United States Environmental Protection Agency
Office of Emergency and Remedial Response
EPA ROD R05 85 019
August 1985

EPA

Superfund Record of Decision:

Schmalz Dump, WI

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO
EPA/ROD/R05-85/019		

4. TITLE AND SUBTITLE	5. REPORT DATE
SUPERFUND RECORD OF DECISION Schmalz Dump, WI	August 13, 1985
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12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report 14. SPONSORING AGENCY CODE 800/00

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Schmalz Dump site is located in the town of Harrison, Wisconsin, on the north shore of Lake Winnebago. The site occupies approximately five acres of wetland in the federally designated Waverly Beach Wetlands area. According to the Wisconsin Department of Natural Resources and court documents, industries dumped wastes at various locations along the north shore of Lake Winnebago for several years. Mr. Gerald Schmalz, site owner, began filling his property in 1968. Records show that the wastes hauled there consisted of car bodies, stone, water tanks, trees, pulp chips and mash. Between 1972 and 1973, the site accepted fly ash and bottom ash from a local utility, and in 1978 and 1979 Mr. Schmalz accepted the demolition debris from a building owned by Allis-Chalmers Corporation.

The selected remedial action includes excavation and offsite disposal of 3,500 cubic yards of contaminated building debris. Total capital cost for the selected remedial alternative is estimated to be $2,088,300.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Schmalz Dump, WI Contaminated Media: soil, wetlands Key contaminants: PCBs, chromium, heavy metals		

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RECORD OF DECISION
OPERABLE UNIT REMEDIAL ALTERNATIVE SELECTION

Site: Schmalz Dump, Harrison, Wisconsin

Documents Reviewed

- Phased Feasibility Study, Schmalz Dump
- Summary of Remedial Alternative Selection
- Responsiveness Summary

Description of Selected Remedy

- Excavation of 3500 cubic yards of Polychlorinated biphenyl (PCB) contaminated building debris and off-site disposal in an approved landfill facility.

Declarations

Consistent with the Comprehensive Environmental Response Compensation and Liability Act of 1980, and the National Contingency Plan (40 CFR Part 300), I have determined that removing the PCB contaminated building debris at Schmalz Dump as a source control operable unit is cost-effective, is consistent with the final goals for the site, and provides adequate protection of public health, welfare and the environment. The State of Wisconsin has been consulted and agrees with the approved remedy.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. In addition, the off-site transport and secure disposition is more cost-effective than other remedial action, and is necessary to protect public health, welfare, and the environment.

The U.S. Environmental Protection Agency (USEPA) will undertake a remedial investigation/feasibility study (RI/FS) of the Schmalz Dump to evaluate potential contamination of pathways and potential contaminants remaining on-site. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of the future remedial action.

August 13, 1985
Date

Valdas V. Adamkus
Regional Administrator

Summary of Operable Unit Remedial Alternative Selection
Schmalz Dump Site, Harrison, Wisconsin

Site Location and Description

The town of Harrison is located on the north shore of Lake Winnebago in the east central section of Wisconsin, about 2 miles east of Menasha, in Calumet County (see Figure 1).

The Schmalz Dump, which occupies approximately 5 acres of wetland in the federall designated Waverly Beach Wetlands area, has undergone unauthorized dumping. The property north and west of the site has also been used for waste disposal. To the south, between the site and the lake, is a moderately populated, residential area. Residents have recently been hooked-up to the Menasha water system, although some have retained wells for auxiliary uses. The neighboring city of Appleton, with a population of 59,040, has its drinking water intake 500 feet from the shore of Lake Winnebago, in close proximity to the site.

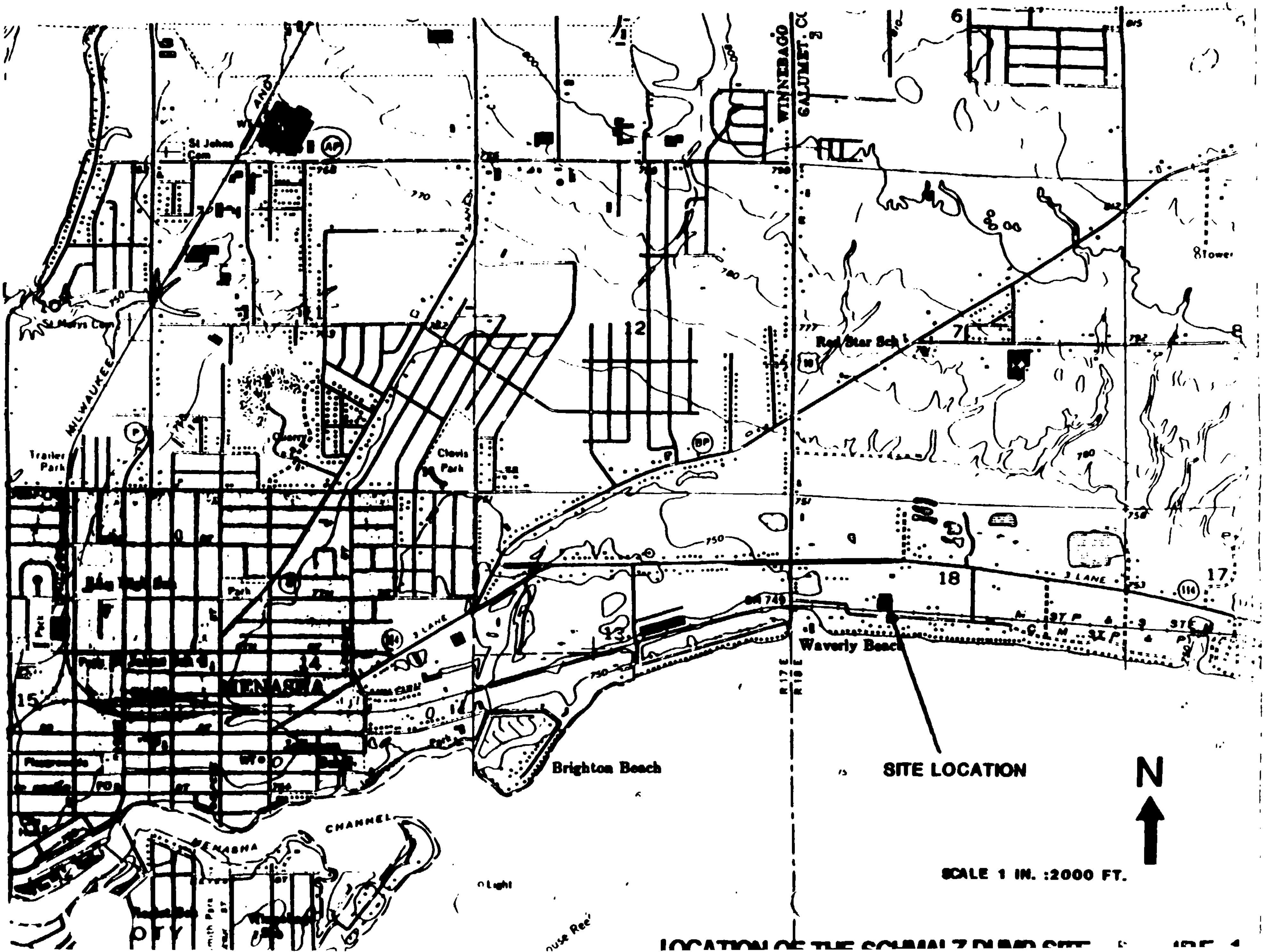
Site History

According to the Wisconsin Department of Natural Resources (WDNR) and court documents, industries dumped wastes at various locations along the north shore of Lake Winnebago for several years. Mr. Gerald Schmalz, site owner, began filling his property in 1968. Records show that the wastes hauled there consisted of car bodies, stone, water tanks, trees, pulp chips and mash. Between 1972 and 1973 the site accepted fly ash and bottom ash from a local utility, and in 1978 and 1979 Schmalz accepted the demolition debris of a building owned by the Allis-Chalmers Corporation.

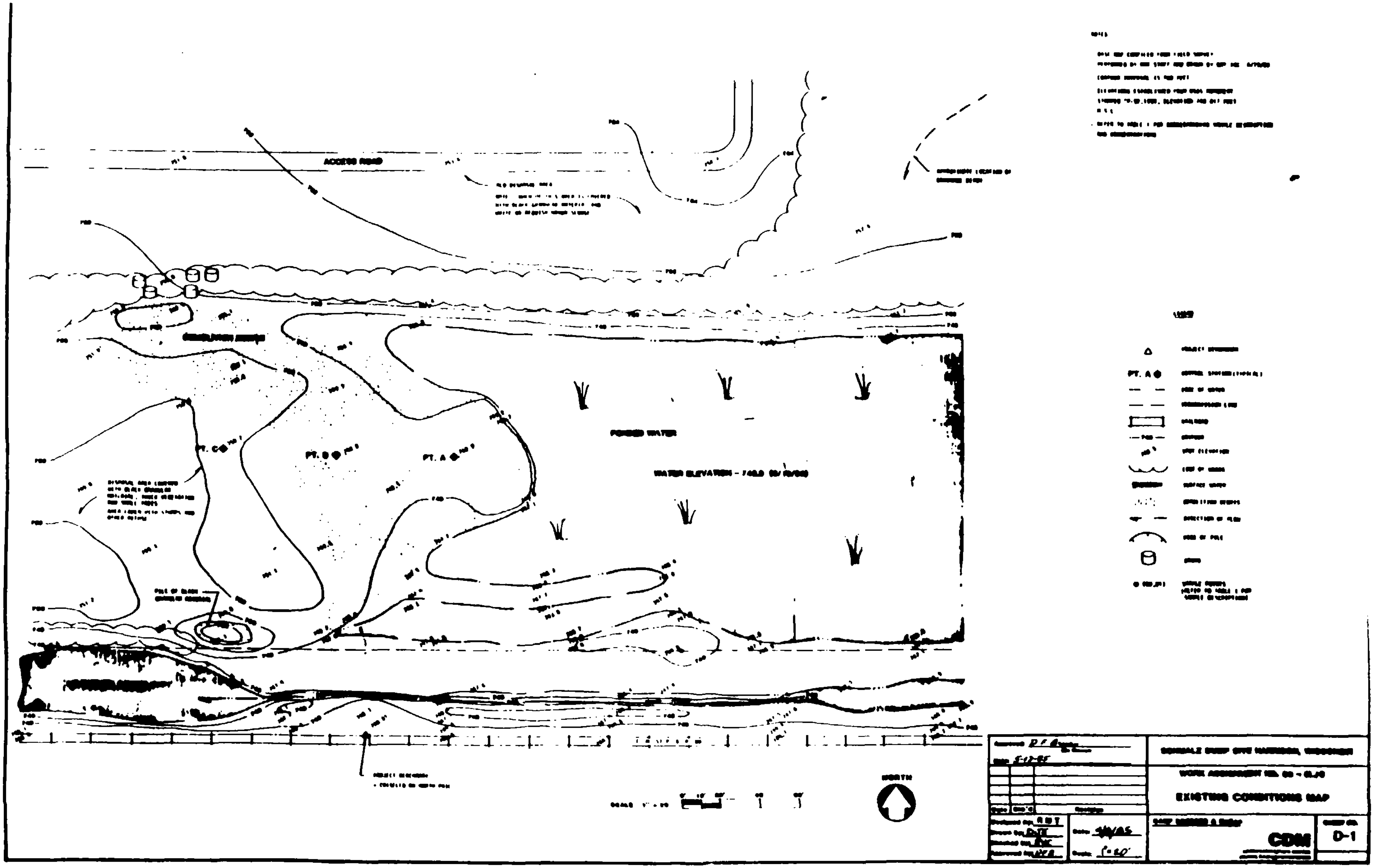
Initial sampling on-site by the State of Wisconsin and the U.S. Army Corps of Engineers (COE) in early 1979 determined that the area where the Allis-Chalmers debris was located was contaminated with concentrations of PCBs as high as 3100 ppm.

In the summer of 1979, the Wisconsin Attorney General filed suit against Mr. Schmalz, the waste hauler - Weiseler Construction, and Allis Chalmers Corporation, alleging illegal disposal of PCBs. However, due to lack of direct evidence, the court ruled against the State. In 1983, Gerald Schmalz sold the property to his son Gregory.

In September 1984, the site was listed on the National Priorities List. USEPA completed a report identifying potentially responsible parties, including waste generators and transporters in October 1984. RI/FS work was initiated during April 1985. Since a threat to public health has been identified due to the PCB contaminated demolition debris, USEPA and WDNR decided to prepare a Phased Feasibility Study (PFS) to evaluate potential source control remedies.



SITE LOCATION
N
SCALE 1 IN. :2000 FT.
Brighton Beach
Waverly Beach
MENASHA
MILWAUKEE
WINNEBAGO
CALUMET CO
MENASHA CHANNEL
St Johns Cem
Trailer Park
Clovis Park
Red Star Sch
Tower


ACCESS ROAD
PONDED WATER
WATER ELEVATION
PT. A
PT. B
PT. C
NORTH
EXISTING CONDITIONS MAP
CDM
D-1

<u>Current Site Status</u>

The PCB contaminated demolition debris covers an area of about one half acre; approximately 3500 cubic yards in volume. The material consists of primarily wood, masonry, shingle, black granular material and concrete, and is generally three to five feet deep, of which one to two feet are under water. Drawing D-1 outlines the area covered by debris.

Test results from 1980 indicate that PCBs are not uniformly dispersed throughout the debris. Some locations sampled were below 1 ppm PCB while others showed concentrations as high as 3100 ppm PCB. Samples collected outside of the debris area had concentrations less than 1 ppm PCB, indicating that the migration of PCBs had initially been confined to the debris and the sediment below it. PCB concentrations for samples analyzed from various substrate types and their depths are presented in Table 1. Sample locations are shown on Drawing D-2.

PCB is a documented animal carcinogen and is known to bioaccumulate in the fat tissues of humans and animals. Studies have shown that exposure to PCBs causes a variety of adverse effects in humans such as impared liver function; neurobehavorial and immunological impairment; and chloracne (a severe skin disorder). Also associated with PCB exposure are premature births, decreased birth weight, birth defects, menstrual disorders and impaired reproduction. Animals experimentally exposed to PCBs have shown pathological changes in the liver, stomach, and skin and increased incidences of cancer in those organs as well. There is some evidence that PCBs have also caused increased cancer incidence in workers who have been exposed to PCBs over prolonged periods.

Based on available sample data and given the current recommended health advisories for PCBs, the Schmalz site poses a significant risk to public health and the environment. There are several pathways for exposure of PCBs, however, direct contact and ingestion of contaminated soil are the most significant pathways at present. The site is frequented by various wildlife, including many types of nesting birds and domestic animals. Local residents use the site for hunting and as a short cut, and could possibly scavenge the debris. Also, children have been known to play in the area.

Other pathways include contaminated surface water, groundwater, and soils, and consumption of contaminated wildlife. At present there is no record of off-site contamination, however, future risks may be created from PCBs being transported by sediment, surface water or groundwater. Although PCBs have greater affinity to sediment, they can become soluble in water. PCB concentrations at the site are high enough to cause this to occur. In addition, solid particles moving in the groundwater and surface waters transport significant amounts of PCBs. These pathways could lead to increased levels of PCBs in Lake Winnebago and consequently to increased concentrations of PCBs in fish inhabiting the lake. In addition, the City of Appleton's drinking water intake, located 500 feet off-shore, as well as private wells in the area, could become contaminated.

Sample results from 1979 and 1980 also showed high levels of lead, chromium, and copper associated with the building debris. These contaminants could also pose a threat to groundwater and surface water pathways through migration in solution or as solid particles. The remedial investigatio

TABLE 1
SUMMARY OF PCB ANALYSIS CONDUCTED AT THE SCHMALZ DUMP SITE, HARRISON, WISCONSIN

Sample No.	Description	Depth (ft)	Analyst	PCB (mg/kg)
1	Granular	2.0	1	585.0
2	Wood	2.0	1	73.4
3	Black Sandy Peat	2.5	1	4.6
4	Granular	2.0	1	72.0
5	Black Sandy Peat	3.0	1	6.0
6	Granular	2.0	1	366.0
7	Wood	2.0	1	124.0
8	Roofing Paper	2.0	1	2.7
9	Black Sandy Peat	3.0	1	4.0
10	Granular	2.0	1	466.0
11	Wood	2.0	1	16.9
12	Black Sandy Peat	3.0	1	4.7
13	Granular	1.0	1	11.7
14	Wood	1.0	1	22.0
15	Black Sandy Peat	1.5	1	4.4
16	Granular	2.0	1	134.0
17	Wood	2.0	1	37.2
18	Granular	2.0	1	71.4
19	Wood	2.0	1	3.1
20	Black Sand	4.0	1	3.2
21	Granular	2.0	1	323.0
22	Wood	2.0	1	37.7
23	Granular	2.0	1	150.0
24	Wood	2.0	1	44.4
25	Black Sandy Peat	4.0	1	2.3
26	Granular	2.0	1	39.0
27	Wood	2.0	1	5.8
28	White Material	1.0	1	37.6
29	Black Sandy Peat	3.5	1	10.0
30	Granular	2.0	1	774.0
31	Wood	2.0	1	127.0
32	Black Sandy Peat	3.0	1	5.6
33	Granular	2.0	1	54.0
34	Wood	2.0	1	1.7
35	Granular	2.0	1	84.0
36	Wood	2.0	1	20.1
37	White Sticky Solids	1.0	1	6.9
38	Granular	2.0	1	166.0
39	Wood	2.0	1	31.1
40	Black Sandy Peat	3.0	1	1.5
41	Granular	1.5	1	149.0
42	Wood	1.5	1	1.6
43	White Solids	1.0	1	3.9
44	Granular	1.5	1	28.6
45	Wood	1.5	1	7.0
46	Black Peaty Sand	3.0	1	1.1
47	Granular	1.5	1	541.0
48	Wood	1.5	1	9.7
49	Red Solids	1.5	1	60.4
50	Granular	2.0	1	1602.0
51	Wood	2.0	1	1396.0

TABLE 1
(continued)

