

Permeability associated with soil type:

10^{-5} to 10^{-7} cm/sec

Score = 1
Reference 3, 14

Physical State

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

Solids and liquids

Score = 3
Reference 2

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No liner present, leachate containment system exists along the southern and western boundaries of the site.

Method with highest score:

No liner, leachate collection system exists along the southern and western boundaries of the site.

Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

	Tox.	Pers.		Tox.	Pers.
ethyl benzene	2	1	trichloroethene	2	2
vinyl chloride	3	2	trans-1,2-dichloro-ethane	3	1
toluene	2	1			

Compound with highest score:

vinyl chloride

Score = 15

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):

Unknown quantity of various wastes disposed of at the site. Known wastes at the facility are oily wastes (hydraulic oils), solvents and paint pigments, and heavy metals.

Basis of estimating and/or computing waste quantity:

For scoring purposes estimates are approximately 300 tons

Score = 5
Reference 2

5 TARGETS

Ground Water Use

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

Groundwater system of concern used as drinking water supply in vicinity of site. No municipal water presently available.

Score = 3

Distance to Nearest Well

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

Estimate from USGS topographic map Wellsville N.

Distance to above well or building:

It is less than 2000' to LaDue Spring which is used as a drinking water source (seasonal)

Score = 4

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

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

House count @ 3.8 people per household

860 people

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

No known irrigation wells within 3-mile radius

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

860 people
Score = 2

Score = 20

SURFACE WATER ROUTE

1 OBSERVED RELEASE

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

Iron was detected above Class D Surface Water Standards in the On-site drainage pond and in the Duffy Hollow Creek downstream sample. Iron was also detected above the Class "GA" Groundwater Quality Standard in the upgradient (background) seep and may be naturally occurring.

Rationale for attributing the contaminants to the facility:

Phase II Surface Water Monitoring Results - See Section 4 of Phase II Report.

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

5.7%

Reference 10,11

Name/description of nearest downslope surface water:

On-Site Pond, Duffy Hollow Creek, Unamed tributary to Duffy Hollow Creek

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

5.7%

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

No areas of the site are located within the unamed tributary or Duffy Hollow Creek.

Score = 2

Is the facility completely surrounded by areas of higher elevation?

No, the facility is located on the side of a hill.

1-Year 24-Hour Rainfall in Inches

2.3" Reference 1,5

Score = 1

Distance to Nearest Downslope Surface Water

Estimated at 800 feet
Reference 10, 11

Score = 2

Physical State of Waste

Solids
liquids

Reference 2
Score = 3

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No liner present, leachate collection system exists along southern and western boundaries of the site.

Method with highest score:

No liner, incomplete leachate collection system.

Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

	Tox.	Pers.		Tox.	Pers.
ethyl benzene	2	1	trichloroethene	2	2
vinyl chloride	3	2	trans-1,2-dichloro-ethene	3	1
toluene					

Compound with highest score:

vinyl chloride

Score = 15

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):

Unknown quantity of various wastes disposed of at the site, known wastes at the site are oily wastes (hydraulic oils), solvents, (methylene chloride wastes, oils), paint pigments and heavy metals.

Basis of estimating and/or computing waste quantity:

Known estimation for scoring purposes is approximately 300 tons, both industrial and municipal

Score = 5
Reference 2

* * *

5 TARGETS

Surface Water Use

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

Uses of surface waters within 3 miles downstream are recreational and fishing.

Is there tidal influence?

No, there is no tidal influence .

Score = 2

Distance to a Sensitive Environment

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

Distance to a coastal wetland is greater than 2 miles

Reference 4

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

No fresh-water wetland within 1 mile.

Reference 4

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

None within 4 miles of the site.

Reference 4

Score = 0

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:

No known water supply intakes within 3 miles of site.

Score = 0

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

Not Applicable

Total population served:

Not Applicable

Name/description of nearest of above water bodies:

Not Applicable

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

Not Applicable

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected: An air survey was completed on May 7, 1986 at the Wellsville-Andover landfill. A photovac tip was calibrated to background air north of the site (wind direction was north to south) and the site was traversed, north to south to north, west to east to west. No readings above background detection. However, readings between 20 and 2000 ppm above background were detected in portions of the leachate collection system (viz. sumps and the pump house). *

Date and location of detection of contaminants

Methods used to detect the contaminants:

Photoionization detector for air analysis
Range 0-2000 ppm
Detection limit 0.05 (benzene)
Detectable compounds: whose ionization potential is below 10.6 ev.
Range encompasses a large number of solvent materials and some important pollutant species.

Rationale for attributing the contaminants to the site:

Not Applicable

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Halogenated Hydrocarbon
(Vinyl Chloride)

Most incompatible pair of compounds:

Halogenated Hydrocarbons/Heavy metals
(vinyl Chloride) (Cadmium & Zinc)

Score = 1

* These readings were taken in confined spaces immediately over the leachate and are not considered observed releases.

Toxicity

Most toxic compound:

Vinyl chloride

Score = 3

Hazardous Waste Quantity

Total quantity of hazardous waste:

Unknown quantity of various wastes disposed of at the site. Known wastes at the facility. For scoring purposes estimates from Phase I source approximates 300 tons.

Basis of estimating and/or computing waste quantity:

Reference 2

* * *

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**

Pop = 23

House Count using 3.8 people per house

Score = 18

Distance to a Sensitive Environment

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

Not Applicable

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

No freshwater wetlands within a mile

Score = 0

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

No critical habitat and endangered species within a mile.

Reference 4

Land Use

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

No commercial or industrial area is within a mile of the site.

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

No national state park, forest or wildlife reserve is within 2 miles.

Reference 2, 13

Distance to residential area, if 2 miles or less:

Not Applicable, no residential area within 2 miles; however, distance to nearest dwelling is approximately 150'.

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

Distance to argicultural land is greater than 1.5 miles.

Reference 13

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

No prime agricultural land

Not Applicable

Reference 13

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

No historic or landmark site within view of the site.

Reference 2,

Score = 0

FIRE AND EXPLOSION

1 CONTAINMENT

o HAZARDOUS SUBSTANCES PRESENT:

ethyl benzene
toluene
vinyl chloride
trans-1,1,dichloroethene
trichloroethene

o TYPE OF CONTAINMENT, IF APPLICABLE

No containment/no liner present

Leachate collection system along southern and western boundaries of the site. ***

Score = 1

2 WASTE CHARACTERISTICS

DIRECT EVIDENCE

o TYPE OF INSTRUMENT AND MEASUREMENTS:

No direct measurements

Score = 0

IGNITABILITY

o COMPOUND USED:

Vinyl chloride; flash point = -108 F

Score = 3

REACTIVITY

o MOST REACTIVE COMPOUND:

Vinyl chloride (Halogenated Hydrocarbons)

Score = 1

INCOMPATIBILITY

o MOST INCOMPATIBLE PAIR OF COMPOUNDS:

Halogenated hydrocarbons and metals

Present but do not pose a hazard

Score = 1

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	902004

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Wellsville-Andover Landfill	Snyder Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Wellsville/Andover	NY	14895	Alleghany		
09 COORDINATES LATITUDE: 77 53' 10" W	LONGITUDE: 43 10' 26" N				

10 DIRECTIONS TO SITE (Starting from nearest public road)

Route 417E from Wellsville, turn left on Duffy Hollow Road, turn left on Snyder Road, approximately 3700' up on right hand side.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
Village of Wellsville	Municipal Building 156 North Main Post Office Box 591			
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**	
Wellsville	NY	14895	(716) 593-1850	
07 OPERATOR (If known and different from owner)	**08 STREET** (Business, mailing, residential)			
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**	
			( )	

13 TYPE OF OWNERSHIP (Check one)

☐ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES ☐ NO DATE ___/___/___ (MONTH DAY YEAR)

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☐ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

BEGINNING YEAR _____ ENDING YEAR _____ ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Oily waste: cutting hydraulic oils, plastics
Solvents: oils, methylene chloride wastes and heavy metals (paint pigments)

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

surface water and groundwater contamination

V. PRIORITY ASSESSMENT N/A

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
N/A				( )
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
			( )	___/___/___ (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	902009

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: 7/86) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

In several groundwater samples analyzed, volatiles were: methylene chloride, acetone, trans-1,2-dichloroethene, and vinyl chlorides.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 7/86) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Iron was detected above Class D surface water quality standards in one stream sample and the on-site drainage pond.

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

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

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

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

Photovac tip used in soil borings: somewhere above the background detection limit.

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

Laboratory analysis of springs used by humans detected methylene chloride, trans 1,2 dichloroethene, trichloroethene

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

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

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	902004

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	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. _____ (mi)

B. less than ½ 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 _____

03 DISTANCE TO NEAREST DRINKING WATER WELL ½ (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
0-35' seasonal fluctuation (ft)	south- southwest	less than 1 (ft)	unknown (gpd)	☐ YES ☒ NO

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

10 RECHARGE AREA		11 DISCHARGE AREA	
☒ YES ☐ NO	COMMENTS	☒ 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
Duffy Hollow Creek	☐	1500 ft
Unnamed tributary to Duffy Creek	☐	700 ft
Dyke Creek	☐	4 (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. 34 NO. OF PERSONS	B. 152 NO. OF PERSONS	C. 860 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 2500' (mi)

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

04 DISTANCE TO NEAREST OFF-SITE BUILDING _____ (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)

Village of Wellsville is approximately 6 miles southwest 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	902004

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	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
5 to 50' (ft)	(ft)		

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
8 (in)	2.3 (in)	5.7 %	S-SW	6.3 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10

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

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. 2-1/3 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (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. none (mi)	B. none (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is located on a gently sloping hillside. The highest elevation on-site (near the top) is at 2200' gently dipping to the south-southwest to a topographic low of 2100'. To the east, lies a topographic low (Duffy Hollow Creek) and to the west lies an unnamed tributary.

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

US Geologic Survey, Wellsville North NY, 1965 topographic map

Phase I HRS Score

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	902004

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

01 NAME: Village of Wellsville	02 D+B NUMBER:		
03 STREET ADDRESS (P.O. Box, RFD #, etc.): Municipal Bldg. 156 N. Main P.O. Box 591	04 SIC CODE:		
05 CITY: Wellsville	06 STATE: NY	07 ZIP CODE: 14895	
08 YEARS OF OPERATION: 15 yrs	09 NAME OF OWNER:		

OPERATOR'S PARENT COMPANY *(If applicable)*

10 NAME:	11 D+B NUMBER:	
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:	
14 CITY:	15 STATE:	16 ZIP CODE:

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

01 NAME:	02 D+B NUMBER:	
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:	
05 CITY:	06 STATE:	07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:	
01 NAME:	02 D+B NUMBER:	
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:	
05 CITY:	06 STATE:	07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:	
01 NAME:	02 D+B NUMBER:	
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:	
05 CITY:	06 STATE:	07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:	

PREVIOUS OPERATORS' PARENT COMPANIES *(If applicable)*

10 NAME:	11 D+B NUMBER:	
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:	
14 CITY:	15 STATE:	16 ZIP CODE:
10 NAME:	11 D+B NUMBER:	
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:	
14 CITY:	15 STATE:	16 ZIP CODE:
10 NAME:	11 D+B NUMBER:	
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:	
14 CITY:	15 STATE:	16 ZIP CODE:

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

Phase I HRS Score

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	902004

II. ON-SITE GENERATOR

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

III. OFF-SITE GENERATOR(S)

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

IV. TRANSPORTER(S)

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

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

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	902004

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
site has 2 ft. soil cover

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION leachate collection system exists along the southern and western boundaries of the landfill site. leachate is coll. and processed off-site.

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Access restricted by a gate.

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
none

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)

EPA FORM 2070-13 (7-81)

SECTION 6

REFERENCES

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

2. Dames & Moore, Engineering-Science, Inc. 1983. Phase I Report: Engineering Investigations and Evaluations at Inactive Hazardous Waste Disposal Sites, Wellsville-Andover, Allegany County, New York.

3. Freeze, R.A. and J.A. Cherry, Groundwater, Prentice Hall, Inc., New York, 1979.

4. New York State Department of Commerce, 1980. Census of Population, Characteristics of People and Housing, Village of Wellsville.

5. 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.

6. Recra Research, Inc./Wehran Engineering, P.C., Leachate Control Options, Village of Wellsville Department of Works, Wellsville, New York.

7. Recra Research, Inc./Wehran Engineers, P.C., 1980. Leachate Migration Investigation, Village of Wellsville, Wellsville, New York.

8. Sax. N.Y., Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Con, New York, 4th ed., 1975.

9. United States Geological Survey, 1965. Andover, New York Topographic Quandrangle Map. (Scale 1:24000).

10. United States Geological Survey, 1965. Wellsville North, New York Topographic Quadrangle Map (Scale 1:24,000).

11. United States Geological Survey, 1965. PR1978, Wellsville South, New York Topographic Quadrangle Map. (Scale 1:24000).

12. United States Geologic Survey, 1965. Whitesville, New York Topographic Quadrangle Map. (Scale 1:24000).

13. USDA - Soil Conservation Service, 1986. Correspondence from Pederson, R.D. to Tanner, P.J.

14. USDA - Soil Conservation Service, 1975. Village of Wellsville Sanitary Landfill Soils Report.

REFERENCES (cont.)

15. Woodruff, J.G., 1942, Geology of the Wellsville Quadrangle, New York, New York State Museum & Science Service, State Education Department, Bulletin No. 238, State University of New York, Albany.

16. Erdman, Anthony, Associates, 1985. Wellsville-Andover Sanitary Landfill Site Photogrammerty Survey (Scale 1"-100').

APPENDIX 1

WORK PLAN AND REVISIONS

PLAN OF STUDY
PHASE II STATE SUPERFUND INVESTIGATION
WELLSVILLE/ANDOVER LANDFILL

December 1985

Project #970-01-1

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Site Description

The Wellsville/Andover Consolidated Landfill (Wellsville Landfill) occupies approximately 138 acres on Snyder Road in the towns of Wellsville and Andover, New York. The landfill is located on a hillside in a rural area (Figure 1). Five residential wells are known to exist in the vicinity of the site. Duffy Hollow Creek and an unnamed tributary to Duffy Hollow Creek flow in a southerly direction to the east and west, respectively of the landfill.

The Wellsville Landfill is composed of two sections. The more recent section, in the northeast portion of the facility (Figure 1) was operated from 1978 to 1983. This area contains a leachate collection system which was installed while the landfill was being constructed.

The older section of the facility was operated from 1964 through 1978. Municipal and industrial wastes were disposed of in trenches in this area. The closed portion of the landfill is covered and seeded and has been retrofitted with a leachate collection system. The withdrawal of leachate from the trenches has resulted in significant subsidence of the ground surface in this area.

1.2 Background

A Phase I investigation was performed by a consulting firm for the New York State Department of Environmental Conservation (DEC) as part of the State "Superfund" Program. As a result of that investigation, existing information about the site was compiled and a preliminary Hazard Ranking System (HRS) score was

generated. A Phase II field investigation was recommended to obtain additional data needed to develop a final HRS score for the site.

Based upon the results of the Phase I effort, the DEC believed that the Wellsville Landfill is an inactive hazardous waste disposal site as defined in Section 27-1301(2) of the State Environmental Conservation Law (ECL). On August 26, 1985, the Village of Wellsville signed a DEC Order on Consent to perform the Phase II investigation of the facility.

1.3 Purpose/Scope

The proposed Phase II program is intended to address data deficiencies identified during the Phase I investigation. The proposed Phase II efforts are expected to provide the information necessary to determine the following:

- An assessment of site conditions.
- The extent and magnitude of contamination, based on site specific hydrogeologic conditions.
- A final HRS score.

The data generated during this study will help define the need for, and magnitude of, further remedial measures at the site.

2.0 TECHNICAL APPROACH

2.1 Scope of Work Definition

The proposed Phase II study of the Wellsville Landfill will consist of a hydrogeologic investigation culminating in an engineering report. The report will include a final HRS score for the site along with required documentation forms. This Plan of Study (POS) conforms with the applicable sections of the following documents:

- Superfund and Contract Laboratory Protocol, DEC 1985.
- Generic Work Plan Phase II Investigations, DEC 1985 (DEC Generic Work Plan).
- Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Water Monitoring, USEPA 1983.

The applicable protocols will be observed in all field and laboratory work.

Following the DEC Generic Work Plan, the proposed Phase II investigation has been segregated into six work tasks. These tasks are as follows:

- Task 1 - Geophysical Survey
- Task 2 - Installation of Monitoring Wells
- Task 3 - Sampling and Analysis
- Task 4 - Safety and Health Plan
- Task 5 - QA/QC Protocols
- Task 6 - Reporting Requirements

The DEC Generic Work Plan lists two other sections which are concerned with project costs. These costs have been submitted

to the Village of Wellsville under separate cover. The six work tasks are described in more detail below. A proposed project schedule of implementation is presented in Section 3.0 of this document.

2.2 Geophysical Survey

Geophysical surveys have already been conducted at the Wellsville Landfill. In June 1977, a seismic survey was performed to define bedrock contours at the site. In October 1979, an earth resistivity survey was conducted to help define the extent of leachate migration from the facility. The results of these surveys have been utilized in planning the location and depth of the monitoring wells. The retrofitting of the closed landfill with a leachate collection system has resulted in the subsidence of the cover material on the waste disposal trenches. This subsidence allows the areas of waste placement to be delineated. The existing survey information will be reviewed to provide additional input to this Phase II investigation. However, no further geophysical surveys will be conducted.

2.3 Installation of Monitoring Wells

2.3.1 Number and Location of Wells

Four groundwater monitoring wells will be installed at the Wellsville Landfill. One well will be located hydraulically upgradient of the site. The other three will be constructed at hydraulically downgradient locations. The proposed locations of the monitoring wells are shown in Figure 2. The final locations will be determined in the field by the supervising geologist. The October 1979 resistivity survey suggested a plume of contamination may exist to the southwest of the landfill. Well CW-4 will be located in the area of the plume, as indicated by the geophysical survey.

2.3.2 Drillers and Well Supervision

Empire Soils Investigation, Inc. (Empire Soils) has been tentatively selected to install the monitoring wells at the Wellsville Landfill. If complications should arise, preventing Empire Soils from performing the work, Rochester Drilling Company, Inc. will probably be utilized.

The field program will be under the overall direction of the Malcolm Pirnie Supervising Geologist (Mr. David Woodhouse). Detailed supervision of the field work will be the responsibility of the Malcolm Pirnie Project Geologist (Mr. Kevin Owen) and/or another qualified field geologist. The field geologist will have the following responsibilities:

- Supervision of all drilling work and well construction.
- Collection, labeling, and identification of formation samples, including rock cores.
- Maintenance of the boring log for each boring.
- Maintenance of pertinent notes in a field notebook and on daily field memos.
- Ensuring that the procedures of the QA/QC and the Health and Safety Plans are followed.

If significant changes in the POS are required due to field conditions, these revisions will be discussed with either Mr. David Woodhouse or Mr. Paul Werthman (Malcolm Pirnie Project Manager) prior to implementation. The DEC and the Village of Wellsville will be informed of significant changes in the field program.

