File 4847

4. CITY OF UTICA DUMP NO. 633015 - PHASE II

4.1 RECORD SEARCH/DATA COMPILATION

EA will conduct a thorough search of federal, state, county, town, and village records to compile information on site history, documented contamination, previous investigations, remedial actions, regional geology, topography, water supply and usage, demographics, and other pertinent information. EA will evaluate the data obtained, discuss findings with NYSDEC, and suggest modifications to the work plan if warranted. Preliminary HRS scores will be developed by EA to identify critical data needs for Phase II field investigations.

4.2 SITE RECONNAISSANCE

EA will conduct site reconnaissance to examine general site access, location of waste and/or fill areas (including the collection of one surficial sediment sample, refer to Section 4.5), site topography and drainage characteristics, areas of apparent offsite migration of wastes, and proximity of the site to populations and water supplies. Site reconnaissance will familiarize key project personnel with the site, enable the project geologists to evaluate potential boring/well locations, and enable the project Health and Safety Officer to develop specific health and safety requirements for each planned activity. Emergency, fire, and hospital services will be identified. A generic health and safety plan has been included as Appendix A. Photographs will be taken, site sketches prepared, and significant features noted. An integral part of site reconnaissance will be an air survey with a HNu photoionization detector (HNu). The air survey will be performed around the site perimeter and throughout the site for safety purposes, and to preliminarily investigate volatile contaminant releases upgradient and down gradient of the site to support the HRS scoring. Detection of

releases to air during site reconnaissance may warrant further confirmation studies. For cost estimating purposes, it is assumed that field activities will require only Level D health and safety protective measures.

4.3 GEOPHYSICS

Multidepth EM and earth resistivity surveying will be performed to evaluate the potential presence of ground water contaminant plumes and stratigraphic conditions. If necessary, magnetometer surveying would also be performed. The number of stations and value of depth settings will be determined on the basis of field conditions. Results of the geophysics will be used to refine the specifications for locations, depths, and number of observation wells to be installed.

4.4 TEST BORINGS AND OBSERVATION WELLS

Based upon the currently available information, EA plans to install three test borings/observation wells (Figure 4-1). This would be performed under full time supervision of an EA geologist. It is anticipated that the following drilling methods will be used: (1) hollow-stem auger in the unconsolidated sediments, and (2) air or water rotary in bedrock. Prior to the drilling of each boring/well, and at the completion of the last boring/well, the drilling equipment which comes in contact with subsurface materials will be steam cleaned, as well as the split spoon sampler after obtaining each sample. Soil sampling will be performed using a split spoon sampler at approximately 5-foot intervals down to the ground-water table, and then continuously (or as possible, depending upon borehole stability) in the unconsolidated sediment aquifer. An HNu would be used to monitor the potential organic vapors emitted from each soil sample. Three soil samples will be selected from the proposed screened interval of each well completed in unconsolidated sediments for analysis of moisture content and grain size or Atterburg limits.

It is anticipated that the wells to be installed at this site will be completed in unconsolidated sediments approximately 10 feet into the aquifer. Standard well construction will include 10 feet of 2-in. diameter threaded joint PVC screen and an appropriate length of PVC riser with a bottom plug/cap, sand pack, bentonite seal, and protective surficial steel casing with a locking cap.

Upon completion and development of the wells by air surging/pumping, the vertical elevation of the upper rim of each well casing will be surveyed in order to aid in evaluation of the ground-water flow direction. A slug test will be performed in each well.

For cost estimating purposes, it is assumed that:

a. Each of the wells will be completed to a depth of 20 feet below ground surface.

b. The 3 wells (and drum sampling, refer to Section 4.6) will require 5 days to install, develop, test, and survey.

c. All drill sites are accessible by truck-mounted drilling rigs as determined by the driller.

d. There are no excessive amounts of cobbles/boulders which would increase drilling time.

e. Steam cleaning of drilling/sampling equipment will be performed at each boring/well location. The fluids will be discharged to ground surface.

f. All drill cuttings, fluids and development water will be left on, or discharged to, the ground surface in the immediate area of the activity.

g. That permission from appropriate land owners to drill borings/ wells on their property will be a simple process (expedited by the NYSDEC, if necessary), so that delays during field operations are not incurred.