Sample No.	Description	Depth (ft)	Analyst	PCB (mg/kg)
52	Black Peaty Sand	3.5	1	8.5
53	Granular	2.0	1	101.0
54	Wood	2.0	1	11.8
55	Black Peaty Sand	3.5	1	1.1
56	Granular	0.5	1	16.7
57	Wood	0.5	1	0.1
58	Granular	2.0	1	88.3
59	Wood	2.0	1	3.4
60	Gray Sand	3.5	1	4.1
61	Granular	2.0	1	46.0
62	Wood	2.0	1	5.1
63	Gray Sand	3.5	1	8.3
64	Granular	2.0	1	41.6
65	Wood	2.0	1	4.9
66	Gray Sand	4.5	1	4.1
67	Granular	2.0	1	420.0
68	Wood	2.0	1	3.2
69	Gray Sand	3.5	1	<1.0
70	Granular	2.0	1	7.8
71	Wood	2.0	1	<1.0
72	Gray Sand	4.0	1	1.4
73	Wood	2.0	1	<1.0
74	Black Peaty Sand	3.0	1	1.3
75	Gray Sand	4.0	1	<1.0
76	Black Granular Solids	Surface	1	<1.0
77	White Solids	Surface	1	<1.0
78	White Solids	Surface	1	<1.0
79	White Solids	Surface	1	<1.0
80	Black Solids	3.5	1	<1.0
81	White Solids	4.0	1	<1.0
82	White Solids	1.0	1	<1.0
83	Black Solids	2.0	1	<1.0
84	White Solids	Surface	1	<1.0
85	White Solids	Surface	1	<1.0
86	Sediment	1.0	2	0.04
87	Sediment	3.0	2	0.04
88	Sediment	1.0	2	0.02
89	Sediment	3.0	2	0.01
90	Sediment	1.0	2	0.11
91	Sediment	3.0	2	0.02
92	Sediment	1.0	2	0.04
93	Sediment	3.0	2	0.02
94	Sediment	1.0	2	0.06
95	Sediment	3.0	2	0.14
96	Sediment	5.0	2	0.27
97	Sediment	1.0	2	0.11
98	Sediment	5.0	2	0.04
99	Sediment	9.0	2	0.06
100	Sediment	1.0	2	0.04
101	Sediment	5.0	2	0.02
102	Sediment	1.0	2	0.85
103	Sediment	3.0	2	0.02
104	Sediment	5.0	2	0.02

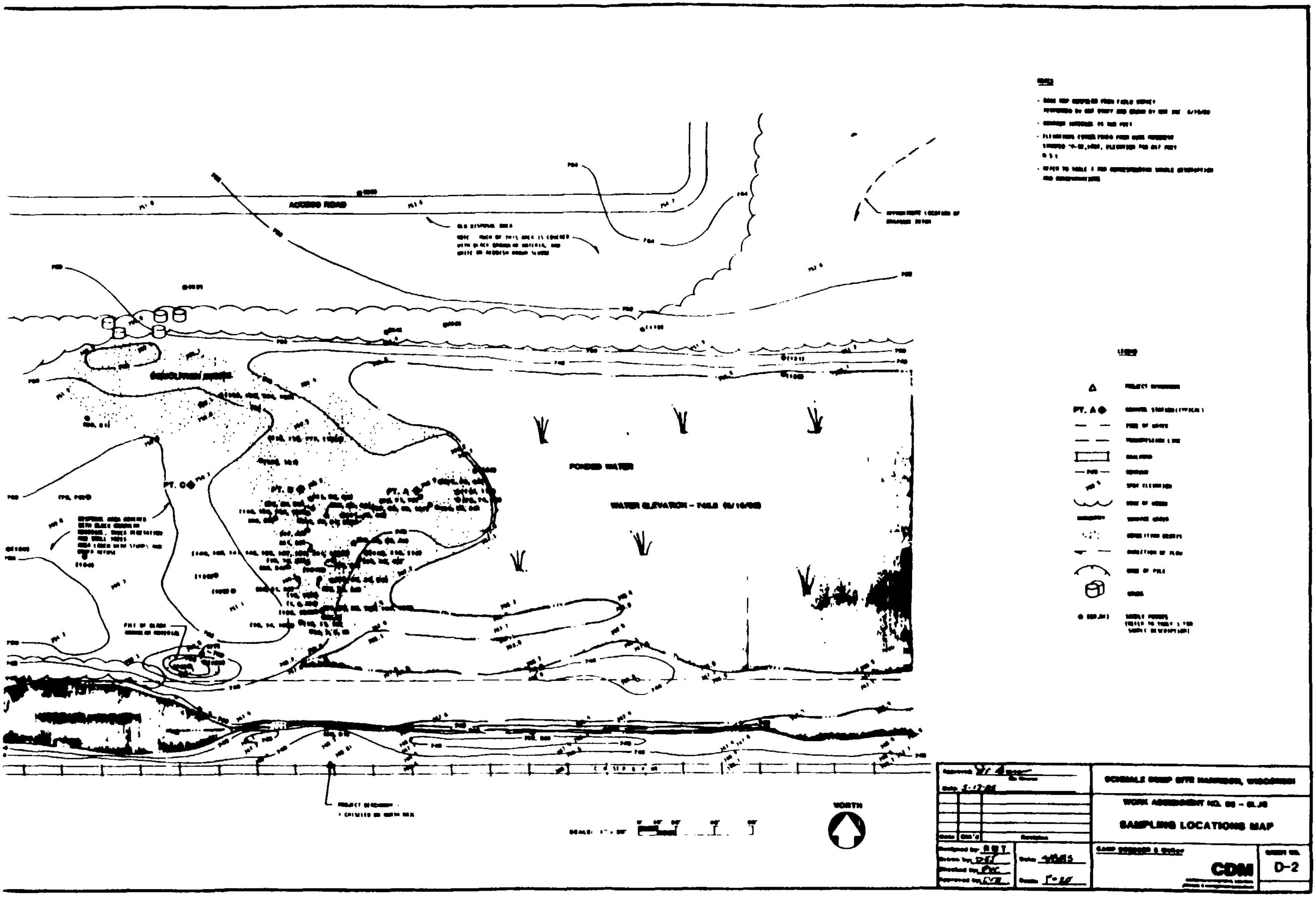
TABLE 1
(continued)

Sample No.	Description	Depth (ft)	Analyst	PCB (mg/kg)
105	Waste	1.0	2	2.3
106	Waste	1.0	2	5.9
107	Waste	1.0	2	2.9
108	Waste	Surface	2	5.6
109	Wood	Surface	2	6.7
110	Wood	Surface	2	2.1
111	Wood	Surface	2	3.4
112	Wood	Surface	2	2.4
113	Wood	Surface	2	2.1
114	Wood	1.0	2	2.8
115	Wood	Surface	2	1.1
116	Wood	Surface	2	2.5
117	Wood	Surface	2	5.3
118	Wood	Surface	2	4.1
119	Soil/Sludge	Surface	2	0.06
120	Sediment	1.0	2	0.04
121	Soil	Surface	2	0.12
122	Sediment	1.0	2	0.03
123	Soil	Surface	2	0.52
124	Black Granular Material	1.0	3	15.0
125	Black Granular Material	3.0	3	210.0
126	Oil Soaked Wood	1.0	3	9.8
127	Black Granular Material	1.0	3	220.0
128	Black Granular Material/ Wood	3.0	3	36.0
129	Wet Granular Material	5.0	3	88.0
130	Black Granular Material/ Wood	1.5	3	2200.0
131	Oil Soaked Wood	1.5	3	110.0
132	Cinder Pile	0.5	3	19.0
133	White Sand/Black Granular Material	1.0	3	0.58
134	White Sand	0.5	3	0.45
135	Clay Material	Surface	3	<0.05
136	Black Granular Material	-	3	<0.2
137	Black Granular Material	Not Located	3	<0.2
138	Black Granular Material	Not Located	3	0.77
139	Black Granular Material	Not Located	3	<0.2
140	Black Granular Material	Not Located	4	185.0
141	Wood	Not Located	4	31.5
142	Other Material	1.0	4	195.0
143	Black Granular Material/ Wood	1.5	4	2400.0
144	Wood	1.5	4	128.0
145	Other	1.5	4	3100.0
146	Oil Soaked Wood	1.5	4	8.94

Analyst:

1 RMT, Inc. May, 1980, July 1980
2 CDM, Inc. November, 1979
3 WDNR November, 1979, March 1980
4 Raltech, Inc. March, 1980

Results are expressed in mg/kg on a dry weight basis


ACCESS ROAD
PONDED WATER
PT. A
PT. B
PT. C
NORTH
SAMPLING LOCATIONS MAP
CDM
D-2

to be performed at the site, following the source control remedial action, will study the various pathways to determine if migration of PCBs and heavy metals has occurred.

The PFS prepared by USEPA in June 1985 concluded that continued exposure of the public and the environment to PCBs presents an unacceptable public health risk. As a result, a removal action to construct a fence around the debris has been completed and a source control operable unit for remedial action is needed to protect public health and the environment from future exposure to PCBs. This action will also control future release of heavy metals associated with the debris

Enforcement

CERCLA related enforcement activities began at the site in 1984. A responsible party search was conducted to identify potentially responsible waste generators and transporters. Eight parties were named for their involvement in the site, including parties who were named in the State's unsuccessful 1979 law suit. Notice letters were sent to each party and a negotiating meeting was held to discuss the cleanup. At the end of the negotiating period, none of the parties had committed to do the work.

Alternatives Evaluation

The phased feasibility study was initiated to evaluate alternative remedial actions for remediation of PCBs at the Schmalz site. Controlling the release of PCBs, by removing the contaminated debris, would eliminate the threat of direct contact and would stop future releases to the surrounding environment and receptor pathways. Five remedial action alternatives were looked at for the site. They are listed in Table 2.

TABLE 2
REMEDIAL ACTION ALTERNATIVES

Alternative 1 - PCB Removal to less than 50 ppm

Removal of building debris contaminated with 50 ppm PCB or greater and off-site disposal by landfilling or incineration.

Alternative 2 - On-Site Disposal

Construction of an on-site disposal facility which meets all applicable State and Federal environmental regulations and laws.

Alternative 3 - Source Control - Source Removal

Removal of all PCB contaminated building debris and off-site disposal by landfilling or incineration.

Alternative 4 - On-Site Management

Actions to minimize direct contact and migration of PCBs by capping, grading, and revegetation of the site and by limiting access.

Alternative 5 - No Action

An alternative that involves no remediation of the site during this operable unit remedial action phase.

Alternative 1

Alternative 1 involves excavation of 1389 cubic yards of material from the site. Sample results from 1980 showed two areas within the debris contain the highest levels of PCBs. Excavation will include approximately four feet of debris and one foot of sediment beneath it. This material will be dewatered on-site and rendered to a form acceptable for the proposed disposal option. A temporary berm will be necessary to prevent contaminated water from reentering the wetland during dewatering and a wash pad will be required for decontamination of trucks and equipment. A wastewater treatment unit will be installed to treat contaminated water generated during dewatering and decontamination. Water treatment will remove PCBs to below the detection limit of .5 ppb. The treated water will then be discharged to the adjacent pond. Any metals in the water will also be removed in this process.

The landfill option for Alternative 1 calls for disposal of material in an off-site TSCA (Toxic Substance Control Act) approved RCRA (Resource Conservation and Recovery Act) landfill facility. Table 3 summarizes the costs for this option.

TABLE 3

Cost for Alternative 1 - Landfill Option

Capital Cost	1,176,050
Annual Operation and Maintenance (O & M)	N/A
Present Worth	1,176,050

The incineration option for this alternative calls for incineration of excavated material at a TSCA and RCRA approved off-site facility. This requires rendering the material to a form acceptable for disposal. This is accomplished by shredding and pulverizing the material on-site and placing it into 30 gallon plastidrums for transport to an approved incinerator. Bulk scrap, that is too large to pass through the shredder, will require cutting with a laser prior to grinding. A fine spray of water over the shredder will be necessary to minimize dust emissions during operations. The costs for this option are summarized in Table 4.

TABLE 4

Cost for Alternative 1 - Incineration Option

Capital Cost	3,346,978
Annual O & M	N/A
Present Worth	3,346,978

Alternative 2

Alternative 2 involves construction of an on-site disposal facility for the PCB contaminated debris. The facility would have to meet all RCRA and TSCA regulations for constructing a disposal facility, as well as all State laws and regulations involved in locating and constructing a disposal facility. In addition, the alternative must comply with site management and control techniques, installation of contaminant monitoring facilities, and contaminant migration protection strategies. This alternative would include excavation of demolition debris and placement in the constructed, on-site land disposal facility. The facility would require a double liner and double leachate collection system. A berm would also be constructed around the facility in compliance with regulations. Table 5 summarizes the cost for this alternative.

TABLE 5

Cost for Alternative 2

Capital Cost	4,582,000
Annual O & M	N/A
Present Worth	
2 year	4,638,000
30 year	4,886,000

Alternative 3

Alternative 3 involves excavation of 3500 cubic yards of material from the wetland. This includes three to five feet of demolition debris and one foot of sediment below it. The material will be dredged from the wetland, dewatered on-site, rendered to a form acceptable for the proposed disposal option and transported to a TSCA approved RCRA facility for disposal. A temporary berm will be constructed to prevent contaminated water from reentering the wetland during dewatering and a wasn pad will be installed for decontamination of trucks and equipment. A wastewater treatment unit will also be required to treat contaminated water generated during dewatering and decontamination. Water treatment will remove PCBs to below the detection limit of .5 ppb. The treatment will remove heavy metals as well. Once treated, the water will be discharged to the adjacent pond.

The disposal options for Alternative 3 are the same as for Alternative 1; landfilling or incineration of waste. The difference in cost is due to the increased amount of material for this alternative. Table 6 summarizes the cost for landfilling the waste.

TABLE 6

Cost for Alternative 3 - Landfill Option

Capital Cost	2,088,300
Annual O & M	N/A
Present Worth	2,088,300

The cost of the incineration option for this alternative is summarized in Table 7 below.

TABLE 7

Cost for Alternative 3 - Incineration Option

Capital Cost	7,180,240
Annual O & M	N/A
Present Worth	7,180,240

Alternative 4

Alternative 4 involves on-site management of the contaminant source in an effort to minimize the threat of direct contact, and reduce the migration of contaminants off-site. This alternative would include site cover and site control features. Site cover would consist of an impermeable cover of clays and soils with supporting vegetation. It would be graded to provide drainage away from the site, in order to prevent vertical migration of rain water, surface runoff and surface water ponding.

Actions taken for this alternative would reduce public exposure to some extent, but would not protect groundwater and the surrounding wetland from leachate transport of PCBs and metals. Cost estimates for Alternative 4 are summarized in Table 8.

TABLE 8

Cost for Alternative 4

Capital Cost	536,938
Annual O & M	14,000
Present Worth	
2 year	561,250
30 year	668,950

Alternative 5

Alternative 5 is the "No Action" alternative. This alternative would involve no remediation of the PCB contaminated material at this phase of the project. Rather, the RI/FS would be completed and a final remedy for the site would be evaluated.

Alternative Evaluation Criteria

The alternatives were evaluated according to the following factors:

- Ability to protect public health and the environment
- Technical feasibility
- Compliance with environmental standards
- Consistency with the final remedy
- Environmental impact
- Community impact

Table 9 summarizes the analysis of the remedial action alternatives.

Summary:

Alternatives 2 and 4 have only marginal technical feasibility due to the nature of the material and the location of the site. There would be difficulty in capping the site in its present condition, and the long term effectiveness of a cap at this site is questionable because of settling of material and seasonally high water table conditions. The high water table would require that the disposal facility be built almost entirely above ground. This would make it difficult to comply with Federal and State regulations for construction of the facility. Other institutional issues arise from the sites location, because of its proximity to Lake Winnebago and area drinking water supplies. In addition, Alternative 4 does not control migration of leachate to the various pathways and receptors. A failure of the facility in Alternative 2 could also result in leachate migration. Both alternatives would have high environmental impact because the site is in a wetland and sensitive flora and fauna are associated with it. Both alternatives have high community impact because the residents disagree with actions, that would leave the possibility of contaminant leachate as a potential problem. Implementation of either alternative would make future on-site studies difficult or impossible and could conflict with the final remedy for the site if that remedy involved further management, treatment, or excavation of the demolition debris.

Alternative 5 does not meet the objectives for the operable unit remedial action. By taking "no action" at the site, the PCB contaminated material will remain unmanaged until a final remedy for the site is implemented. This would pose a significant threat to public health and the environment and would not prevent migration of PCBs into the various pathways around the site.

Both options of Alternative 3 are technically feasible, cost-effective, do not require complex planning or design, protect public health, would not conflict with the final remedy, exceed applicable and relevant environmental standards, and have low community impact and high community acceptance.

The issue differentiating the two methods of disposal at this site is the extensive manipulating of the demolition debris required to render it acceptable for incineration. The nature of the material is such that it requires grinding and cutting to reduce the bulk. This creates significant handling and safety problems since PCB contaminated fugitive dust will likely be generated during operations, and would have a negative environmental impact due to the dust emissions. In addition, some material, such as concrete with reinforced rods, metal beams and other metal objects, are unsuitable for incineration and must be landfilled. Landfilling all of the material will greatly reduce the potential for dust emissions and significantl cut down on safety and handling problems.

TABLE 9

SUMMARY OF ALTERNATIVES ANALYSIS

ALTERNATIVES	ABILITY TO PROTECT PUBLIC HEALTH	TECHNICAL FEASIBILITY	COMPLIANCE WITH ENVIRONMENTAL STANDARDS *	ENVIRONMENTAL IMPACT	COMMUNITY IMPACT
PCB Removal to less than 50 ppm	Moderate	High	Meets Standards	Landfill: low Incineration: Moderate	Moderate
On-Site Disposal	Moderate	Low	Meets Standards	High	High
Source Control-Source Removal	Good	High	Exceeds Standards	Landfill: Low Incineration: Moderate	Low
On-Site Management	Poor	Low	Does Not Attain Standards	High	High
No Action	Poor	N/A	Does Not Attain Standards	N/A	High

*Environmental standards refer to the applicable and relevant standards as refered to in the proposed changes to the NCP dated February 12, 1985.

Both options of Alternative 1 are technically feasible, cost-effective, do not require complex design. However, this alternative could conflict with the final remedy for the site because mobilization, subcontractor procurement and berm construction will have to be repeated if the final remedy calls for excavation of the remaining material. In addition, Regional policy dictates advisory levels of 1 ppm for PCBs in soils and sediment and even lower levels for water. Health advisories currently being developed by USEPA recommend setting advisory levels for PCBs much lower that 1 ppm for sites where direct contact with PCBs is a concern.

Alternative 3 is the most cost-effective alternative because it best protects public health and the environment and is most consistent with the final remedy for the site. However, due to the health and safety concerns associated with dust emissions and handling problems, and the nature of the material, the landfill option of Alternative 3 is recommended as the alternative that cost-effectively protects public health and the environment.

Community Relations

Copies of the PFS were made available to the community on July 1, 1985. Two locations served as repositories in the area: the Fox Valley Library of the University of Wisconsin in Menasha, and the Harrison Town Hall. The USEPA issued a press release on June 25, 1985, which announced the availability of the study, the commencement of the 3-week public comment period, and the schedule for the public meeting.

