New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

Langdon Marsh
Commissioner

File RI/FS Oswego

New York State Department of Environmental Conservation Invites Public Comment On the Proposed Remedial Action Plan for the MILLER CONTAINER DIVISION SITE Inactive Hazardous Waste Disposal Site Volney, New York November 1994

Dear Interested Citizen:

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the NYS Department of Health (NYS DOH), is inviting public comment on the recently completed Proposed Remedial Action Plan (PRAP) for the Miller Container Division Site (Miller).

A public meeting will be held on December 7, 1994 at 7:00 PM in the Fulton City Hall, located at 141 South First Street in Fulton. At this meeting, the results of the site investigations and feasibility study will be presented. The proposed site remedy will be presented and the rationale for its selection will be explained. The public will then be given an opportunity to ask questions about the site and comment on the PRAP. The NYSDEC will accept written comments through December 30, 1994. After gathering public comments on the PRAP, the NYSDEC will prepare a Record of Decision (ROD), formally announcing the remedial plan for the site. All comments received at the meeting and in writing during the comment period will be addressed in the Responsiveness Summary section of the ROD.

Based on the Remedial Investigation (RI) Report and the Feasibility Study (FS) Report, the NYSDEC proposes a remedy consisting of:

- a groundwater extraction system (13 extraction wells)
- a groundwater treatment system (an air stripper and activated carbon)
- vapor extraction to treat contaminated soil (vacuum wells)
- continued groundwater monitoring

This proposal includes the continued operation of a water treatment system at the Fulton Water Works.

The Miller Container Division site consists of a parcel of land which is about 40 acres in size. The site is the location of the former Miller can manufacturing facility (the Plant), now owned and operated by Reynolds Metals. The site, located just outside the City of Fulton on Route 57, is bounded by Route 481 on the north and east, the Miller Brewery property on the east and south, and Route 57 and the Riverscape apartments on the west.

In 1986, during the removal of an underground storage tank, it was discovered that solvents from the tank and its associated network of pipes had leaked into the surrounding soils and groundwater. Miller installed monitoring wells to determine the extent of groundwater contamination. In 1987 and 1988 Miller installed three recovery wells as part of an Interim Remedial Measure (IRM) to capture and treat the contaminated groundwater. During the initial investigation it was determined that some of the same contaminants found in the area of the tank were also being detected in one of three municipal wells located across Route 57 from the site. In 1990, two of the municipal wells were taken out of service due to the levels of contamination detected. In order to protect the public water supply, Miller conducted an additional IRM in 1991 and 1992 which consisted of the construction of a water treatment system on the Fulton wellfield property. This system has been in operation since 1992 treating the water from the three operating wells, removing all detectable site related contaminants.

PROPOSED REMEDIAL ACTION PLAN

"MILLER CONTAINER DIVISION"
Volney, Oswego County, New York
Site No. 7-38-029
October 1994

SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a combined groundwater pump and treat and vapor extraction system for the Miller Container Division, Site Number 7-38-029. This remedy is proposed to address the threat to human health and the environment created by the presence of chlorinated solvents in soils and groundwater at the site. The site is located upgradient of several public water supply wells. Contaminants from the site have impacted water quality of at least two of these wells. The contaminated wells were taken out of service until a water treatment plant capable of removing the contamination was constructed by Miller. The plant went into service in June 1992 and has operated satisfactorily since then.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the rationale for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments submitted during the public comment period.

This PRAP is issued by the NYSDEC as an integral component of the citizen participation plan responsibilities provided by the New York State Environmental Conservation Law (ECL), and 6 NYCRR Part 375 (a State regulation). This document is a summary of the information that can be found in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) reports (described below) on file at the document repositories.

The NYSDEC may modify the preferred alternative or select another response action presented in this PRAP and the RI/FS Reports based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

To better understand the site and the investigations conducted there, you are encouraged to review the documents at the following repositories:

Fulton Public Library
160 South First Street
Fulton, New York 13069

* NYSDEC Region 7 Offices
615 Erie Boulevard West
Syracuse, New York 13204-2400
Attn: Charles Branagh
(315) 426-7400
8:30 a.m. - 4:45 p.m.

* NYSDEC Central Offices
Room 222
50 Wolf Road
Albany, New York 12233-7010
Attn: Michael DiPietro, Project Manager
(518) 457-0315
8:30 a.m. - 4:45 p.m.
* By appointment only

Written comments on the PRAP can be submitted to Mr. DiPietro at the address given above.

DATES TO REMEMBER:

November 28 - December 30, 1994
Public comment period on RI/FS Reports, PRAP, and preferred alternative.

December 7, 1994 at 7:00 p.m.
Public meeting at the Fulton City Hall,
141 South First Street, Fulton, New York

SECTION 2: SITE LOCATION AND DESCRIPTION

The Miller Container Division Site (No. 738029) is located in the Town of Volney, Oswego County, on the east side of Route 57, approximately 1500 feet south of the intersection of Routes 57 and 481 (see Figure 1). The site is situated just outside the City of Fulton. The site is approximately 40 acres in size and is bordered on the north and east by Route 481, the south by the Miller Brewery, and on the west by Route 57 and a property occupied by a two-story apartment building.