4.5 SAMPLING

All sampling and analysis will be conducted in accordance with the QA/QC Plan (Appendix B). The analytical program for every water and sediment sample will include 133 priority pollutants (Appendix C), plus the U.S. EPA Priority Pollutant metals. Also, all additional non-priority pollutant GC/MS major peaks will be identified and quantified. Major peaks will be considered as those whose area is 10 percent or greater than the calibrating standard(s). Based upon the currently available information, EA anticipates collection and analysis of the following numbers and types of samples (Figure 4-1):

3 Ground water samples (one from each Phase II well).

2 Surface Water (Canal) samples

4 Sediment samples (one will be collected during the site recon in the vicinity of the clusters of drums; the other 3 will be collected later in the study, along with each of the surface water and leachate samples).

1 Leachate/seepage samples (along the Mohawk River).

4.6 SPECIAL STUDIES

In order to evaluate the type of wastes present, EA proposes to collect 2 discrete samples of drum contents. The analytical program for these samples would be the same as described previously in Section 4.5; plus ignitability, corrosivity, reactivity and EP toxicity.

4.7 CONTAMINATION ASSESSMENT

EA will evaluate the data obtained during the records search and field investigations, prepare final HRS scores and documentation forms, complete EPA form 2070-13 and Part One of 2070-12 and summarize site history, site characteristics, available sampling and analysis data, and determine the adequacy of the existing data to confirm release, and if there is a population at risk.

4.8 REMEDIAL COST ESTIMATE

EA will evaluate remedial alternatives for the site and develop a list of potential options given the information available on the nature and extent of contamination. Approximate cost estimates for the selected potential remedial options will be computed. This work is not intended to be, or a substitute for, a formal cost effectiveness analysis of potential remedial actions.

4.9 FINAL PHASE II REPORT

EA will prepare a final report consistent in format and content with EA's previous Phase I reports. The Phase II report will include:

a. The results of the Phase II investigation, completed with boring logs, photos, and sketches developed as part of the Phase II field work.

b. Final HRS scores with detailed documentation.

c. Selected potential remedial alternatives and associated cost estimates.

EA will also supply as backup, the following raw data and resulting reduction:

a. geophysical
b. well logs
c. all sampling forms and data
d. all analytical data
e. chain-of-custody forms
f. soil sampling forms and classifications
g. other collected information

4.10 COST ESTIMATE

Based on the scope of work and assumptions described above, Table 4-1 summarizes the estimated costs to complete the Phase II investigation at the City of Utica Dump site. Table 4-2 summarizes the allocation of effort for each subtask. Tables A-1 through A-4 show EA's labor rates, subcontractor costs, analytical costs and other direct costs. Unit costs for additional scope will be based on rates shown in Tables A-1 through A-4.

REVISED APRIL 1985

TABLE 4-1 LEVEL OF EFFORT/ENGINEERING BUDGET FOR PHASE II INVESTIGATIONS

Site: City of Utica Dump
Consultant: EA Engineering, Science, and Technology, Inc.

Total Direct Cost:	50,905
Subcontractor/ODC Mgt:	1,685
Fee:	1,256
Total Cost Plus Fee:	53,846