The public meeting was held on July 9, 1985 at the Harrison Town Hall. Approximately 20 residents attended the meeting. Representatives of the USEPA, WDNR and local government were present. The USEPA présentation explained the purpose of the PFS, described the current situation regarding site contamination, and the alternative being recommended by USEPA. Questions regarding the project were also answered. One public comment was submitted during the meeting. The public comment period ended on July 22, 1985. Public comments are addressed in the attached responsiveness summary.

Consistency With Other Environmental Laws

The proposed action will not require on-site treatment, storage or disposal of hazardous wastes. Therefore, there are no issues involving the consistency of on-site actions with RCRA or TSCA. The removal, transport and disposal of PCBs are regulated under TSCA. Therefore, the disposal facility must be TSCA approved and meet all disposal requirements established in 40 CFR 761.60.

Generally PCBs in liquid medium, with concentrations above 50 ppm must be incinerated. In most instances, USEPA recommends incineration of PCBs whether in a liquid or solid medium, regardless of concentration levels. However, due to the nature of material at the Schmalz site, and because the PCBs are absorbed on solid medium, landfilling the material is recommended. The landfill must meet all requirements under TSCA and RCRA and pass a compliance inspection within six months of receiving the waste.

The recommended alternative will be in compliance with RCRA and TSCA as well as Act 404 of the Clean Water Act (CWA). It will also be consistent with Executive Order 11990 - Protection of Wetlands. A wetlands assessment Statement of Findings is attached to this document. The recommended alternative will require a discharge of treated water back into the wetland. Although will not be required to obtain a permit for this action, all discharge will treated to less than .5 ppb PCBs and applicable metal concentration levels to comply with the State of Wisconsin's discharge limits. The proposed action will also comply with Wisconsin's environmental laws NR 181 and NR 157 of the Wisconsin Administrative Code. These laws are essentially equivalent to RCRA and TSCA, respectively.

Recommended Alternative

The National Oil and Hazardous Substances Contingency Plan (NCP) [40 CFR Part 300.68(j)] states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial measure which the agency determines is cost-effective (i.e., the lowest cost alternative that is technologically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare or the environment. Based on the evaluation of the cost and effectiveness of each proposed alternative, the comments received from the public and the WDNR, and State and Federal environmental requirements, Alternative 3 has been determined to be most cost-effective.

The recommended alternative is considered a source control operable unit remedial action (removal of contaminant source of PCBs), as defined in section 300.68(d) of the proposed changes to the NCP. The objective of the action is to eliminate future releases from the contaminant source to the various pathways and to remove the threat of direct contact to the surrounding community and the environment. The RI/FS will examine appropriate final response actions for the site.

The capital cost of this alternative is estimated to be $2,088,300. Since this action involves excavation and off-site disposal, there are no O&M costs for this alternative. In addition, present worth values are equal to capital costs because the recommended alternative involves a one time, short term action with no O & M costs and an estimated construction time of two months. Table 10 lists the tasks and estimated costs for the recommended alternative.

Schedule

The USEPA REM II contractor, Camp, Dresser, and McKee Inc., will manage the design and construction of the remedial action. The St. Paul, Minnesota District of the COE will offer oversite during construction. The schedule of activities is as follows:

Complete Enforcement Negotiations	08/09/85
Approve Remedial Action (sign ROD)	08/09/85
Start Design	08/12/85
Complete Design	09/30/85
Sign Superfund State Contract for Construction	10/01/85
IAG with USACOE	10/01/85
Start Construction	10/07/85
Complete Construction	12/20/85

Future Actions

A USEPA funded RI/FS is scheduled to start in January 1986. The study will include an assessment of potential pathways through which PCBs and metals could migrate, and testing for other contaminants present on-site or migrating off-site. The RI/FS is schedule for completion by Spring 1987.

Table 10

TASK LIST AND ESTIMATED COSTS OF RECOMMENDED ALTERNATIVE

Mobilization and on-site handling costs	150,000
Wash pad construction and access road	50,000
Design cost	30,760
Construction Management	129,240
Office trailer and utilities	25,000
Berm construction and material cost	120,000
Activated carbon water treatment	60,000
Transportation cost for excavated material @ $2,100 per load x 351 truck loads	737,100
Disposal cost for material (include disposal of spent activated carbon) @ $150 per cubic yard x 3,508 cubic yards	526,200
Disposal of decon water	35,000
Shut down costs (includes berm removal)	150,000
Administration/Management	75,000
Total Estimate	$2,088,300

WETLANDS ASSESSMENT - STATEMENT OF FINDINGS

This "Statement of Findings" documents the wetlands assessment performed at the Schmalz Site. The statement is in accordance with Executive Order 11990 - Protection of Wetlands, which requires Federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

The Schmalz Dump Site is located in the Waverly Beach Wetlands of the Winnebago Pool. The site has undergone unauthorized dumping of PCB contaminated building debris, which was disposed of directly into the wetlands. The recommended alternative for the operable unit remedial action proposes to remove the debris and associated contaminated sediment in an effort to eliminate the threat to public health and the environment and to restore tne wetlands.

Because the site is located in a wetlands, there are no alternative actions or locations to be considered in making the decision to locate the remedial action in the wetlands. However, all proposed actions will comply with state and local wetlands protection standards.

The design for construction will include safeguards to minimize harm to the wetlands during operations. A temporary berm will be installed between the affected area and the remaining pond to prevent dispersion of PCB contaminated sediments and water. Once the debris and associated sediments are excavated, the water within the bermed area will be pumped through a water treatment unit and then discharged to the adjacent pond. The pump will also serve as a flood control device in the event of heavy rainfall. This will prevent contaminated water from overflowing onto adjacent land, and possibly contaminating more of the wetlands. All contaminated water generated from dewatering of the excavated material and decontamination of equipment will be collected and treated. Temporary concrete pads will be built for on-site truck loading and storage of material. Upon completion, the impermeable liner along the face of the berm will be removed and the remaining uncontaminate clay and sand will be used as a sediment layer for the affected area.

The proposed remedial action will have beneficial effects on the wetlands. The action wil not remove any acreage that is currently used as animal habitat and will improve the quality of the wetland. Upon completion of the excavation and removal of material, the wetland will be closer to its natural condition.

COMMUNITY RELATIONS RESPONSIVENESS SUMMARY
SCHMALZ DUMP SITE
HARRISON, WISCONSIN

INTRODUCTION

This "Community Relations Responsiveness Summary" documents citizen concerns and issues raised during the planning and preparation of the Phased Feasibility Study (PFS) for an operable unit remedial action at the Schmalz Dump Site, Harrison, Wisconsin. It also documents, for the public record, the U.S. Environmental Protection Agency's (USEPA) response to the comments presented during the public comment period on the PFS.

CONCERNS RAISED DURING THE COMMENT PERIOD

The PFS was completed on June 27, 1985. Copies of the PFS were made available to the community on July 1, 1985. A public meeting was held at the Harrison Town Hall on July 9, 1985, to present the findings of the PFS and solicit public comment. Approximately 20 residents attended the meeting. One attendee submitted a public comment regarding the proposed action. The Agency subsequently received one other public comment from a local resident and written comments from the Wisconsin Department of Natural Resources (WDNR) regarding the PFS. The public comment period ended on July 22, 198

Although none of the comments received by USEPA expressed dissatisfaction with the recommended alternative, other issues of concern were expressed during the public comment period. These issues are addressed below.

ISSUE: Testing for PCBs in Nearby Water Supplies

A number of residents are concerned about the safety of the water supplies in the area. The city of Appleton's drinking water intake is located in close proximity to the site, and there are several private wells in the areas that are used as auxiliary water supplies. Previous testing of wells near the site, and of the Appleton water supply have not shown levels of PCBs above trace amounts. However, because these tests were done in 1980, citizens have raised questions regarding the lack of current sample data.

Comment: USEPA should test the City of Appleton's water supply as well as all operating private wells in the area for PCBs.

Response: During the development of the work plan for the site, USEPA and WDNR determined that the PCB contaminated debris, which is the source of PCB contamination at the site, was the most serious threat to public health and the environment. Based on this conclusion, the decision was made to develop alternatives to control the release of PCBs, prior to other scheduled site activities. Once the source is removed, USEPA will continue the long term study to determine if migration of contaminants to ground water, surface water, or soils, has occurred.

Private well sampling is currently scheduled for spring 1986. The tests will be performed on three operating wells close to the site to determine if PCBs or other contaminants are present. A second sampling of additional wells will be performed, if necessary, based on the analytical results of the initial samples. If private wells in the area show contamination, a soil sampling program will be implemented. In response to citizen's concerns about Appleton's water supply, USEPA and WDNR are working with the City of Appleton to develop a PCB Sampling program. The initial sampling date has not yet been determined; however, biannual sampling for PCBs has been recommended to the city. In addition, USEPA is proposing to move up the private well sampling date to winter 1986. However, because residences are connected to the Menasha water supply, and private wells are used for outdoor purposes if the residents choose to do so, the Agency does not feel that sampling sooner is necessary.

ISSUE: Disposal of Materials Containing Less than 50 ppm in a Wisconsin Solid Waste Landfill

The WDNR has commented that the high cost of disposal of the PCB contaminated debris could be reduced by developing a plan for disposal of PCBs with less than 50 ppm in a Wisconsin landfill.

Comment: We (WDNR) believe that the disposal cost will be significantly reduced if the less than 50 ppm waste was disposed of in a Wisconsin solid waste landfill.

Response: While the USEPA agrees with the idea presented by WDNR, there are several factors that prevent this alternative from being viable. Due to the nature of the waste, and the uneven distribution of PCBs throughout the debris, it is not possible to determine if material is highly contaminated without implementing an extensive and costly sampling program. The high cost of sampling would substantially reduce any cost savings for this alternative. In addition, a Wisconsin solid waste landfill would most likely have to build a special cell for the waste. This would be expensive and would result in an increase in cost per ton for disposal. Another factor is the time involved for implementation of this alternative. Because of the high water table in the wetland, excavation must be done during the dry season, which extends through December. Extensive sampling and procuremen of a disposal site could not be done in time to complete the work this year. This would result in the PCB contaminated debris remaining in place until the dry season begins next year. The prohibiting factors associated witn taking part of the material to a Wisconsin solid waste facility would be the same for a RCRA subtitle C landfill.

ISSUE: WDNR's Position On Alternatives Evaluated

The WDNR has expressed concerns regarding various issues arising from the evaluation of the remedial action alternatives. Questions were raised as to whether the alternatives for on-site management and on-site disposal would meet the requirements of Wisconsin's Administrative Code, Chapters NR 181 and NR 157, and whether they would be consistent witn the permanent remedy for the site.

Comment: The alternatives for on-site management and on-site disposal do not meet the requirements of NR 181 nor are they consistent with the permane remedy for the site.

Response: Under the Superfund law, USEPA is required to address various alternatives during the development of the feasibility study. The list must include at least the following alternatives for evaluation: 1) one that meets environmental standards; 2) one that exceeds environmental standards; 3) one that does not attain environmental standards but provides protection to public health and the environment; 4) one for off-site disposal; and 5) the No Action alternative.

Although USEPA recognizes the State of Wisconsin's position on these issues, we are obligated to address certain alternatives regardless of their compliance with environmental regulations or consistency with a permanent remedy for the site.

The remaining comments, submitted by WDNR, are related to the context of the PFS. These comments are responded to as appropriate. It should be noted that although these comments will not be incorporated into the PFS, they will be a permanent part of the Record of Decision (ROD) document.

ISSUE: Permit for On-Site Berm

Comment: We (WDNR) think there should be a discussion in the report on the need for a permit from the Corps of Engineers (COE).

Response: A permit from the COE is not required during on-site construction at a Superfund site. In lieu of a permit, the COE will review and approve the proposed design for the remedial action.

ISSUE: Estimates for Operation and Maintenance Costs (O&M) of Alternatives

Comment: O&M costs for on-site management and on-site disposal should be included in cost estimates for alternatives.

Response: O&M costs for the alternatives (if applicable) have been calculated and included in the ROD document.

ISSUE: Fish in Wetlands

Comment: It should be noted that there are no fish in the wetlands except possibly during spawning.

Response: Comment noted.

ISSUE: Institutional Considerations for Management of PCBs

Comment: Institutional considerations for management of PCB contaminated material with concentrations below 50 ppm are not discussed in Section 6.1.3 of the PFS as inferred.

Response: The USEPA is committed to protect the public and the environment from toxic chemicals such as PCBs. Region V has taken a strong stance on this issue and has implemented a recommended advisory level of 1 ppm for PCBs in the environment. In addition, health advisories currently being developed USEPA include recommendations for advisory levels to be lower that 1 ppm.

ISSUE: PCB Levels for Fish in Lake Winnebago

Comment: Information on PCB levels in fish in Lake Winnebago should be included in the PFS risk assessment.

RESPONSE: During the PFS, USEPA looked at the immediate hazards associated with the site and felt justified in performing a source control operable unit based o the exposure to the surrounding population and the flora and fauna of the wetland. The RI/FS will address the various pathways through which contaminants could migrate and contaminate receptors, including fish in Lake Winnebago. In addition, USEPA has discussed this site with the U. S. Fish and Wildlife Service and will continue to get their input throughtout the course of the RI/FS.

ISSUE: Public health Considerations for Alternative 4 - Capping Material On- Site

Comment: A discussion should be included in the Public Health Considerations of Alternative 4 relating to animals burrowing through the clay cap and possible human consumption of this wildlife.

Response: This is a valid consideration and would be a concern if Alternative 4 was the recommended alternative. Studies have shown that PCBs accumulate in the fat tissues of animals and human exposure through the food chain is a definite threat to public health.

ISSUE: Comparison of Institutional Considerations of Alternatives

Comment: Section 7.3 in the PFS, which summarizes the institutional considerations for the alternatives, should be expanded to include a more detailed discussion of alternatives for on-site management and on-site disposal as well as the "no action" alternative.

Response: Institutional considerations for the on-site management, on-site disposal and the "no action" alternatives are discussed in detail in Section 6 of the PFS. A summary of institutional considerations for these alternatives follows.

On-site disposal would require compliance with several Federal and State environmental regulations and laws, including the locational criteria. This would be difficult to comply with at this site. In addition, Federal regulations would include: TSCA and RCRA requirements for construction of a disposal facility; RCRA regulations for monitoring and protection of groundwater and surface water; Executive Order 11990 - Wetlands Protection; requirements for management of PCBs under TSCA (and Chapter NR 157 of Wisconsin's laws); and regulations for dredging and filling of a wetland. The on-site management alternative involves closure requirements under RCRA and Chapter NR 181 as well as TSCA and Chapter NR 157, in addition to several of the requirements mentioned under on-site disposal above. These numerous requirements would be very difficult, if not impossible, to comply with due to the location and nature of the site.

The "no action" alternative would be in violation of several State and Federal laws. Among these are: proper disposal of PCBs under TSCA and NR 157; and filling of a wetland under section 404 of the Clean Water Act and Chapter 30 of Wisconsin's Statutes.

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
SCHMALZ DUMP SITE

I. Site Location and Description

The Schmalz Dump Site is located on the north shore of Lake Winnebago in the Town of Harrison. Harrison is located approximately ten miles south of Appleton, and two miles east of Menasha, in Calumet County, in the east central section of Wisconsin (see Figure 1).

The Site occupies approximately seven acres in the Waverly Beach Wetlands area (Figure 2), that has undergone unauthorized dumping. The property north and west of the site has also been used for waste disposal. A wet marshy area bounds the site to the east, with a railroad right-of-way to the south. Beyond the railroad tracks, between the Site and the Lake, is a moderately populated residential area. All of these residences have been hooked-up to the Menasha water system, although some have retained wells for auxiliary uses. The neighboring city of Appleton, with a population of 60,000, has its drinking water intake approximately 500 feet from the shore of Lake Winnebago, in close proximity to the site.

II. Current Site Status

Site History

According to the Wisconsin Department of Natural Resources (WDNR) and court documents, industries dumped wastes at various locations along the north shore of Lake Winnebago for several years. Mr. Gerald Schmalz, previous site owner, began filling his property in 1968. Records show that the wastes hauled there consisted of solid waste, car bodies, stone, trees, pulp chips and mash. Between 1972 and 1973 the site accepted fly ash and bottom ash from Menasha Utility, and in 1978 and 1979 Schmalz accepted the demolition debris of a building owned by the Allis-Chalmers Corporation.

Initial on-site sampling by the State of Wisconsin and the U.S. Army Corps of Engineers (U.S. ACE) in early 1979 determined that the area containing the Allis-Chalmers debris was contaminated with concentrations of PCBs as high as 3100 parts per million (ppm). Lead and chromium were also detected in relatively high concentrations at several sampling stations.

In the summer of 1979, the Wisconsin Attorney General filed suit against Mr. Schmalz, the waste hauler - Weiseler Construction, and Allis Chalmers Corporation, alleging illegal disposal of PCBs. However, due to lack of direct evidence the court ruled against the State. In 1983, Gerald Schmalz sold [illegible] property to his son Gregory.