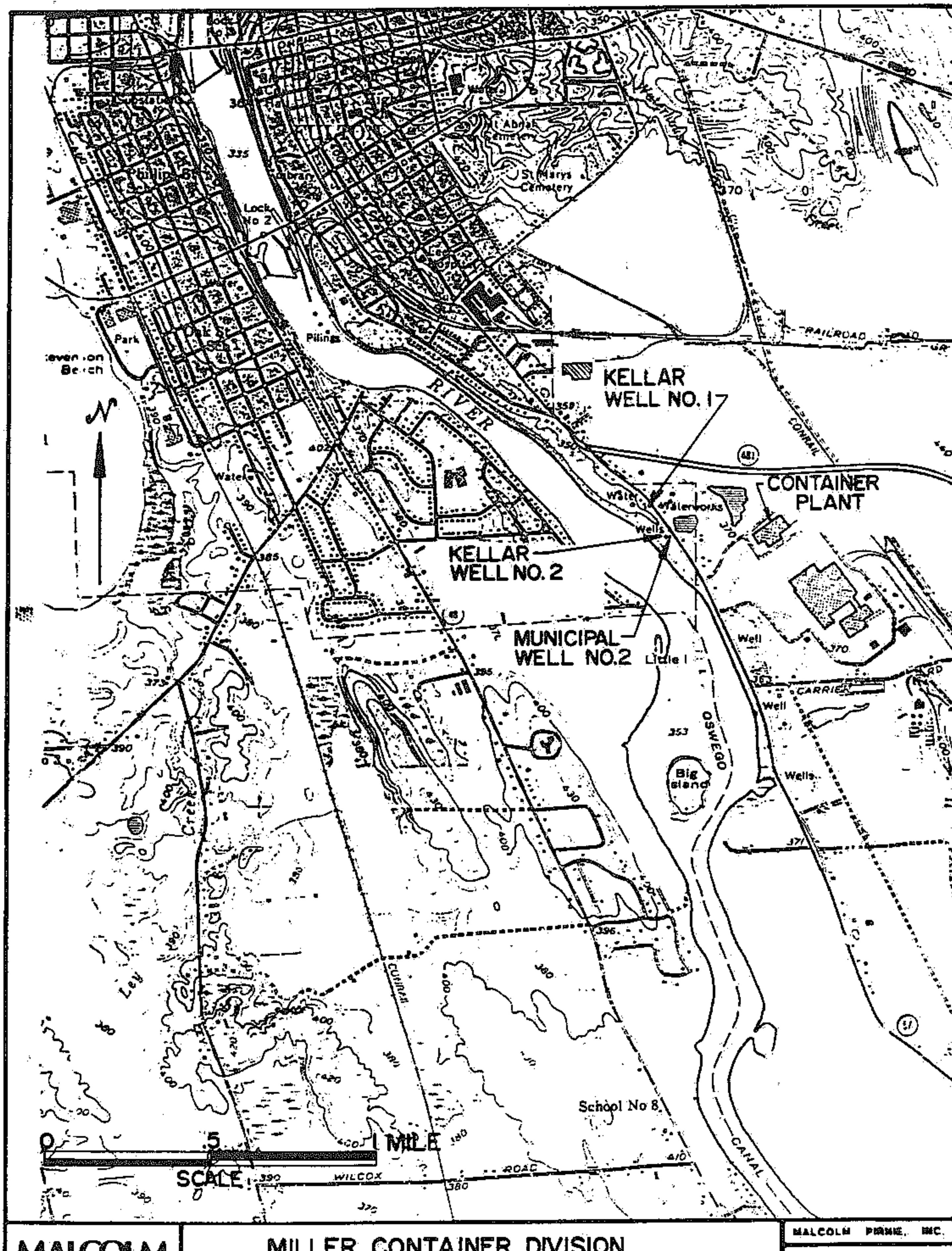
Area land usage is a combination of residential and light industrial. The site has a low, rolling topography with local relief (elevation) ranging from 362 feet above mean sea level (AMSL) to 386 feet AMSL. The property consists of a well manicured lawn with ornamental plantings of trees scattered around the site. The Container Plant, now owned and operated by Reynolds Metals, is located near the south property line approximately 1000 feet east of Route 57.

A shallow manmade pond is located 250 feet northwest of the Plant. The Oswego River is located on the opposite side of Route 57 from the site. A strip of land, between Route 57 and the river, ranging in width from 150 to 350 feet, is occupied by the City of Fulton municipal water facility including three production wells (see Figure 2).

The site is underlain by glacial and lake deposits consisting of a variety of sand, gravel, silt, and clay. These formations range in thickness from 20 feet east of the plant to near 90 feet in the center area of the site. These unconsolidated sediments are underlain by bedrock which consists of interbedded shale, sandstone, and mudstone. Two of the most distinct stratigraphic features of the site are the layers of coarse till which lie over the bedrock in most locations. The lower till is an extremely dense lodgement till overlaid by a loose and permeable ablation till. The lodgement till is a significant barrier to the vertical migration of groundwater.

Groundwater in the area of the site occurs in the overburden and in the underlying bedrock. Overburden groundwater flows in a generally westward direction toward the Oswego River. No site data is available on the flow direction in the bedrock aquifer, however, regional flow is north toward Lake Ontario.

Another registry site in close proximity to Miller is the Mirabito Property, Site number 738022, as well as a fuel spill being managed by the Region 7 Spill Response Program, Spill Number 91-06796. Both of these are located immediately north of the Fulton Municipal Well Field. The Mirabito site was the subject of a Phase II investigation and report which determined that no