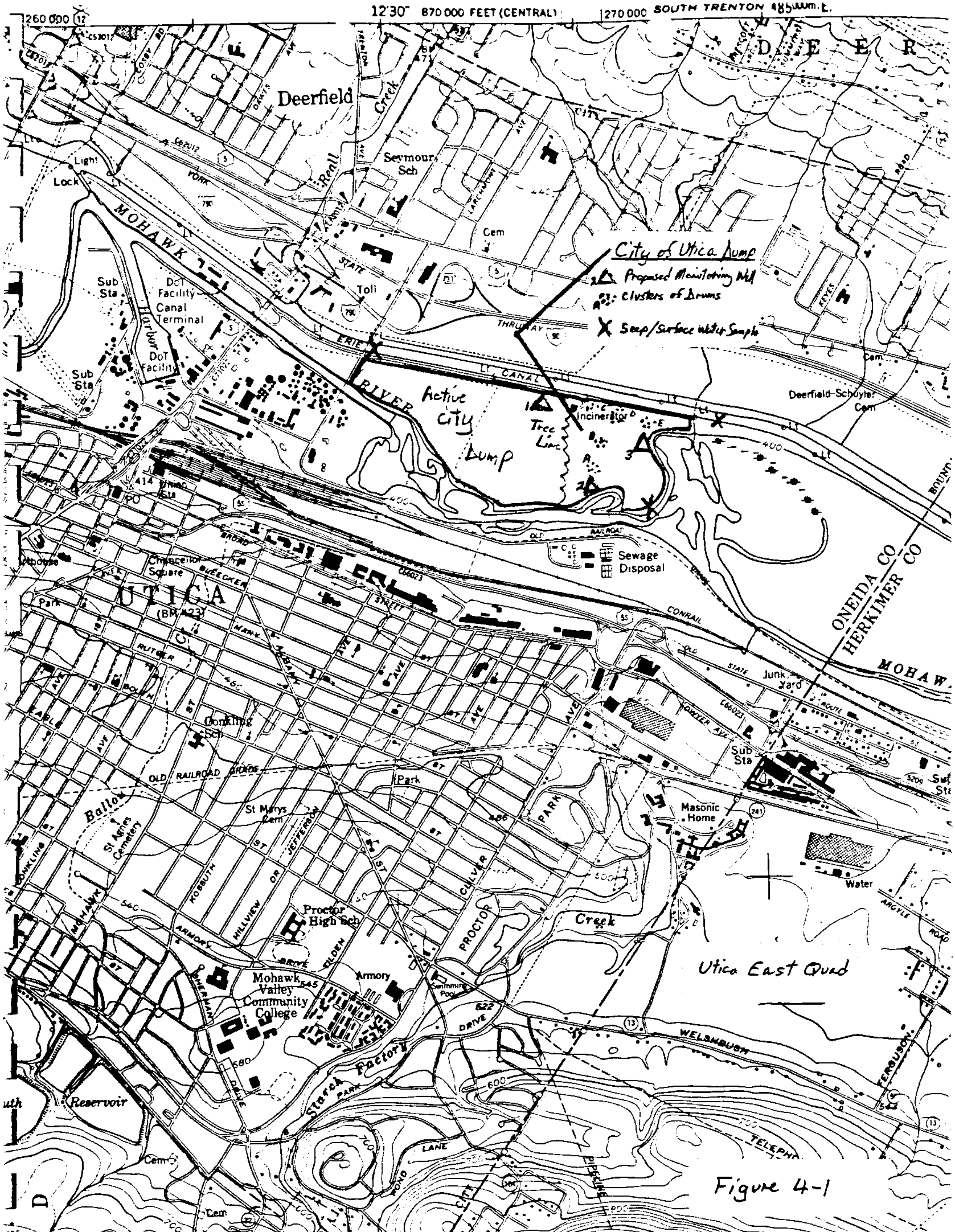
Phase II Task Description	Direct Hours	Direct Labor Cost	Labor Overhead	Laboratory Analysis	Travel and Subsistence	Equipment Charges	Subcontractors	Misc.	Subtotal ODC	Total
1. Record Search/ Data Compilation	88	1,339	1,781	---	300	---	---	---	300	3,420
2. Site Reconnaissance	36	769	1,023	---	550	450	---	---	1,000	2,792
3. Geophysics	16	240	319	---	340	225	2,300	---	2,865	3,424
4. Test Borings/Soil Sampling/Observation Wells	48	720	958	900	1,050	585	5,125	---	7,660	9,338
5. Ground Water/Surface Water/ Sediment Sampling	36	422	561	15,500	630	355	---	600	17,085	18,068
6. Contamination Assessment	56	1,345	1,789	---	---	---	---	---	---	3,134
7. Remedial Cost Estimate	16	393	523	---	---	---	---	---	---	916
8. Report Production	62	760	1,011	---	---	---	---	750	750	2,521
9. Project Management/ QA	62	1,273	1,693	---	---	---	---	---	---	2,966
10. Special Studies	8	120	160	3,896	---	50	---	100	4,046	4,326

TABLE 4-2 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PHASE II INVESTIGATIONS
HOURLY TIME ESTIMATES

Site: City of Utica Dump
Consultant: EA Engineering, Science, and Technology, Inc.