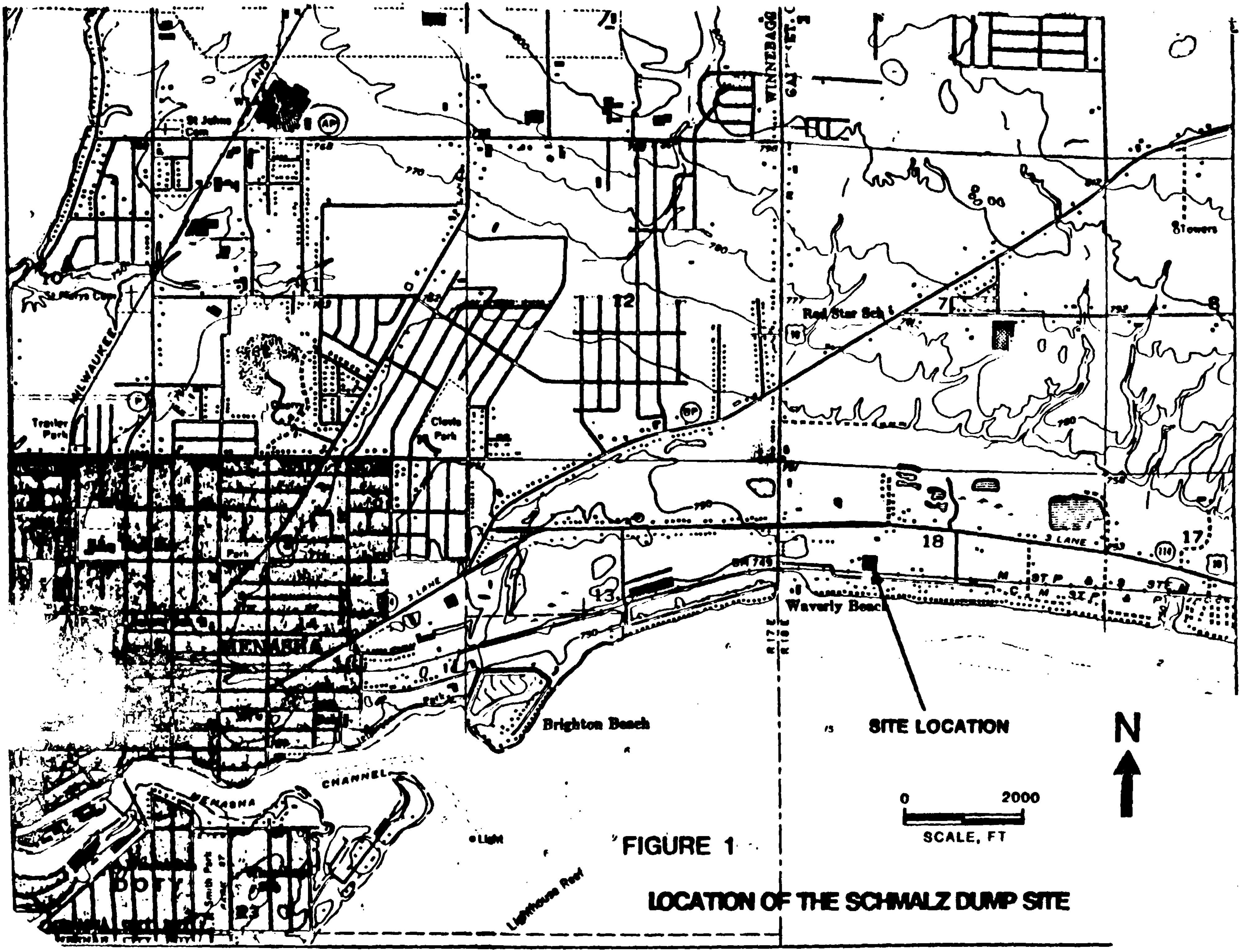


FIGURE 1

LOCATION OF THE SCHMALZ DUMP SITE

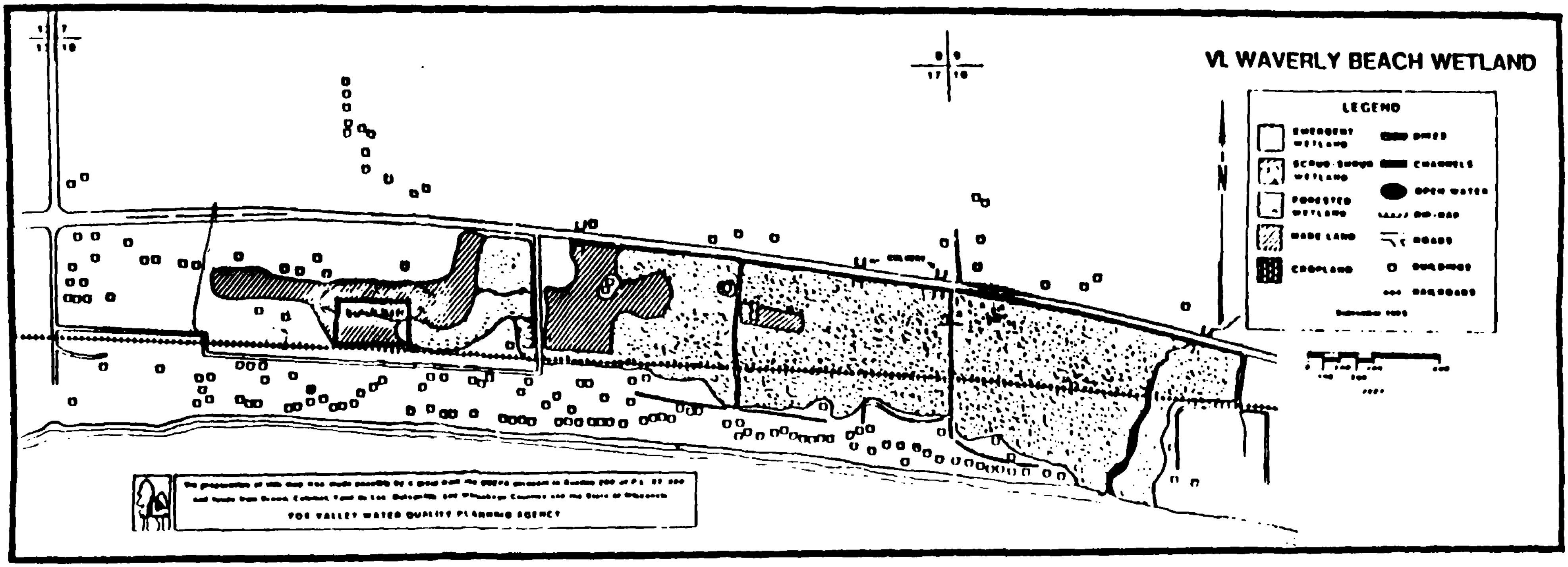


FIGURE 2

SCHMALZ DUMP SITE
HARRISON, WISCONSIN

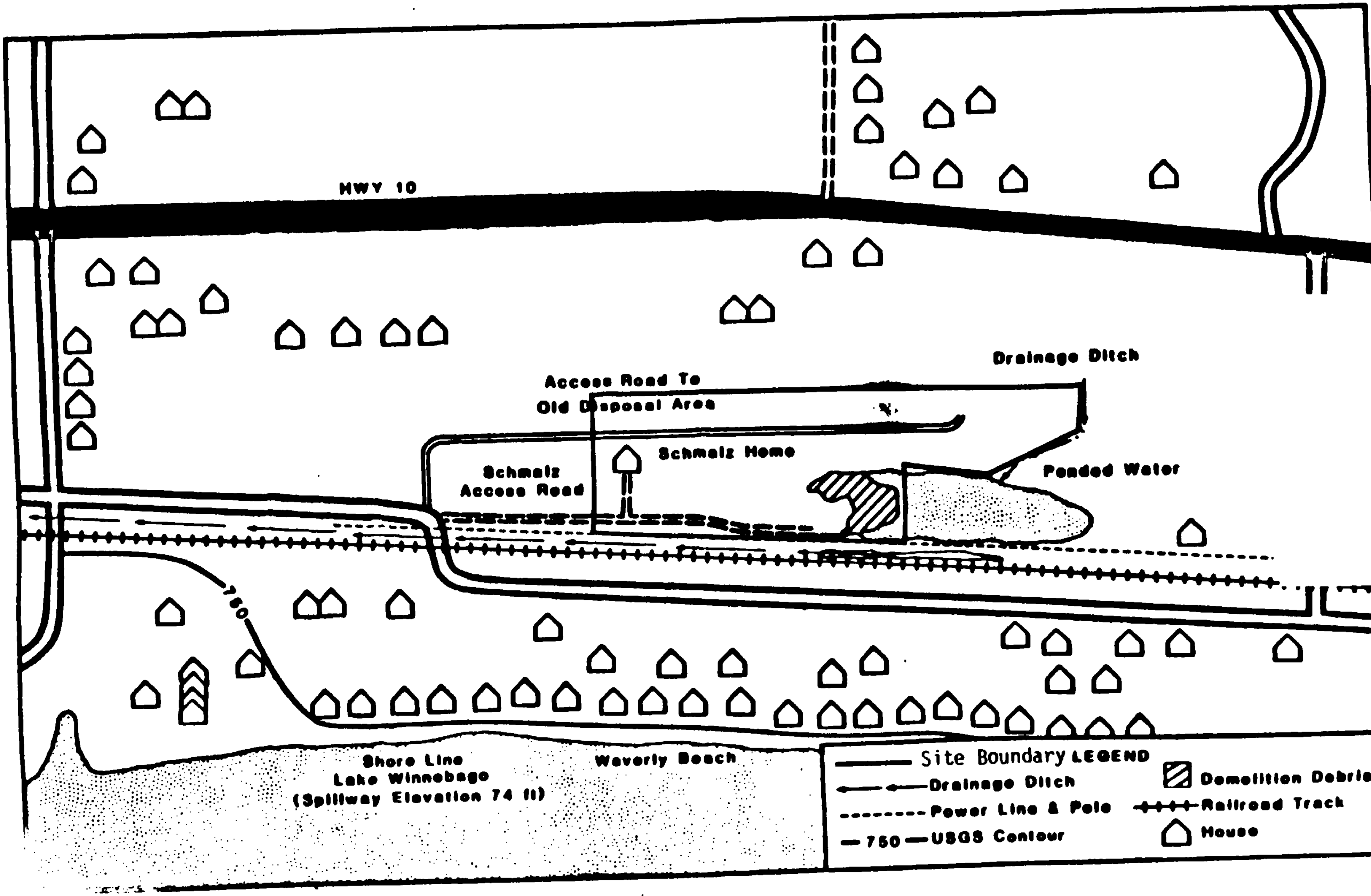


FIGURE 3

In September 1984, the site was listed on the national priorities list. USEPA completed a report identifying potentially responsible parties, including waste generators and transporters in October 1984. The Remedial Investigation/Feasibility Study (RI/FS) was initiated during April 1985. Since a threat to public health had been identified due to the PCB contaminated demolition debris, USEPA and WDNR decided to prepare a phased feasibility study to evaluate potential source control remedies.

In August 1985, a Record of Decision was signed approving an operable unit to address the PCB contamination at the site. The operable unit consists of removal of construction debris and sediments containing elevated concentrations of PCBs. Additionally, the water/solids mixture in the sediments will be separated, with solids destined for a USEPA approved hazardous waste landfill. The water will undergo metals precipitation and activated carbon treatment for removal of PCBs, chromium and lead prior to discharge to the pond area of the Schmalz property. Implementation of the operable unit is scheduled to occur in the fall of 1987.

Site Characterization

RI/FS work has progressed concurrently with design of the operable unit. The scope of the RI work at the Site included the installation of monitoring wells, and collection of soil, sediment, surface water, residential well, and groundwater monitoring well samples. The objectives of the RI were to characterize the remaining site and to determine if a public health or environmental threat exists outside the PCB contaminated area of the site. All samples were analyzed for priority pollutant metals and PCBs. A percentage of these were also analyzed for EP Toxicity and organic priority pollutants. Results of the RI are discussed below.

Groundwater

Groundwater samples collected during the RI indicate the presence of low levels of trivalent chromium beneath the site, in the water table aquifer. Levels range from 14 micrograms per liter (ug/l) to 48 ug/l within the site boundary but do not exceed background levels downgradient of the site (see Figure 4 and Table 1).

Groundwater samples collected indicate the existence of two separate plumes of trivalent chromium. A diffuse, east-west trending plume beneath the site, and an isolated off-site anomaly west of the Schmalz Site. In the diffuse east-west trending plume beneath the site, groundwater samples contain levels of chromium ranging from 14 ug/l to 48 ug/l. Groundwater samples in the vicinity of the isolated anomaly to the west of th Site exhibited high concentrations of soluble chromium (1140 ppb) (see Figure 4). The chromium contamination at this location is not asociated with suspended particles and appears to emanate from a localized point source. Based on the history of dumping in the area, this phenomenon is not unusual.

Dissolved Chromium Distribution (μg/l)

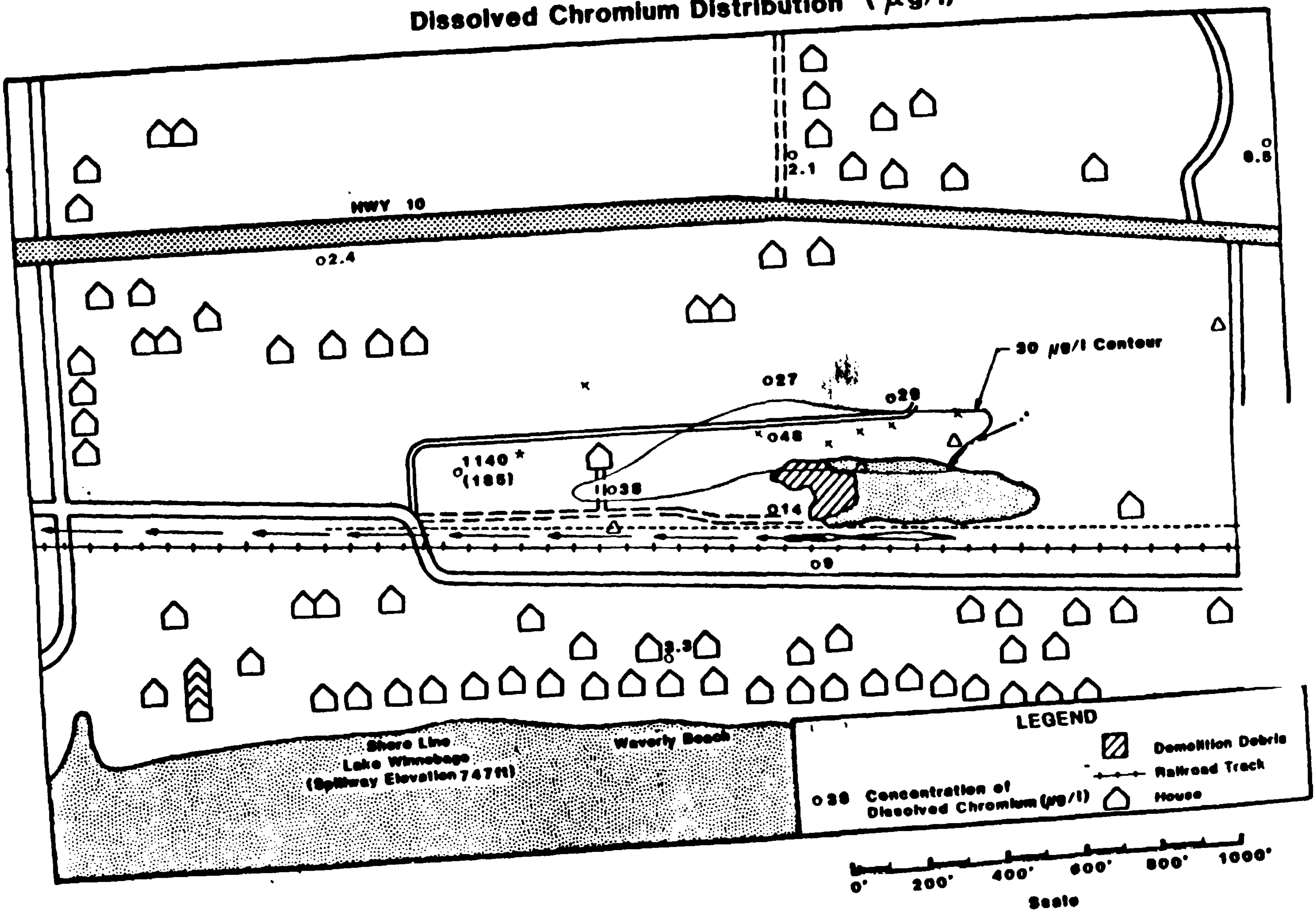


Figure 4

TABLE 1

GROUNDWATER SAMPLE ANALYSES

Well Location	Total Pb ug/l	Dissolved Pb ug/l	Total Cr^{+3} ug/l	Dissolved Cr^{+3} ug/l	Ratio of Total to Dissolved Cr	Cr^{+6} ug/l	Total Suspended Solids mg/l
Detection Limit	2	2	0.5	0.5		10	5
GW-1	-	-	89	38	1.89	-	392
GW-2	149	-	390	48	8.13	-	603
GW-3	64	-	120	27	4.44	-	418
GW-4	-	-	45	14	3.21	-	102
GW-5	-	-	60	8.9	6.74	-	274
GW-6	-	-	22	6.5	3.38	-	77
GW-7	-	-	40	2.1	19.05	-	188
GW-8	-	-	25	2.4	10.42	-	274
GW-9[1]	-	-	1130	1140	0.99	-	429
GW-9a	-	-	286	185	1.55	-	210
GW-10	-	-	21	3.3	6.36	-	280
GW-11	-	-	102	29	3.52	-	382
DW-01	-	-	2.4	1.5	1.6	-	-

- = Below detection limit.

DW-01 is a sample of the water used during drilling.

[1] Note: Relative percent difference between total and dissolved chromium in sample GW-9 = 0.88%, which is well within the precision limits of the analytical procedure.

Residential wells downgradient of the site were also sampled during the RI. Sample results did not indicate the presence of lead or chromium, but did show degraded groundwater quality due to high levels of iron, magnesium, potassium, sodium, ammonia, strontium and boron. None of these levels exceed primary drinking water standards however, iron and sodium levels exceed secondary drinking water standards (see Table 2).

Based on existing literature, surficial soils overlie 15 to 35 feet of fine grained, saturated silty sand and a 30 to 50 foot thick clay layer, which in turn overlies a 5 to 20 foot thick hardpan layer. In the immediate vicinity of the site, the silty sand unit has a thickness of 20 feet. Clay and hardpan layers are impermeable, and isolate the contaminted silty sand aquifer from the deeper Paleozoic dolomite and sandstone aquifers in which local residents have their wells. Schematic east-wast and nort-south cross sections through the site are illustrated in Figures 5 and 6.

Based on the above discussion, the silty sand aquifer beneath the site appears to be separated from the lower aquifer by a fairly thick, continuous clay layer. It is therfore unlikely that contaminants from the site would enter the lower aquifer and reach residential wells. Also, chromium levels found in groundwater do not exceed the drinking water standard of 50 ug/l under the Safe Drinking Water Act (SDWA).

Surface Water and Sediments

Surface water and sediment samples collected from the area of demolition debris disposal contained elevated concentrations of PCBs, lead and chromium. This area will be addressed during removal of the debris under the operble unit remedial action. Samples collected in the drainage ditch south of the site and at the entrance of Lake Winnebago did not contain elevated level of these contaminants.

The shallow aquifer beneath the site contains levels of trivalent chromium above background. Based on RI data, the water table is three to five feet below the land surface and direction of flow is to the southwest, towards Lake Winnebago. Because the City of Appleton obtains their drinking water from the Lake, the City's population was identified as a potential receptor (see Figure 7).

As part of the RI, a groundwater modeling study was performed to determine movement of chromium in the groundwater over time. Although the model did not indicate that chromium found at the site would migrate toward the lake shore, the flow rate of groundwater is estimated to be between eight and eleven feet per year. This indicates that in fifty years, groundwater containing chromium would have migrated just beyond the site boundary (see Figure 8).