2.3.3 Well Construction

All groundwater monitoring wells will be screened on the top of the bedrock in the unconsolidated overburden. Previous geophysical surveys indicate that bedrock is less than 10 feet deep at the upgradient end of the landfill. In the downgradient direction, bedrock depth appears to be less than 50 feet. If bedrock is at greater depths, the wells will be completed at 50 feet or a minimum of five (5) feet into the water bearing zone in the unconsolidated sediments.

The intention of this study is to screen all wells in the unconsolidated sediments at the bedrock interface. However, the possibility exists that a water bearing zone may not be encountered in the overburden. In that case, bedrock coring may be required. The wells would then be completed in the uppermost water bearing fracture zone encountered in bedrock.

Each hole will be bored using a hollow stem auger. Split spoon samples will be collected at five-foot intervals or at noticeable changes in stratigraphy. Split-spoon samples will be visually identified in the field by the Malcolm Pirnie geologist. Samples will be placed in glass jars, labelled, and archived until the end of the project. Boring logs, including monitoring well installation details, will be constructed for each well based upon the field descriptions. Particle size analyses (sieve analysis) will be performed on one sample collected from each well. The depth to the water level in each boring being drilled will be measured each morning and just prior to installation of the wells into the boring. Upon reaching final depth, the depth of the boring will be measured and recorded on the boring log.

A typical monitoring well installation is illustrated in Figure 3. Each well will be constructed with 2-inch inside diameter (I.D.), 5-foot long PVC screens and 2-inch I.D. PVC risers. The well annulus in the screening interval will be backfilled with well-sorted medium sand. Depending on the thickness of the saturated zone, a ten (10) foot interval may be spanned by the sand pack in the downgradient wells. The screened interval will be isolated from overlying zones with approximately four feet of bentonite grout. Cement-bentonite grout will be used to backfill the remainder of the well annulus to the surface and to provide a surface cap. Each well will be equipped with a locking, protective steel casing. The casing will be painted and labelled with the assigned well number.

Development by either air or water will be performed at the time of well installation. During development, the water will be contained to prevent entry into surface water bodies. After the wells have been developed, bailer permeability tests will be performed on each well. After installation, the casings will be surveyed to determine the location and elevation of the wells relative to a referenced datum.

2.3.4 Decontamination and Site Clean-up

Certain procedures will be followed to reduce the possibility of unintentionally introducing contaminants into the monitoring wells during construction. The upgradient well will be installed first, in order to avoid possible cross-contamination from downgradient locations. The augers will be cleaned of foreign material and then steam cleaned between wells. Dependent on site conditions at the time, decontamination will be performed either at the individual well sites or at a central decontamination station. All residuals of the cleaning operation will be contained at the station.

Liquids will be disposed of in the landfill leachate collection system while solids will be placed in the last trench in the newer portion of the landfill. As an alternative, well cuttings may be stored in drums on the site until the results of the laboratory analyses are received. If levels of contamination are below acceptable limits, the solid residuals may be used to fill in the subsided trenches in the old landfill area. DEC approval will be obtained before such an action is taken. Between samples, the split spoons will be washed with soapy water, rinsed with water, swabbed with acetone and then washed with hexane.

After each well is constructed, the well site will be cleaned up. All drill cuttings, along with other debris and paper, will either be removed and placed in the final trench in the newer portion of the landfill or used in the old portion of the landfill as described above. Any depressions resulting from the drilling operations will be filled in with clean fill from the site or well cuttings.

2.4 Sampling and Analysis

Samples of groundwater, surface water, and stream sediments will be collected. All samples will be analyzed for the following parameters:

1. Priority Pollutant Metals (Unfiltered Samples)
2. Priority Pollutant Organics
3. Cyanide
4. pH
5. Dissolved Oxygen
6. Conductivity

In the GC/MS scans, up to 30 additional peaks present in levels more than 10% above the calibrating standard will be

identified, as required by the DEC generic work plan. Either Recra Research or another DEC-approved laboratory (probably Compu Chem Laboratories) will perform the analyses. The DEC Contractor Laboratory Protocol (CLP) will be followed.

Samples will be collected on a one-time basis. Water samples will be obtained from:

1. The four monitoring wells.
2. Four residental wells and three springs near the site.
3. Two locations in Duffy Creek.
4. Two locations in the unnamed tributary to Duffy Creek.

If a leachate breakout is evident during the samping period, the seep will be sampled. Otherwise, one sample will be obtained from the sump in the leachate collection system. Grab samples will be taken of the sediments at the locations sampled for surface water in Duffy Creek and the unnamed tributary. Water and sediment samples will also be obtained from the on-site pond. In all, there will be 17 water samples and five sediment samples tested.

Groundwater samples will be collected using teflon bailers. The wells will be evacuated with PVC bailers. To avoid cross-contamination of wells, dedicated bailers will be utilized in each well. The PVC bailers will be left in the well after sampling. The teflon bailers will be decontaminated with soapy water, clean water, acetone, and hexane and removed from the site.

Before each well is evacuated, the groundwater elevation will be measured with an electronic water depth indicator. Continuously recharging wells will be evacuated

until field measurements (pH or conductivity) stabilize. A minimum of three to five well volumes of water will be removed. Wells which do not recharge continuously will be evacuated to dryness and allowed to recover before sampling. Surface water samples will be collected with a pond sampler. The sampler will be washed with soapy water, rinsed with clean water, and swabbed with acetone and hexane between locations.

Samples will be stored in either glass or plastic containers with teflon-lined caps, as appropriate. All containers will be precleaned and prelabelled. Necessary preservation will be conducted in the field, including acidification and chilling. Samples will be placed in coolers and transferred under chain-of-custody command to the designated analytical laboratory. Field and trip blanks will be prepared and included in the samples for analysis. A bound notebook will be used to record all field notes and a field report will be prepared.

Four air samples will be taken using an HNU photoionizer. One sample will be upwind while the other three will be downwind of the site. The sampling will be performed when personnel first arrive at the site and will precede all other field work.

2.5 Safety and Health Plan

A Safety and Health Plan has been prepared specifically for the Wellsville Landfill. The plan is presented in Attachment I. All contractor and subcontractor personnel will be required to read the plan prior to entry on the site. The procedures will be followed during all field work performed at the facility. The Wellsville Landfill is considered to require Level D protection.

2.6 QA/QC Protocols

Quality assurance and quality control (QA/QC) protocols will be established to ensure the reliability of the data generated for the Wellsville Landfill. The QA/QC plan for the field work is presented in Attachment II. The analytical laboratory will follow DEC required CLP. The QA/QC documentation will be provided in the analytical report prepared by the laboratories.

2.7 Reporting

Based upon the results of this study, a Phase II report will be prepared for submission to the DEC. To comply with the DEC Generic Work Plan, the report will contain the following sections:

- Title Page
- Table of Contents
- Executive Summary
- Purpose
- Scope of Work
- Site Assessment
- Final HRS Score (including HRS worksheets and documentation records)
- Appendices
- References

The content of each section will provide the information set forth in the DEC Generic Work Plan.

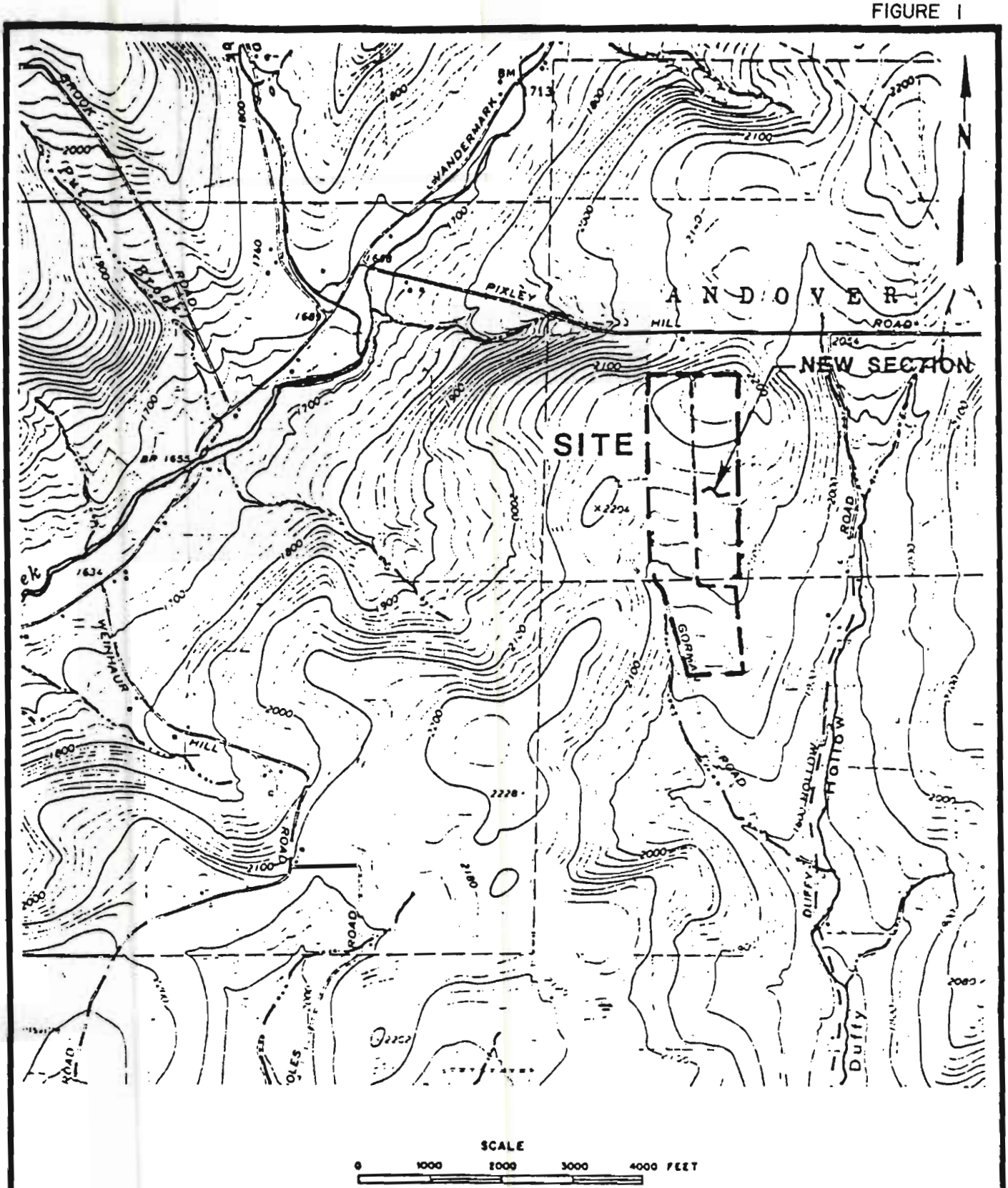
3.0 WORK SCHEDULE

A schedule for completing the major milestones associated with this project has been developed. These targeted completion dates are tabulated below.

MILESTONES	TARGETED COMPLETION DATES
1. Submittal of Plan of Study (POS to Wellsville)	December 30, 1985
2. Submittal of POS for DEC Review	January 6, 1986
3. DEC Approval of POS	April 18, 1986
4. Installation of Groundwater Monitoring Wells	May 15, 1986
5. Collection of Soil and Water Samples	June 1, 1986
6. Laboratory Analysis of Samples	July 11, 1986
7. Submittal of Draft Phase II Report to Wellsville	November 28, 1986
8. Submittal of Final Phase II Report to Wellsville	December 19, 1986
9. Submittal of Final Phase II Report for DEC Review	December 31, 1986

The proposed work schedule is felt to be reasonable. The time table may be modified according to needs and conditions encountered during the course of the project. However, the revisions in the schedule are not expected to prevent Wellsville from meeting any of the deadlines set forth in the DEC Order on Consent.

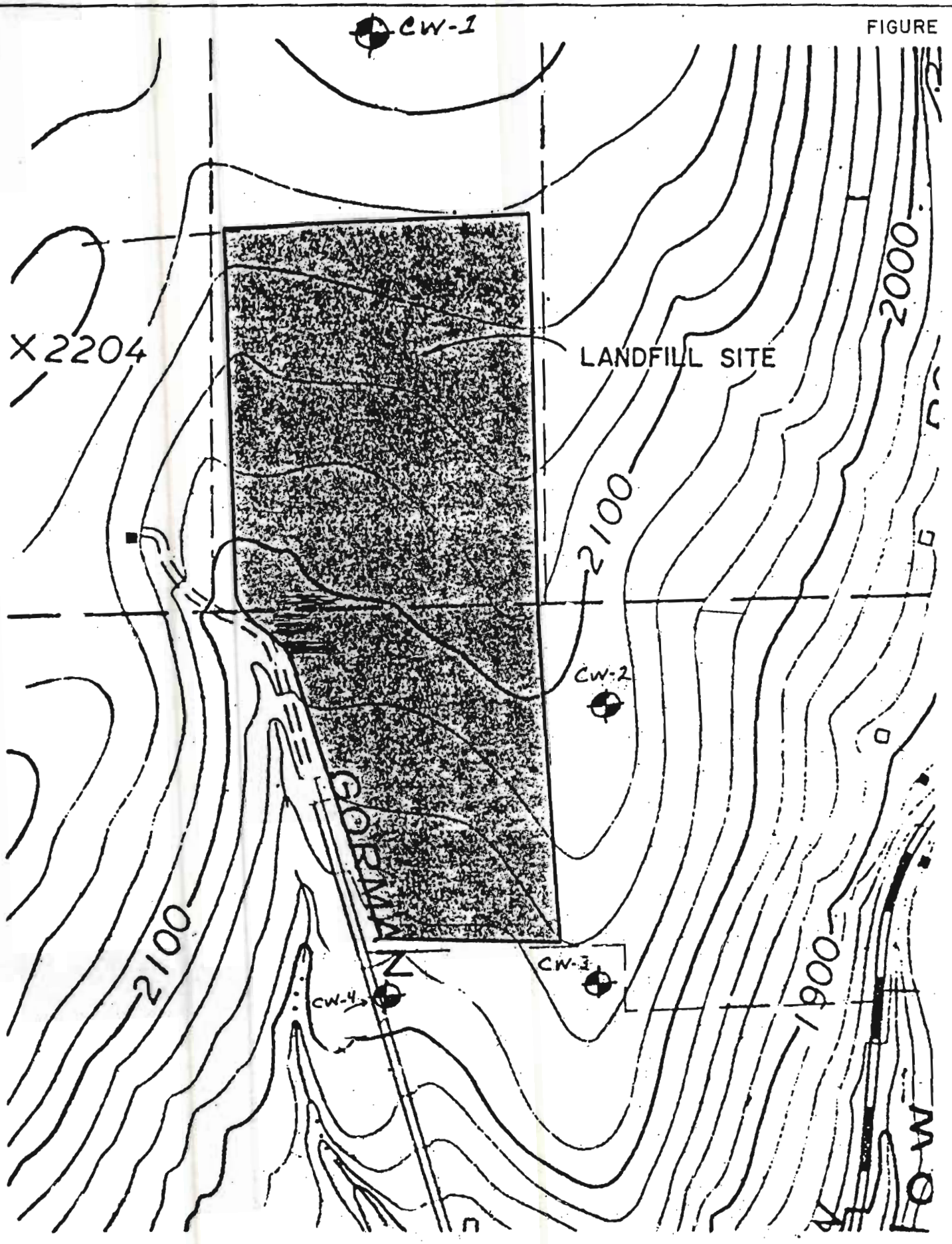
FIGURE 1



REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
WELLSVILLE NORTH, NY (1965) QUADRANGLE

SITE LOCATION MAP
WELLSVILLE LANDFILL
VILLAGE OF WELLSVILLE DEC 1985

FIGURE 2

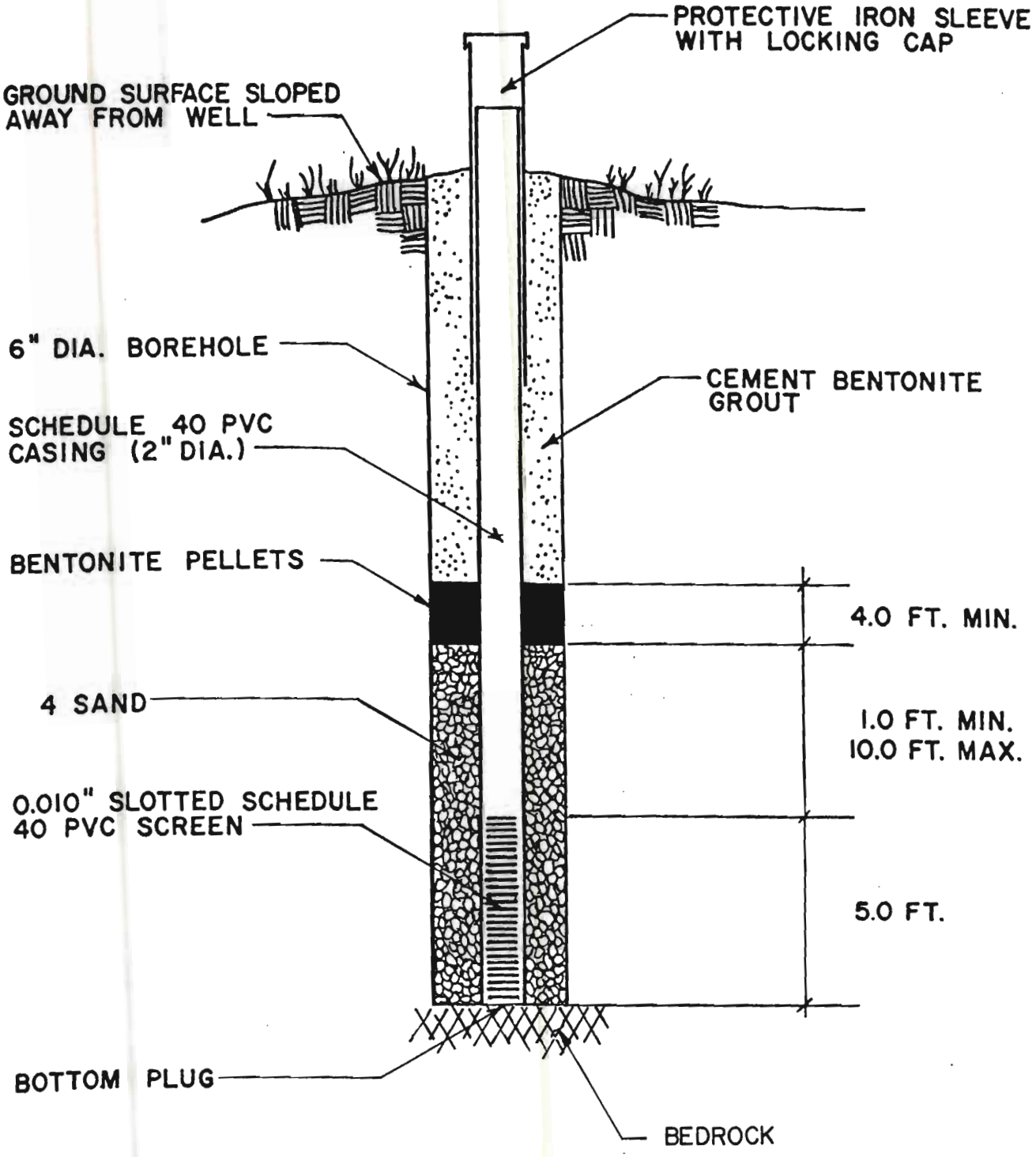


LEGEND

CW-1 PROPOSED SAMPLING WELLS

LOCATION OF PROPOSED SAMPLING WELLS

VILLAGE OF WELLSVILLE DEC 1985



WELLSVILLE PHASE II
INVESTIGATION
TYPICAL MONITORING WELL

VILLAGE OF WELLSVILLE

ATTACHMENT I

HEALTH AND SAFETY PLAN
WELLSVILLE LANDFILL

December 1985
970-01-1

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Description of Field Activities

Malcolm Pirnie will conduct a Phase II field investigation of the Wellsville/Andover Consolidated Landfill (Wellsville Landfill). This investigation will include the following field activities:

- o installing groundwater monitoring wells
- o collecting and analyzing groundwater, surface water, leachate, and sediment samples
- o analyzing air quality using an HNu.