Phase II

Task Description	Professional/Technical Levels				
	P-4	P-3	P-2	P-1	T-3
1. Record Search/ Data Compilation	8	16	24	16	24
2. Site Reconnaissance	12	12	12		
3. Geophysics			16		
4. Test Borings/Soil Sampling/ Observation Wells			48		
5. Ground Water/Surface Water/ Sediment Sampling			18	18	
6. Contamination Assessment	40		16		
7. Remedial Cost Estimate	8	8			
8. Report Production			12		50
9. Project Management/QA	16	30			16
10. Special Studies			8		



12'30"
870 000 FEET (CENTRAL)
260 000
270 000
SOUTH TRENTON 485000m.E.
DEER
Deerfield
Seymour Sch
Cem
City of Utica Dump
Proposed Monitoring Well
Clusters of Drums
Seep/Surface Water Sample
Active City Dump
Tree Line
Incinerator
MOHAWK RIVER
ERIE CANAL
THRUWAY
Light
Lock
Sub Sta
DoT Facility
Canal Terminal
Harbor
Deerfield-Schuyler Cem
Sewage Disposal
Union Sta
PO
Chancellor Square
UTICA
BLEECKER
Park
CONRAIL
ONEIDA CO
HERKIMER CO
Junk Yard
Conkling Sch
OLD RAILROAD GRADE
St Marys Cem
St Agnes Cemetery
Ballou
Masonic Home
Water
Proctor High Sch
Creek
Utica East Quad
Armory
Mohawk Valley Community College
Swimming Pool
WELSHBUSH
Starch Factory
Reservoir
Cem
LANE

Figure 4-1

Revised June 1985

5. ILION LANDFILL NO. 622004 - PHASE II

5.1 RECORD SEARCH/DATA COMPILATION

EA will conduct a thorough search of federal, state county, town, and village records to compile information on site history, documented contamination, previous investigations, remedial actions, regional geology, topography, water supply and usage, demographics, and other pertinent information. EA will evaluate the data obtained, discuss findings with NYSDEC after completion of the geophysics, and suggest modifications to the work plan if warranted. Preliminary HRS scores will be developed by EA to identify critical data needs for Phase II field investigation.

5.2 SITE RECONNAISSANCE

EA will conduct site reconnaissance to examine general site access, location of waste and/or fill areas, site topography and drainage characteristics, areas of apparent offsite migration of wastes, and proximity of the site to populations and water supplies. Site reconnaissance will familiarize key project personnel with the site, enable the project geologists to evaluate potential boring/well locations, and enable the project Health and Safety Officer to develop specific health and safety requirements for each planned activity. Emergency, fire, and hospital services will be identified. A generic health and safety plan has been included as Appendix A. Photographs will be taken, site sketches prepared, and significant features noted. An integral part of site reconnaissance will be an air survey with a HNu photoionization detector (HNu). The air surveys will be performed around the site perimeter and throughout the site for safety purposes, and to preliminarily investigate volatile contaminant releases up gradient and down gradient of the site to support the HRS scoring. Detection of releases to air during site reconnaissance may warrant further confirmation studies. For cost estimating purposes, it is assumed that field activities will require only Level D health and safety protective measures.

5.3 GEOPHYSICS

Multidepth EM and earth resistivity will be performed to evaluate the potential presence of ground water contaminant plumes and stratigraphic conditions. If necessary, magnetometer surveying would also be performed. The number of stations and value of depth settings will be determined on the bsais of field conditions. Results of the geophysics will be used to refine the specifications for locations, depths, and number of observation wells to be installed.

5.4 TEST BORINGS AND OBSERVATION WELLS

Based upon the currently available information, EA plans to install three test borings/observation wells (Figure 5-1). This would be performed under the full time supervision of an EA geologist. It is anticipated that hollow-stem auger drilling would be used in the unconsolidated sediments. Prior to the drilling of each boring/well, and at the completion of the last boring/well, the drilling equipment which comes in contact with subsurface materials will be

steam cleaned, as well as the split spoon sampler after obtaining each sample. Soil sampling will be performed using a split spoon sampler at approximately 5-foot intervals and at detected major stratigraphic changes. An HNu would be used to monitor the potential organic vapors emitted during drilling operations and from each soil sample. Samples of the major soil/unconsolidated sediment types encountered during drilling will be collected for either grain size analysis (non-cohesive materials) or Atterberg Limits (cohesive materials).

It is anticipated that the wells to be installed at this site will be completed in unconsolidated sediments approximately 10 feet into the aquifer. Standard well constructin will include 10 feet of 2-in. diameter threaded joint PVC screen and appropriate length of PVC riser with a bottom plug/cap, sand pack, bentonite seal, and protective surficial steel casing with a locking cap.