Based on the rate of groundwater movement, and taking into consideration the dilution that would occur once ground water discharges to the Lake, the levels of chromium in the groundwater should never

TABLE 2

SCHMALZ DUMP SITE - REMEDIAL INVESTIGATION - RESIDENTIAL WELL DATA
(Samples collected Oct. thru Dec. 1985)
(Concentrations expressed in ug/l)

PARAMETER	DRINKING WATER STDS	NUMBER EXCEED DRK. STDS	1584 RW-1	1583 RW-2	2530 RW-3	1581 RW-4	1580 RW-5	1579 RW-6
METALS:								
Arsenic	50	0	ND	ND	ND	ND	ND	26
Lead	50	0	ND	9.4	ND	ND	2.7	ND
Silver	50	0	ND	ND	4.40	ND	6.8	ND
Boron			285	345	306	299	410	299
Barium	1000	0	236	141	157	140	87	110
Cadmium			ND	3.47	ND	ND	ND	ND
Chromium	50	0	ND	ND	8.24	ND	ND	ND
Copper	A 1300	0	47	ND	ND	404	8	ND
Iron	S 300	5	7820	2490	277	1100	10100	3000
Lithium			17.1	14	12.9	13.1	13	ND
Manganese	S 50	0	19.8	11.7	7	15.7	6.3	28.2
Strontium			1800	1560	1580	1020	1900	549
Zinc	S 5000	0	809	ND	ND	ND	74.4	ND
Calcium			61400	46700	52900	55300	43400	46900
Potassium			3240	3330	2730	2490	3170	ND
Magnesium			53300	50600	50600	44200	41100	41200
Sodium	C 20000	6	33000	32000	33400	36000	29500	27000
Fluoride	4000	0	300	300	300	300	300	300
Ammonia (as N)			2500	1970	1740	1500	1400	2120
Alkalinity (as CaCO3)			510000	418000	439000	394000	436000	360000
Sulfate (as SO4)	S 250000	0	18000	4000	5000	ND	ND	ND
Chloride (as Cl-)	S 250000		20000	16000	28000	21000	9000	ND
VOLATILES:								
Carbon Disulfide			ND	ND	2.3	ND	ND	ND
SEMIVOLATILES:								
Phenol	B 3500	0	ND	ND	ND	1.1	1.4	ND
Di-n-Butylphthalate	B 3500	0	ND	1.2	ND	ND	ND	ND
Butylbenzylphthalate			ND	ND	ND	ND	1.4 J	ND
PESTICIDES:								
NONE DETECTED								

ND = Not Detected
J = Estimated Value
S = Secondary Drinking Water Standards
A = Proposed Maximum Concentration Levels
B = Health Advisory Guidance Level
C = American Heart Association Recommended Level

Figure 5

Schematic East - West Cross-Section Through Schmalz Site
Based on Representative Well Logs

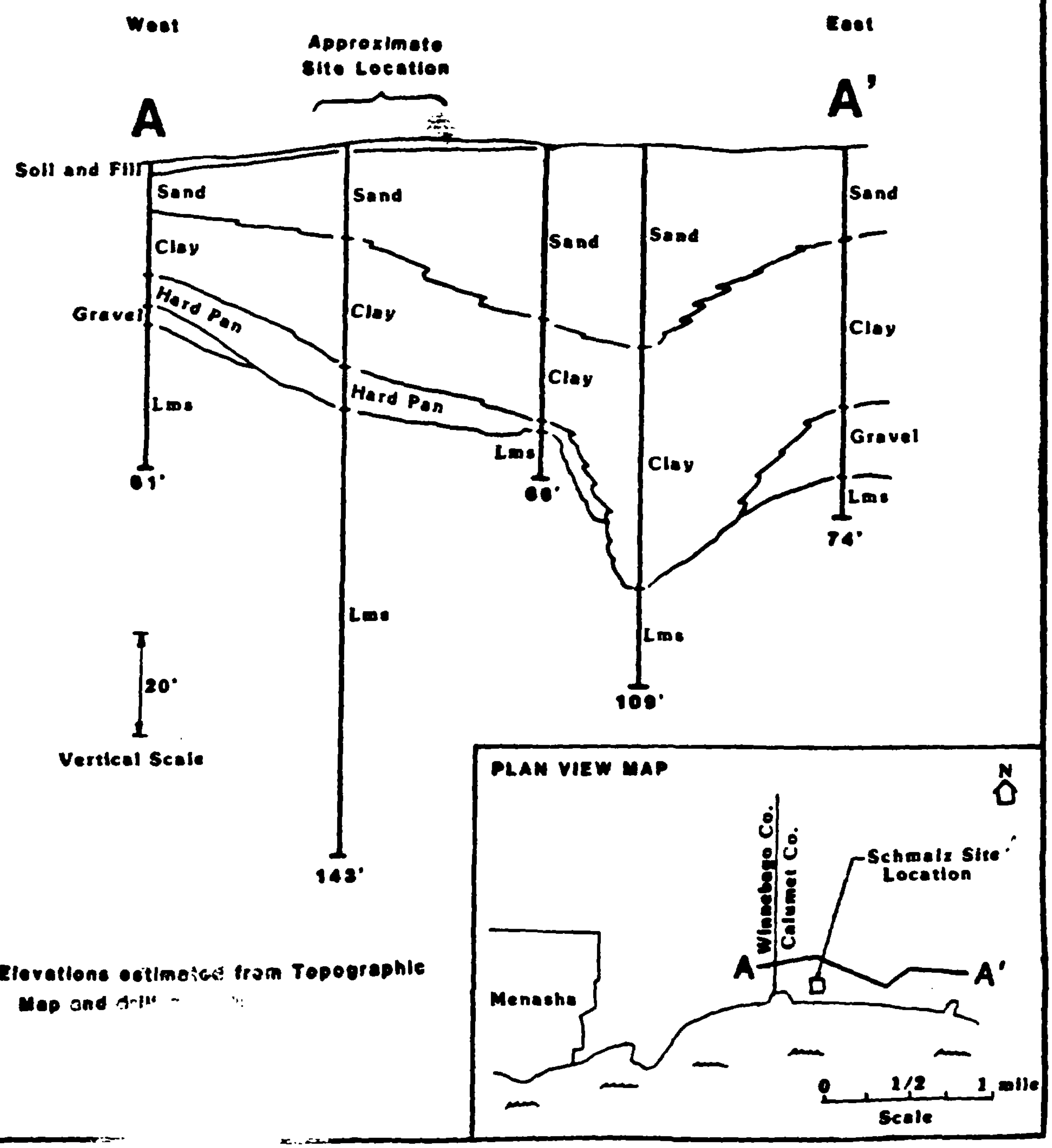


Figure 6

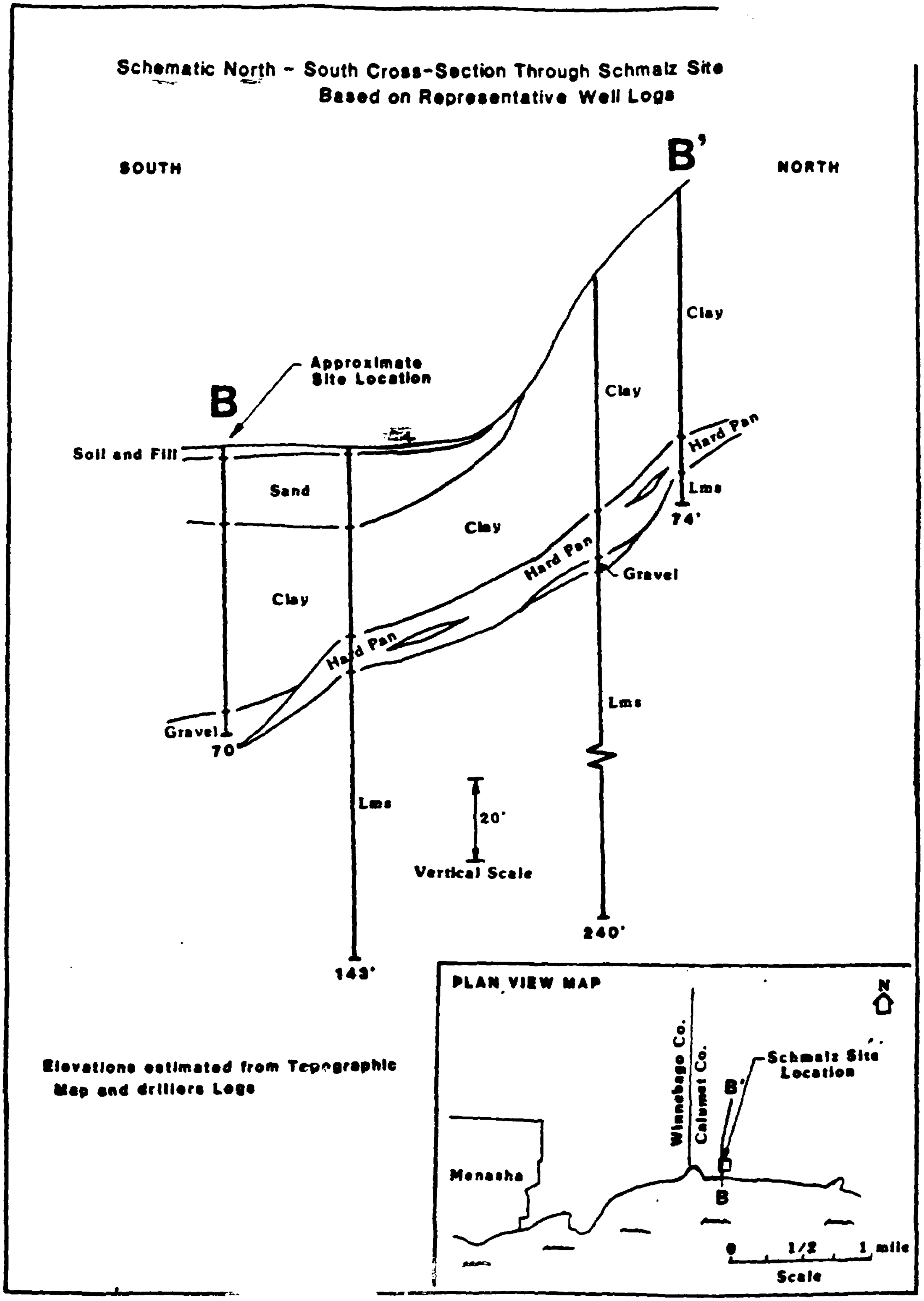

Schematic North - South Cross-Section Through Schmalz Site
Based on Representative Well Logs
SOUTH
NORTH
B'
B
Approximate Site Location
Soil and Fill
Sand
Clay
Clay
Clay
Clay
Hard Pan
Hard Pan
Hard Pan
Lms
Lms
Lms
Gravel
Gravel
70'
74'
143'
240'
20'
Vertical Scale
Elevations estimated from Topographic Map and drillers Logs
PLAN VIEW MAP
N
Winnebago Co.
Calumet Co.
Schmalz Site Location
B'
B
Menasha
0
1/2
1 mile
Scale

Figure 7 Water Table

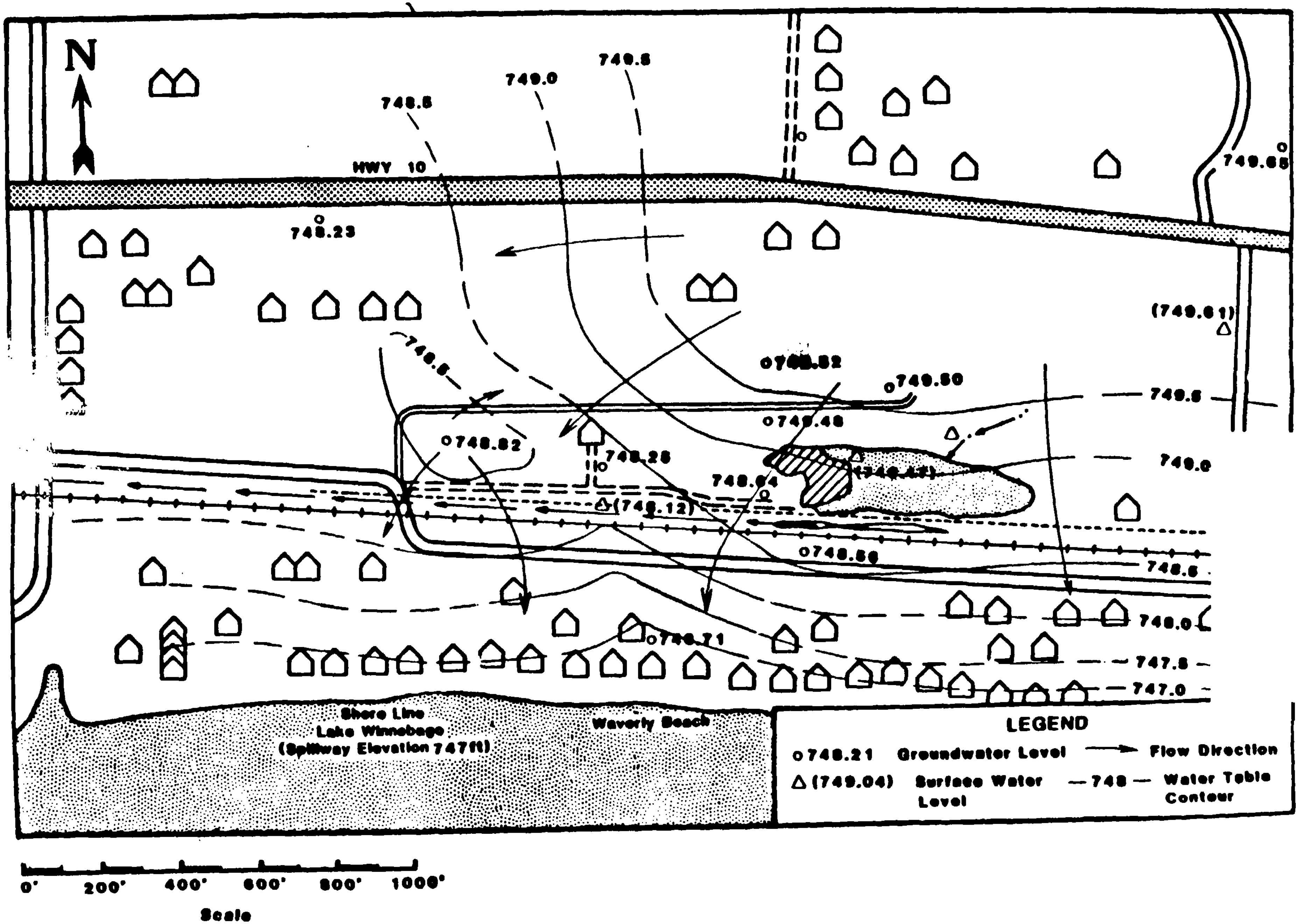
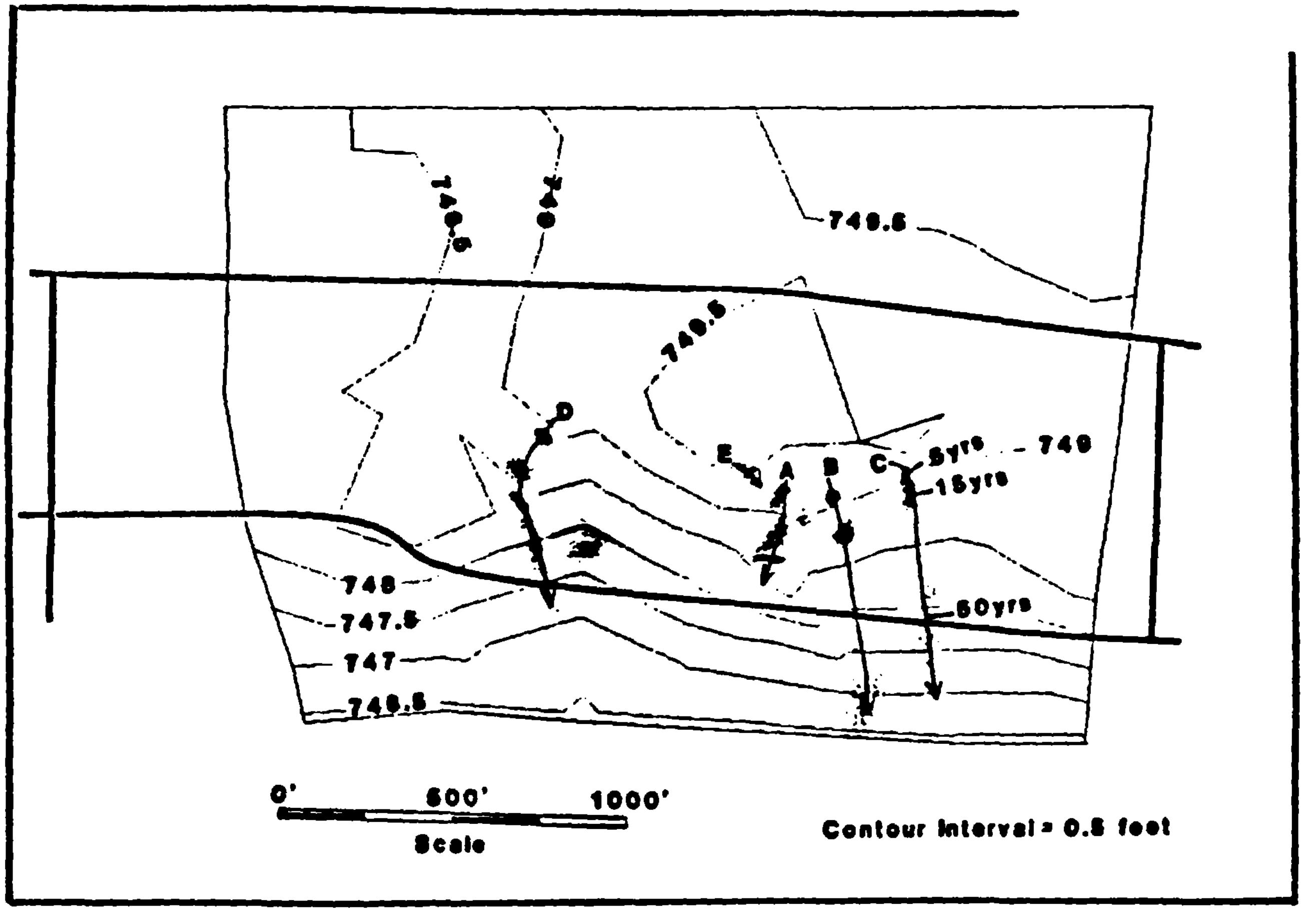
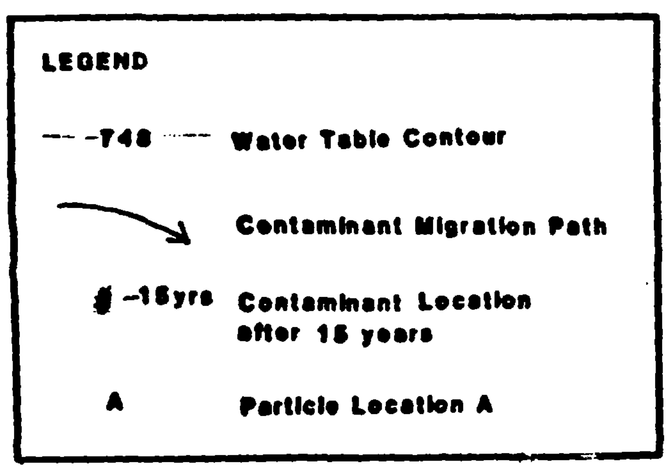


Figure 8





Contaminant Migration in Dry Pe… …ter Table

at 5, 15, and 50

pose a threat to Appleton's water supply. Also, as discussed above, chromium levels in the groundwater do not exceed the SDWA standard of 50 ug/l.