Malcolm Pirnie will be assisted in the field by a subcontracted drilling company.

1.2 Summary of Potential Hazard

A variety of waste materials have been disposed of at the Wellsville Landfill. Potentially hazardous materials which may have been placed in the landfill include wastes containing cyanides, heavy metals, phenols, and chlorinated organics. The major potential exposure pathway is considered to be direct dermal contact. Exposure through inhalation is not considered to be a significant concern. However, air samples will be analyzed with an HNu to help verify this belief. Ingestion is also not deemed to be a significant potential exposure pathway.

1.3 Purpose and Applicability

The purpose of this plan is to present the minimum health and safety procedures to be followed during the Phase II field activities. Conditions encountered in the field may require additional precautions. The Health and Safety Officer and field

personnel will exercise discretion in determining what other precautions, if any, should be taken.

This plan applies to all personnel conducting field activities supervised by Malcolm Pirnie project personnel. At times, personnel not supervised by the Malcolm Pirnie field geologist will be present on the site. Examples would be representatives of the Village of Wellsville and the DEC. Since the field geologist has no supervisory control of such personnel, Malcolm Pirnie is not responsible for the health and safety of these people. However, copies of the Health and Safety plan will be provided to both the Village and the DEC for review.

2.0 PERSONNEL CONTACTS AND TELEPHONE NUMBERS

2.1 Health and Safety Officer

All field activities by Malcolm Pirnie personnel will be under the supervision of Mr.Kevin Owen, the field geologist. Mr. Owen will also serve as the project Health and Safety Officer. As such, Mr. Owen will be responsible for the implementation of the health and safety plan. In addition, Mr. Owen will serve as the liaison between Malcolm Pirnie and Wellsville and DEC personnel. The Health and Safety Officer will decide what additional precautions, if any, should be implemented in the field.

2.2 Field Personnel

There will be only a limited number of personnel involved in field activities at any one time. During the well installation phase, in addition to the Malcolm Pirnie field geologist, the only field personnel will be the subcontracted driller and driller's assistant. The only field personnel involved during the sample collection will be the field geologist and a Malcolm

Pirnie technician. Other personnel, not subject to Malcolm Pirnie supervision, such as representatives of the DEC and Wellsville, may be present at times.

2.3 Wellsville Contacts

2.3.1 Contact For Field Activities

The primary Wellsville personnel to be contacted to coordinate activities is:

- Mr. Robert Thurner (Village Maintenance Garage, Wellsville) [716-593-1850].

In Mr. Thurner's absence, Mr. Donald McFarquhar, Director of Public Works or Mr. Jon Palmer, Deputy Director of Public Works (same address and telephone number) should be contacted.

2.3.2 Contacts for Emergencies

In case of an emergency, Wellsville personnel to be contacted (in order of preference) are:

- Mr. Donald MacFarquhar
- Mr. Jon Palmer
- Mr. Robert Thurner

All of the above personnel are based in the Village Maintenance Garage, Wellsville [716-593-1850].

2.3.3 On-Site Telephone

A telephone is available on the Wellsville landfill. The telephone [716-593-5237] is located in the pump station. This building is usually kept locked. However, a key will be provided to field personnel for use.

2.3.4 On-site Emergency Equipment

There are no emergency equipment located on the Wellsville Landfill. However, the drill rig should be equipped with a fire extinguisher and tools, such as shovels, which could be used in an emergency.

2.4 Off-Site Emergency Service

2.4.1 Hospital

The hospital located closest to the site is the Jones Memorial Hospital in Wellsville [phone (716)593-1100].

2.4.2 Fire Company

In case of fire, the emergency number (911) should be called.

2.4.3 Police Services

To reach the police, in case of an emergency, the emergency number (911) should be called. The Wellsville Landfill is under the jurisdiction of the New York State Police [phone (716)593-1000]. The Wellsville Village Police can be reached at telephone number (716)593-5600.

2.4.4 Ambulance Service

Ambulance service is provided by the Wellsville Volunteer Ambulance Company [phone (716)593-4330].

3.0 SAFETY PROCEDURES

3.1 Before Implementation of Field Activities

Before any field work is begun, the following actions will be taken:

- Copies of the Health and Safety Plan will be provided to the Village of Wellsville and the DEC for review.
- All field personnel will read the Health and Safety Plan and sign the plan to acknowledge having read the document.
- All necessary field and safety equipment will be obtained and organized. The condition of all equipment will be checked to make sure the gear is in proper functioning order.
- Mr. Thurner (or Mr. MacFarquhar) will be contacted to coordinate field activities.

The Health and Safety Officer should implement any additional procedures deemed necessary to ensure the health and safety of field personnel.

3.2 During Field Activities

3.2.1 Monitoring

After arrival on the site and before actually beginning any field work, the air will be monitored by an HNu. The air monitoring procedures are set forth in the POS. During drilling operations, the air will be periodically monitored

by the HNu. The results of this activity will help determine the need for breathing protection devices, i.e. respirators.

3.2.2 Level of Protection

Level "D" protection is considered sufficient for this facility. Each personnel will be required to wear the following during field activities including sample collection, handling, and packaging:

- air purifying respirator i.e. half-face respirator with organic vapor cartridges (if indicated necessary by air monitoring)
- safety goggles or glasses
- hard hats (when in field)
- disposal Tyvek overalls
- inner surgical type gloves
- outer chemical protective gloves
- chemical resistant rubber boots

Some of these items exceed Level "D" protection. However, given the unknown extent of contamination, the added protection to prevent dermal exposure is considered prudent.

3.2.3 Safety Precautions

Field personnel will take all necessary and prudent precautions to avoid the potential for accidents and exposure to contamination. The procedures will include:

- Wearing all protective clothing during field activities.

- Wearing the air purifying respirator whenever necessary, as indicated by air monitoring.

- Properly decontaminating all reusable equipment before leaving the work site. Decontamination will consist of washing the equipment with soapy water, rinsing with clean water, and swabbing with hexane. A central decontamination station will be established, depending upon field conditions.

- Disposing of all disposable equipment and clothing before leaving the work site. The material will be temporarily stored in drums and then will be disposed of in the last trench of the new portion of the landfill.

- Using all equipment for only the prescribed purposes in the prescribed manner.

- Organizing and storing equipment in a manner that is easily accessible but safe.

During drilling operations, Malcolm Pirnie personnel will only be functioning as inspectors of the boring and well installations. Subcontracted drilling personnel will operate the rig and all equipment. The split spoon samples will be collected and opened by the driller. Malcolm Pirnie personnel will then visually inspect the sample and place the material in properly labelled containers.

Any injuries or accidents should be reported to the Health and Safety Officer. The Health and Safety Officer will ensure that the personnel receive any first aid,

decontamination, or other types of treatment which may be deemed necessary. The injuries and/or personnel exposures will be recorded on an incident report sheet (Figure 1).

3.3 After Completion of Field Activities

At the end of each day, field personnel should decontaminate all reusable equipment, as described above. All disposable equipment and clothing should be properly stored for later disposal. Workers should clean themselves. After all field work and the final decontamination is completed, the stored materials will be properly disposed of. The Health and Safety Officer will develop specific decontamination procedures and locations at the site.

4.0 PERSONNEL REVIEW

All Malcolm Pirnie and subcontractor personnel participating in the field activities at the Wellsville Landfill are required to read this plan. Upon reviewing the plan, personnel are to sign below. The signature will indicate the personnel have reviewed the Health and Safety plan, will make every effort to implement the plan, and have brought any concerns they may have to the attention of the Health and Safety Officer.

Signature Date

FIGURE I

MALCOLM PIRNIE, INC.

INCIDENT REPORT

Project_____ Health & Safety Mgr._____

Site Location_____ Project Mgr._____

Incident Summary_____

_____

_____

Date and Time of Incident_____

Exposed Individuals_____

_____

_____

Exposed to_____

_____

Actions Taken:

First Aid Administered

Doctor Examination

Other_____

_____

_____

_____

ATTACHMENT II
QUALITY ASSURANCE - QUALITY CONTROL PLAN
WELLSVILLE LANDFILL
PHASE II FIELD INVESTIGATION

DECEMBER 1985
Project 970-01-1

TABLE OF CONTENTS

1.0 INTRODUCTION

In order to help ensure the reliability of all data generated during the Phase II field investigation of the Wellsville Landfill, a quality assurance-quality control (QA/QC) plan has been developed. The plan is presented below. The Malcolm Pirnie field geologist will be responsible for the implementation of this QA/QC plan.

2.0 INSTALLATION AND TESTING OF MONITORING WELLS

2.1 Well Installation

The Malcolm Pirnie field geologist will directly supervise the boring and installation of all groundwater monitoring wells. The field geologist will be responsible for ensuring the monitoring wells are constructed in accordance with the Plan of Study (POS) and the New York State Department of Environmental Conservation (DEC) Generic Work Plan for Phase II Investigations (Generic Work Plan). In addition to project supervision, specific duties of the field geologist include:

- Maintaining the boring logs for each boring.
- Preparing construction details and diagrams for each monitoring well installed.
- Collecting, labelling, and identifying formation samples (split spoon samples).
- Measuring groundwater elevations to the nearest 0.01 feet with an electrical water level indicator.
- Recording all field data and pertinent notes in a field notebook and/or on daily memos.

- Ensuring decontamination procedures are observed between samples, between wells, and before leaving the site.

- Ensuring the Health and Safety and the QA/QC Plans are implemented.

- Maintaining all archived samples until the end of the project.

The field geologist will be responsible for preparing the groundwater potentiometric maps and geologic cross-sections based on field data.

2.2 Well Testing

After installation and development, the field geologist will perform bailer permeability tests on all monitoring wells. Each well will be evacuated using a submersible pump. The date and time of testing, well tested, and initial water levels will be recorded on data sheets in the field notebook, as will be the pumping rate. After drawdown is completed, the rate of recovery of the water level will be measured and recorded on the data sheets. The field geologist will be responsible for conducting the permeability calculations.

3.0 SAMPLE COLLECTION

3.1 Scope of Sampling

As part of the Phase II investigation , samples of groundwater, surface water and sediments will be obtained for laboratory analysis. The Plan of Study (POS) details the specifics of the sampling efforts. The groundwater samples will be collected from the monitoring wells installed during this investigation.

Additional samples will be obtained from area residential drinking wells. Surface water samples will be taken from area streams, springs or seeps (if any exist), the leachate collection system, and an on-site pond. Measurements for pH, conductivity and dissolved oxygen will be taken in the field. Sediment samples will be collected from the streams and the pond. Sampling will be conducted on a one-time basis.

3.2 Field Notebook

Field personnel will maintain a field notebook. All pertinent data will be recorded in the field notebook. At a minimum, the data recorded should include:

- Name and location of site.
- Name of samplers
- Date and time of sampling
- Weather conditions
- Locations sampled
- Sampling, decontamination, and bailing (for wells) equipment and procedures
- Water levels in monitoring wells (initially and prior to sampling)
- Well volume calculations and volume of water removed from wells
- Types and numbers of samples collected (including containers used and analytical parameters)
- Sample preservation techniques
- Final disposition of samples

Other information which may impact on the laboratory analyses of the samples or the evaluation of the data should also be recorded.

3.3 Sampling Procedure

3.3.1 Surface Water Samples

Surface water samples will be collected with a pond sampler. The pond sampler is basically a pole capable of holding a pre-cleaned sample container which can be submerged to collect a grab sample. Before use and between sampling locations, the entire apparatus will be decontaminated. Decontamination will consist of rinsing the equipment with clean water, washing with soapy water, rinsing with distilled water, swabbing with acetone, and finally rinsing with hexane.

3.3.2 Groundwater Samples

Prior to sampling, all groundwater monitoring wells will be evacuated and allowed to recover. The wells will be evacuated using dedicated PVC bailers which will be left in the wells. The initial water levels will be recorded and one well-volume of water will be calculated. The wells will be bailed until field measurements (pH or conductivity) stabilize. At a minimum, three to five well-volumes of water will be withdrawn from wells which are continuously recharging. Wells which do not recharge continuously will be evacuated to dryness.

All water samples will be collected with a teflon bailer. Before use and between monitoring wells, the teflon bailer will be decontaminated following the procedure described above from the pond sampler.

3.3.3 Sediment Samples

All sediment samples will be grab samples collected with a Ponar grab (i.e. Ponar Dredge). Before use and

between sampling locations, the Ponar grab will be decontaminated as described above for the pond sampler.

3.4 Sample Container

All samples will be placed in pre-cleaned plastic or glass containers, as appropriate. The containers will be properly labelled before sampling personnel enter the site. The labels will include the following information:

- Malcolm Pirnie project number
- Date of sampling
- Initials of samplers
- Parameters samples are to be tested for
- Sample location.

All sample containers will be provided by the subcontracted analytical laboratory which will follow DEC CLP. The laboratory will be responsible for pre-cleaning all sample containers. Samples for metals analysis can be placed in plastic or glass containers. The samples for organic analysis will be placed in glass containers. When required as for chlorinated organics and pesticides analysis, the containers will have teflon-lined caps.

3.5 Sample Preservation

All sample preservation will be conducted in the field. The preservations will include:

- Total metals - add HNO_3 to pH below 2
- Phenolics - cool to 4°C, add H_2SO_4 to pH below 2
  add 1.0 g $CuSO_4$ per liter
- Chlorinated Organics - cool to 4°C
- Pesticides - cool to 4°C
- Purgeable and Extractible Organics - cool to 4°C
  add 0.008% $Na_2S_2O_3$

All preservations will be conducted according to EPA guidelines.

3.6 Sample Shipping

The laboratory analysis will be conducted by either Recra Research or Compu Chem Laboratories. All samples will be placed on ice in coolers in the field. If RCRA Research performs the analyses, Malcolm Pirnie personnel will deliver the samples in the coolers to the laboratory. Packing the samples in ice in the coolers will help guarantee the integrity of the sample container. If the analyses is performed by Compu Chem, Compu Chem will provide packages for shipping the sample containers. Malcolm Pirnie personnel will place the containers in the packages and deliver the samples to an express freight service for shipment to Compu Chem.

3.7 Chain-of-Custody

All samples will be shipped under chain of custody control. A copy of a Malcolm Pirnie chain-of-custody sheet is attached.

4.0 SAMPLE ANALYSIS

The samples will be analyzed by a DEC-approved laboratory (either Recra Research or Compu Chem). The laboratory will follow DEC Contractor Laboratory Protocol (CLP). Further elaboration of QA/QC procedures is therefore not considered necessary.

MALCOLM PIRNIE, INC.

CHAIN OF CUSTODY RECORD:

ANALYSIS FOR CHARACTERISTICS OF HAZARDOUS WASTE

CLIENT NAME: _____

LOCATION: _____

REPRESENTATIVE SAMPLE DESCRIPTION	COLLECTED BY/DATE	SAMPLING METHOD	CHARACTERISTIC(S) TO BE TESTED*	HANDLING PRECAUTIONS	RECEIVED BY/DATE	PRESERVATION METHOD	TESTED BY/DATE

COMMENTS: _____

* I = IGNITABILITY
C = CORROSIVITY
R = REACTIVITY
EM = EP TOXICITY (Metals)
EO = EP TOXICITY (Organics)

Mr Thurner

New York State Department of Environmental Conservation
600 Delaware Avenue, Buffalo, N.Y. 14202-1073

Henry G. Williams
Commissioner

March 3, 1986

Mr. Robert Gardner, Mayor
Village of Wellsville
156 N. Main Street
P.O. Box 591
Wellsville, New York 14895

Dear Mayor Gardner:

Phase II Work Plan
Wellsville - Andover Landfill
Site No. 902004

The Plan of Study submitted by the Village of Wellsville for performing a Phase II Study on the Wellsville - Andover Landfill in accordance with the October, 1985 Order on Consent has been reviewed. This work plan is in conformance with Departmental requirements, and with several minor technical modifications, is approved under Section V of that order.

This approval is granted subject to the several minor technical changes discussed with Mr. MacFarquhar on February 26th. These include:

1) The progression of drilling activity must be CW-1, CW-4, CW-3, CW-2 as labeled in the approval work plan.

2) An HNu or OVA meter must be present on site during all drilling activities. Readings must be taken and recorded for all split spoon samples.

3) The LaDue spring must be included in the spring samples taken (not specifically mentioned).

4) For all sediment samples obtained, duplicate samples for E.P. Toxicity must be taken. The E.P. Toxicity samples are to be stored for possible analysis if the sediment sample results are high.

5) The site code (902004) should be included on all reports and correspondence related to this project.

The next step in completing this Phase II investigation is the actual field work and sample collection. In order to schedule oversight activities by DEC personnel, it would be appreciated if you contacted Mr. Clare at (716) 847-4585 as soon as a firm schedule for sampling and/or well drilling activities is established.

If you should have any questions concerning this approval or any other aspect of this project, please feel free to contact us.

Very truly yours,

Peter J. Buechi, P.E.
Regional Engineer for Solid and Hazardous Waste

cc: Lawrence Clare
Peter Burke
Robert Thurner
Raymond Lupe

PJB:jps

NT M1-M1

New York State Department of Environmental Conservation
600 Delaware Avenue Buffalo, NY 14202-1073

Henry G. Williams
Commissioner

July 10, 1986

Mr. Kent McManus
Malcolm Pirnie, Inc.
3619 Packard Road
Niagara Falls, NY 14303

Dear Mr. McManus:

Wellsville-Andover Site No. 902004

This letter confirms our July 10, 1986 telephone conversation regarding the field sampling program for the Wellsville-Andover Phase II Study.

The intent of the Phase II Study is to evaluate impact of the landfill on the environment -- air, surface water and groundwater. The sampling points and parameters were selected to best characterize the impact, if any, of the material in the landfill on offsite receptors. In our approval of the sampling points and parameters, it was assumed that the sampling would be performed at one point in time. A picture of stream quality data (under steady state conditions in the landfill) would then result.

The problems you have experienced with the use of meters in the field to measure conductivity, pH and dissolved oxygen are limiting the value of the Phase II sampling program. Interpretation of the data will be more difficult than if the sampling had been carried out on one date.

Your proposal to eliminate dissolved oxygen measurements is not acceptable. Dissolved oxygen is one of the most important parameters in assessing stream quality data. Its measurement is essential to this study. I trust that any resampling of surface water for dissolved oxygen will include temperature measurements so that the data can be interpreted.

We are looking forward to the submission of the Phase II Report for this project.