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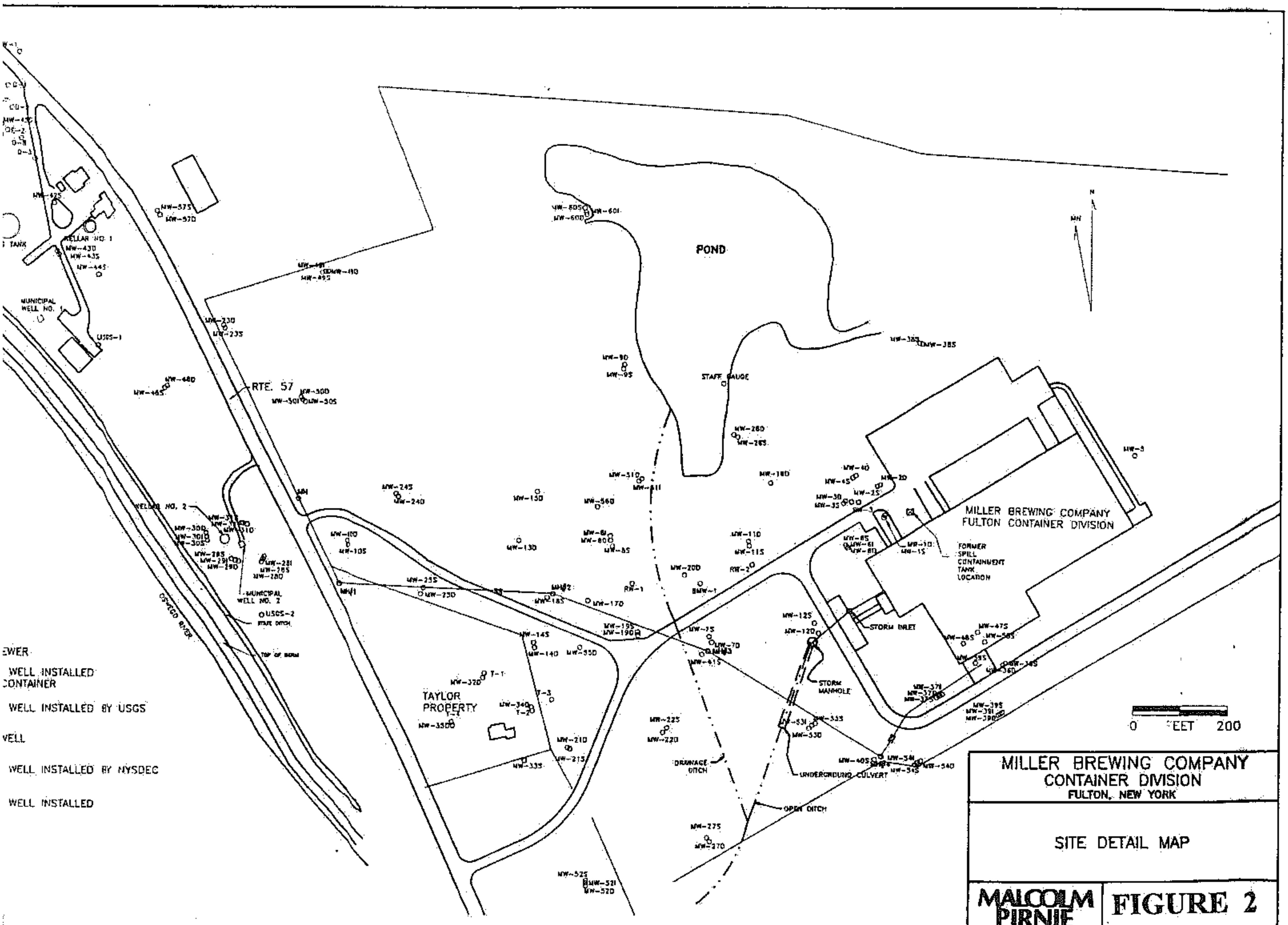
MALCOLM PIRNIE

MILLER CONTAINER DIVISION
SITE LOCATION MAP

MALCOLM PIRNIE, INC.

FIGURE 1



MILLER BREWING COMPANY
CONTAINER DIVISION
FULTON, NEW YORK

SITE DETAIL MAP

MALCOLM PIRNIE

FIGURE 2

hazardous waste was present at the site, nor was any contamination found which would present a concern for public health or the environment. The fuel spill is being treated and contained by several extraction wells and a water treatment unit (ie. air stripper). Data from monitoring wells indicates no contaminant migration toward the public water supply beyond the extraction wells.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

1976-86: Container Plant construction was completed in 1976. Part of the plant design included a 500 gallon spill containment tank located outside the western corner of the plant. This tank was connected by three pipelines to trench drains in the drum storage room inside the plant. In April 1986, as part of a system-wide upgrading operation, Miller excavated and removed the tank and its associated pipes. Though there was no record of spills at the plant, visibly stained soil was noted below the tank and pipes during the removal. The tank's contents consisted of spent solvents including methylene chloride, trichloroethane, trichloroethene, tetrachloroethene, toluene, and xylene.

1990: As part of the ongoing investigation, Miller Brewing Company, the Potentially Responsible Party (PRP), conducted a soil gas survey in several areas of the site. Locations for the survey were chosen on the basis of historical/anecdotal information and groundwater sampling results which could not easily be explained by known spills or releases. The survey identified potential contamination outside the southern corner of the plant, near the sewer line along Route 57, at the corner of the north parking lot, and east of the Taylor property fence line located 775 feet west of the plant.

April 1991: Miller informed the NYSDEC of the discovery of oil and VOC contamination of soil beneath the floor of the plant near the southern corner. This release was discovered during the excavation of a sump. This work was being done as part of an effort to remove underground tanks at the plant.

None of the above contamination could be linked to a specific release. Most of the contamination appears to be the result of past practices at and around the plant.

3.2: Remedial History

In April 1986 Miller, the PRP, retained Day Engineering to collect samples of the containment tank contents and the soil surrounding the tank. The results of this sampling led the PRP to retain Calocerinos and Spina (C&S) to perform the first phase of a hydrogeologic investigation later in 1986. Ten soil borings were completed and wells were installed in four of the borings. Data from these wells indicated significant groundwater contamination in the area of the spill containment tank. The direction of groundwater flow was also determined. In August 1985 tetrachloroethene (PCE) was detected at Municipal Well #2 (M2), one of three Fulton water supply wells then in operation to the west of the site. PCE was detected at a concentration of 2 parts per billion (ppb). At that time there was no readily identifiable source for this contamination and the level detected was far below guidance values then in effect (50 ppb). The NYSDEC requested that Miller begin regular sampling of M2. Miller instead proposed that a well pair (MW-10S & 10D) be installed along the property line between M2 and the spill tank. This was agreed to by the Department.

In September 1986 Miller retained Malcolm Pirnie, Inc. (MPI) to conduct the second phase of the investigation. A total of 27 monitoring wells were installed at this point in the investigation. Miller proposed a groundwater remediation protocol in February 1987. The NYSDEC and Miller negotiated a Consent Order for an Interim

Remedial Measure (IRM) outlined in the groundwater remediation protocol. Three recovery wells (RW-1, 2,&3) were installed in April 1987 and the construction of the treatment system (air stripper) was begun in November 1987. The recovery system was put into operation in June 1988.