Soils

Surface and subsurface soil samples collected at the Site, show lead and chromium to be the contaminants of concern. Lead and trivalent chromium were found throughout the site at concentrations ranging from detection limits to 1940 milligrams per kilogram (mg/kg) and 964 mg/kg respectively (see figures 9 and 10).

PCB contamination is confined to the area where demolition debris was disposed, volatile and semi-volatile organics were found at low levels and at scattered locations.

During the RI, it was noted that several teenaged children use the Site as a dirt bike trail. It was also noted that fresh refuse was continuously being dumped on site. Given that the Site is an attractive nuisance, and that the area containing high levels of lead and chromium in soils is accessable, it was determined that direct contact is an exposure route.

Threat to Public Health

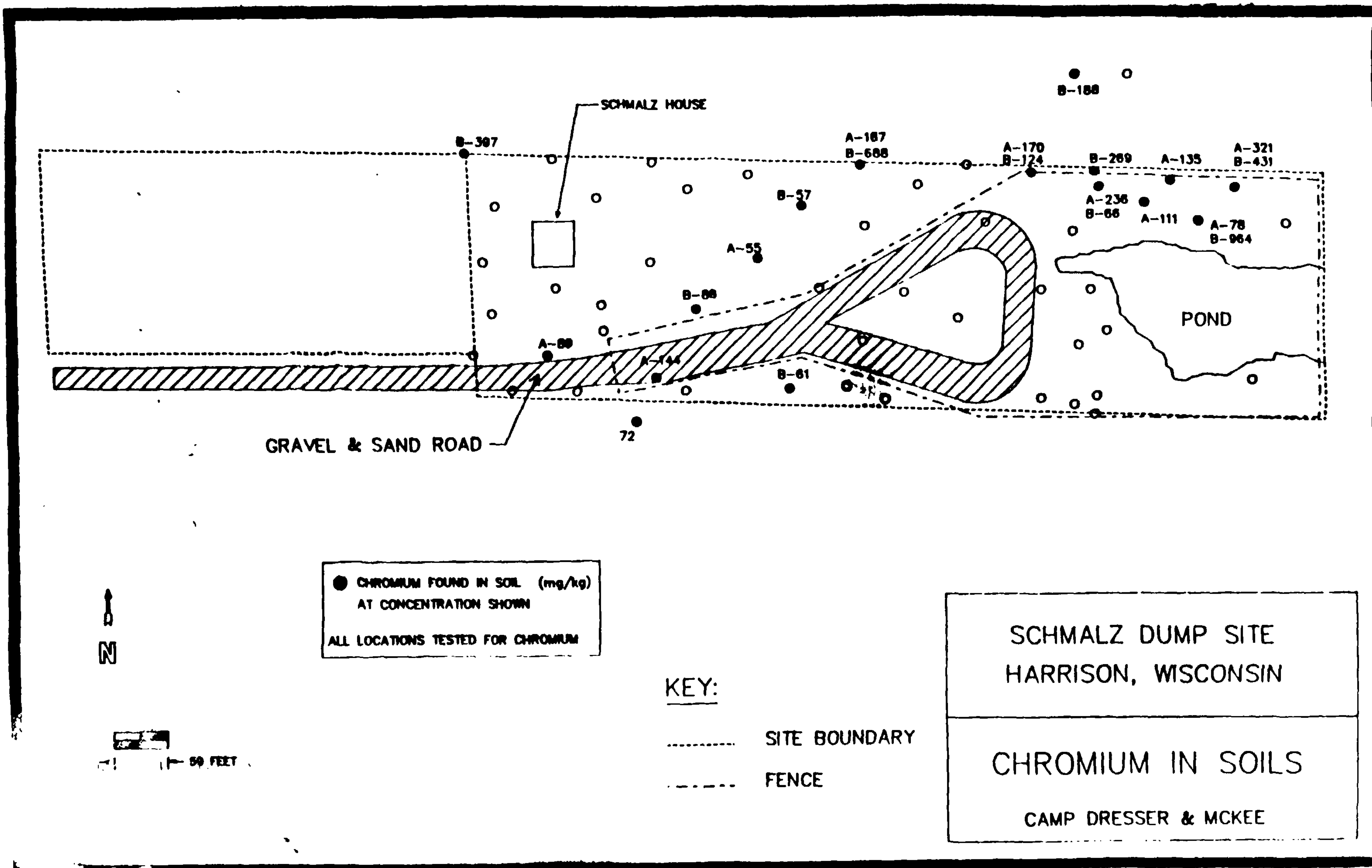
The Public Health Evaluation (PHE) for the Schmalz site identified lead and chromium as the contaminants of concern. The pathway of exposure is direct contact with lead and chromium contaminated soils on site.

Potential risks from contaminated soils are based on the assumption that the site would be used for residential development in the future. Since lead and chromium are noncarcinogens, the acceptable chronic daily intake (AICs) were used to calculate allowable daily chemical intake levels from the identified exposure route. An AIC is the dose that is anticipated to be without lifetime risk when taken daily.

Exposure risks from direct contact were calculated based on the assumption that a child in a residential setting would consume between one and ten grams of soil per day. Based on the AICs for lead and chromium, .014 and 140 milligrams per day respectively, soil on the Schmalz site pose and unacceptable lifetime risk from direct contact.

Groundwater was determined not to be a public health threat because chromium concentrations are below the SDWA drinking water standards. However, leaching of chromium and/or lead to groundwater could potentially cause drinking water standards to be exceeded. To determine if leachable amounts of contaminants would leach, EP Toxicity Extraction Tests were performed on soils during the RI. Results of the tests show that very low levels of both lead and chromium are leachable. Leachable concentrations ranged from .071 to .146 mg/l for lead and from .011 to .063 mg/l for chromium. Considering dilution factors these values are not exp[illegible] cause exceedences of drinking water standards. These [illegible] e

FIGURE 9

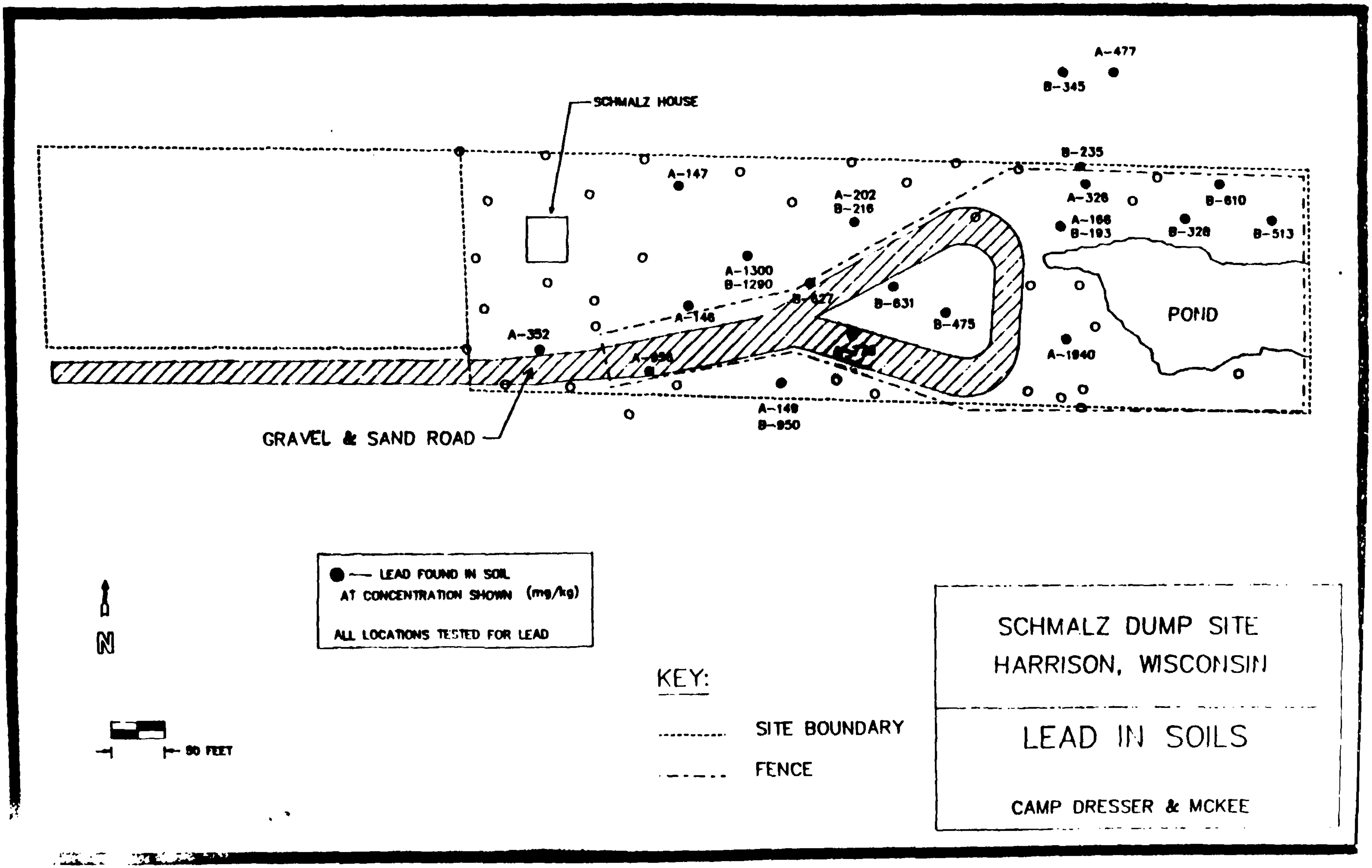


SCHMALZ DUMP SITE
HARRISON, WISCONSIN

CHROMIUM IN SOILS

CAMP DRESSER & MCKEE

FIGURE 10



A-477
B-345
SCHMALZ HOUSE
B-235
A-147
A-202
B-216
A-328
B-610
A-166
B-193
B-328
B-513
A-1300
B-1290
B-627
B-631
B-475
A-146
A-352
A-1940
POND
A-149
B-950
GRAVEL & SAND ROAD
LEAD FOUND IN SOIL
AT CONCENTRATION SHOWN (mg/kg)
ALL LOCATIONS TESTED FOR LEAD
N
50 FEET
KEY:
SITE BOUNDARY
FENCE
SCHMALZ DUMP SITE
HARRISON, WISCONSIN
LEAD IN SOILS
CAMP DRESSER & MCKEE

well below the EP Toxicity test's 5 mg/l limit for determining if the soil is a RCRA hazardous waste and indicates that very little of the contaminants will leach from soils to groundwater. In addition, trivalent chromium has an affinity to fine grained, silty soils like those found in the site area. This would inhibit movement of chromium through the aquifer, and probably explains why chromium has not migrated farther to date.

Based on the above discussions, onsite soils are not likely to ever increase chromium and lead concentrations to greater that the drinking water MCLs of 50 ug/l. However, because there is a remote possibility that this pathway could later become a concern, it was determined that groundwater should be monitored over time.

III. Enforcement

CERCLA related enforcement activities began at the site in 1984. A responsible party search was conducted to identify potentially responsible waste generators and transporters. Eight parties were named for their involvement in the site, including parties who were named in the State's uncuccessful 1979 law suit. Notice letters were sent to each party and a negotiating meeting was held to discuss the RI/FS. At the end of the negotiating period, none of the parties had committed to do the work.

In August 1987, Potentially Responsible Parties (PRPs) were again notified for the Remedial Design and Remedial Action (RD/RA) of the final remedy. Notification letters were sent to:

Allis-Chalmers Corporation — delisted on 9/11/87
Akrisol
Mr. Gregory Schmalz
Mr. Gerald Schmalz
Menasha Corporation
Menasha Electric and Water Utility
James Peters Company
Weisler Construction

August 17, 1987 marked the commencement of the negotiation moritorium. October 16, 1987 is the deadline for PRP involvement in the RD/RA. At this time, no good faith effort has been put forth by the PRPs. Therefore, no extention of the negotiation moritorium has been made.

IV. Community Relations

The public comment period for the RI/FS began on August 17, 1987. Copies of the Phase Two RI Report and the FS Report were made available to the community on this date. Two locations served as repositories for these reports as well as the proposed plan and the remainder of the administrative record. U.S. EPA issued a press release containing the proposed plan prior to commencing the comment period.

A public meeting was held on August 19, 1987, to discuss the findings of the RI/FS and to present the U.S. EPA and WDNR preferred alternative. Questions regarding the project were also answered. No public comments were submitted during the meeting. Two subsequent comments were received. The public comment period ended September 8, 1987. Public comments are addressed is the attached responsiveness summary.

V. Alternatives Evaluation

The feasibility study was initiated to evaluate alternative remedial actions for remediation of contamination at the Schmalz Site. Response objectives for the site were identified in the Public Health Evaluation (PHE). Based on the PHE, protection from direct contact with contaminated soils and monitoring for degradation of groundwater quality from these soils were identified as the site specific response objectives.

A variety of technologies to address response objectives was identified and evaluated for further consideration. From these, eleven alternatives were developed and screened for protectiveness, implementability and cost. Following screening, six alternatives remained and were subjected to detailed analysis using the evaluation criteria outlined in SARA. Table 3 lists the six alternatives evaluated.

TABLE 3
REMEDIAL ACTION ALTERNATIVES

Alternative	Description
A-1	Groundwater extraction coagulation/ flocculation, filtration, ion exchange, and discharge
A-3	Slurry wall and cap
B-1	RCRA Subtitle C cap
B-2	Soil cap
B-5	Solidification, stabilization, on-site disposal
C-1	No action

In order to address response objectives adequately, two groups of alternatives were developed; those addressing groundwater and those addressing soils. The alternatives numbers in Table 3 refer to the numbering in the feasibility study. Group A alternatives address groundwater, group B alternatives address soils, and the no action alternative makes up group c.

DESCRIPTION OF ALTERNATIVES

Alternative A-1: Groundwater Extraction, Coagulation/Flocculation, Filtration, Ion Exchange and Discharge

This alternative would entail treating the groundwater at the Schmalz Dump site to remove chromium to background levels. Treatment would involve coagulation of the suspended solids contained in extracted groundwater by means of polymer or lime addition, and flocculation to enhane the formation of larger particles. Sedimentation would follow, in which the insoluble forms of lead and chromium would be separated from the water. The next treatment process would be filtration, removing the fines and "polishing" the treated water. The final treatment process would be a cation exchange unit, where the soluble chromium remaining would be removed from the water. Following treatment, water would be discharged to the on-site pond.

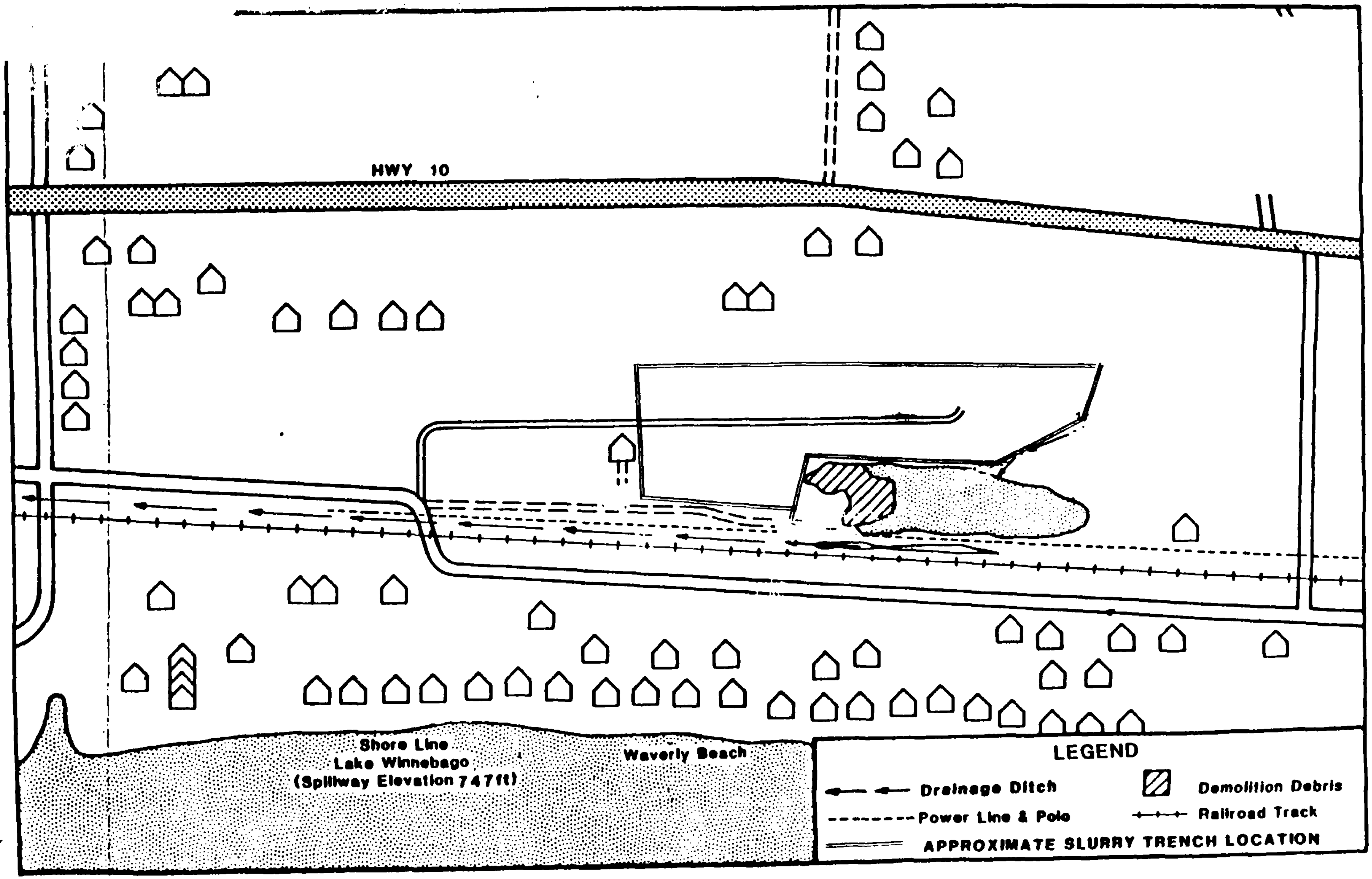
The volume of contaminated water to be pumped and treated was estimated to be 42 million gallons or 3 pore volumes of the water table aquifer beneath the site. This is the amount that would have to be extracted to reduce chromium levels to background. Background for the site is assumed to be approximately 5 ug/l, based on upgradient monitoring well samples. The extraction system would be composed of 2-inch diameter wells placed on 10-foot centers around the perimeter of the site. Water would be pumped at a rate of 50 gallons per minute with a project duration of approximately 19 months.