Very truly yours,

Lawrence G. Clare

Lawrence G. Clare, P.E.
Senior Sanitary Engineer

LGC:ec
cc: Mr. Robert Thurner

Wellsville Andover - Site 902004
Field Changes to Phase II Work Plan

	Change	Field Conditon	Rationale
1.	CW-1 eliminated Spring added	Two (2) dry borings to bedrock	Bottom of surface water collection trench is about at bedrock. Two (2) active springs above bottom on uphill side. Springs should represent upgradient groundwater.
2.	CW-2 eliminated Spring added	Village intercepted (4/86) Spring with 10' trench in bedrock borrow pit on east side of old landfill. Spring in shale beneath 2' of sandstone.	Spring should represent groundwater at proposed location of CW-2. Good flow. Well would tap the same aquifer.
3.	CW-3B, CW-4B added	Two (2) aquifers encountered in drilling. Cluster wells installed.	Leachate may be leaving landfill via either aquifer.
	CW-3 location changed	Two (2) dry holes to bedrock on southeast corner. Well moved west.	Probably hit sandstone outcropping noted at CW-2. Poor seismic data on bedrock depth.
4.	Upstream sample location changed Unnamed tributary to Duffy Hollow Creek	Unnamed tributary to Duffy Hollow originates in landfill. Leachate evident from pump station upstream	Spring about opposite Pump station on west side of unnamed tributary represents the furthest upstream continued source of visibly uncontaminated surface water
5.	Private well sampling ~~Bauer~~ Well eliminated ARNOLD GREEN	Negotiated reduction in sampling locations to offset #3 additions	~~Bauer~~ and Kelly wells are both so far downstream that no ~~effect~~ is expected. Sampling data available from previous DEC sampling.

L. Clare
6·24·86

New York State Department of Environmental Conservation
600 Delaware Avenue, Buffalo, N.Y. 14202-1073

970-01-1
C-6

Henry G. Williams
Commissioner

July 11, 1986

Mr. Robert Thurner
Village of Wellsville
156 N. Main Street
Wellsville, New York 14895

Dear Mr. Thurner:

Phase II Investigation
Wellsville Andover Landfill
Site No. 902004

This letter will confirm our discussions regarding completion of the field work for Phase II Investigation being performed by the Village and your consultant.

Several field changes were made in the Work Plan originally approved by this office on March 3, 1986. The five (5) changes summarized in the attached chart were agreed to in May and June, 1986. Please review this summary for any corrections and/or additions which may be appropriate. These changes to the approved work plan are acceptable to this office and should be considered to meet the provisions of the Consent Order.

There were several deviations from accepted practice in carrying out the field sampling at this site. Although we have discussed most of them, I believe that a satisfactory Phase II Report is possible with the samples obtained.

On July 10, 1986, I received a telephone request from Mr. MacManus to delete dissolved oxygen measurements from the list of parameters to be measured in the surface waters. This request was apparently precipitated by Malcolm Pirnie's inability to obtain a D.O. meter for the recent resampling of the streams. The request was denied (refer to the attached letter).

If you would like to discuss either the attached Work Plan modifications or any other aspect of this investigation, please feel free to telephone me at 716-847-4585.

Very truly yours,

Lawrence G. Clare

Lawrence G. Clare, P.E.
Senior Sanitary Engineer

cc: Mr. Donald MacFarquhar
Mr. Raymond Lupe
Mr. John Tygert

August 4, 1986

New York State Department
of Environmental Conservation
600 Delaware Avenue
Buffalo, New York 14202-1073

Attention: Mr. Lawrence G. Clare
Senior Sanitary Engineer

Re: Wellesville-Andover Site No. 902004

Gentlemen:

As per your letter dated July 10, 1986, we have completed (viz. on July 30, 1986) dissolved oxygen and temperature measurements at the surface water sampling locations for the above-referenced site. As per our telephone discussion of July 10, 1986, dissolved oxygen and temperature measurements were not taken on groundwater or leachate samples.

We are currently summarizing the analytical data received to date and have initiated preparation of the Phase II Report.

If you have any questions in regard to this matter, please contact us.

Very truly yours,

MALCOLM PIRNIE, INC.

Kent R. McManus, P.E.
Project Engineer

cc: Mr. Robert Thurner
Village of Wellsville
File: 970-01-1; C-6

APPENDIX 2

CONSENT ORDER

APPENDIX A

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of a Field Investigation to Identify Any Threat to the Environment Caused by the Alleged Disposal of Industrial and Hazardous Wastes by:	ORDER ON CONSENT
VILLAGE OF WELLSVILLE 156 North Main Street P.O. Box 591 Wellsville, New York 14895	Index No. File No. 84-165
Respondent	9-1317

WHEREAS:

1. The New York State Department of Environmental Conservation (the "Department") is responsible for the enforcement of Article 27, Title 13, of the Environmental Conservation Law of the State of New York (the "ECL") entitled "Inactive Hazardous Waste Disposal Sites."

2. The Village of Wellsville (the "Respondent") is a Village organized and existing under the laws of the State of New York.

3. Respondent owns property at the Wellsville/Andover Landfill (the "Site"). A map of the Site is attached hereto and is hereby incorporated into this Order as Appendix "A."

4. Beginning in 1964 and continuing through 1983, the Village of Wellsville, the Town of Wellsville, the Village of Andover, and the Town of Andover operated a municipal landfill at the Site on Snyder Road in the Towns of Andover and Wellsville.

5. The Department alleges that the Site is an inactive hazardous waste disposal site, as that term is defined in ECL Section 27-1301(2).

6. The Department alleges that hazardous and industrial wastes, hazardous waste constituents, and toxic degradation products thereof at the Site constitute a significant threat to the environment.

7. Pursuant to ECL Section 27-1313(3)(a), whenever the Commissioner of the Department of Environmental Conservation (the "Commissioner") "finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment; he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program subject to the approval of the Department, at such site, and (ii) to implement such program within reasonable time limits specified in the Order."

8. The Department and Respondent acknowledge that the goals of this Order shall be that Respondent shall develop and implement a field investigation program to:

(i) determine the nature of the wastes and the areal extent and vertical distribution of the wastes disposed of at the Site;

(ii) attempt to identify any past, current and/or potential future releases or migration of hazardous waste, as

that term is defined in ECL Section 27-1301(1), and/or industrial waste, from the site to other on-Site and off-Site areas; and

(iii) evaluate the on-Site and off-Site impacts of any such migration upon the environment.

9. Respondent does not admit (a) that it or anyone else disposed of any hazardous substances or wastes at the Wellsville/ Andover Landfill Site, or (b) that it is a person responsible for cleanup of, or remedial efforts at, the Site or any damages related to the Site, and this Order shall not be construed as an admission.

NOW, having considered this matter and being duly advised, IT IS ORDERED THAT:

I. All investigations, proposals, reports, plans, remedial programs and supplements and revisions thereto covered by this Order shall address both on-Site and off-Site (in the vicinity of the Site) contamination which may be caused by the alleged disposal of hazardous and industrial wastes at the Site, and shall be prepared, designed and executed in accordance with Requisite Technology. As used in this Order, Requisite Technology means engineering, scientific and construction principles and practices subject to the Department's approval, which (a) are technologically feasible, and (b) will most effectively identify any present or potential future threat to the environment posed by the alleged disposal of hazardous and industrial wastes at and in the vicinity of the Site.

Respondent will make a good faith effort to submit proposals, reports, field investigations, and any supplements or revisions thereof in accordance with Requisite Technology.

II. As used herein, "hazardous wastes" shall mean hazardous wastes, any hazardous constituents thereof, and any toxic degradation products of such wastes and of such constituents.

III. Respondent shall undertake a field investigation of the Site and of areas off-Site which may be affected by the alleged disposal of hazardous or industrial wastes (the "Field Investigation").

IV. On or before January 10 __, 1986, the Respondent shall submit to the Department a proposed written scope of work (the "Proposal") outlining the nature and extent of the work to be undertaken in conducting the Field Investigation. At a minimum, the Proposal shall meet the requirements of the generic workplan attached hereto as Appendix "B" and include the names of the consulting firm(s), contractor(s) and laboratory to be performing the work.

V. Within 30 days after receipt of the Proposal, the Department shall provide written notification to Respondent of its acceptance of or reasonable objections to the Proposal. If the Department accepts the Proposal, Respondent shall perform the Remedial Investigation in accordance with the Proposal.

If the Department refuses to accept the Proposal, then within 30 days after receipt of the Department's reasonable objections to the Proposal, Respondent shall revise the Proposal

in accordance with the terms, provisions and conditions of this Order and shall submit to the Department a Proposal which has been revised in accordance with the Department's reasonable objections (the "Revised Proposal").

Within 15 days after receipt of the Revised Proposal, the Department shall provide written notification to Respondent of its acceptance of or reasonable objections to the Revised Proposal. If the Department accepts the Revised Proposal, Respondent shall perform the Field Investigation in accordance with the Revised Proposal.

If the Department refuses to accept the Revised Proposal, the parties shall meet within 30 days of notification by the Department to the Respondent of its refusal to accept and its reasonable objections, and shall attempt to resolve their differences and negotiate a Proposal acceptable to both parties.

The accepted Proposal or the accepted Revised Proposal shall be attached hereto and shall be incorporated into this Order as Appendix "C". Such Proposal shall hereafter be referred to as the "Accepted Proposal".

The Department shall not unreasonably withhold acceptance of a proposal which satisfies the terms, conditions and provisions of this Order.

VI. On or before December 31, 1986, Respondent shall submit to the Department a Field Investigation Report (the "Report"), founded upon its performance of the Field Investigation in accordance with the Accepted Proposal. The Report shall include

a copy of the Accepted Proposal and all data generated, and all other information obtained, during the Field Investigation and completed site hazard ranking score sheets.

VII. Within sixty (60) days after its receipt of the Report, the Department shall provide written notification to Respondent of its acceptance of or reasonable objections to the Report.

Within 60 days after its receipt of notice of reasonable objections, Respondent shall revise the Report and/or reperform or supplement the Field Investigation in accordance with the terms, provisions and conditions of this Order and shall submit to the Department a Report which has been revised in accordance with the Department's reasonable objections (the "Revised Report").

Within fifteen (15) days after its receipt of the Revised Report, the Department shall provide written notification to Respondent of its acceptance of or reasonable objections to the Revised Report.

If the Department refuses to accept the Revised Report the parties shall meet within 30 days of notification by the Department to the Respondent of its refusal to accept and its reasonable objections, and shall attempt to resolve their differences and negotiate a Proposal acceptable to both parties.

VIII. The Department reserves the right to request a modification and/or an amplification and expansion of the Field Investigation and Report by Respondent within the time periods set forth above, to address specific off-Site areas if the Department reasonably determines that further off-Site investigation is

necessary, as a result of reviewing data generated by the Field Investigation or as a result of reviewing other data or facts. The Report shall be attached hereto and shall be incorporated into this Order as Appendix "D."

IX. The Department shall review the Report and shall use the Report as the basis of the development of the Site Hazard Ranking Score assigned to the Site for State and Federal Superfund Site ranking purposes.

X. The Department shall, upon reasonable notice to Respondent, have the right to obtain for the purpose of comparative analysis "split samples" or "duplicate samples," at the Department's option, of all substances and materials sampled by Respondent pursuant to this Order. As used herein: "split samples" shall mean whole samples divided into aliquots; "duplicate samples" shall mean multiple samples, collected at the same time from exactly the same location, using the same sampling apparatus, collected into identical containers prepared identically, filled to the same volume, and thereafter identically handled and preserved.

XI. Respondent shall provide notice to the Department of any excavating, drilling or sampling to be conducted pursuant to the terms of this Order at least five (5) working days in advance of such activities. The Department shall designate a Project Engineer to whom such notice can be given in person or by telephone.

XII. Respondent shall permit any duly designated officer, employee, consultant, contractor or agent of the Department to enter upon the Site or areas in the vicinity of the Site which may be under the control of Respondent, and any areas necessary to gain access thereto, for inspection purposes and for the purpose of making or causing to be made such sampling and tests as the Department deems necessary, and for ascertaining Respondent's compliance with the provisions of this Order. All such inspections, sampling and testing shall be done at the Department's expense, and Respondent shall not be responsible to reimburse the Department or any other person for such expenses, except where such inspections, sampling and testing are necessary due to Respondent's violation of this Order.

XIII. Respondent shall use reasonable efforts to obtain whatever permits, easements, right-of-way, rights-of-entry, approvals or authorizations which are necessary in order to perform the Field Investigation and all of Respondent's other obligations pursuant to this Order. However, it cannot be held responsible for gaining access to property outside of its control or jurisdiction.

XIV. Respondent shall retain a third-party professional consultant, contractor, and/or laboratory to perform the technical, engineering and analytical obligations covered by this Order. Said consultant, contractor, and/or laboratory shall have demonstrable experience, capabilities and qualifications in the type of work which they will be performing.

Or if a laboratory owned by Respondent is utilized, or professional scientists, engineers, or technicians in the employ of Respondent are utilized to fulfill the terms and conditions of this Order, said laboratory, laboratory staff, and professionals shall have demonstrable experience, capabilities and qualifications in the type of work which they will be performing.

XV. Respondent shall not suffer any penalty under any of the provisions, terms and conditions hereof, or be subject to any proceedings or actions for any remedy or relief, if it cannot comply with any requirements of the provisions hereof because of an act of God, war, riot, weather conditions, breach of contract by its third-party consultant, contractor, and/or laboratory, or other condition as to which negligence or willful misconduct on the part of Respondent was not a proximate cause, provided, however, the Respondent shall immediately notify the Department in writing when it obtains knowledge of any such condition and request an appropriate extension or modification of the provisions hereof.

XVI. Nothing contained in this Order shall be construed as barring, diminishing, adjudicating or in any way affecting (1) any legal or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the Department or Respondent may have against anyone other than Respondent, its directors, officers, employees, servants, agents, successors and assigns; (2) the Department's right to enforce, at law or in equity, the terms and conditions of this Order against Respon-

dent, its directors, officers, employees, servants, agents, successors and assigns in the event that Respondent shall fail to fulfill any of the provisions hereof; and (3) the Department's right to bring any action, at law or in equity against Respondent, its directors, officers, employees, servants, agents, successors and assigns with respect to areas or resources that may have been affected or contaminated as a result of the alleged release or migration of hazardous or industrial wastes from the Site or from areas in the vicinity of the Site; or (4) Respondent's rights to enforce this order against the Department. Nothing herein shall be construed as affecting the Department's or the Respondent's rights to commence any action or proceeding to which either may be entitled in connection with, relating to, or arising out of the alleged disposal of hazardous or industrial wastes at the Site.

XVII. The terms of this Order shall not be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers, either at common law or as granted pursuant to statute or regulation.

XVIII. Neither the State of New York nor any agency thereof shall be held out as a party to any contract entered into by Respondent in carrying out activities pursuant to this Order, nor shall the State of New York or any agency thereof be liable for any injuries or damages to persons or property resulting from acts or omissions of the respondent its officers, directors, employees, agents, servants, receivers, trustees, successors,

assignees, or any other persons, including, but not limited to firms, corporations, subsidiaries, contractors or consultants, in carrying out activities pursuant to this Order.

XIX. The effective date of this Order shall be the date this Order is signed by the Commissioner or his designee.

XX. If, for any reason, Respondent desires that any provision of this Order be changed, Respondent shall make timely written application therefore to the Regional Director of Region 9 of the Department, setting forth reasonable grounds for the relief sought.

XXI. Within 30 days after receiving an executed copy of this Order, Respondent shall file a Declaration of Covenants and Restrictions with the real property records of the Allegany County Clerk's Office, for the purpose of providing notice of this Order to all potential future purchasers of any portion of the Site. Said Declaration must indicate that any successor in title to any portion of the Site may be responsible for implementing the provisions of this Order.

XXII. In the event that Respondent proposes to convey the whole or any part of its ownership interest in the Site, Respondent shall, not less than 30 days prior to the consummation of such proposed conveyance, notify the Department in writing of the identity of the transferee and of the nature and date of the proposed conveyance. In advance of such proposed conveyance, Respondent shall notify the transferee in writing, with a copy to the Department, of the applicability of this Order.

XXIII. Notwithstanding the foregoing, to the extent required by Environmental Conservation Law §27-1313(g), as added by Chapter 38 of the Laws of 1985, the State of New York shall provide, from the state hazardous waste remedial fund, within the limitations of appropriations therefor, seventy-five percent of the eligible design and construction costs for any remedial program which Respondent is liable solely because of its ownership of the Site and which are not recovered from or reimbursed or paid by another responsible party or the federal government.

XXIV. A. All communication required hereby to be made between the Department and Respondent in writing shall be transmitted by United States Postal Service or hand delivered to the addresses in paragraphs A and B hereunder.

B. Communication to be made from Respondent to the Department shall be made as follows:

1. 1 copy to the Regional Director, Region IX, 600 Delaware Avenue, Buffalo, New York 14202.

2. 1 copy to the Division of Solid and Hazardous Waste, Room 209, 50 Wolf Road, Albany, New York 12233.

3. 1 copy to the Director, Division of Environmental Enforcement, Room 618, 50 Wolf Road, Albany, New York 12233.

1. 1 copy to Village of Wellsville, 156 N. Main Street, P.O. Box 591, Wellsville, New York 14895.

2. 1 copy to Mr. Alan J. Knauf, Harris, Beach, Wilcox, Rubin & Levey, Two State Street, Rochester, New York 14614.

3. 1 copy to Mr. John W. Clarke, Harris, Beach, Wilcox, Rubin & Levey, Two State Street, Rochester, New York 14614.

D. The Department and Respondent respectively reserve the right to designate different addresses on notice to the other.

XXV. The provisions of this Order shall be deemed to bind Respondent, its officers, directors, agents, servants, employees, successors and assigns.

XXVI. Nothing herein shall be construed to bind any entity not specifically bound by the terms of this Order.

XXVII. The provisions hereof shall constitute the complete and entire Order between Respondent and the Department concerning the Site. No terms, conditions, understandings or agreements purporting to modify or vary the terms hereof shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestions or comments by the Department regarding reports, proposals, plans, specifications, schedules or any other writing submitted by Respondent shall be construed as relieving Respondent to its obligations to obtain such formal approvals as may be required by this Order.