Upon completion and development of the wells by air surging/pumping, vertical elevation of the upper rim of each well casing will be surveyed in order to aid in evaluation of the ground-water flow direction. Depending upon the yield of each Phase II well, a short-term low-yield pumping test will be performed in each well.

For cost estimating purposes, it is assumed that:

a. Each of the wells will be completed to a depth of 20 feet below ground surface.

b. The 3 wells will require 5 days to install, develop, and test.

c. All drill sites are accessible by truck-mounted drilling rigs as determined by the driller.

d. There are no excessive amount of cobbles/boulders which would increase drilling time.

e. Steam cleaning of drilling/sampling equipment will be performed at each boring/well location. The fluids will be discharged to ground surface.

f. All drill cuttings, fluids and development water will be left on, or discharged to, the ground surface in the immediate area of the activity.

g. That permission from appropriate land owners to drill borings/wells on their property will be a simple process (expedited by the NYSDEC, if necessary), so that delays during field operations are not incurred.

5.5 SAMPLING

All sampling and analysis will be conducted in accordance with the QA/QC Plan (Appendix B). The analytical program for every water and sediment sample will include 133 prioroty pollutants (Appendix C), plus the U.S. EPA Priority Pollutant Metals. Also, all additional non-priority pollutant GC/MS major peaks will be identified and quantified. Major peaks will be considered as those whose area is 10 percent or greater then the calibrating standard(s). Based upon the currently available information, EA anticipates collection and analysis of the following numbers and types of samples (Figure 5-1):

3 Ground water samples (one from each Phase II well).

2 Surface water samples from the Canal.

3 Surficial sediment samples.

5.6 SPECIAL STUDIES

In order to evaluate the type of wastes present, EA proposes to collect 2 discrete samples of drum contents, one of which will be selected by screening with the HNu. The analytical program for these samples would be the same as described previously in Section 5.5, plus ignitability, corrosivity, reactivity, and EP toxicity.

5.7 CONTAMINATION ASSESSMENT

EA will evaluate the data obtained during the records search and field investigations, prepare final HRS sores and documentatin forms, complete EPA form 2070-13 and Part One of 2070-12 and summarize site history, site characterisitics, available available sampling and analysis data, and determine the adequacy of the existing data to confirm release, and if there is a population at risk.

5.8 REMEDIAL COST ESTIMATE

EA will evaluate remedial alternatives for the site and develop a list of potential options given the information available on the nature and extent of contamination. Approximate cost estimates for the selected potential remedial options will be computed. This work is not intended to be, or a substitute for, a formal cost effectiveness analysis of potential remedial actions.

5.9 FINAL PHASE II REPORT

EA will prepare a final report consistent in format and content with EA's previous Phase I reports. The Phase II report will include:

a. The results of the Phase II investigation, completed with boring logs, photos, and sketeches developed as part of the Phase II field work.

b. Final HRS scores with detailed documentation.

c. Selected potential remedial alternatives and associated cost estimate.

EA will also supply as backup, the following raw data and resulting reduction:

a. geophysical
b. well logs
c. all sampling forms and data
d. all analytical data
e. chain-of-custody
f. soil sampling forms and classifications
g. other collected information

5.10 COST ESTIMATE

Based on the scope of work and assumptions described above, Table 5-1 summarizes the estimated costs to complete the Phase II investigations at the Ilion Landfill site. Tabel 5-2 summarizes the allocations of effort for each subtask. Tabesl A-1 through A-4 show EA's labor rates, subcontractor costs, analytical costs and other direct costs. Unit costs for additional scope will be based on rates shown in Tables A-1 through A-4.

REVISED APRIL 1985

TABLE 5-1 LEVEL OF EFFORT/ENGINEERING BUDGET FOR PHASE II INVESTIGATIONS

te: Ilion Landfill
nsultant: EA Engineering, Science, and Technology, Inc.