Due to continuing deterioration of the water quality across the site and at the municipal well field, the site investigation was expanded. Miller agreed to perform a full Remedial Investigation and Feasibility Study (RI/FS). The RI/FS Workplan was approved in February 1991. The RI Report was submitted in August 1993 and final approval was given by the Department in October 1993. Due to some differences in data interpretation, Miller conducted supplementary field work and submitted a report in July 1994.

A draft FS was received in July 1994 and changes to the FS were approved in September 1994.

SECTION 4: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, the PRP has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was completed in two phases. The first phase was completed between 5/90 and 10/93. The second phase was carried out between 11/93 and 7/94. A report entitled "Miller Brewing Company, Container Division, Remedial Investigation Report" dated July 1993 has been prepared describing the field activities and findings of the RI in detail. The RI activities consisted of the following:

- Installation of 114 monitoring wells to assess the extent and levels of groundwater contamination and characterize the aquifers.
- Three rounds of soil vapor surveys to identify potential source areas and define plume boundaries.
- A pump-test involving the three operating Fulton water supply wells adjacent to the site (Municipal Well 2, Kellar Well 2, and Kellar Well 1) in order to assess the effects of pumpage on contaminant migration and assess the aquifer characteristics.
- Test pits were excavated to visually and chemically assess soil contamination.
- A vacuum extraction (VE) pilot test was conducted to assess the effectiveness of VE as a remedial action.
- An additional pump-test was conducted to assess the effectiveness of the IRM at Recovery Well 1.
- A magnetometer survey was conducted in several areas of the site to determine if buried metal objects might be present at these locations.
- Hydraulic conductivity testing was conducted on all of the monitoring wells installed on and off site. Groundwater velocity estimates were also made.
- An investigation of process tanks located beneath the south corner of the plant was conducted.

To determine which media (soil, groundwater, etc.) is contaminated at levels of concern, the analytical data obtained from the RI were compared to environmental Standards, Criteria, and Guidance (SCGs, defined in Section 7.2 below). Groundwater SCGs identified for this site were based on NYSDEC Ambient Water Quality Standards and Guidance Values. For the evaluation and interpretation of soil analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure rates, certain areas and media of the site require remediation. These are summarized below. Complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, SCGs are given for each medium.

Across the site, in the various media, a large number of the class of compounds known as volatile organic compounds (VOCs) have been detected. Most prevalent, and found at the highest levels, are trichloroethane (TCA), tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and dichloroethane (DCA). The last two of these compounds, DCA and DCE are believed to be breakdown products of the original contaminants as well as components of the original spill. These compounds may occur when TCA, TCE, and PCE are acted upon by chemical and bacteriological processes in soil and groundwater which act to break them down by partially de-chlorinating the parent compound. Additional contaminants found at the site include benzene, toluene, ethylbenzene, and xylene (BTEX), and several ketones including methyl isobutyl ketone, methyl amyl ketone, and acetone.

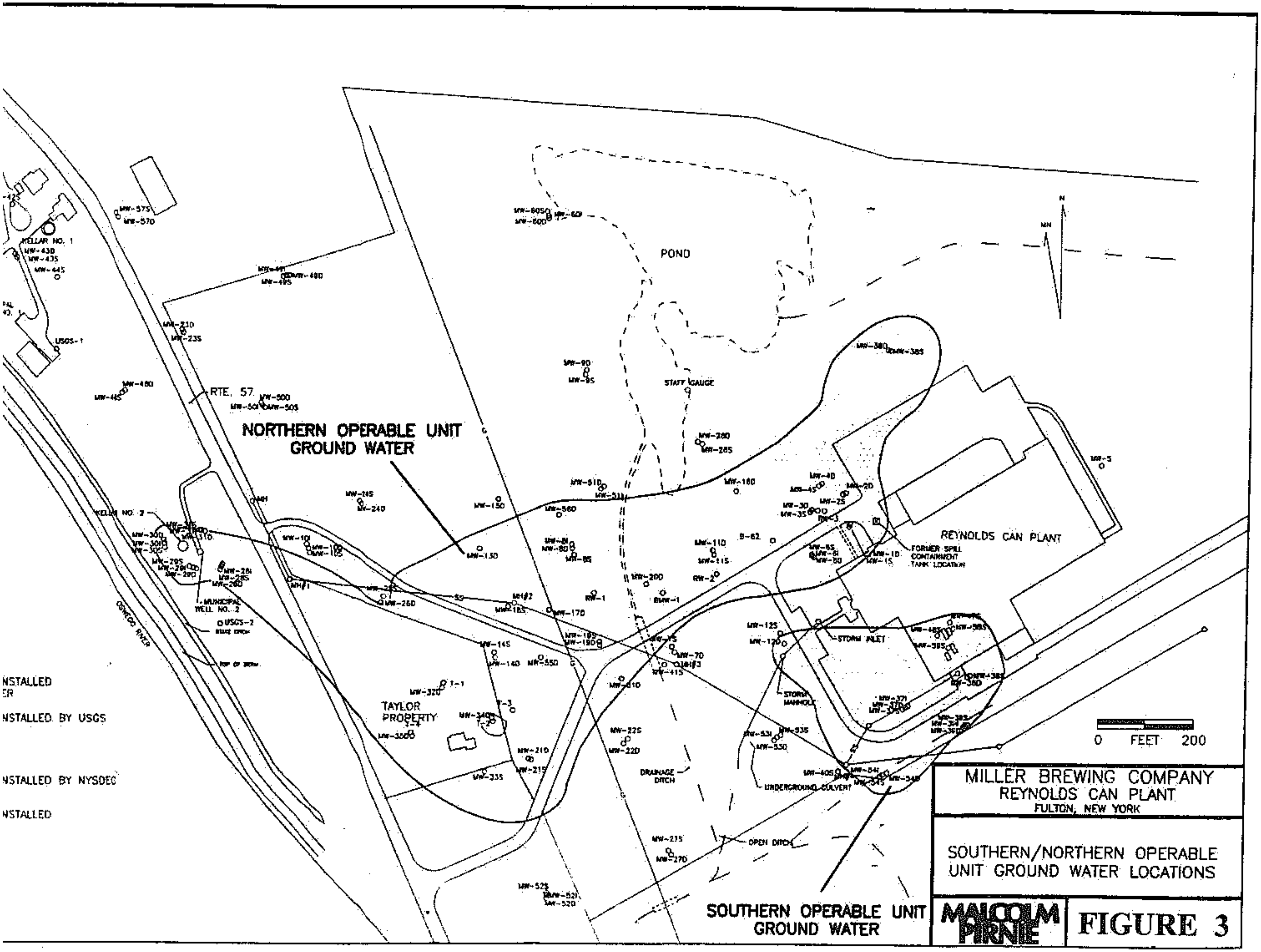
Section 4.3 below describes the types of human exposures that may present added health risks to persons at or around the site. Two possible exposure pathways were identified. These were by dermal exposure to and ingestion of contaminated soil in the former northern barrel storage area and ingestion of drinking water at the public water supply. Contact with contaminated soil would not impact the community since the contamination is limited to the plant site. Monitoring of the public water supply did not indicate the presence of contamination from the site in the water distribution system. The contaminated wells were taken out of service as soon as drinking water standards (maximum contaminant levels) were exceeded. A more detailed discussion of the health risks can be found in Section 6.0 of the RI Report.