DATED: , 1985 , New York

HENRY G. WILLIAMS
Commissioner
New York State Department of
Environmental Conservation

Respondent hereby waives its right to a hearing for purposes of determination of the terms and conditions of the foregoing order, and waives any objection to the terms and conditions of the foregoing order

Respondent - Village of Wellsville
By Robert G. Gardner
Title - Mayor, Village of Wellsville
Date - August 26, 1985

(Seal)
Corporate

State of New York)
ss.:
County of Allegany)

On this 27th day of August 85, 1985 before me personally came Robert G. Gardner, to me known, who being by me duly sworn did depose and say that he resides at 355 North Main St. Wellsville, N.Y. that he is the Mayor of the Village of Wellsville, the Municipal corporation described in and which executed the foregoing instrument; and that he signed his name as authorized by said Village Board

Doritha M Watson
NOTARY PUBLIC

DORITHA M WATSON
Notary Public No 796
State of New York
Qualified in Allegany County
My Commission Expires March 30, 1986

APPENDIX 3

BORING LOGS/MONITORING WELL INSTALLATIONS

BORING B-1

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/9/86	**LOCATION:** Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger	**SAMPLING METHOD:** 2" ID Split Spoon
ELEVATION:	**DATUM:** NE of LF near tree line

SAMPLE no.	SAMPLE depth	blows per 6"		DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN	WELL CONST.	REMARKS
S-1	0'-2'	2	2			very loose, brown, SAND and SILT, some gravel, organic debris, moist, changing at 6" to yellow-brown, SAND and SILT, some gravel, moist, changing		
		2	3					
S-2	5'-6'	4	100	5		to very dense, brown, CLAY and SILT, some sand and rock fragments, wet		
S-3	6'-8'	6	14			dense, gray, SILT and CLAY and ROCK FRAGMENTS, dry		
		25	43					
S-4	10'-11'	21	100/6"	10		very dense, gray, SILT and CLAY and ROCK FRAGMENTS, dry		
				15				
				20				
				25				
				30				
				35				

NOTES: Boring B-1 terminated at 10'

BORING B-1C

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/8/86	**LOCATION:** Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger CME-55	**SAMPLING METHOD:** 2" ID Split Spoon
ELEVATION: 2170'	**DATUM:** N. Side of Landfill

SAMPLE no.	SAMPLE depth	blows per 6"		DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN	WELL CONST.	REMARKS
S-1	0'-2'	1	2		BKD	Loose brown, SANDY-SILT, topsoil changing at 6" to grayish CLAY and SILT, some sand and gravel, moist.		
		3	3					
S-2	5'-7'	20	36	5	BKD	very dense, brown, medium to fine, SAND and SILT, some gravel and rock fragments, dry		
		34	20					
S-3	10'-12'	21	25	10	BKD	very dense, gray, fine SAND and SILT and ROCK FRAGMENTS rust staining present, dry.		
		61	60					
S-4	15'-17'	17	40	15		very dense, gray, fine SILT and CLAY, some sand and rock fragments, rust staining present, dry, becoming slightly moist at 16.5-16.8, then dry.		
		36	50/3"					
				20				
				25				
				30				
				35				

Photovac tip readings

NOTES: Refusal of augers at 19.5'. Hole dry on 5/8/86 and 5/9/86.
Boring abandoned on 5/9/86.
BKD - background detection limit

MALCOLM

BORING B-3A

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/13/86	**LOCATION:** Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger	**SAMPLING METHOD:** 2" ID Split Spoon
CME-55	
ELEVATION: 2040'	**DATUM:** SE corner of LF, on LaDue property

SAMPLE no.	SAMPLE depth	blows per 6"		DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN	WELL CONST.	REMARKS
S-1	0'-2'	3	2			loose, brown, SAND and SILT, organic debris, dry, changing at 1' to...gray, fine, SAND and SILT, some clay and rock fragments, rust-staining present, moist.		
		3	5					
				5				
				10				
				15				
				20				
				25				
				30				
				35				

NOTES: Auger relented at 5'. Boring abandoned.

MALCOLM

BORING B-3B

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/13/86	**LOCATION:** Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger	**SAMPLING METHOD:** 2" ID Split Spoon
CME-55	
ELEVATION: 2040'	**DATUM:** SE of LF ≈ 50' E of B-3A

SAMPLE no.	SAMPLE depth	SAMPLE blows per 6"		DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN	WELL CONST.	REMARKS
S-1	0'-2'	4	4			loose, brown, SAND and SILT, organic debris, dry, changing at 1.5' to gray fine SAND and SILT, some CLAY and ROCK FRAGMENTS, some rust staining dry.		
		5	13					
S-2	5'-7'	20	16	5		dense, gray, fine SAND and SILT and CLAY and ROCK FRAGMENTS, some rust staining, dry.		
		17	17					
S-3	10'-10.9'	22	13	10		medium, dense, gray fine, SAND and CLAY and ROCK FRAGMENTS, rust staining, dry		
		14	100/0					
				15				
				20				
				25				
				30				
				35				

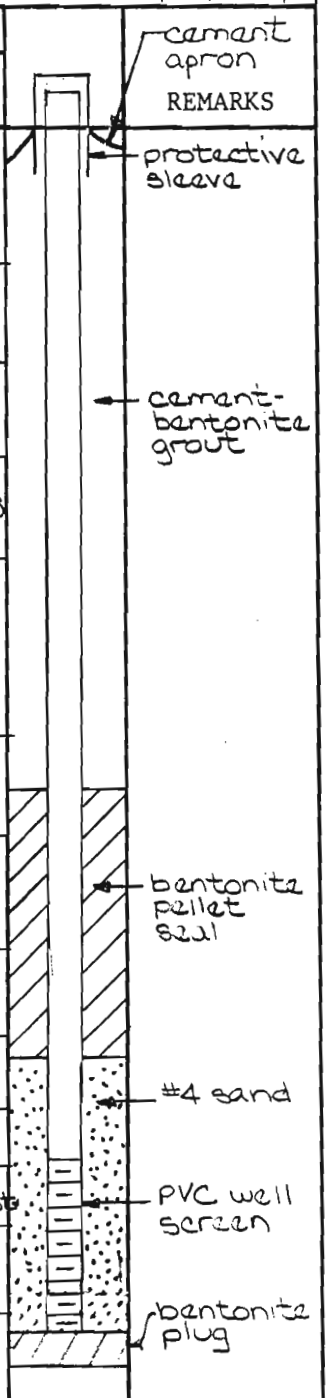
NOTES: Auger refusal at 11.5', boring terminated

MALCOLM

BORING CW-38 / B-3

PROJECT: Wellsville Phase II Investigation	PROJECT NO: 970-01-1
DATE: 5/14/86	LOCATION: Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	INSPECTOR: KCO
DRILLING METHOD: Hollow Stem Auger CME-55	SAMPLING METHOD: 2" ID Split Spoon
ELEVATION: 2032'	DATUM: S-Central side of LF on LaDue property

SAMPLE no.	SAMPLE depth	blows per 6"		DEPTH	STRATA	SOIL DESCRIPTION (density, color, SOIL, admixtures, moisture, other notes, ORIGIN)
S-1	0'-2'	2	4		36	loose, brown, SAND and SILT, organic debris, moist, changing at 1.5' to gray SAND and CLAY and ROCK FRAGMENTS, some rust-staining moist
		5	11			
S-2	5'-7'	10	20	5	400	dense, gray CLAY and brown, fine SAND, some SILT and ROCK FRAGMENTS, dry, no staining
		26	20			
						dense, gray CLAY and brown fine SAND, and ROCK FRAGMENTS, slightly moist.
S-3	10'-12'	24	22	10	85	
		22	23			very dense, gray, CLAY and brown, fine SAND and ROCK FRAGMENTS slightly moist.
S-4	15'-17'	25	49	15	130	very dense, brown, fine SAND and SILT and ROCK FRAGMENTS, rust-staining, wet, changing at 21' to gray CLAY and brown, fine, SAND, ROCK FRAGMENTS, rust-staining, moist.
		22	16			
S-5	20'-22'	26	21	20	200	dense, brown, fine SAND and SILT and ROCK FRAGMENTS, rust-staining present, wet.
		31	81			
S-6	22'-24'	15	22		130	medium dense, brown, fine SAND and SILT and gray CLAY and some rock fragments, rust-staining present, moist.
		20	19			
S-7	24'-26'	9	10	25	16	
		14	22			
S-8	26'-28'	17	12		200	dense, brown, fine, SAND and SILT and GRAVEL, some rock fragments, little clay some rust-staining, moist.
		16	16			
S-9	28'-29.5'	14	50		9	very dense, brown, SAND and SILT and gray CLAY and ROCK FRAGMENTS, rust-staining, present, slightly moist
		120	50/3"			
S-10	30'-30.8'	44	100/3"	30	130	very dense, brown, fine, SAND and SILT and ROCK FRAGMENTS, wet
S-11	32'-34'	29	51		43	very dense, brown, fine, SAND, SILT, and ROCK FRAGMENTS, some clay, moist
		66	71			
S-12	34'-35.3'	20	100		65	very dense, brown, fine, SAND and SILT and ROCK FRAGMENTS, gray CLAY, rust-staining present, moist
		100/3"		35		
S-13	36'-36.5'	100/6"			8	very dense, red brown, laminated fine SAND and CLAY, some silt, moist.
					PHOTOVAC TIP	



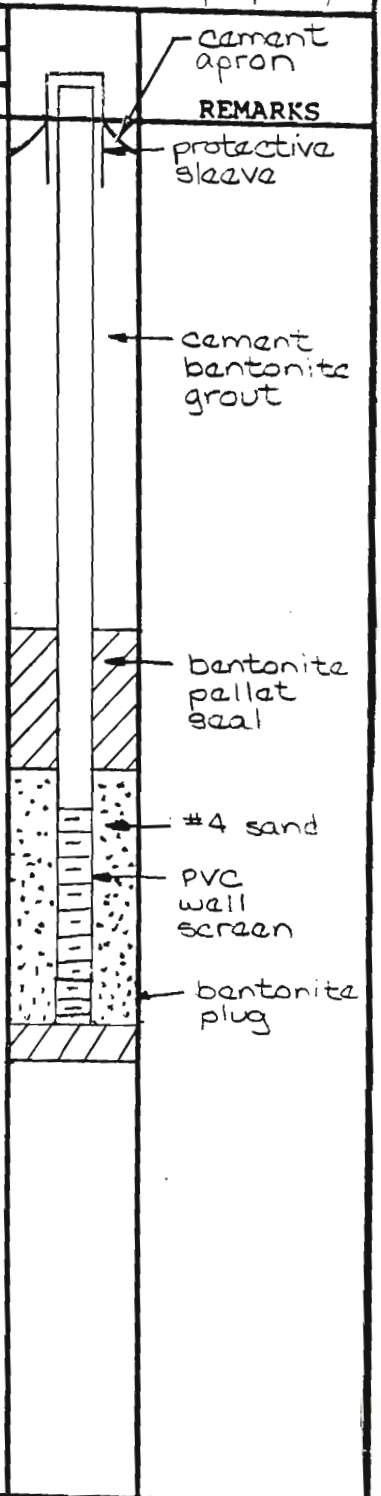
REMARKS

NOTES: Well installation includes a bentonite plug, PVC well screen at 35'-33.5' a #4 sand pack at 33.5'-30' a bentonite pellet seal at 30'-21' and a cement bentonite grout to the surface. A protective sleeve with locking cap covers the PVC stick-up. Cement apron placed around well.

BORING CW-3A

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/15/86	**LOCATION:** Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger	**SAMPLING METHOD:** 2" ID Split Spoon
CME-55	
ELEVATION: 2032'	**DATUM:** S Central side of LF on LaDue property

SAMPLE no.	SAMPLE depth	SAMPLE blows per 6"	DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN
			5		See CW-3B log for soil descriptions
			10		
			15		
			20		
			25		
			30		
			35		



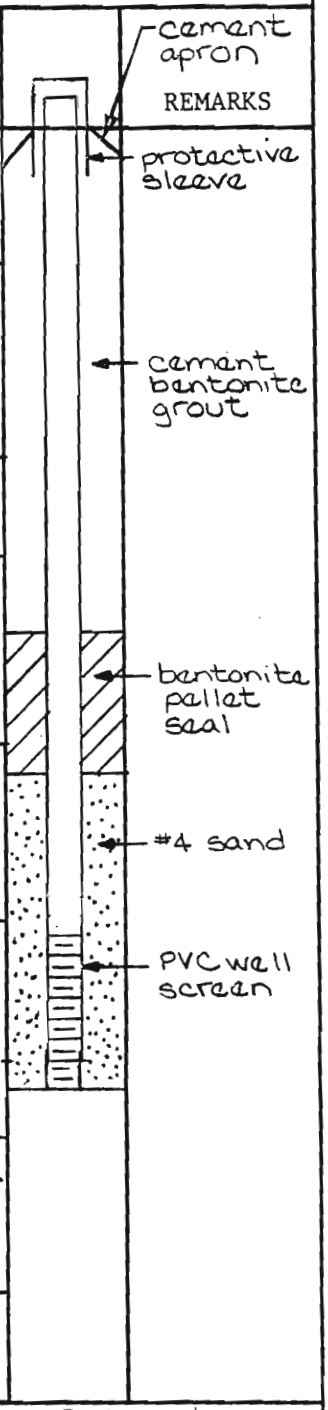
NOTES: Well installation includes a bentonite plug, PVC well screen at 26' to 21', a #4 sand pack at 26' to 20', a 4' bentonite pellet seal at 20' to 15', and cement bentonite grout to the surface. A protective sleeve with locking cap covers the PVC stickup. Cement apron placed around well.

MALCOLM PIRNIE

BORING CW-4B

PROJECT: Wellsville Phase II Investigation	PROJECT NO: 970-01-1
DATE: 5/12/86	LOCATION: Wellsville / Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	INSPECTOR: KCO
DRILLING METHOD: Hollow Stem Auger CME-55	SAMPLING METHOD: 2" ID Split Spoon
ELEVATION: 2026'	DATUM: Approx. 4' east of CW-4A

SAMPLE no.	SAMPLE depth	SAMPLE blows per 6"	DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN
S-1	0'-2'	4 9 / 8 10			medium dense, gray, CLAY, some SAND, some stones, fill, rust-staining present, moist, changing at 2' to...
S-2	5'-7'	8 17 / 27 19	5		very dense, brown, fine SAND and SILT, some ROCK FRAGMENTS, no staining, moist, changing at 6.5' to brown, fine SAND and SILT and CLAY and ROCK FRAGMENTS, moist.
S-3	10'-12'	9 18 / 16 24	10		dense, gray, CLAY, some SAND and ROCK FRAGMENTS, no staining, moist, water at 12.5'
S-4	12.5'-14.5'	5 / 14 15 / 18			medium dense, brown, SAND and SILT, some ROCK FRAGMENTS, red staining present, wet, becoming grayish at 13.5', fine SAND and SILT and CLAY, some ROCK FRAGMENTS, moist.
S-5	15'-17'	12 14 / 14 13	15		
S-6	20'-22'	8 20 / 20 27	20		medium dense, brown, SAND and SILT, some ROCK FRAGMENTS, moist, changing at 16' to gray, CLAY, some fine SAND and SILT, some ROCK FRAGMENTS, some rust-staining, slightly moist
S-7	25'-27'	16 16 / 19 26	25		dense, gray, fine SAND, some SILT and CLAY and ROCK FRAGMENTS, wet, changing at 21' to gray CLAY and ROCK FRAGMENTS, some brown, fine SAND, rust staining present throughout, slightly moist.
S-8	29'-29.5'	6 100/6	30		NO RECOVERY 1st ATTEMPT dense, gray, fine SAND and SILT and CLAY, some ROCK FRAGMENTS, no staining, gray CLAY at 26.5', moist.
			35		very dense, gray, fine, SAND and CLAY, some SILT and ROCK FRAGMENTS, rust-staining present, wet



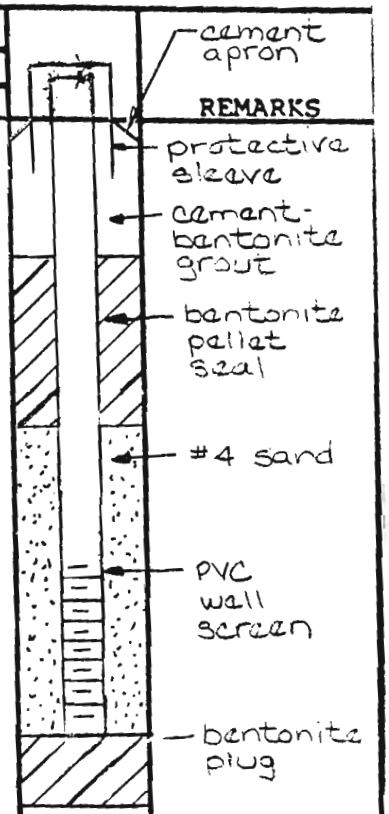
REMARKS

NOTES: Bedrock encountered at 29.5' Well installation includes PVC well screen at 30.5'-25.5', a #4 sand pack from 30.5'-20', a bentonite pellet seal from 20' - 16', and cement-bentonite grout to the surface. A protective sleeve with locking cap covers the PVC stick-up Cement apron placed around well.

BORING CW-4A/B-2

PROJECT: Wellsville Phase II Investigation	**PROJECT NO:** 970-011
DATE: 5/9/86	**LOCATION:** Wellsville/Andover Landfill
DRILLING CONTRACTOR: Rochester Drilling	**INSPECTOR:** KCO
DRILLING METHOD: Hollow Stem Auger	**SAMPLING METHOD:** 2" ID Split Spoon
	SW corner LF, on LaDue property
ELEVATION: 2026'	**DATUM:** B-2 / CW-4A

SAMPLE no.	SAMPLE depth	SAMPLE blows per 6"	DEPTH	STRATA	SOIL DESCRIPTION density, color, SOIL, admixtures, moisture, other notes, ORIGIN
			5		See CW-4B log for soil descriptions
			10		
			15		
			20		
			25		
			30		
			35		



REMARKS

NOTES: Well installation includes: Bentonite seal at 18'-20', PVC well screen from 13-18', #4 sand pack at 9'-18', a bentonite pellet seal at 4'-9', a cement bentonite grout to the surface. A protective sleeve with locking cap covers the PVC stickup. Cement apron placed around well. See CW-4B for soil description.

MALCOLM

APPENDIX 4

GROUNDWATER AND SURFACE WATER STANDARDS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Groundwater Standards

Groundwater standards are presented in 6 NYCRR Part 703. These standards are specified to protect non-saline groundwaters for drinking water purposes. The standards were last revised in 1978. Many of these values were taken from the report entitled Drinking Water and Health, Volume I, National Academy of Sciences, 1977. The Part 703 regulations also include "effluent standards" which apply to point source discharges to groundwater.

Surface Water Standards

Surface water standards are presented in 6 NYCRR Parts 701 and 702. These standards are separately specified for protection of human health (drinking water) and aquatic life. They were revised in 1985 to include standards for a large number of toxic substances and the scientific methodologies for developing those standards. In addition, the regulations were amended in 1984 to revise specifications for analytical determinations and in 1985 to upgrade coliform standards for certain water classes.

Guidance Values

The 1985 revisions to the surface water regulations include the concept of guidance values. A guidance value differs from a standard in that the specific value for the substance has not been adopted through rulemaking. Guidance values are developed in accordance with the standard-setting methodologies presented in Part 701 and are used in Department programs for protection of both surface water and groundwater. All Department guidance values, as well as standards for toxic pollutants, are compiled in the Division of Water document known as TOGS 38.

December 1985

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§ Acenaphthene (83-32-9)	A, A-S, AA, AA-S	20		H	C
	GA		20	H	C
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Acrylic acid (79-10-7)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Acrylonitrile (107-13-1)	A, A-S, AA, AA-S		0.07	H	A
	GA		0.07	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Alachlor (15972-60-8)	A, A-S, AA, AA-S			H	
	GA	35.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Aldicarb (116-06-3)	A, A-S, AA, AA-S	7		H	B
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Aldicarb & Methomyl (116-06-3; 16752-77-5)	A, A-S, AA, AA-S			H	
	GA	0.35		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S		0.002	H	A
Aldrin	GA	ND		H	S
(309-00-2)	A, A-S, AA, AA-S, B, C	*		A	
	D	*		A	
	SA, SB, SC	*		A	
	I		*	A	
	SD	*		A	

Remarks: ND - Not Detectable
* Refer to Standards and Values for "Aldrin and Dieldrin"

§	A, A-S, AA, AA-S			H	
Aldrin & Dieldrin	GA			H	
(309-00-2;	A, A-S, AA, AA-S, B, C	0.001		A	M*
60-57-11)	D	0.001		A	M*
	SA, SB, SC	0.001		A	M*
	I		0.001	A	M
	SD	0.001		A	M*

Remark: Applies to sum of aldrin and dieldrin
* NOTE in promulgated standards is incorrect. Correct NOTE is M.