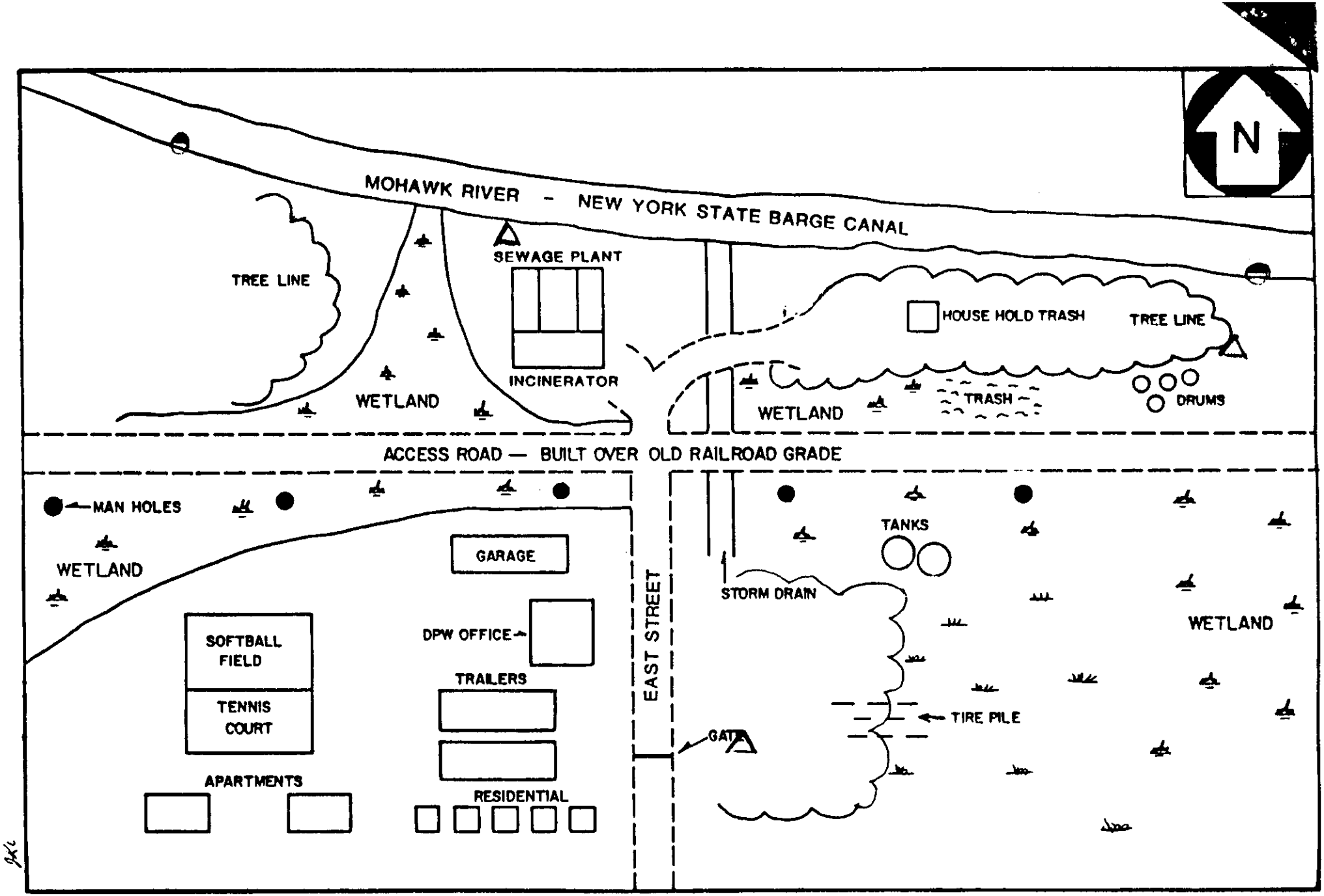
Total Direct Cost:	47,860
Subcontractor/ODC Mgt:	1,526
Fee:	1,264
Total Cost Plus Fee:	50,650

Phase II Task Description	Direct Hours	Direct Labor Cost	Labor Over-head	Labor-atory Analysis	Travel and Sub-sistence	Equipment Charges	Sub-contractors	Misc.	Subtotal ODC	Total
. Record Search/ Data Compilation	88	1,339	1,781	---	300	---	---	---	300	3,420
. Site Reconnaissance	36	769	1,023	---	550	450	---	---	1,000	2,792
. Geophysics	16	240	319	---	340	270	2,300	---	2,910	3,469
. Test Borings/Soil Sampling/Observation Wells	48	720	958	900	1,000	585	5,325	---	7,810	9,488
. Ground Water/Surface Water/ Sediment Sampling	40	469	624	12,400	630	355	---	400	13,785	14,878
. Contamination Assessment	56	1,345	1,789	---	---	---	---	---	---	3,134
. Remedial Cost Estimate	16	393	523	---	---	---	---	---	---	916
. Report Production	62	760	1,011	---	---	---	---	750	750	2,521
. Project Management/ QA	62	1,273	1,693	---	---	---	---	---	---	2,966
. Special Studies	8	120	160	3,896	---	50	---	50	3,996	4,276

TABLE 5-2 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PHASE II INVESTIGATIONS
HOURLY TIME ESTIMATES

Site: Ilion Landfill
Consultant: EA Engineering, Science, and Technology, Inc.