Alternative A-3: Slurry Wall and Cap

The purpose of this alternative is to prevent contaminant migration by containing the plume and isolating the waste from surface infiltration. This alternative involves the installation of a circumferential slurry wall around the perimeter of the site (Figure 11). The slurry trench would be excavated three feet into the confining clay (located approximately 25 feet below the ground surface). The backfill material would consist of a mixture of excavated soil, water, and bentonite clay. The permeability of the walls would be greatly reduced because of the swelling properties of the clay. Thus, the lateral migration of contaminated groundwater within the walls would be minimized. The low permeability of the underlying clay layer prohibits the vertical movement of the groundwater. Because the slurry walls would be keyed into this formation, the potential for migration of contaminated water under the walls would be low.

An impermeable cap would be constructed over the affected area to prevent the area enclosed by the walls from filling with water. The cap would consist of a 24-inch layer of vegetated topsoil, a layer of geotextile fabric, 12 inches of gravel, a 20-mm synthetic liner, and 24 inches of compacted clay.

FIGURE 11 APPROXIMATE LOCATION OF SLURRY WALL



Operation and Maintenance (O&M) on the slurry wall and cap would be required as part of the alternative. O&M would include periodic inspections of both the cap and slurry wall for signs of erosion, settlement, or subsidence. Additional maintenance of the cap would include the application of fertilizer and periodic mowing to prevent invasion by deep-rooted vegetation.

It is not anticipated that extensive 'pooling' of water will occur within the slurry wall. However, if necessary, a low capacity extraction well could be installed to extract water. The amount of leachate extracted would be very little and could be sent to the local POTW for treatment.

The slurry wall and cap alternative would require that a groundwater monitoring program be instituted. For the purposes of this alternative, it is assumed that the monitoring program will conform with RCRA requirement (40 CFR Part 264.95 and 264.97). This program would consist of placing five monitoring wells on off-site properties to the south and west of the site. The wells would be sampled and analyzed for pH, conductivity, dissolved chromium, and dissolved lead on a quarterly basis for the first year and annually thereafter for 15 years.

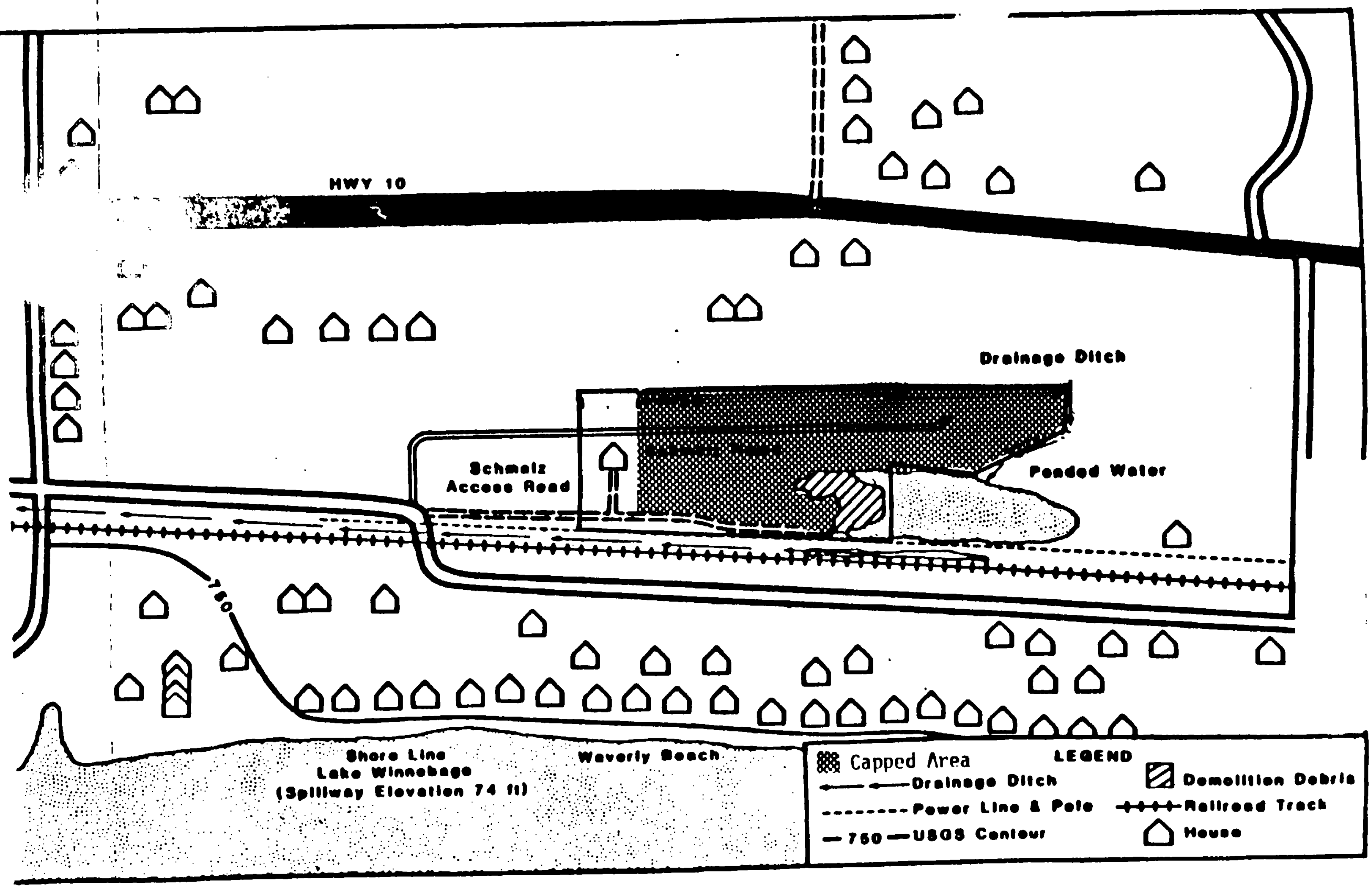
Operation and Maintenance (O&M) would include periodic inspections of both the cap and slurry wall for signs of erosion, settlement subsidence.

Alternative B-1: Cap

Capping of the site would involve construction of a three-layer cap conforming to RCRA guidelines. The area to be capped is outlined on Figure 12. This operation would first consist of the placement of a two-foot clay layer, compacted in six-inch lifts. A twenty-mil synthetic liner would then be placed over the clay. Next, a one-foot thick drainage layer of gravel would be spread and overlain with geotextile fabric. The geotextile fabric would maintain the drainage layer and help to stabilize a final layer of twenty-four inches of topsoil by keeping fine topsoil particles from filling the pore space of the gravel layer. The topsoil would be vegetated to prevent erosion. Also, the cap would have a minimum slope of two percent to the northeast. Drainage channels will be constructed to direct surface runoff to the present site drainage. Precipitation that percolates through the topsoil would flow laterally through the gravel and over the impermeable synthetic and clay barrier and into the drainage channels.

Operation and maintenance of the cap would include periodic inspections for signs of erosion, settlement, or subsidence. Maintenance of the cap would also include the application of fertilizer and periodic mowing and weed control techniques to prevent invasion by deep-rooted vegetation.

FIGURE 12
APPROXIMATE EXTENT OF CAP



Groundwater monitoring would be recommended in conjunction with this alternative. The monitoring plan described for Alternative A-3 would apply here.

Alternative B-2: Soil Cover

The placement of a soil cover over the contaminated area would involve placement of 24 inches of low permeability compacted earth over the site (see Figure 12). The area will then be graded and sloped adequately to allow surface water runoff. The final grade will be approximately two percent to the northeast. The finished surface will be covered with six inches of topsoil and vegetated. Site drainage would also be provided. A diversion ditch constructed upgradient would divert flow to the pond to limit surface water contact with the final cover. Runoff from the cover would be captured by two drainage channels and directed to the ditch located south of the site.

Operation and maintenance of the cap would include periodic inspections for signs of erosion, settlement, or subsidence. Maintenance of the cap would also include the application of fertilizer and periodic mowing and weed control techniques to prevent invasion by deep-rooted vegetation.

Groundwater monitoring would be required in conjunction with the soil cap. The monitoring plan described under Alternative A-3 would also apply here.

Alternative B-5: Excavation, Solidification/Stabilization

This alternative involves the excavation of all contaminated soil, treatment of the soil with solidification/stabilization reagents, and backfilling of the excavated areas with the treated soil. Approximately 8000 cubic yards would be excavated in the contaminated areas. Solidification/Stabilization (S/S) would be used as a permanent remedial action to limit the off-site mobility, solubility and toxicity of the heavy metals.

The S/S process is commercially offered as a complete, on-site mobile treatment unit. The unit is outfitted with reagent tanks, metering equipment and an operating console which monitors the entire process. The waste is first slurried then pumped to the treatment unit where mixing and chemical reaction with the solidification/stabilization reagents occurs. The treated material is then pumped back to the excavated area where solidification occurs within 36 to 72 hours.

A slurry tank would be used to mix the dry sand with water to produce a sludge with a maximum solid content of 30 to 40 percent. This improves the efficiency of the process and the handling characteristics of the waste. Following this, the material is pumped to the treatment unit and then to [illegible] [illegible]ed areas. The treated soil would then be spread and gr[illegible] [illegible]e excaved areas, and a gravel cover placed on the si[illegible]

Dewatering of the soils taken from the site may be necessary prior to treatment unless a groundwater extraction alternative is implemented in conjunction with excavation. The drawdown of the extraction wells could effectively dewater the soils to a depth of greater than five feet. If an alternative involving groundwater extraction is not selected, the soils could be dewatered after excavation by placement on a drainage pad next to the excavated area and water allowed to drain back into the pit. In addition, steps for delisting the soil as a hazardous waste would also need to be considered and carried out.

Alternative C-1: No Action

As the name implies, if this alternative is selected, no remedial action would be taken at the site and current conditions would persist. This alternative was evaluated in the Public Health Assessment presented in the Remedial Investigation Report, and this assessment serves as the basis for the evaluation of all other remedial action alternatives. This option could be applied to the groundwater, soil, or both. No capital or O&M costs would be associated with this alternative.

EVALUATION OF ALTERNATIVES

The alternatives listed in Table 3 were evaluated using criteria mandated by SARA Section 121(b)(1)(A-G). A discussion of these criteria as they relate to each remedial alternative follows. The no action alternative is discussed separately at the end.

Compliance with ARARs

Alternatives were assessed as to whether they attain Legally Applicable or Relevant and Appropriate Requirements (ARARs) of other Federal and State environmental and public health laws. The evaluation of ARARs included, contaminant-specific, location-specific and action-specific ARARs.

For contaminant-specific ARARs, all alternatives would meet the following ARARs upon implementation:

- SDWA Drinking Water Standard Maximum Concentration Limits (MCLs);
- Wisconsin Statute NR140 (groundwater protection);
- 42 U.S.C. 7401 (National Ambient Air Quality Standards for Total Suspended Partiulates);
- CWA Ambient Water Quality Criteria for Protection of Aquatic Life;
- Water Quality Act, Section 118, Great Lakes Protection.

Alternative A-1 would also meet the following ARARs:

- NPDES requirements of the Clean Water Act (CWA) cited in 40 CFR 125.100-.104;
- Wisconsin Statute NR 102, NR 104 and NR 219 (relating to stream classification/standards and sampling/testing methods for surface water);
- Wisconsin Statute NR 108 (relating to wastewater treatment facility plan review and standards).

Location-specific ARARs which have been reviewed for the site include:

- Executive Order 11990, Protection of Wetlands;
- Executive Order 11998, Protection of Floodplains;
- Wisconsin Statute NR 115, Shoreland Management.

The site has been determined not to be within the floodplain of Lake Winnebago. Further, it has been determined that construction of any of the alternatives being evaluated would occur in an upland area, not clasified as a wetland. As such, implementation of any of the remedial alternatives considered are complaint with these two Executive Orders.

The following action-specific ARARs have been identified for the site:

For Alternative A-1, the following apply:

- 40 CFR 122.44(a) (Best available technology economically achievable is required to control toxic and non-conventional pollutants);
- 50 FR 30794 (Applicable Federal Water Quality Criteria must be complied with);
- 40 CFR 136.1 - 136.4 (Sample preservation procedures, containers, holding times are prescribed);
- 40 CFR 122.21 (NPDES Permit Requirements).

For Altrnative A-3, the following ARARs have been identified:

- Section 404 of CWA, 40 CFR Part 230 and 231 (Part of the clean water act addressing dredge andfill requirements in wetland areas);
- Wisconsin Statute NR 180 and NR 181 (solid waste landfill cap standards);

° 40 CFR Part 264.117(c) (relating to the restriction of post closure use);

° 40 CFR Parts 264.228(b) and 264.310(b) (relating to the prevention of run-on/runoff from damaging a site cover);

° 40 CFR Parts 264.258 and 264.310 (relating to landfill closure);

° 40 CFR Part 268 (relating to groundwater diversion and slurry wall installations).

For Alternative B-1, the same ARARs are applicable with the exception of 40 CFR Part 268.

For Alternative B-2, components of the clean closure requirements of 40 CFR 264.113, 264.228 and 264.258 as well as the landfill closure requirements of 40 CFR 264.113, 264.228, 264.258 and 265.310 are relevant and appropriate. Compliance with these ARARs would be achieved upon implementation of this alternative.

For Alternative B-5, RCRA Subtitle C and Wisconsin Statute NR 181 were determined not to apply due to the residual stabilized mass being delisted as a hazardous waste. RCRA Subtitle D and NR 180 would still be applicable.

At this time, it is not anticipated that any ARARs waivers would needed for the alternatives evaluated. Based on the evaluation performed in the FS, all alternatives would comply with Federal and State ARARs upon implementation.

Reduction of Toxicity, Mobility or Volume

The degree to which alternatives employ treatment that reduces toxicity, mobility or volume was evaluated during the detailed analysis of alternatives.

Alternative A-1 has been developed to ensure that the mobility and volume of lead and chromium in groundwater be significantly reduced. A necessary result of this is that the concentration of these compounds will be increased in process sidestreams (water treatment sludge and products of resin regeneration). This would cause an increase in toxicity. There is however, no indication that EP toxicity values for these sidestreams would necessarily increase.

Implementation of Alternative A-3 is not expected to reduce the toxicity or volume of lead or chromium in groundwater, however the mobility of the compounds would be curtailed throughout the effective life of the alternative. As the RI has indicated that these compounds are currently of limited mobility, a slurry wall and cap would essentially eliminate future mobility of these compounds in groundwater within the area of remediation.

Implementation of Alternatives B-1 or B-2 is expected to [illegible]icantly reduce the mobility of lead and chromium in the site soi[illegible] [illegible] do nothing to reduce toxicity or volume of contaminants.

The mobility and toxicity of lead and chromium are expected to be somewhat reduced as a result of implementing Alternatives B-5 due to decreasing the potential for leaching. The volume of material containing these compounds would increase slightly.

Short Term Effectiveness

The short-term effectiveness was assessed for each of the alternatives. Factors evaluated include, magnitude of reduction of existing risks, short-term risks associated with implementation and time necessary to achieve protection. A discussion of each follows.

In the short term of Alternative A-1, the risk of ingesting on-site groundwater would decrease with decreasing influent chromium levels. To a lesser extent, risk reduction would also occur as a result of implementation of Alternative A-3, but only to those potential users of the groundwater directly affected by the groundwater flow alteration caused by the slurry wall and cap.

For Alternative B-1 and B-2, short-term risks associated with direct contact with soils would not be altered. Alternative B-5 would increase the short-term risks to workers responsible for implementing the alternative and may contribute to increased risk to the local residents as well, especially during excavation, due to potential airborne migration of dusts from the site.

On a short-term basis, Alternatives A-1, A-3, B-1 and B-2 are all envisioned to provide equivalent protection to both the community and workers conducting the remedial action, whereas Alternative B-5, by virtue of its necessitating intimate contact with on-site soils, would offer a decreased level of protection to site workers.

The time until identifiable protection is achieved is assumed to be the duration of plannning, construction and implementation of each alternative. In summary:

Alternative A-1	4 years
Alternative A-3	28 months
Alternative B-1	20 months
Alternative B-2	20 months
Alternative B-5	16 months

Long-term Effectiveness and Permanence

Alternatives were evaluated for the long-term effectiveness and permanence they afford along with the degree of certainty that the remedy will prove successful. Factors considered include, magnitude of residual risks, type and degree of long-term management required, potential for exposure to wastes, long-term reliability of engineering and institutional controls, and the potential need for replacement of the remedy.

Long-term risk reduction associated with the ingestion of chromium in the groundwater would occur as a result of implementing Alternative A-1, however, as there are no identifiable potential users of the groundwater, the magnitude of risk reduction is can not be quantified.

Implementation of Alternative A-3 is not expected to decrease long-term risks in the same manner, as chromium would remain in the groundwater system and potential exposure could occur, particularly in the event of placing a drinking water well within the capped area. Again, the risks are unquantifiable.

Alternative B-1 would eliminate risks associated with contacting on-site soils for as long as the cap was properly maintained. Similar risk reduction would occur with Alternative B-2. Implementation of Alternative B-5 is not expected to significantly minimize risks associated with ingestion of soils without additional restrictions on use of the site (e.g., additional fencing).

Owing to the relatively complex nature of treatment system components, Alternative A-1 is deemed to have a low reliability. In comparison, Alternatives A-3, B-1, and B-2 are deemed more reliable due to their simplicity. The reliability of Alternative B-5 is unknown principally due to the lack of data documenting long-term success or failure of similar projects.

Components of Alternative A-1 will not require replacement throughout the life of the remedial action (2 to 3 years). For Alternative A-3, B-1 and B-2, the only potential need for replacement is seen to be that of the cap or soil cover. This need could occur if the original cap was washed out by some storm event, if heavy equipment were to abrade the cover, or if unforseen subsisence were to occur. Replacement of Alternative B-5 is not applicable.

Implementability

The ease or difficulty of implementing each alternative was assessed during the detailed analysis. Factors evaluated included degree of difficulty associated with construction, expected operational reliability, need to obtain approvals and permits, and availability of necessary equipment and specialists.

All alternatives evaluated have been constructed for various applications in the past. Alternatives B-1 and B-2 are constructable with a lesser degree of engineering than Alternatives A-1, A-3 or B-5. Treatability tests or compatibility testing is required for Alternatives A-1, A-3 and B-5 prior to design and construction.