§	A, A-S, AA, AA-S		50	H	E
Alkyl dimethyl	GA		50	H	E
benzyl ammonium	A, A-S, AA, AA-S, B, C	*		A	
chloride	D			A	
(68391-01-5)	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Refer to Standards for "Quaternary ammonium compounds"

§	A, A-S, AA, AA-S		50	H	E
Alkyl diphenyl	GA		50	H	E
oxide sulfonates	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Aluminum, ionic	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	100		A	I
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

§	A, A-S, AA, AA-S			H	
Amiben	GA	87.5		H	S
(133-90-4)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S	*		H	
Aminocresols	GA	*		H	
(95-84-1;	A, A-S, AA, AA-S, B, C	**		A	
2835-95-2;	D	**		A	
2835-99-6)	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Refer to Standards for phenolic compounds
** Refer to Standards for phenols-total unchlorinated

§	A, A-S, AA, AA-S		50	H	E
Aminomethylene	GA		50	H	E
phosphonic	A, A-S, AA, AA-S, B, C			A	
acid salts	D			A	
(NA)	SA, SB, SC			A	
	I			A	
	SD			A	

§	A, A-S, AA, AA-S		1	H	B
Aminopyridine	GA		1	H	B
(462-08-8;	A, A-S, AA, AA-S, B, C			A	
504-24-5;	D			A	
504-29-0)	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: Applies to sum of isomers.

Ammonia	A, A-S, AA, AA-S	2,000*		H	R
	GA			H	
	A, A-S, AA, AA-S, B, C	**		A	H
	D	**		A	H
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * NH_3 + NH_4 as N.
** Unionized ammonia only as NH_3; formulas for calculating standards at varying pH and temperature for different Classes are as follows:

AA; AA-S, A; A-S, B; C;

Standard (mg/l) = 0.031 [f(T)/g(pH)]

T = temperature in °C and
g(pH) = 1; if pH $\geq$ 7.7

$g(pH) = 10^{[0.74\ (7.7-pH)]}$; if pH $<$ 7.7
f(T) = 1; if T $\geq$ 10°C

$$f(T) = \frac{1 + 10^{(9.73-pH)}}{1 + 10^{(pK_T-pH)}};\ \text{if } T < 10°C$$

$$pK_T = 0.090 + \frac{2730}{(T + 273.2)}$$

D;

Standard (mg/l) = 0.15 [f(T)/g(pH)]

$g(pH) = 1 + 10^{[1.03\ (7.32-pH)]}$
f(T) as above

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AMMONIA STANDARDS (Continued):
FRESHWATER STANDARDS BASED ON FORMULA ON PAGE 3

Standards For All FW Classes Except D

Un-ionized Ammonia (mg/Liter NH_3)

pH	0°C	5°C	10°C	15°C	20°C	25°C	30°C
6.50	0.0018	0.0027	0.0040	0.0040	0.0040	0.0040	0.0040
6.75	0.0027	0.0041	0.0061	0.0061	0.0061	0.0061	0.0061
7.00	0.0042	0.0063	0.0094	0.0094	0.0094	0.0094	0.0094
7.25	0.0064	0.0096	0.0144	0.0144	0.0144	0.0144	0.0144
7.50	0.0098	0.0148	0.0220	0.0220	0.0220	0.0220	0.0220
7.75	0.0138	0.0208	0.0310	0.0310	0.0310	0.0310	0.0310
8.00	0.0139	0.0209	0.0310	0.0310	0.0310	0.0310	0.0310
8.25	0.0140	0.0210	0.0310	0.0310	0.0310	0.0310	0.0310
8.50	0.0142	0.0211	0.0310	0.0310	0.0310	0.0310	0.0310
8.75	0.0145	0.0214	0.0310	0.0310	0.0310	0.0310	0.0310
9.00	0.0150	0.0219	0.0310	0.0310	0.0310	0.0310	0.0310

Total Ammonia (mg/Liter NH_3)

pH	0°C	5°C	10°C	15°C	20°C	25°C	30°C
6.50	6.82	6.82	6.83	4.65	3.21	2.24	1.58
6.75	5.87	5.87	5.89	4.01	2.76	1.93	1.37
7.00	5.06	5.06	5.07	3.45	2.38	1.67	1.13
7.25	4.36	4.36	4.37	2.98	2.06	1.44	1.02
7.50	3.77	3.77	3.78	2.58	1.78	1.25	0.89
7.75	2.99	2.99	3.00	2.05	1.42	1.00	0.72
8.00	1.70	1.70	1.70	1.17	0.81	0.58	0.42
8.25	0.97	0.97	0.97	0.67	0.47	0.34	0.25
8.50	0.56	0.56	0.56	0.39	0.28	0.20	0.15
8.75	0.33	0.33	0.33	0.23	0.17	0.13	0.10
9.00	0.20	0.20	0.20	0.14	0.11	0.09	0.07

Standards for Class D

Un-ionized Ammonia (mg/Liter NH_3)

pH	0°C	5°C	10°C	15°C	20°C	25°C	30°C
6.50	0.008	0.013	0.019	0.019	0.019	0.019	0.019
6.75	0.014	0.021	0.031	0.031	0.031	0.031	0.031
7.00	0.021	0.032	0.048	0.048	0.048	0.048	0.048
7.25	0.030	0.046	0.069	0.069	0.069	0.069	0.069
7.50	0.040	0.061	0.091	0.091	0.091	0.091	0.091
7.75	0.049	0.074	0.110	0.110	0.110	0.110	0.110
8.00	0.056	0.084	0.125	0.125	0.125	0.125	0.125
8.25	0.061	0.091	0.135	0.135	0.135	0.135	0.135
8.50	0.065	0.096	0.141	0.141	0.141	0.141	0.141
8.75	0.068	0.100	0.145	0.145	0.145	0.145	0.145
9.00	0.071	0.104	0.147	0.147	0.147	0.147	0.147

Total Ammonia (mg/Liter NH_3)

pH	0°C	5°C	10°C	15°C	20°C	25°C	30°C
6.50	31.9	31.9	31.9	21.8	15.0	10.5	7.41
6.75	29.5	29.5	29.5	20.1	13.9	9.69	6.86
7.00	25.7	25.7	25.7	17.6	12.1	8.48	6.00
7.25	20.8	20.8	20.8	14.2	9.84	6.89	4.88
7.50	15.5	15.5	15.5	10.6	7.34	5.15	3.66
7.75	10.6	10.6	10.6	7.29	5.06	3.56	2.55
8.00	6.84	6.84	6.84	4.71	3.28	2.33	1.68
8.25	4.22	4.22	4.22	2.92	2.05	1.47	1.08
8.50	2.54	2.54	2.54	1.78	1.27	0.93	0.70
8.75	1.53	1.53	1.53	1.09	0.80	0.60	0.47
9.00	0.94	0.94	0.94	0.69	0.52	0.41	0.33

To convert these values to mg/Liter N, multiply by 0.822.

- From EPA, 1983. Ambient Water Quality Criteria For Ammonia - Draft. USEPA, Washington, D.C., 189 pp + iii + three appendices.

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SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S		1	H	A
Aniline	GA		1	H	A
(62-53-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Anthracene	GA		50	H	E
(120-12-7)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Antimony	A, A-S, AA, AA-S		3	H	B
(7440-36-0)	GA		3	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Arsenic	A, A-S, AA, AA-S	50		H	Q
(7440-38-2)	GA	25		H	S
	A, A-S, AA, AA-S, B, C	190*		A	H
	D	360*		A	H
	SA, SB, SC	63*		A	H
	I		63*	A	H
	SD	120*		A	H
Aryltriazoles	A, A-S, AA, AA-S		50	H	E
(NA)	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S			H	
Atrazine	GA	7.5		H	S
(1912-24-9)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Dissolved arsenic form

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§	A, A-S, AA, AA-S		0.07	H	A
Azinphosmethyl	GA	4.4		H	S
(86-50-0)	A, A-S, AA, AA-S, B, C	0.005		A	J
	D			A	
	SA, SB, SC	0.01		A	J
	I		0.01	A	J
	SD			A	
§	A, A-S, AA, AA-S		0.5	H	A
Azobenzene	GA		0.5	H	A
(103-33-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Barium	A, A-S, AA, AA-S	1,000		H	Q
(7440-39-3)	GA	1,000		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S			H	
Benefin	GA	35.0		H	S
(1861-40-1)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		0.002	H	D
Benz(a)anthracene	GA		0.002	H	D
(56-55-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		1.0	H	A
Benzene	GA	ND		H	S
(71-43-2)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: ND - Not Detectable					
§	A, A-S, AA, AA-S		0.02	H	A
Benzidine	GA		0.02	H	A
(92-87-5)	A, A-S, AA, AA-S, B, C	0.1		A	H
	D	0.1		A	H
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Benzisothiazole (271-61-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Benzo(b)-fluoranthene (205-99-2)	A, A-S, AA, AA-S		0.002	H	D
	GA		0.002	H	D
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Benzo(k)-fluoranthene (207-08-9)	A, A-S, AA, AA-S		0.002	H	D
	GA		0.002	H	D
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Benzo(a)pyrene (50-32-8)	A, A-S, AA, AA-S		0.002	H	A
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: ND - Not Detectable					
Beryllium (7440-41-7)	A, A-S, AA, AA-S		3	H	B
	GA		3	H	B
	A, A-S, AA, AA-S, B, C	11* or 1,100**		A	H
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * When hardness is less than or equal to 75 ppm. ** When hardness is greater than 75 ppm. All standards and values except Human apply to acid-soluble form.					
§ Bis (2-chloro-ethyl) ether (111-44-4)	A, A-S, AA, AA-S		0.03	H	A
	GA	1.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§	A, A-S, AA, AA-S		4	H	A
Bis (2-ethyl-	GA	4,200*		H	S
hexyl) phthalate	A, A-S, AA, AA-S, B, C	0.6		A	I
(117-81-7)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * Bis (2-ethylhexyl) phthalate not included in 100 ug/l summation criterion for Class GA.					
Boric Acid, Borates	A, A-S, AA, AA-S		125	H	B
& Metaborates	GA		125	H	B
(as Boron)	A, A-S, AA, AA-S, B, C			A	
(11113-50-1;	D			A	
10043-35-3;	SA, SB, SC			A	
1303-96-4)	I			A	
	SD			A	
Remarks: Applies only to boric acid, borates and metaborates (as boron equivalents).					
Boron	A, A-S, AA, AA-S		*	H	
(Acid-Soluble)	GA		*	H	
(7440-42-8)	A, A-S, AA, AA-S, B, C	10,000		A	J
	D			A	
	SA, SB, SC	1,000		A	J
	I		1,000	A	J
	SD			A	
Remarks: * Refer to guidance values for boric acid, borates and metaborates.					
§	A, A-S, AA, AA-S			H	
Bromacil	GA	4.4		H	S
(314-40-9)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Bromide	A, A-S, AA, AA-S		2,000	H	B
(NA)	GA		2,000	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Bromodichloro-	GA		50	H	E
methane	A, A-S, AA, AA-S, B, C			A	
(75-27-4)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Bromoform (75-25-2)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Butachlor (23184-66-9)	A, A-S, AA, AA-S			H	
	GA	3.5		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Butoxyethoxy-ethanol (112-34-5)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Butoxypropanol (5131-66-8)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Butyl benzyl phthalate (85-68-7)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Butyl isopropyl phthalate (NA)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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Cadmium (7440-43-9)	A, A-S, AA, AA-S	10		H	Q
	GA	10		H	S
	A, A-S, AA, AA-S, B, C	*		A	I
	D	**		A	M
	SA, SB, SC		2.7	A	M
	I		2.7	A	M
	SD		2.7	A	M
§ Captan (133-06-2)	A, A-S, AA, AA-S			H	
	GA	17.5		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Carbaryl (63-25-2)	A, A-S, AA, AA-S			H	
	GA	28.7		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Carbofuran (1563-66-2)	A, A-S, AA, AA-S	15		H	B
	GA		15	H	B
	A, A-S, AA, AA-S, B, C	1.0		A	J
	D	10		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Carbon tetra-chloride (56-23-5)	A, A-S, AA, AA-S		0.4	H	A
	GA	5		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Chlordane (57-74-9)	A, A-S, AA, AA-S		0.02	H	A
	GA	0.1		H	S
	A, A-S, AA, AA-S, B, C		0.002	A	M
	D		0.002	A	M
	SA, SB, SC		0.002	A	M
	I		0.002	A	M
	SD		0.002	A	M

Remarks: * exp(0.7852 [ln (ppm hardness)] - 3.490)
** exp(1.128 [ln (ppm hardness)] - 3.828)
All standards and values except Human apply to acid-soluble form.

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Chloride (NA)	A, A-S, AA, AA-S	250,000		H	R
	GA	250,000		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Chlorobenzene (108-90-7)	A, A-S, AA, AA-S	20		H	C
	GA		20	H	C
	A, A-S, AA, AA-S, B, C	5		A	I
	D	50		A	L
	SA, SB, SC		5	A	I
	I		5	A	I
	SD		50	A	L
§ Chloroform (67-66-3)	A, A-S, AA, AA-S	0.2		H	A
	GA	100		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 2-Chloronaphthalene (91-58-7)	A, A-S, AA, AA-S	10		H	D
	GA		10	H	D
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 5-Chloro-o-toluidine (95-79-4)	A, A-S, AA, AA-S		0.7	H	A
	GA		0.7	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Chromium (7440-47-3)	A, A-S, AA, AA-S	50		H	Q
	GA			H	
	A, A-S, AA, AA-S, B, C	*		A	H
	D	**		A	H
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * exp(0.819 [ln (ppm hardness)] + 1.561)
** exp(0.819 [ln (ppm hardness)] + 3.688)
all standards except Human apply to acid-soluble form.

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SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
Chromium	A, A-S, AA, AA-S			H	
(hexavalent)	GA	50		H	S
(NA)	A, A-S, AA, AA-S, B, C	11		A	H
	D	16		A	H
	SA, SB, SC	54		A	H
	I		54	A	H
	SD	1,200		A	H

Remarks: All standards and values except Human apply to acid-soluble form.

§	A, A-S, AA, AA-S		0.002	H	D
Chrysene	GA		0.002	H	D
(218-01-9)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Cobalt	A, A-S, AA, AA-S			H	
(7440-48-4)	GA			H	
	A, A-S, AA, AA-S, B, C	5		A	I
	D		110	A	K
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: All standards and values except Human apply to acid-soluble form.

Copper	A, A-S, AA, AA-S	200		H	R
(7440-50-8)	GA	1,000		H	S
	A, A-S, AA, AA-S, B, C	*		A	H
	D	**		A	H
	SA, SB, SC	2.0		A	H
	I		2.0	A	H
	SD	3.2		A	H

Remarks: * exp(0.8545 [ln (ppm hardness)] - 1.465)
** exp(0.9422 [ln (ppm hardness)] - 1.464)
All standards and values except Human apply to acid-soluble form.

Cyanide	A, A-S, AA, AA-S	100		H	R
(NA)	GA	200		H	S
	A, A-S, AA, AA-S, B, C	5.2*		A	H
	D	22*		A	H
	SA, SB, SC	1.0*		A	H
	I		1.0*	A	H
	SD	1.0*		A	H

Remarks: * As free cyanide - the sum of HCN and CN^- expressed as CN.

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§	A, A-S, AA, AA-S	100		H	Q
2,4-Dichloro-	GA	4.4		H	S
phenoxyacetic	A, A-S, AA, AA-S, B, C			A	
acid	D			A	
(94-75-7)	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S	0.01		H	A
DDT, DDD & DDE	GA	ND		H	S
(50-29-3;	A, A-S, AA, AA-S, B, C	0.001		A	H
72-54-8;	D	0.001		A	H
72-55-9)	SA, SB, SC	0.001		A	H
	I		0.001	A	H
	SD	0.001		A	H
Remarks: ND - Not Detectable					
§	A, A-S, AA, AA-S			H	
Demeton	GA			H	
(8065-48-3;	A, A-S, AA, AA-S, B, C	0.1		A	J
298-03-3;	D			A	
126-75-0)	SA, SB, SC	0.1		A	J
	I		0.1	A	J
	SD			A	
§	A, A-S, AA, AA-S			H	
Diazinon	GA	0.7		H	S
(333-41-5)	A, A-S, AA, AA-S, B, C	0.08		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Dibromochloro-	GA		50	H	E
methane	A, A-S, AA, AA-S, B, C			A	
(124-48-1)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Dibromodichloro-	GA		50	H	E
methane	A, A-S, AA, AA-S, B, C			A	
(NA)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§	A, A-S, AA, AA-S		50*	H	E
2,2-Dibromo-3-	GA		50*	H	E
nitrilopropion-	A, A-S, AA, AA-S, B, C		20**	A	J
amide & Dibromo-	D		50**	A	K
acetonitrile	SA, SB, SC			A	
(10222-01-2;	I			A	
3252-43-5)	SD			A	

Remarks: * Applies to 2,2-dibromo-3-nitrilo-propionamide only.
** Applies to the sum of the two chemicals.

§	A, A-S, AA, AA-S		50	H	E
Di-n-butyl	GA	770*		H	S
phthalate	A, A-S, AA, AA-S, B, C			A	
(84-74-2)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Di-n-butyl phthalate not included in 100 ug/l summation criterion for Class GA

§	A, A-S, AA, AA-S			H	
Dicamba	GA	0.44		H	S
(1918-00-9)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

§	A, A-S, AA, AA-S	20*/30**		H	C
Dichlorobenzenes	GA	4.7***		H	S
(95-50-1;	A, A-S, AA, AA-S, B, C	5		A	I, N
106-46-7;	D	50		A	L
541-73-1)	SA, SB, SC		5	A	I, N
	I		5	A	I, N
	SD		50	A	L

Remarks: * Applies to meta (1,3-) isomer only.
** Applies to para (1,4-) isomer only.
*** Applies to sum of para (1,4-) and ortho (1,2-) isomers only.
Other standards and values apply to total dichlorobenzenes.

§	A, A-S, AA, AA-S		50	H	E
1,1-Dichloroethane	GA		50	H	E
(75-34-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ 1,2-Dichloroethane (107-06-2)	A, A-S, AA, AA-S	0.8		H	A
	GA		0.8	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 1,1-Dichloroethylene (75-35-4)	A, A-S, AA, AA-S		0.07	H	A
	GA		0.07	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ trans-1,2- Dichloroethylene (156-60-5)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Dichloro- fluoromethane (75-43-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 2,4-Dichlorophenol (120-83-2)	A, A-S, AA, AA-S	0.3		H	C
	GA		0.3	H	C
	A, A-S, AA, AA-S, B, C	*		A	
	D	*		A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Refer to standard for phenols - total chlorinated.