Phase II Task Description	Professional/Technical Levels				
	P-4	P-3	P-2	P-1	T-3
1. Record Search/ Data Compilation	8	16	24	16	24
2. Site Reconnaissance	12	12	12		
3. Geophysics			16		
4. Test Borings/Soil Sampling/ Observation Wells			48		
5. Ground Water/Surface Water/ Sediment Sampling			20	20	
6. Contamination Assessment	40		16		
7. Remedial Cost Estimate	8	8			
8. Report Production			12		50
9. Project Management/QA	16	30			16
10. Special Studies			8		



ILION LANDFILL

ILION, N.Y.

SITE MAP

(NOT TO SCALE)

△ Monitoring Well (Proposed)

● Surface Water/Sediment Sample

FIGURE 5-1

Note: Base Map from NUS Phase I Report

6. REMEDIAL COST ESTIMATE

6.1 SITE SUMMARY AND PHASE II SAMPLING AND ANALYSIS

The Utica Dump site is an inactive dump located at the end of Incinerator Road in the City of Utica, Oneida County, New York. The site encompasses approximately 55 acres and is situated in a remote swampy area bordered by the Erie Barge Canal to the north, the Mohawk River to the south and east, and the City of Utica's Hardfill Landfill to the west. The site was operated by the City of Utica from the early 1930s until 1972 to dispose of municipal wastes and some wastes from local industries. Local companies deny using the site except for disposal of their non-industrial wastes (Appendixes 1.4.1-7 through 1.4.1-12). Little else is known about the quantity or nature of the wastes. Presently, the City of Utica Dump is generally covered and vegetated, except for the eastern and southern edge (toe) of the dump where there is a steep slope of exposed debris. The City currently uses the northwestern-most portion of the site for disposal of snow removed from city streets. Several drum clusters containing unknown substances (both solid and liquid) are present throughout the site.

The New York State Department of Environmental Conservation (NYSDEC) collected sediment and aqueous leachate samples at the site in 1981. The aqueous samples indicated concentrations above the CRDL for phenols, aldrin, I-BHC, S-BHC, V-BHC and heptochlor, as well as low levels of some metals (Appendix 1.4.4-1).

The sediment samples indicated concentrations of chlorobenzene, methylene chloride, heptochlor, total cyanide, and total phenols above the CRDC. Concentrations of heavy metals were also detected (Appendix 1.4.4-1).

As part of the Phase II investigation, three monitoring wells were installed on 27-28 June and 1 July 1985. The upgradient well had to be replaced due to vandalism, and a new well was installed by NYSDEC on 5 April 1986. Sampling of two of these wells was performed by EA personnel on 7 and 8 April 1987; the third well was inaccessible due to the flooding of the Mohawk River. Analysis of the ground-water samples indicates that aluminum, arsenic, barium, iron, magnesium, potassium, and sodium were detected in elevated concentrations in the downgradient sample (as compared with the concentration detected in the upgradient sample) indicating an observed release from the site to the ground water. It should be noted that, with the exception of iron, the concentrations of the metals mentioned above fall below the limits recommended by the New York State Quality Standards for Class GA ground water.

Due to flooding of the Mohawk River during the Phase II sampling program, surface water samples could not be collected. However, a seep was observed at that time to be flowing directly into the Mohawk River. A seep sample (both aqueous and sediment) was collected and analyzed. Results of these samples indicated concentrations of 21 metals, 3 volatile organics, total cyanide, total phenol, and Arochlor 1254 (PCB) above the contract required detection limit (CRDL), indicating an observed release to surface water (Table 4-2).