Contamination at the Miller site is found in wastes, soil, and groundwater. The wastes and soil contamination are found in the source areas which are located near the plant. The description of the source areas can be most effectively carried out by dividing the sources into two areas defined as follows. The northern unit includes the spill containment tank and north parking lot source area and the groundwater plume which extends from this source across the site to the municipal wells. The southern unit encompasses the source beneath the south corner of the plant and the localized groundwater plume which extends from this source.

Northern Unit

Soil

Soil contamination in this area is limited to the vicinity of the removed spill containment tank and the northwestern corner of the parking lot. The most commonly detected compounds and their respective range of concentrations (in ppb)



NORTHERN OPERABLE UNIT
GROUND WATER
SOUTHERN OPERABLE UNIT
GROUND WATER
POND
STAFF GAUGE
REYNOLDS CAN PLANT
FORMER SPILL CONTAINMENT TANK LOCATION
STORM INLET
STORM MANHOLE
UNDERGROUND CULVERT
DRAINAGE DITCH
OPEN DITCH
TAYLOR PROPERTY
RTE. 57
OSWEGO RIVER
KELLAR NO. 1
KELLAR NO. 2
MUNICIPAL WELL NO. 2
USGS-1
USGS-2
N
MN
0 FEET 200
NSTALLED
NSTALLED BY USGS
NSTALLED BY NYSDEC
NSTALLED
MILLER BREWING COMPANY
REYNOLDS CAN PLANT
FULTON, NEW YORK
SOUTHERN/NORTHERN OPERABLE
UNIT GROUND WATER LOCATIONS
MALCOLM PIRNIE
FIGURE 3

are presented below. The soil clean-up values are based upon NYSDEC TAGM HWR-94-4046, "Determination of Soil Clean-up Objectives and Clean-up Levels".

Compound	Concentration (ppb)	Soil Clean-Up Level (ppb)
Acetone	17-110	253
1,1-Dichloroethene	16	400
1,2-Dichloroethene	380	300
1,1,1-Trichloroethane	7-64	800
Tetrachloroethylene	7-380	2366
Methylene Chloride	7-16	100
Trichloroethylene	55	700
Toluene	210	1500
Xylenes	65-350	1200
Ethylbenzene	65	5500

Groundwater

Groundwater contamination extends in a well defined plume across the site from the northern source area (Figure 3). The following list indicates the highest levels of groundwater contamination found for each of the most common site contaminants. The SCG in the last column indicates the groundwater or drinking water standard. All values are in ppb.

Compound	Concentration (ppb)	SCG (ppb)
Methylene Chloride	4200	5
1,1-Dichloroethene	3200	5
1,1-Dichloroethane	1000	5
1,1,1-Trichloroethane	42000	5
Trichloroethylene	810	5
Tetrachloroethylene	14000	5
c-1,2-Dichloroethene	690	5

The high concentration of contaminants in groundwater, relative to the detected soil contamination, raises a question regarding the source of groundwater contamination. One possible explanation is that there are undetected, isolated pockets of non-aqueous phase liquids in the subsurface near the source areas. Another possibility is that heavily contaminated soils removed during the tank excavation and removal created high levels of groundwater contamination.

Surface Water

Surface water found at the site was sampled and found to contain no contaminants above the analytical detection limits. This surface water was collected from the onsite pond.

Waste Materials

No discrete waste materials were found in the northern area. This source area consisted of contaminated soils which were removed when the spill containment tank and pipelines were removed.

Southern Unit

Soil

Soil contamination in this area is primarily located beneath the southwest corner of the plant. The contamination appears to be the result of solvent and lubricant releases from two process tanks. The following is a summary of the most commonly detected compounds and their respective concentration ranges.

Compound	Concentration (ppb)	Soil Clean-Up Level (ppb)
1,1-Dichloroethane	3-180	358
Acetone	22-81	263
1,1-Dichloroethene	5	777
1,2-Dichloroethene	750	383
1,1,1-Trichloroethane	17-7000	1816
Tetrachloroethylene	12-5700	4350
Methylene Chloride	8-700	251
Trichloroethylene	12-12000	1505
Benzene	800	139

(continued)

Compound	Concentration (ppb)	Soil Clean-Up Level (ppb)
Toluene	92-460	3585
Methyl Isobutyl Ketone	14-67	2270
Methyl Butyl Ketone	8-220	1673
Methyl Amyl Ketone	45-2900	-
4-Methyl-2-Pentanol	11	-
alpha-Pinene	20	-
Phenanthrene	39	50000
2-Octanone	810	-

Groundwater

Groundwater contamination from the Southern source area is confined to a limited area extending to the south-southwest of the plant (Figure 3). Values given below are maximum concentrations of the most commonly detected contaminants in the southern plume. The SCG in the last column indicates the groundwater or drinking water standard. All values are in ppb.