§ Dichloropropanes (78-99-9; 78-87-5; 142-28-9; 26638-19-7)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: Applies to sum of dichloropropane isomers.

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§	A, A-S, AA, AA-S		0.0009	H	A
Dieldrin	GA	ND		H	S
(60-57-1)	A, A-S, AA, AA-S	0.001*		A	H
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * Refer to standard for "Aldrin and Dieldrin" combined. ND - Not Detectable					
§	A, A-S, AA, AA-S		50	H	E
Diethyl phthalate	GA		50	H	E
(84-66-2)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		1.0	H	D
N,N-Dimethyl	GA		1.0	H	D
aniline	A, A-S, AA, AA-S, B, C			A	
(121-69-7)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Dimethlyformamide	GA		50	H	E
(68-12-2)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Dimethyl phthalate	GA		50	H	E
(131-11-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		0.07	H	A
2,6-Dinitrotoluene	GA		0.07	H	A
(606-20-2)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Di-n-octyl phthalate	GA		50	H	E
(117-84-0)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Diphenyl-hydrazine (122-66-7)	A, A-S, AA, AA-S		0.05*	H	A
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * (1,2-) isomer only. ND - Not Detectable					
§ Dithane (142-59-6)	A, A-S, AA, AA-S			H	
	GA	1.75		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Dodecylguanidine salts (13590-97-1; 2439-10-3)	A, A-S, AA, AA-S		50	H	B
	GA		50	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: Applies to the sum of dodecylguanidine salts, as dodecylguanidine.					
§ Dyphylline (479-18-5)	A, A-S, AA, AA-S	50		H	D
	GA		50	H	D
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Endosulfan (115-29-7)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	0.009		A	H
	D	0.22		A	H
	SA, SB, SC	0.001		A	H
	I		0.001	A	H
	SD	0.034		A	H
§ Endrin (72-20-8)	A, A-S, AA, AA-S	0.2		H	Q
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C	0.002		A	H
	D	0.002		A	H
	SA, SB, SC	0.002		A	H
	I		0.002	A	H
	SD	0.002		A	H
Remarks: ND - Not Detectable					

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§ Ethylbenzene (100-41-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Ethylene chloro-hydrin (107-07-3)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Ethylene glycol (107-21-1)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Ethylene oxide (75-21-8)	A, A-S, AA, AA-S		0.05	H	A
	GA		0.05	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Ethylenethiourea (96-45-7)	A, A-S, AA, AA-S			H	
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: ND - Not Detectable					
§ Ferbam (14484-64-1)	A, A-S, AA, AA-S			H	
	GA	4.18		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Fluoranthene (206-44-0)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§	A, A-S, AA, AA-S		50	H	E
Fluorene	GA		50	H	E
(86-73-7)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Fluoride	A, A-S, AA, AA-S	1,500		H	R
(NA)	GA	1,500		H	S
	A, A-S, AA, AA-S, B, C	*		A	J
	D	**		A	J
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * (0.02) exp(0.907 [ln (ppm hardness)] + 7.394)
** (0.1) exp(0.907 [ln (ppm hardness)] + 7.394)

§	A, A-S, AA, AA-S			H	
Folpet	GA	56.0		H	S
(133-07-3)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Gross Alpha Radiation	A, A-S, AA, AA-S	15 pCi/L*		H	Q
(NA)	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 15 picocuries per liter, excluding radon and uranium.

Gross Beta Radiation	A, AA	1,000 pCi/L*		H	R
(NA)	A-S, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 1,000 picocuries per liter, excluding strontium-90 and alpha emitters.

§	A, A-S, AA, AA-S		50	H	E
Guaifenesin	GA		50	H	E
(93-14-1)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Heptachlor & Heptachlor epoxide (76-44-8; 1024-57-3)	A, A-S, AA, AA-S	0.009		H	A
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C	0.001		A	H
	D	0.001		A	H
	SA, SB, SC	0.001		A	H
	I		0.001	A	H
	SD	0.001		A	H
Remarks: ND - Not Detectable					
§ Hexachloro-benzene (118-74-1)	A, A-S, AA, AA-S		0.02	H	A
	GA	0.35		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Hexachloro-butadiene (87-68-3)	A, A-S, AA, AA-S	0.5		H	A
	GA		0.5	H	A
	A, A-S, AA, AA-S, B, C	1.0		A	J
	D	10		A	K
	SA, SB, SC	0.3		A	J
	I		0.3	A	J
	SD	3.0		A	K
§ Hexachloro-cyclohexanes (58-89-9; 319-84-6; 319-85-7; 319-86-8; 6108-10-7; 608-73-1)	A, A-S, AA, AA-S		0.02*	H	A
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C	0.01*		A	H
	D	2*		A	H
	SA, SB, SC	0.004*		A	H
	I		0.004*	A	H
	SD	0.16*		A	H
Remarks: * Applies to sum of all isomers. ND - Not Detectable					
§ Hexachloro-cyclopentadiene (77-47-4)	A, A-S, AA, AA-S	1.0		H	C
	GA		1.0	H	C
	A, A-S, AA, AA-S, B, C	0.45		A	J
	D	4.5		A	K
	SA, SB, SC	0.07		A	J*
	I		0.07	A	J*
	SD	0.7		A	K
Remarks: * NOTE in promulgated standards is incorrect. Correct NOTE is J.					
§ Hexachloro-phene (70-30-4)	A, A-S, AA, AA-S			H	
	GA	7		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ 2-Hexanone (591-78-6)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Hydrazine (302-01-2)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	*		A	J
	D	**		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 5 ug/l at less than 50 ppm hardness and 10 ug/l at greater than or equal to 50 ppm hardness.

** 50 ug/l at less than 50 ppm hardness and 100 ug/l at greater than or equal to 50 ppm hardness.

Hydrogen sulfide (7783-06-4)	A, A-S, AA, AA-S		**	H	
	GA		**	H	
	A, A-S, AA, AA-S, B, C	2.0*		A	H
	D			A	
	SA, SB, SC	2.0*		A	H
	I		2.0*	A	H
	SD			A	

Remarks: * Undissociated.
** Refer to Sulfides.

§ Hydroquinone (123-31-9)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C	2.2		A	J
	D	4.4		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 1-Hydroxy-ethylidene-1,1-diphosphonic acid (2809-21-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 2-(2-Hydroxy-3, 5-di-tert-pentylphenyl) - benzotriazole (25973-55-1)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S		0.002	H	D
Indeno (1,2,3-cd)	GA		0.002	H	D
pyrene	A, A-S, AA, AA-S, B, C			A	
(193-39-5)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Iron	A, A-S, AA, AA-S	300		H	Q
(7439-89-6)	GA	300		H	S
	A, A-S, AA, AA-S, B, C	300		A	J
	D	300		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S			H	
Isodecyl diphenyl	GA			H	
phosphate	A, A-S, AA, AA-S, B, C	1.73		A	I
(29761-21-5)	D	22		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Isophorone	GA		50	H	E
(78-59-1)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S			H	
Isothiazolones, total	GA			H	
(isothiazolinones)	A, A-S, AA, AA-S, B, C	1		A	J
(includes 5-chloro-	D	10		A	K
2- methyl-4	SA, SB, SC			A	
isothiazolin-3-one	I			A	
& 2-methyl-4	SD			A	
isothiazolin-3-one)					
§	A, A-S, AA, AA-S			H	
Kepone	GA	ND		H	S
(143-50-0)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: ND - Not Detectable

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Lead (7439-92-1)	A, A-S, AA, AA-S	50		H	Q
	GA	25		H	S
	A, A-S, AA, AA-S, B, C	*		A	H
	D	**		A	H
	SA, SB, SC	8.6		A	H
	I		8.6	A	H
	SD	220		A	H
§ Linear alkyl benzene sulfonates (LAS) (NA)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	40*		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Magnesium (7439-95-4)	A, A-S, AA, AA-S	35,000		H	B
	GA		35,000	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Malathion (121-75-5)	A, A-S, AA, AA-S			H	
	GA	7.0		H	S
	A, A-S, AA, AA-S, B, C	0.1		A	H
	D			A	
	SA, SB, SC	0.1		A	H
	I		0.1	A	H
	SD			A	
§ Maneb (12427-38-2)	A, A-S, AA, AA-S			H	
	GA	1.75		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Manganese (7439-96-5)	A, A-S, AA, AA-S	300		H	Q
	GA	300		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * exp(1.266 [ln (ppm hardness)] -4.661)
** exp(1.266 [ln (ppm hardness)] -1.416)
All standards and values except Human apply to acid-soluble form.

Remarks: * LAS with side chains greater than 13 carbons only.

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§	A, A-S, AA, AA-S			H	
MCPA	GA	0.44		H	S
(94-74-6)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Mercaptoben-	GA		50	H	E
zothiazole	A, A-S, AA, AA-S, B, C			A	
(149-30-4)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Mercury	A, A-S, AA, AA-S	2		H	Q
(7439-97-6)	GA	2		H	S
	A, A-S, AA, AA-S, B, C		0.2	A	H
	D		0.2	A	H
	SA, SB, SC		0.1	A	H
	I		0.1	A	H
	SD		0.1	A	H
§	A, A-S, AA, AA-S		50	H	E
Methacrylic acid	GA		50	H	E
(79-41-4)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S	35		H	R
Methoxychlor	GA	35		H	S
(72-43-5)	A, A-S, AA, AA-S, B, C	0.03		A	H
	D			A	
	SA, SB, SC	0.03		A	H
	I		0.03	A	H
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Methoxyethyl-	GA		50	H	E
benzene	A, A-S, AA, AA-S, B, C			A	
(3558-60-9;	D			A	
4013-34-7)	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		0.002	H	D
Methylbenz(a)-	GA		0.002	H	D
anthracenes	A, A-S, AA, AA-S, B, C			A	
(NA)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Naphthalene (91-20-3)	A, A-S, AA, AA-S	10		H	C
	GA		10	H	C
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Niacinamide (98-92-0)	A, A-S, AA, AA-S	500		H	B
	GA		500	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Nickel (7440-02-0)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	*		A	H
	D	**		A	H
	SA, SB, SC	7.1		A	H
	I		7.1	A	H
	SD	140		A	H
§ Nitralin (4726-14-1)	A, A-S, AA, AA-S			H	
	GA	35.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Nitrate (NA)	A, A-S, AA, AA-S	10,000*		H	Q
	GA	10,000*		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Nitrilotri-acetate (NTA) (NA)	A, A-S, AA, AA-S		3*	H	A
	GA		3*	H	A
	A, A-S, AA, AA-S, B, C	5,000		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * exp(0.76 [ln (ppm hardness)] + 1.06)
** exp(0.76 [ln (ppm hardness)] + 4.02)
All standards and values except Human apply to acid-soluble form.

Remarks: * As N.

Remarks: * Applies to Nitrilotriacetic acid.

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SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
Nitrite (NA)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	100* or 20**		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * Warm water fishery waters. ** Cold water fishery waters.					
§ Nitrobenzene (98-95-3)	A, A-S, AA, AA-S	30		H	C
	GA		30	H	C
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ N-Nitroso-diphenylamine (86-30-6)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Paraquat (4685-14-7)	A, A-S, AA, AA-S			H	
	GA	2.98		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Parathion & Methyl parathion I,M (56-38-2; 298-00-0)	A, A-S, AA, AA-S			H	
	GA	1.5		H	S
	A, A-S, AA, AA-S, B, C	0.008		A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Pentachloro-nitrobenzene (608-93-5)	A, A-S, AA, AA-S			H	
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: ND - Not Detectable.					

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§ Pentachloro-phenol (87-86-5)	A, A-S, AA, AA-S	*		H	
	GA	21		H	S
	A, A-S, AA, AA-S, B, C	0.4		A	I
	D	**		A	L
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenanthrene (85-01-8)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenol (108-95-2)	A, A-S, AA, AA-S	*		H	
	GA	*		H	
	A, A-S, AA, AA-S, B, C	**		A	L
	D	**		A	L
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenolic compounds (total phenols) (NA)	A, A-S, AA, AA-S	1		H	R
	GA	1		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenols, total chlorinated (NA)	A, A-S, AA, AA-S	*		H	
	GA	*		H	
	A, A-S, AA, AA-S, B, C	1.0		A	L
	D	1.0		A	L
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenols, total unchlorinated (NA)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	5.0		A	L
	D	5.0		A	L
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Refer to standard for Phenolic compounds (total phenols).
** Refer to standard for Phenols, total chlorinated.

Remarks: * Refer to standard for Phenolic compounds (total phenols).
** Refer to standard for Phenols, total unchlorinated.

Remarks: * Refer to standard for Phenolic compounds (total phenols).

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§ Phenyl ether (101-84-8)	A, A-S, AA, AA-S	10		H	C
	GA		10	H	C
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phenylpropanol-amine (14838-15-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Phorate & Disulfoton (298-02-2; 298-04-4)	A, A-S, AA, AA-S			H	
	GA	ND		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: ND - Not Detectable.					
§ Polychlorinated biphenyl, PCB (NA)	A, A-S, AA, AA-S	0.01		H	A
	GA	0.1		H	S
	A, A-S, AA, AA-S, B, C	0.001		A	H
	D	0.001		A	H
	SA, SB, SC	0.001		A	H
	I		0.001	A	H
	SD	0.001		A	H
§ Propachlor (1918-16-7)	A, A-S, AA, AA-S			H	
	GA	35.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Propanil (709-98-8)	A, A-S, AA, AA-S			H	
	GA	7.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Propazine (139-40-2)	A, A-S, AA, AA-S			H	
	GA	16.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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§ Pyrene (129-00-0)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Pyridine (110-86-1)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Quaternary ammonium compounds (including dimethyl benzyl ammonium chloride & dimethyl ethyl benzyl ammonium chloride) (NA)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	10		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Radium 226 (NA)	AA	3 pCi/L*		H	R
	A, A-S, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 3 picocuries per liter.

Radium 226 plus Radium 228 (NA)	A, A-S, AA, AA-S	5 pCi/L*		H	Q
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 5 picocuries per liter.

Selenium (7782-49-2)	A, A-S, AA, AA-S	10		H	Q
	GA	20		H	S
	A, A-S, AA, AA-S, B, C	1.0*		A	I
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * All standards except Human apply to acid soluble form.

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Silver (7440-22-4)	A, A-S, AA, AA-S	50		H	Q
	GA	50		H	S
	A, A-S, AA, AA-S, B, C	0.1*		A	I
	D	**		A	H***
	SA, SB, SC			A	
	I			A	
	SD	2.3		A	H

Remarks: * ionic silver.
** exp(1.72 [ln (ppm hardness)] - 6.52)
*** NOTE in promulgated standards is incorrect. Corect NOTE is H. Acid soluble form applies to D and SD Classes.

§ Simazine (122-34-9)	A, A-S, AA, AA-S			H	
	GA		75.25	H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Strontium 90 (NA)	A, A-S, AA, AA-S	8 pCi/L*		H	Q
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * If two or more radionuclides are present, the sum of their doses shall not exceed annual potential dose of 4 millirems per year.

§ Styrene (100-42-5)	A, A-S, AA, AA-S	50		H	C
	GA	931*		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Styrene not included in 100 ug/l summation criterion for Class GA.

Sulfate (NA)	A, A-S, AA, AA-S	250,000		H	Q
	GA	250,000		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

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Sulfides, total (NA)	A, A-S, AA, AA-S		50*	H	C
	GA		50*	H	C
	A, A-S, AA, AA-S, B, C	**		A	
	D			A	
	SA, SB, SC	**		A	
	I		**	A	
	SD			A	
Sulfite (NA)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	200		A	J
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 2,4,5-T (93-76-5)	A, A-S, AA, AA-S			H	
	GA	35		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Tetrachloro-benzenes (95-94-3; 634-66-2; 634-90-2)	A, A-S, AA, AA-S	10		H	C
	GA		10	H	C
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 2,3,7,8-Tetra-chlorodibenzo-p-dioxin (TCDD) (1746-01-6)	A, A-S, AA, AA-S			H	
	GA	0.000035		H	S
	A, A-S, AA, AA-S, B, C	0.000001		A	M
	D	0.000001		A	M
	SA, SB, SC			A	
	I			A	
	SD			A	
§ 1,1,2,2-Tetra-chloroethane (79-34-5)	A, A-S, AA, AA-S		0.2	H	A
	GA		0.2	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Tetrachloro-ethylene (127-18-4)	A, A-S, AA, AA-S		0.7	H	A
	GA		0.7	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * Expressed as hydrogen sulfide.
** Refer to standards and values for "Hydrogen Sulfide" where applicable.

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§ Tetrahydro-furan (109-99-9)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Thallium (7440-28-0)	A, A-S, AA, AA-S		4	H	B
	GA		4	H	B
	A, A-S, AA, AA-S, B, C	8		A	I
	D	20		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: All standards and values except Human apply to acid-soluble form.					
§ Theophylline (58-55-9)	A, A-S, AA, AA-S	40		H	B
	GA		40	H	B
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Thiram (137-26-8)	A, A-S, AA, AA-S			H	
	GA	1.75		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Toluene (108-88-3)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ o-Toluidine (95-53-4)	A, A-S, AA, AA-S		0.6	H	A
	GA		0.6	H	A
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Tolyltriazole (29385-43-1)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S		0.01	H	A
Toxaphene	GA	ND		H	S
(8001-35-2)	A, A-S, AA, AA-S, B, C	0.005		A	H
	D	1.6		A	H
	SA, SB, SC	0.005		A	H
	I		0.005	A	H
	SD		0.07	A	H
Remarks: ND - Not Detectable					
§	A, A-S, AA, AA-S	10		H	Q
2,4,5-TP	GA	0.26		H	S
(Silvex)	A, A-S, AA, AA-S, B, C			A	
(93-72-1)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S		50	H	E
Tributyltin	GA		50	H	E
oxide	A, A-S, AA, AA-S, B, C			A	
(56-35-9)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S	10		H	C
Trichloro-	GA		10	H	C
benzenes	A, A-S, AA, AA-S, B, C	5		A	I,M
(87-61-6;	D	50		A	L
108-70-3;	SA, SB, SC	5		A	I,N
120-82-1;	I		5	A	I,N
12002-48-1)	SD	50		A	L
Remarks: Applies to sum of isomers.					
§	A, A-S, AA, AA-S		50	H	E
1,1,1-Trichloro-	GA		50	H	E
ethane	A, A-S, AA, AA-S, B, C			A	
(71-55-6)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S	0.6		H	A
1,1,2-Trichloro-	GA		0.6	H	A
ethane	A, A-S, AA, AA-S, B, C			A	
(79-00-5)	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§ Trichloro-ethylene (79-01-6)	A, A-S, AA, AA-S		3	H	A
	GA	10		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Trichloro-fluoromethane (75-69-4)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Trichlorotri-fluoroethanes (26523-64-8; 354-58-5; 76-13-1)	A, A-S, AA, AA-S		50*	H	E
	GA		50*	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * Applies to sum of isomers.					
§ Trifluralin (1582-09-8)	A, A-S, AA, AA-S			H	
	GA	35.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§ Trimethyl-benzenes (25551-13-7; 526-73-8; 95-63-6; 108-67-8)	A, A-S, AA, AA-S		50*	H	E
	GA		50*	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
Remarks: * Applies to sum of isomers.					
§ Trimethyl-pyridine (collidine) (108-75-8; 1462-84-6)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§ Triphenyl phosphate (115-86-6)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C	4		A	J
	D	40		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	
Tritium (NA)	A, A-S, AA, AA-S	20,000 pCi/L*		H	Q
	GA			H	
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: * 20,000 picocuries per liter; if two or more radionuclides are present, the sum of their annual dose equivalent to the total body or any organ shall not exceed 4 millirems per year.