The contents of two drums were also collected on 7 and 8 April 1987. Two volatile organics, 17 metals, total cyanide, total phenol, and 16 base neutral/acid extractable organics were detected above the CRDL (Table 4-3). EP Tox performed on the drum samples found no elevated levels of metals. For U.S. EPA bulk drum hazardous waste characteristics, only one drum had a parameter (corrosivity) outside the threshold limits.

6.2 RECOMMENDED REMEDIAL ACTION

Results of the Phase II investigation of the Utica Dump site reveal a need for further study and remedial action. It is recommended that a remedial investigation/feasibility study (RI/FS) be initiated to better define the extent and nature of the wastes on site. Although final recommendations for remedial action should be made after the RI/FS is completed, the following presents options for additional investigative action and remedial action based on the results of the Phase II investigation:

- Installation of additional monitoring wells and establishment of a ground-water monitoring program. At a minimum, the plan should include biannual sampling for heavy metals and volatile organics. The cost of installing the additional wells is $16,000-$28,000, based upon eight new wells. The annual cost for the monitoring program is in the range of $75,000-110,000.

- Develop a surface water monitoring program for the area adjacent to the Mohawk River. Sampling should be done at least twice a year and should be analyzed for heavy metals, volatile organics, total cyanide, total phenol, and PCB. The estimated annual cost for this program is $25,000-$40,000.

- Installation of a membrane-lined cap over the entire 55-acre site. This measure is expected to reduce leachate generation and consequently limit leachate flow towards the Mohawk River. The proposed system may incorporate a clay layer, a synthetic membrane, a sand drainage layer, and topsoil cover. The site should then be seeded with appropriate vegetation. A detailed study of site topography and an engineering analysis would be necessary prior to designing the cap. The capping system should include a gas venting system. Estimated cost of the system as described above ranges from $7,500,000 to $11,800,000. Annual maintenance costs are estimated at $30,000-$55,000.

- Installation of a ground-water extraction and treatment system integral to the above-mentioned cap. Based on a 40-in./year rainfall, an area of 2,400,000 square feet (55 acres), leachate generation is estimated to be 0.05-0.1 mgd. It is anticipated that 3-4 wells would be placed within the landfill and induce cones of depression for leachate removal. These wells would then pump to a treatment system. Cost of installing the wells and pumps is estimated to be $25,000-$45,000. Capital costs for an activated carbon treatment system range from $16,000/mgd for erection

of a leased system to $700,000/mgd for construction of a permanent system. Annual O & M costs can be expected to vary from $395,000 to $580,000/mgd depending upon system components.

Two other remediation alternatives were considered but found to be inappropriate for the Utica Dump site. A slurry wall running along the eastern and southern border of the site was found to be impractical due to the depth to bedrock (>100 ft). Cost of this method of containment would be prohibitive. Also found to be economically unfeasible was the excavation and disposal alternative, due to the large volume of waste and cover material and anticipated hauling distance. The "no action" option was deemed inappropriate based on the results of the Phase II investigation. A summary of the recommended remediation costs is provided in Table 6-1. It should be noted that these recommendations are preliminary at best, and costs presented are rough estimates which are based upon the Phase II investigation information.

It should be emphasized that additional information is required before any remedial action is taken. An RI/FS would be an appropriate initial step in providing a technically sound and cost-effective remediation of the Utica Dump site.

TABLE 6-1 RECOMMENDED REMEDIAL MEASURES
UTICA DUMP SITE, UTICA, NEW YORK

Action	Initial Cost	Annual O & M Cost
Installation of eight ground-water monitoring wells	$16,000-$28,000	$75,000-$110,000*
Surface water monitoring program	---	$25,000-$40,000*
Capping of landfill	$7,500,000-$11,800,000	$30,000-$55,000
Leachate collection wells	$25,000-$45,000	---
Activated carbon leachate treatment system	$16,000-$700,000/mgd**	$395,000-$580,000/mgd

* Includes sampling and analysis program.
** Wide cost variation due to numerous treatment methods available from mobile systems to permanently housed pumping and treatment equipment.

REFERENCES FOR CHAPTER 6

Compendium of Costs of Remedial Technologies at Hazardous Waste Sites, Final Report, Hazardous Waste Engineering Research Laboratory, Office of Research and Development, U.S. EPA, Cincinnati, Ohio, September 1985.

Handbook: Remedial Action at Waste Disposal Sites, U.S. EPA Technology Transfer, Cincinnati, Ohio, October 1985.