Compound	Concentration (ppb)	SCG (ppb)
Methylene Chloride	2800	5
1,1-Dichloroethene	1100	5
1,1-Dichloroethane	3000	5
1,1,1-Trichloroethane	11000	5
Trichloroethene	2000	5
Tetrachloroethene	1200	5
c-1,2-Dichloroethene	52000	5
1,2-Dichloroethane	14	5
Carbon Tetrachloride	410	5
Toluene	110	5
Ethylbenzene	150	5
Xylene	200	5
Acetone	5600	50
Methyl Isobutyl Ketone	2400	50
Methyl Ethyl Ketone	25	50

Surface Water

There was no surface water in the Southern area of the site.

Waste Materials

Waste material found in the Southern source area consists of free oil found below the plant structure. The following table lists concentrations of the most commonly detected contaminants which were found in oil that flowed into excavations in the southern area. For comparison purposes, analytical results from oil contaminated soils from the excavation are also provided. Values are in ppb.

Compound	Stained Soil (ppb)	Waste Oils (ppb)
1,1-Dichloroethane	3-180	1000-218000
c-1,2-Dichloroethene	750	5000-350000
Tetrachloroethene	12-5700	8500-1140000
Trichloroethane	17-7000	20000-2070000
Trichloroethene	12-12000	7500-130000
Methylene Chloride	8-700	1500-75000
Xylene	-	790-120000
Benzene	800	-
Toluene	92-460	1200-98000
Acetone	22-81	525000
Methyl Isobutyl Ketone	14-67	-
Methyl Butyl Ketone	8-220	-
Methyl Amyl Ketone	45-2900	-

4.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or an exposure pathway can be effectively addressed before completion of the RI/FS.

Miller initiated an IRM early in 1991 which consisted of the construction of a treatment system for the three municipal wells adjacent to the Miller site. The system was designed to take the production from Municipal Well 2, Kellar Well 2, and Kellar Well 1 and process the water through a packed column air stripper to remove the volatile organic compounds which had been detected in all three wells. Miller signed a Consent Order with the State which committed them to the construction of a system which would reduce the level of site specific contaminants to non-detectable levels (defined as less than 0.5 ppb). The water would then be routed into the Fulton municipal water supply system. The terms of the Order also required the installation of a vapor phase carbon unit to filter the air emissions from the stripper.

The facility was constructed on City of Fulton property adjacent to the three wells and the waterworks buildings. The system began operations on June 10, 1992 and after a 15 day demonstration period the system was officially put into operation. Since that time (June 25, 1992), the system has been treating the production of the well field with only brief interruptions to make adjustments and improvements to the system.

Under the terms of Consent Order #A702659106, Miller is committed to pay for various incremental costs incurred by the operation of the treatment facility. Miller's commitment will continue, as specified in the Consent Order, until such time that the aquifer is remediated or it is determined that the contamination impacting all three water supply wells is not the responsibility of Miller. The Consent Order presents the specifics of Miller's obligations, this paragraph being a brief description of those obligations.

4.3 <u>Summary of Human Exposure Pathways</u>:

An exposure pathway is the process by which an individual is exposed to a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media (e.g., soil, groundwater) and transport mechanisms; 3) the point of exposure; 4) the route of exposure (e.g., ingestion, inhalation); and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Completed pathways known to or that may exist at the site include:

- Ingestion of contaminated groundwater from the impacted municipal wells was a potential pathway. As noted in Section 4.1, Page 5, the contaminated wells were taken out of service before contamination could be detected in the distribution system. The water treatment system eliminates this pathway.

- ingestion of contaminated soil in the northern source area is a possible exposure pathway for workers at the plant; and,

- dermal contact with northern contaminated soils is a possible exposure pathway for workers at the plant.

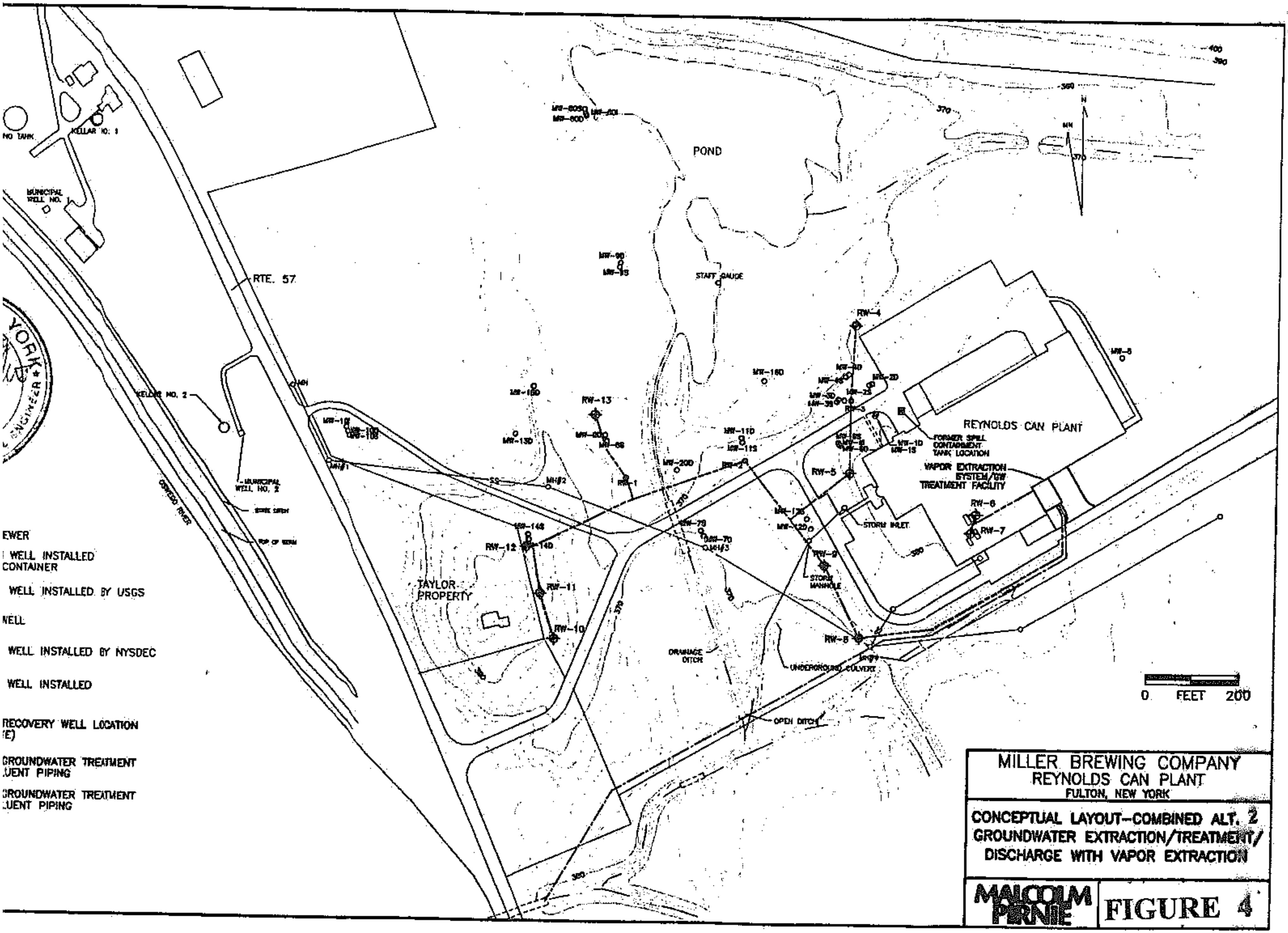
4.4 <u>Summary of Environmental Exposure Pathways</u>:

There have been no completed pathways identified for wildlife exposure to site contaminants. The onsite pond would have been a potential contact point for wildlife to come into contact with site contamination, but sampling conducted from the pond has indicated that no contaminant migration to surface water has occurred.

SECTION 5: <u>ENFORCEMENT STATUS</u>

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and the Miller Brewing Company entered into a Consent Order in April 1990. The



MILLER BREWING COMPANY
REYNOLDS CAN PLANT
FULTON, NEW YORK

CONCEPTUAL LAYOUT–COMBINED ALT. 2
GROUNDWATER EXTRACTION/TREATMENT/
DISCHARGE WITH VAPOR EXTRACTION

MALCOLM PIRNIE

FIGURE 4

Order obligates the responsible parties to carry out an RI/FS only. Upon issuance of the Record of Decision, the NYSDEC will request that the PRPs implement the selected remedy under an Order on Consent.

The following is a chronological enforcement history of this site.

Date	Index No.	Subject of Order
1/22/88	A701118704	IRM Order to implement groundwater remediation protocol.
3/90	A701118704	Amendment to Order providing for the discharge of water to the Oswego River from Municipal Well 2 and Kellar Well 2.
4/90	A702279004	RI/FS Consent Order
8/91	A702659106	IRM Consent Order to construct a municipal water treatment facility to treat impacted groundwater from the three municipal wells adjacent to the site.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR 375-1.10. These goals are established under the overall goal of protecting human health and the environment and meeting all Standards, Criteria, and Guidance (SCGs).

At a minimum, the remedy selected should eliminate or mitigate all significant threats to public health and the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Eliminate to the extent practicable the contamination present within the on-site soils/waste (reduce soil contaminant levels to levels protective of groundwater as indicated in soil tables in Section 4.1).
- Eliminate the potential for direct human or animal contact with the contaminated soils on-site.
- Mitigate the impacts of contaminated groundwater to the environment.
- Prevent, to the extent practicable, migration of contaminants in the source areas to groundwater.
- To the extent practicable, provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC). The AOC for the site is the area from the spill source locations to the Fulton municipal well field.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Miller Container Division site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Feasibility Study Report, Reynolds Can Plant Site" (former Miller Container Plant), dated September 1994. A summary of the detailed analysis follows.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils, groundwater, and waste materials at the site.

Alternative 1: No Further Action

Present Worth (30 yrs @ 8%):	$ 1,129,522
Capital Cost:	$ 15,000
Annual O&M:	$ 99,000
Time to Construct:	2-3 months

The above costs do not include the capital or O&M costs of the IRM incurred to date.

The no further action alternative recognizes the remediation of the site completed under the previously completed IRM. It requires continued monitoring only, to evaluate the effectiveness of the remediation completed under the IRM.

This is an unacceptable alternative as the site would remain in its present condition and the threat presented by contaminated soils and groundwater would remain.

Alternative 2: Groundwater Extraction + Central Treatment + Direct Discharge + Vapor Extraction + Monitoring

Present Worth (30 yrs @ 8%):	$ 5,985,502
Capital Cost:	$ 1,502,400
Annual O&M:	$ 394,200
Time to Construct:	6 months - 1 year

Alternative 2 (Alternative 1 of the Feasibility Study Report), consists of the installation of 10 groundwater extraction wells to supplement the three existing wells which were part of the 1988 IRM. These wells would be located in such a way that they would contain and collect contaminated groundwater from the northern and southern source areas (Figure 4). A vapor extraction system would be installed in the southern source area to remediate contaminated soils located beneath the south corner of the plant.

Water from the extraction wells would be piped to a central treatment system where it would pass through an air stripper which would remove the volatile contaminants from the water. The discharge water would then be directed through a carbon bed filter to remove any residual contamination. The water would then be discharged to surface water. The air discharge would pass through a vapor phase carbon filter to remove the volatile contaminants from the air stream. Water collected from the two wells inside the southern source area would be further treated by being passed through an oil/water separator prior to air stripping.

The vapor extraction system would consist of a minimum of two vapor extraction wells located in the southern source area. Vapor from these wells would be passed through a carbon adsorption system for volatile contaminant treatment prior to discharge.

Alternative 2 would also consist of continued water level and chemical monitoring to assess the effectiveness of the system.