Vanadium (7440-62-2)	A, A-S, AA, AA-S			H	
	GA			H	
	A, A-S, AA, AA-S, B, C	14		A	J
	D	190		A	K
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: All standards and values except Human apply to acid-soluble form.

§ Vinyl chloride (75-01-4)	A, A-S, AA, AA-S		0.3	H	A
	GA	5.0		H	S
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

§ Xylenes (1330-20-7; 106-42-3; 108-38-3; 95-47-6)	A, A-S, AA, AA-S		50	H	E
	GA		50	H	E
	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

Remarks: Applies to sum of isomers.

Zinc (7440-66-6)	A, A-S, AA, AA-S	300		H	R
	GA	5,000		H	S
	A, A-S, AA, AA-S, B, C	30		A	I
	D	*		A	H
	SA, SB, SC	58		A	H
	I		58	A	H
	SD	170		A	H

Remarks: * exp(0.83 [ln (ppm hardness)] + 1.95)
All standards and values except Human apply to acid soluble form.

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

Date of Revision: July 24, 1985

SUBSTANCE (CAS NO.)	WATER CLASSES	MICROGRAMS/LITER STANDARD	GUIDANCE VALUES	TYPE	NOTES
§	A, A-S, AA, AA-S			H	
Zineb	GA	1.75		H	S
(12122-67-7)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	
§	A, A-S, AA, AA-S			H	
Ziram	GA	4.18		H	S
(137-30-4)	A, A-S, AA, AA-S, B, C			A	
	D			A	
	SA, SB, SC			A	
	I			A	
	SD			A	

NEW YORK STATE AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES

INDEX OF SUBSTANCES

APPENDIX 5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 1984 SAMPLING RESULTS

600 Delaware Avenue Buffalo, NY 14202-1073

May 27, 1986

Mr. Kevin Owen
Malcolm Pirnie, Inc.
3619 Packard Road
Niagara Falls, NY 14303

Dear Mr. Owen:

Phase II Investigation
Wellsville Andover

During the field work performed at the Wellsville Andover Landfill, we discussed a number of items which would be desirable for inclusion in the Phase II Report. The following material is attached for your use in compiling that report:

1. HRS Score Sheet

   The attached copy of a blank HRS Score Sheet was obtained from our Albany Office in early April. It is, I believe, the only blank form available in Region 9.

2. Private Well Sampling

   Region 9 did sample a number of private residences in the area of the Wellsville Andover Landfill in 1984. The attached chart summarizes the results of this sampling. These analyses would most appropriately be included in compiling the Phase II Report.

This material is being forwarded at this time to assure its availability to you through your data compilation. By copy of this letter, I am also providing a copy of the private well sampling results to the Village.

It is my intent to confirm our concurrence with the field changes made in the work plan as well as the results of our May 15, 1986 meeting with Village officials regarding the sampling program. Unfortunately, time has not been available to do so to date.

I trust this material will be useful to you.

Sincerely,

Lawrence G. Clare, P.E.
Senior Sanitary Engineer

LGC:ec
ATT.
cc: Mr. John Tygert
Mr. Raymond Lupe
Mr. Robert Thurner

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PRIVATE WELL SAMPLING
WELLSVILLE-ANDOVER
November 14, 1984

Sample Number	Resident	Supply	Oil & Grease (mg/l)	Phenols ug/l (ppb)	Volatile Organics ug/l (ppb)	Metals[1] ug/l (ppb)
01	Fred Kelley, Jr.	56' Well	3.8	<1.0	N.D.	Cr - 4.1 Cu - 112 Zn - 19
02	Leaon Fanton	55' Well	4.9	<1.0	N.D.	Zn - 15
03	Arnold Green	97' Well	2.1	<1.0	N.D.	Zn - 8.4
04	Henry Bauer	130' Well	5.2	<1.0	N.D.	Zn - 207
05	Rosalie Rosini	150' Well	4.0	<1.0	N.D.	Zn - 7.7
06	Barbara Ladue	Spring	<1.0	<1.0	Trans-1,2-Dichloroethene (150 ug/l) Trichloroethene (9.0 ug/l)	Cu - 12 Zn - 17
07	Russell Teller	120' Well	3.4	<1.0	N.D.	Zn - 41

N.D. - Not Detected

[1]Metals analyzed for with detection limits (ug/l):

Ag - 3.0	Cr - 4	Pb - 50	Hg - 0.2
Be - 1.0	Cu - 2	Zn - 3.0	Sb - 10
Cd - 10	Ni - 15	As - 10	Sc - 5
			Ti - 10

APPENDIX 6

NATIONAL PRIMARY DRINKING WATER
PROPOSED OR RECOMMENDED MAXIMUM CONTAMINANT LEVELS

MALCOLM PIRNIE WATER ALERT

P. Voorhees / Thomas

NOVEMBER/DECEMBER 1985

EPA ANNOUNCES NEW DRINKING WATER GOALS AND REGULATIONS

Background

The Federal Safe Drinking Water Act (SDWA) directs the United States Environmental Protection Agency (EPA) to issue National Primary Drinking Water Regulations (NPDWRs) in interim and revised forms. While the revised forms are developed, the Interim Primary Regulations are in effect as they have been since June 1977. The revised primary drinking water regulations are being developed in four phases:

Phase 1: volatile synthetic organic chemicals (VOCs)

Phase 2: synthetic organic chemicals (SOCs), inorganic chemicals (IOCs), and micro-organisms

Phase 3: radionuclides

Phase 4: disinfectant by-products, including trihalomethanes

Phase 5: other SOCs, pesticides and IOCs not previously considered.

The various steps in developing all four phases include:

1. Publish an Advance Notice of Proposed Rulemaking (ANPRM)
2. Propose recommended maximum contaminant levels (RMCLs)
3. Finalize RMCLs and propose maximum contaminant levels (MCLs)
4. Finalize MCLs

On November 13, 1985, proposals for Step 3 of Phase 1 (VOCs) and Step 2 of Phase 2 (SOCs, IOCs, and micro-organisms) were published in the Federal Register. In the November 14, 1985, Federal Register, EPA issued revised

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FT. LAUDERDALE, ORLANDO, FL • HAMDEN, CT • HOUSTON, SAN ANTONIO, TX • JACKSON, MS
NEWPORT NEWS, VA • PARAMUS, NJ • ST. PAUL, MN • WINSTON-SALEM, NC • AND CITIES OVERSEAS

standards for fluoride. A description of the proposed regulations for each is included in this Water Alert.

Phase 1 - VOCs

On June 12, 1984, EPA issued proposed RMCLS for nine VOCs. The November 13 notice includes final RMCLs and proposed MCLs for eight of the compounds. Tetrachloroethylene is not included in the current list of VOCs because of new data which have been made available concerning its toxicity. The November 13 notice also includes proposed monitoring requirements for other unregulated VOCs. A summary of each of the actions announced in the Federal Register notice is presented below.

Final RMCLS - Final RMCLs which were promulgated for the eight VOCs are presented in Table 1 at the end of this Water Alert. The RMCLs are nonenforceable health goals and are set at levels at which "no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety". RMCLs of zero were set for five of the VOCs which have sufficient human or animal evidence to be considered probable human carcinogens. The other three compounds are not probable human carcinogens and were set at levels based upon their chronic toxicity.

Proposed MCLs - The proposed MCLs for the eight VOCs were set as close to the RMCLs as possible, based on health considerations, treatment technologies, costs, analytical methods, and other factors such as air pollution and waste disposal. The proposed MCLs will lead to enforceable standards. The proposed MCLs for the eight VOCs are presented in Table 1.

Treatment Technologies - EPA has determined that the best generally available treatment technologies for removal of VOCs are packed tower aeration and granular activated carbon (GAC) adsorption. These treatment technologies can reasonably achieve 90-99 percent removal of the VOCs, and would have to be used by public water systems that receive variances.

Proposed Monitoring Requirements - As part of the VOC regulations, the EPA has proposed monitoring and reporting requirements for the eight regulated VOCs and for an additional 51 unregulated compounds which are listed in Table 2. EPA has identified three options for the monitoring program with different initial and repeat monitoring requirements. Surface and ground

waters have been considered separately. A summary of the three options is presented in Table 3.

The public comment period of 90 days on the proposed Phase 1 regulations began on November 13, 1985. Questions for which EPA is requesting comments are presented throughout the discussion in the Federal Register notice.

Analytical Methods - The EPA has developed three new analytical methods for demonstrating compliance with one or more of the proposed MCLs. The Practical Quantitation Level (PQL) for the VOCs is 5 ug/L, which represents the lowest level achievable by good laboratories within specified limits during routine laboratory operations. The accuracy of these methods at 5 ug/L is ±40 percent.

1. Method 502.1 - Volatile Halogenated Organic Compounds in Water by Purge and Trap Gas Chromatography

2. Method 503.1 - Volatile Aromatic and Unsaturated Organic Compounds in Water by Purge and Trap Gas Chromatography

3. Method 524.1 - Volatile Organic Compounds in Water by Purge and Trap Gas Chromatography/Mass Spectrometry

Monitoring for the 51 unregulated VOCs shall also be by the above methods, and for EDB and DBCP the following method must be used:

- Method 504 - Measurement of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-chloropropane (DBCP) in Drinking Water by Microextraction and Gas Chromatography

Tetrachlorethylene - An RMCL was proposed for tetrachloroethylene at zero on June 12, 1984. On November 13, 1985, EPA reopened the public comment period on the RMCL for tetrachloroethylene for 45 days to provide the opportunity to review and comment on the new data on the toxicology of tetrachloroethylene which recently became available. The new data appear to confirm that zero is appropriate. However, EPA will promulgate the RMCL and propose an MCL for tetrachloroethylene after the close of the 45 day comment period.

Phase 2 - SOCs, IOCs and Micro-organisms

On October 5, 1983 EPA published an ANPRM for the 73 contaminants included in Phase 2. The three groups of contaminants covered in Phase 2 include synthetic organic chemicals (SOCs), inorganic chemicals (IOCs), and

micro-organisms. The second step in developing drinking water regulations is the proposal of RMCLs. The November 13 Federal Register notice includes 4 microbiological RMCLs, 11 IOC RMCLs, and 26 SOC RMCLs. The notice presents the factors for the selection of contaminants for regulation, and includes discussions of analytical methods available for measurement, the occurrence in drinking water, and the potential health effects of exposure to the contaminants. Proposed RMCLs for substances considered to be probable human carcinogens are set at the zero level, and RMCLs for substances not treated as probable human carcinogens are set based upon chronic toxicity and or other data assessments of carcinogenicity and toxicity are issued separately by the EPA as health advisories. Health advisories are available for 28 chemicals for which RMCLs are proposed and 10 which are not being proposed. The proposed RMCLs for Phase 2 are listed in Table 4.

Microbiological - The four microbiological contaminants covered by the proposed rule are coliforms, turbidity, Giardia and viruses. Total coliforms and turbidity are include as indicators for a number of organisms (pathogens) which have adverse health effects. RMCLs are proposed for Giardia, (a parasite) and viruses because they reportedly caused more than 80,000 cases of infectious disease between 1971 and 1982. Two microbiological parameters included in the ANPRM of October 5, 1983 for which RMCLs are not proposed at this time are Heterotrophic Plate Count and Legionella. Monitoring heterotrophic plate count is included with the compliance monitoring requirements for total coliforms. A health advisory will be developed for Legionella.

In addition, the EPA presented possible treatment techniques which may be included in future rulemaking, and requested public comments on the following:

1. Mandatory filtration and disinfection of surface water.
2. Mandatory disinfection of ground water.

The ANPRM of October 5, 1983 listed 23 IOCs under consideration for Primary Drinking Water Regulations. RMCLs are currently proposed for 11 IOCs (one of which was not listed in the ANPRM - nitrite). One IOC (fluoride) was proposed separately and is discussed at the end of this Water Alert, and 6 IOCs (cyanide, molybdenum, nickel, silver, sodium, and sulfate) have been determined inappropriate for regulation based upon limited health effects data and/or occurrence in drinking water. Five IOCs (antimony, beryllium,

thallium, vanadium and aluminum) will be addressed at a later date, and one IOC (zinc) has been determined inappropriate for regulation.

The EPA proposed RMCLs for 26 of the 43 SOCs listed in the ANPRM. Five SOCs (atrazine, meta-dichlorobenzene, dioxin [2,3,7,8-TCDD], endrin, and hexachlorobenzene) were determined inappropriate for regulation because of the lack of occurrence data or insufficient health effects data. In addition, 14 SOCs will be reconsidered in later phases of the Revised Regulations.

The public comment period of 120 days on the proposed RMCLs for Phase 2 began on November 13, 1985. The EPA has requested comments on all aspects of the proposed regulations.

Fluoride Regulations

In a separate Federal Register notice published on November 14, 1985, EPA issued revised drinking water standards for fluoride. The current interim MCL for fluoride is 1.4 to 2.4 mg/L, depending on annual average maximum temperature. The revised standards for fluoride include:

- A final RMCL of 4.0 mg/L
- A proposed MCL Of 4.0 mg/L
- A proposed secondary maximum contaminant level (SMCL) of 2.0 mg/L

These levels are independent of temperature.

EPA has concluded that dental fluorosis, which was formerly regarded as an adverse health effect and which was the basis for the interim drinking water standard, is not an adverse health effect under the Safe Drinking Water Act, but rather a cosmetic effect that would adversely affect public welfare. The final RMCL will protect against crippling skeletal fluorosis with an adequate margin of safety. The SMCL is not a federally enforceable standard, and it is intended to provide guidance to states and communities for limiting the occurrence of dental fluorosis while still permitting optimal fluoride levels for the reduction of cavities.

The public notice also includes a proposal by EPA that no variances from the fluoride MCLs be available. Proposed monitoring, reporting and notification regulations to support the rules also are included.

Summary

The work completed by EPA for Phases 1 and 2 are significant steps in the development of Revised Regulations. Malcolm Pirnie's Drinking Water Technology Group in, association with Culp/Wesner/Culp, has been developing cost and treatment technology documents for contaminants contained in Phases 1 and 2 for the EPA. As a result, we have in-house all the available literature and data concerning the characteristics and treatment of the contaminants. We are available to answer questions concerning the treatment technology and costs associated with removing any of these contaminants.

TABLE 1

PROPOSED MCLs AND FINAL RMCLs FOR PHASE 1

Compound*	Proposed MCL (mg/L)	RMCL (mg/L)
Trichloroethylene	0.005	0
Carbon tetrachloride	0.005	0
Vinyl chloride	0.001	0
1,2-Dichloroethane	0.005	0
Benzene	0.005	0
1,1-Dichloroethylene	0.007	0.007
1,1,1-Trichloroethane	0.200	0.200
p-Dichlorobenzene	0.750	0.750

*A final RMCL will be published for tetrachloroethylene after the close of the 45-day comment period, to allow for public comments on the new data. The MCL for tetrachloroethylene will be proposed at that time.

TABLE 2

UNREGULATED VOCs PROPOSED IN MONITORING REQUIREMENTS

Chloroform
Bromodichloromethane
Chlorodibromomethane
Bromoform
trans-1,2-Dichloroethylene
Chlorobenzene
m-Dichlorobenzene
Dichloromethane
cis-1,2-Dichloroethylene
o-Dichlorobenzene
1,2,4-Trichlorobenzene
Fluorotrichloromethane
Dichlorodifluoromethane
Dibromomethane
1,2-Dibromoethane (EDB)
1,2-Dibromo-3-chloropropane (DBCP)
Toluene
p-Xylene
o-Xylene
m-Xylene
1,1-Dichloroethane
1,2-Dichloropropane
1,1,2,2-Tetrachloroethane
Ethylbenzene
1,3-Dichloropropane
Styrene
Chloromethane
Bromomethane
Bromochloromethane
1,2,3-Trichloropropane
1,2,3-Trichlorobenzene
n-Propylbenzene
1,1,1,2-Tetrachloroethane
Chloroethane
1,1,2-Trichloroethane
Pentachloroethane
bis-2-Chloroisopropyl ether
sec-Dichloropropane
1,2,4-Trimethylbenzene
n-Butylbenzene
Naphthalene
hexachlorobutadiene
o-Chlorotoluene
p-Chlorotoluene
1,3,5-Trimethylbenzene
p-Isopropyltoluene
1,1-Dichloropropane
iso-Propylbenzene
tert-Butylbenzene
sec-Butylbenzene
Bromobenzene

TABLE 3

SUMMARY: MONITORING OPTIONS

Initial Round	Option 1	Option 2	Option 3
Time to Complete	4 years	4 years	5 years
Ground Water Systems:			
Regulated[1]	Quarterly: confirmation of positive samples	Quarterly: State can reduce to 1 sample	1 sample
Unregulated	1 sample/ confirmation	1 sample/State discretion on confirmation	1 sample at 25% of wells
Surface Water Systems:			
Regulated and Unregulated	Monthly for one year	Quarterly for one year	State Discretion
Repeat Monitoring[2]			
Regulated[1]			
VOCs ND/Invulnerable	5 years	5 years (GWS) State Discretion (SWS)	State Discretion
VOCs ND/Vulnerable	3 years	3 years	State Discretion
VOCs detected	Monthly	Quarterly	Annually (GWS) State Discretion (SWS)
Unregulated	10 years	State discretion	None

Notes:

1. Vinyl chloride would only be required for systems that had detected other chlorinated 2-carbon VOCs. No requirements for vinyl chloride in surface water systems.
2. ND - Not detected
3. GWS - Ground Water Systems
4. SWS - Surface Water System

TABLE 4

PROPOSED RMCLs FOR PHASE 2

Microbiological Parameters	Proposed RMCL[1]
Total Coliforms	0
Turbidity	0.1 NTU[2]
Giardia	0
Viruses	0
Inorganic Contaminants	
Arsenic	0.050
Barium	1.5
Cadmium	0.005
Chromium	0.12
Copper	1.3
Lead	0.020
Mercury	0.003
Nitrate	10
Nitrite	1
Selenium	0.045
Asbestos (medium and long fibers)	7.1 mf/L[3]
Synethetic Organic Chemical	
Acrylamide	0
Alachlor	0
Aldicarb, aldicarb sulfoxide and aldicarb sulfone	0.009
Carbofuran	0.036
Chlordane	0
cis-1,2-Dichloroethylene	0.07
DBCP	0
1,2-Dichloropropane	0.006
o-Dichlorobenzene	0.62
2,4-D	0.07
EDB	0
Epichlorohydrin	0
Ethylbenzene	0.68
Heptachlor	0
Heptachlor epoxide	0
Lindane	0.0002
Methoxychlor	0.34
Monochlorobenzene	0.06
PCBs	0
Pentachlorophenol	0.22
Styrene	0.14
Toluene	2.0
2,4,5-TP	0.052
Toxaphene	0
trans-1,2-Dichloroethylene	0.07
Xylene	0.44

Note:

1. mg/L unless otherwise noted
2. NTU = Nephelometric Turbidity Unit
3. million fibers per liter