Assessments of the reliability of the component technologies comprising alternative A-1 reveal that several problems can occur at each component stage. This could result in delays or inability to implement the alternative. For Alternative A-3, the reliability of slurry wall technology is deemed high, subject to the achievement of design tolerances for head differentials across the wall.

Capping (Alternatives A-3 and B-1) employs reliable technology for sealing off contamination from the aboveground environment and significantly reducing underground migration of wastes. Alternative B-2 employs reliable technology for sealing off contamination from the aboveground environment, but is not reliable for reducing underground waste migration.

For Alternative B-5, there is considerable research data to suggest that silicates used together with a cement setting agent can stabilize a wide range of materials including metals. However, the feasibility of using silicates for any application must be determined on a site specific basis particularly in view of the large number of additives and different sources of silicates which may be used. Soluble silicates such as sodium and potassium silicate are generally more effective than fly ash, blast furnace slag, etc.

Based on the content of soils on the site, Alternative B-5 may be difficult to implement. Contaminated soils consist of solid waste, wood, brick, and car bodies, which would make implementation difficult.

In order to implement the alternatives presented, U.S. EPA will need to coordinate with and obtain necessary approvals and permits from other offices within the agency and from other agencies.

The following Agency participation will be required in the remedial action implementation:

- U.S. Army Corps of Engineers - will design, construct and oversee remedial action;
- State of Wisconsin - will aid in coordination of a voluntary well abandonment, assume responsibility for operation and maintenance activities after one year following construction, coordinate site access, and provide 10 percent share of construction costs.

In addition, approvals from other agencies will also be necessary. These are listed below for each alternative.

Agency	Alternative
U.S. Army Corps of Engineers	A-1, A-3, B-1, B-2, B-5 (Wetlands)
County Zoning Department	A-1, A-3, B-1, B-2, B-5 (Shoreland Zoning)
WDNR	A-1 (Discharge)
RCRA (USEPA)	B-5 (Delisting Residuals)
State of Wisconsin	A-1, A-3, B-1, B-2, B-5 (Well Abandonment)
Menasha POTW	A-3 (if POTW disposal of leachate extraction is required)

Since none of the alternatives have proposed off-site treatment, storage or disposal services, availability of these services is not a concern for the project. However, on-site activities for each alternative will require specific equipment and specialist services.

For Alternative A-1, each component of the treatment process is available, however, procurement of the ion exchange units and resins may require 16 to 20 weeks after ordering. The remaining treatment system components are available as prefabricated units. Treatment plant operators would also be needed and may require licensing.

Alternatives A-3, B-1 and B-2 do not require a high level of skilled personnel for implementation. Equipment necessary for these alternatives would be provided by the remedial action contractor.

For Alternative B-5, the manufacturer/supplier of the solidification/stabilization process provides equipment and operations specialists for the duration of treatment. Standard earth moving equipment would be required for final placement of solidified materials.

Cost

Each alternative was evaluated for estimated costs of implementation. Estimated costs include capital costs as well as annual operation and maintenance costs. The net present worth of these costs provides the basis for cost comparison.

The present worth analysis was performed on all remedial alternatives using a 10 percent discount (interest) rate over a period of 30 years except where the life of a given component of an alternative was less than 30 years. Inflation was not considered in preparing the present worth costs and a depreciation of 100 percent was assumed. The present worth costs for each alternative are summarized in Table 4.

TABLE 4
COST COMPARISON OF REMEDIAL ALTERNATIVES

A-1 Groundwater Extraction, Coagulation Sedimentation, Ion Exchange, Discharge	$2,085,813	$902,083	$3,361,700
A-3 Slurry Wall and Cap	$3,143,130	$9,315	$3,210,729
B-1 Cap	$2,292,848	$17,940	$2,391,798
B-2 Soil Cover	$687,664	$17,940	$786,614
B-7 Excavation, Solidification/ Stabilization	$2,790,152	$9,775	$2,812,131
C-1 No Action	$0	$0	$0

Community Acceptance

As the groundwater is not presently being used as a drinking water source, and contamination at the site is confined to on-site media, the community does not perceive the site as an immediate danger. Because of this, the community has not expressed negative reaction to any of the alternatives, except no action.

State Acceptance

When evaluating potential response actions, it is important to consider State concerns with alternatives evaluated. The State of Wisconsin has expressed support for alternatives that address direct contract threats. Because groundwater quality is within the Wisconsin Statute NR 140 requirements for groundwater protection, they do not feel that a groundwater treatment alternative is warranted. Alternative B-2 would most closely meet State ARARs for closure under the State's Solid Waste Statute, NR 180, and their Hazardous Waste Statute NR 181.

The State has expressed reservation concerning our decision not to address off-site groundwater contamination which is emenating from an off-site source as part of the remedy. We have proposed that this off-site area be addressed under the site discovery process as a separate site. The State is concerned that the new site may not be addresed for several years under the current site discovery process.

Overall Protection of Human Health and the Environment

Following the analyses of remedial options against individual evaluation criteria, the alternatives were assessed from the standpoint of whether they would provide adequate protection to human health and the environment based on the evaluation criteria.

Based on the evaluation criteria, it appears that alternatives A-3, B-1 and B-2 would provide adequate protection from contaminated soils on site. A-3 and B-1 provide additional protection for groundwater, which is not considered a pathway of concern. Alternative A-1 does not provide protection from contaminated soils which is the only pathway of concern at the site. Thus, this alternative would have to be combined with an alternative to achieve protection. Although Alternative B-5 would be protective upon implementation, there are risks to workers and residents associated with implementing it. In addition, the ability to implement the alternative is some what questionable due to the content of the soils.

No Action Alternative

The no action alternative was also evaluated using the criteria listed in Section 121 (b)(1)(A-G) of SARA. The following discussion provides the results of the no action evaluation.

If no action was implemented at the Site, it would not comply with the ARARs listed below.

- RCRA Subtitle C, Hazardous Waste Landfill Closure Requirements;
- Wisconsin Statute NR 180, Sanitary Landfill Closure;
- Wisconsin Statute NR 181, Hazardous Landfill Closure;

No action would not reduce mobility, toxicity or volume of contaminants nor would it protect against future direct contact exposure. No short or long-term protectiveness or risk reduction would occur at the site, and community response was not favorable to a no action alternative. In addition, although there is no cost involved presently, this alternative has the greatest potential for future remedial action costs. In summary, the no action alternative does not provide adequate protection of human health and the environment.

COMPARISON OF ALTERNATIVES

In order to determine the most cost-effective alternative that is protective of human health and the environment, attains ARARs and utilizes permanent solutions and treatment technologies to the maximum extent practicable, alternatives were compared to each other. Comparisons are based on the evaluation criteria mandated by SARA, and as discussed in the previous section of this ROD.

All the alternatives would comply with Federal and State ARARs if implemented. Treatment alternatives A-1 and B-5 would require compliance of additional action-specific ARARs, but this is not seen as a problem.

None of the alternatives would reduce toxicity of lead and chromium in soils or chromium in the groundwater. Because metals are persistent as natural elements, it is not feasible to change their form. Alternative A-1 actually increases the toxicity of chromium because it increases the concentration. All alternatives reduce the mobility of lead and chromium in soils except A-1. A-1 reduces mobility of contaminants in groundwater only. A-1 also reduces the volume of contaminated groundwater. A-3 and B-1 reduce the mobility of contaminants in both media. None of the alternatives reduce the volume of contaminated soils and B-5 actually increases the volume slightly.

For short-term effectiveness, alternatives A-1, A-3 and B-1 reduce risks from groundwater, however A-1 does not reduce risks from soils. Alternatives B-2 and B-5 provide risk reduction from soils only. None of the alternatives, except B-5, pose a threat during implementation. B-5 would expose workers and the community to wind blown contaminants and direct contact during construction. The schedule for planning and implementation of all the alternatives call for one and a half to three years. This is not expected to cause any adverse effects.

In considering long-term effectiveness, alternative A-1 reduces risk to groundwater but not to soils. Alternatives A-3 and B-1 provide protection from groundwater and soils. B-2 and B-5 provide good protection for soils but only minimal protection for groundwater. The reliability and potential for replacement for the alternatives was also considered. Reliability of all alternatives, except B-5, is considered good. Reliability of B-5 is unknown. Replacement of A-1 and B-5 is not applicable. There is a possibility that alternatives A-3, B-1 and B-2 would need replacement.

In evaluating implementability, it is invisioned that A-1, A-3 and B-5 would be more difficult because they require more complex design. Reliability would be low for A-1 and B-5 during implementation. This is due to complexity and the likelihood of one or more components of the system failing. Alternatives A-1 and B-5 would also require additional approvals and specialists and lead time to implement them.

The evaluation of overall protection indicates that alternative A-1 does not protect against direct contact with soils, and alternative B-5 has risks associated with implementation and implementability.

To summarize the comparison of alternatives, it is apparent that the cost-effective alternative that is protective of human health and the environment is alternative B-2. Alternative A-1 does not protect against direct contact. Alternatives A-3 and B-1 are not cost effective because they provide excess protection for groundwater. Alternative B-5 would be protective upon implementation, however, there are several problems associated with implementation of this alternative that make it undesirable.

VI. Selected Remedy

Section 121 of SARA requires that all remedies for Superfund sites be protective of human health and the environment and comply with applicable or relevant and appropriate Federal and State laws. Based on the evaluation of all alternatives using the SARA Section 121 requirements, and the technical, public health, environmental impacts and cost criteria, the U.S. EPA, in conjunction with WDNR, selected Alternative B-2 as the final remedy for the site. The remedy entails:

- Installation of a low permeability soil cap over the contaminated soil;
- Implementation of a groundwater monitoring program;
- Implementation of a voluntary well abandonment program for residents between the site and the lake;
- Recommendation that adjacent property be evaluated under the CERCLIS program;

The selected remedy will adequately protect public health and the environment from direct contact, ingestion and inhalation of soils containing lead and chromium. Groundwater monitoring will provide essential information on changes in groundwater quality and will enable corrective action to be taken should lead or chromium levels exceed drinking water standards in the future.

The remedy is considered the most cost-effective remedial action. It complies with Federal and State ARARs and is protective of human health and the environment by eliminating the threat of direct contact with contaminated soils. Based on current information, the preferred alternative meets the protectiveness, implementability and cost effectiveness standards of CERCLA, as amended by SARA, and the NCP.

Protectiveness

Based on the Public Health Evaluation developed for the site, direct contact with contaminated soils on-site is the only pathway of concern. Eliminating the potential for direct contact by utilizing a compact soil cap over the contaminated soils is protective of human health and the environment. Establshing a groundwater monitoring program to monitor long-term compliance with groundwater protection standards for lead and chromium will provide protection from potential future releases.

Compliance with Other Laws

The selected remedy has been evaluated to ensure that all Federal and State public health and environmental requirements have been identified and that all appropriate ARARs will be attained. The site-specific ARARs for the selected remedy are listed below.

Resource Conversation and Recovery Act (RCRA) Subtitle C

Because RCRA specifically regulates hazardous waste management after November 19, 1980, RCRA is not applicable for the Schmalz Dump site. However, since hazardous waste was disposed of at the site, certain RCRA Subtitle C closure requirements are relevant and appropriate. RCRA Subtitle C, Subpart G defines closure and post-closure requirement for landfills. Under Subpart G, two closure options exist, clean closure and disposal, or landfill closure. RCRA regulations on clean closure are found in 40 CFR 264.113, 264.228 and 264.258. Under clean closure, contaminant levels must be below established Agency-approved cleanup-levels for all pathways. Regulations for disposal, or landfill closure are found in 40 CFR 264.113, 264.228, 264.258,a nd 263.310. Under this closure option, the site must be capped to minimize infiltration, and a 30-year groundwater monitoring, leachate treatment and post closure maintenance program must be implemented. A corrective action strategy for potential releases from the facility must also be developed, and if nececessary, implemented.

For the Schmalz Dump site, neither clean closure nor landfill closure is relevant and appropriate as a whole. Clean closure requires elimination of exposure to all pathways. At Schmalz Dump there is a direct contact exposure pathway. Landfill closure addresses contaminated groundwater and leachate pathways as well as direct contact. At Schmalz Dump there is no groundwater contamination or leachate release. Based on the above considerations, components of both closure options have been deemed relevant and appropriate. Thus, relevant and appropriate components from both options have been tailored into a site-specific closure option that is protective of public health.

The Agency has recognized that a void exists between closures in RCRA Subtitle C. This type of tailored closure approach has been proposed by the Agency in its Alternate Closures proposed ruling of March 19, 1987. This proposal recommends designing closures based on exposure pathways of concern.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) mandates that U.S. EPA establish regulations to protect human health from contaminants in drinking water. The drinking water standard, or maximum concentration limit (MCL), for both chromium and lead is 50 ug/l.

For water that is used for drinking, the MCLs are generally applicable where water will be provided to 25 or more people. MCLs are relevant and appropriate where surface water or groundwater could be used for drinking water. At the Schmalz Dump site, chromium detected in groundwater did not exceed the MCL, and lead was not reported above the detection limits. Therefore, groundwater at the Schmalz Site is in compliance with the SDWA without implementing treatment.

Clean Water Act

Section 404 of the Clean Water Act (CWA) regulates dredge and fill activities in navigable waters in the United States. Protection of wetlands is a primary goal of the dredge and fill permit program. Permit applications for these activities are reviewed for impact on public interest and compliance with relevant Section 404 (b)(1) Guidelines. The U.S. Army Corps of Engineers (U.S. ACE) has agreed that U.S. EPA need not obtain permits for Superfund activities, however, the proposed activities should be based on technical factors, including:

- A determination that proposed filling activities will not have adverse impacts on the aquatic ecosystem;
- A determination that fill materials do not degrade water quality or contribute to violations of any State standard;
- A determination of the potential short-term and long-term effects of filling activities on the physical, chemical and biological components of the wetland.

The determination as to whether an area is actually a wetland is made by the U.S. ACE. At the Schmalz Dump site, U.S. ACE has determined that the area to be capped is an upland area because it is not inundated with water for any significant time during the year. Therefore, CWA regulations for dredge and fill activities in the area where the soil cap will be installed are not applicable or relevant and appropriate.

The areas on-site that are emergent are considered wetlands and thus, if any future actions were taken at these locations, Section 404 of CWA would be applicable.

Wetlands Protection

Exeuctive Order 11990 - Wetlands Protection, regulates activities in wetlands. U.S. EPA implemented these requirements into their Policy on Floodplains and Wetlands Assessments for CERCLA Actions in August, 1985. As discussed previously under CWA, the area to be capped on the Schmalz Dump site is not a wetland area. Here too, if actions are taken in wetland areas of the Site, the Wetlands Protection Order would be applicable.

NR 140 Wisconsin Administrative Code (WAC)

Wisconsin's groundwater protection Administrative Rule, Chapter NR 140 WAC, regulates public health groundwater quality standards for the State of Wisconsin. NR 140 is a promulgated State Administrative Rule and is, therefore, applicable for Superfund activities in Wisconsin. The enforceable groundwater quality standard for chromium is 50 ug/l. This is equivalent to the MCL for chromium under the SDWA.

NR 180 WAC

Wisconsin's Solid Waste Management Administrative Rule, Chapter NR 180 WAC, regulates solid waste in the State. This rule is not applicable for the Schmalz Dump site because the site contains hazardous wastes, and because the dump was never licensed under NR 180. Certain components of the rule may be relevant and appropriate based on the history of filling at the site, since solid wastes are combined with contaminated soils in the area proposed for capping. However, NR 180 requirements are not more stringent than RCRA regulations that are relevant and appropriate for the site, nor are they more stringent than Wisconsin's Hazardous Waste Management Administrative Rule, Chapter NR 181.

NR 181 WAC

Wisconsin's Hazardous Waste Management Administrative Rule, Chapter NR 181 WAC, regulates the handling of hazardous waste in the State. Similar to Federal RCRA regulations, NR 181 regulates waste handling after 1980. Therefore, like RCRA, NR 181 is not applicable, but certain requirements may be relevant and appropriate for Superfund sites. Section NR 181.44(12) of the rule regulates closure of landfill facilities without operating licenses. The requirements under this section are relevant and appropriate for the Schmalz Dump Site. In addition, certain components of closure for licensed facilities are also relevant and appropriate. ~~The selected~~ remedy for the Site fully complies with NR 181.44(12). And, since requirements for closure of licensed facilities ~~under NR 181~~ are not more stringent than RCRA, the selected [illegible]y complies with relevant and appropriate components of clos[illegible]nder NR 181.

NR 115 WAC

Wisconsin's Shoreland Management Program Administrative Rule, Chapter NR 115 WAC, regulates zoning and use regulations for shorelands in the state. This rule is applicable to the Schmalz Dump site because the facility is within 1,000 feet of Lake Winnebago, and is, therefore, subject to the County Shoreland-Wetland Zoning ordinance, adopted pursuant to Chapter NR 115, and enforced by the County. Under this ordinance, all actions taken on shorelands-wetlands must be approved by the County Planning Department. Preliminary indications by the Planning Department favor the proposed remedy, provided proper erosion controls are utilized. These erosion controls are also required under RCRA and NR 181 closure regulations, and will, therefore, comply with these requirements.

Cost Effectiveness and Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy is the lowest cost alternative that adequately protects public health and the environment from the threat of direct contact at the Schmalz Site. While other alternatives evaluated also provide protection, they are more costly while achieving the same desired results.

Under SARA, selected remedies should attempt to satisfy the statutory preference for treatment as the principal element. The selected remedy does not satisfy this treatment preference because none of the components of the alternative involve treatment. Alternative B-5, solidification/stabilization of soils, would seem to be the most desirable alternative because it utilizes treatment as the principal element. However, due to site-specific conditions, this alternative has serious drawbacks. First, because the contaminated soils consist of solid waste, white goods, wood, brick, and car bodies, solidification and stabilization of the soils would likely be infeasible. Alternative B-5 also poses a short-term risk to workers and the community during implementation, would increase the volume of contaminated soils, and has unknown reliability. In addition, solidification and stabilization of the soils is not condusive to a wetlands environment. Capping and vegetation of the site is.

Based on the above considerations, alternative B-5 was considered impracticable due to questionable technical feasibility, inadequate short-term protection, and inappropriate site conditions. Therefore, the statutory preference for treatment is not satisfied because treatment was found to be impracticable.

Schedule

The following are the key milestones for implementation of the remedial action:

° ROD Signature	9/25/87
° Award Interagency Agreement to U.S. ACE	FY 1988 Q1
° Start Remedial Design (RD)	FY 1988 Q1
° Complete RD	FY 1989 Q1
° Begin Remedial Action	FY 1989 Q2