Alternative 3: Groundwater Extraction + Central Treatment + Direct Discharge + Reapplication + Soil Flushing + Monitoring

Present Worth (30 yrs @ 8%):	$ 5,942,864
Capital Cost:	$ 1,471,900
Annual O&M:	$ 402,500
Time to Construct:	6 months - 1 year

Alternative 3 (FS Report Alternative 2), differs from Alternative 2 in that it does not include vapor extraction. Instead soils in the southern source area would be treated by the application of treated groundwater to flush contaminants from the soils.

Soil flushing would be conducted by introducing treated water to the area of the collection tanks under the south corner of the plant. This alternative would require pilot testing to determine its effectiveness.

Alternative 4: Groundwater Extraction + Central Treatment + Direct Discharge + Reapplication + Bioremediation + Monitoring

Present Worth (30 yrs @ 8%):	$ 6,248,835
Capital Cost:	$ 1,553,300
Annual O&M:	$ 494,200
Time to Construct:	12 months - 18 months

Alternative 4 (FS Report Alternative 3), is similar to Alternative 3 with the addition of bioremediation to the remedy for the southern source area.

As with Alternative 3, a portion of the water treated by air stripping would be reapplied to the southern source soils. In Alternative 4 the water would be further treated with nutrients and, if needed, microorganisms to enhance the biological activity in the contaminated soils. This remedy would require extensive pilot testing.

Alternative 5: Groundwater Extraction + Central Treatment + Direct Discharge + Air Sparging + Vapor Extraction + Monitoring

Present Worth (30 yrs @ 8%):	$ 7,062,065
Capital Cost:	$ 2,081,400
Annual O&M:	$ 672,300
Time to Construct:	12 months - 18 months

Alternative 5 (FS Report Alternative 4), is similar to Alternative 2, with the addition of two air sparging systems.

Air sparging is the process by which air or some other gas is introduced below the water table by means of vertical or horizontal wells. The air bubbling up through the contaminated groundwater strips a portion of the volatile contaminants from the groundwater.

This alternative would involve the installation of one sparging system in the southern source area and one in the northern source area. Each system would consist of a horizontal sparging well below the water table and a horizontal vapor recovery well above the watertable. Pilot testing would be required to verify the effectiveness of this technology at the site.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

Alternative 1 would not be protective of human health and the environment because it would do nothing to control the contamination in the southern source area. It would also rely upon the existing, three well recovery system which has not been completely successful in containing the northern plume.

Alternatives 2-5 would be expected to be protective of human health and the environment. Each of these alternatives would reduce risk through the restriction of contaminant migration in groundwater. Each would protect groundwater and mitigate the direct contact threat by removing the southern source soil contamination through vapor extraction.

The groundwater collection and treatment aspects of Alternatives 2-5, would combine a control/isolation remedy with a permanent separation/treatment remedy. While it is anticipated that the groundwater RAOs would not be met for 20-30 years, there is a high degree of confidence that the groundwater collection system would contain the northern and southern plumes. Any residual contamination currently beyond the reach of the collection system would not pose a threat to human health because of the treatment system currently in place at the municipal well field. It is anticipated that the soil remedial alternatives would take between 1 and 5 years to achieve the RAOs for soil.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The main SCGs for this site are:

- Chemical-Specific
  a) NYS Groundwater standards
  b) NYS Soil Clean-up Levels (TAGM 4046, 1/24/94)
  c) NYSDOH Drinking water standards (10 NYCRR Part 5)

- Action-Specific
  a) SPDES discharge requirements
  b) Sewer use requirements
  c) Air discharge requirements
  d)Hazardous waste management requirements.

Alternative 1 would meet action-specific SCGs. The system currently operates in accordance with the listed SCGs. Chemical-specific SCGs would not be met because it is not reasonable to believe that the current recovery wells would significantly improve groundwater quality in the southern source area.

Alternatives 2-5 would meet the identified SCGs. The groundwater treatment system common to these four alternatives would eventually cause groundwater quality to approach or meet standards. Each of the soil treatment alternatives would result in the attainment of soil clean-up goals. Alternatives 2 and 5, which involve vapor extraction, provide a higher degree of confidence since a pilot study has already been conducted to assess the effectiveness of this technology. Each of these alternatives would be required to meet mandated action-specific SCGs by meeting requirements for surface water, sewer, and/or air discharges.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

For Alternatives 2-5, short-term risk to on-site workers and the community would be due to fugitive dust emissions during the installation of the required wells and during remediation. These risks would be minimized through monitoring and the use of appropriate protective equipment by all on-site workers. In addition, any risk posed during operation of the treatment system would be easily controlled through proper system operation, maintenance, and monitoring. A health and safety plan would be developed prior to the implementation of any alternative.

Alternative 1 would not result in any increased risk to human health and the environment in the southern source area. Any risks posed to on-site workers during recovery well maintenance or replacement in the northern area would be minimal and easily controlled.

The period of time required for groundwater treatment under Alternatives 2, 3, and 4 would be similar; about 30 years, however, soil remedial goals would be expected to be met sooner with vapor extraction (Alt. 2), about one year, than with soil flushing or bioremediation (Alts. 3 or 4), 3-5 years. This is based upon the relative effectiveness of each technology on the contaminants present below the plant. Although pilot testing has not been conducted to determine the effectiveness of air sparging (Alt. 5) at the site, the time required to achieve groundwater goals may be 10 years less than that of the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternatives 2-5 would involve on-site treatment. The groundwater pump and treat technology common to the four alternatives would be considered a permanent remedy because, in addition to the onsite treatment of contaminated groundwater, it would also be effective in containing the plumes. The soil remedial technologies and air sparging are assumed to by effective; however, soil flushing, bioremediation, and air sparging have not been demonstrated for the site. Initial testing would be required to determine the applicability of these technologies. Initial testing would include the performance of bench and pilot tests. If proven effective, the soil treatment technologies would provide for permanent treatment of contamination present in the soil beneath the southern end of the plant.

Although remedial-action objectives for the southern area soil would be met within a relatively short time frame, 1-5 years, by implementing any of the Alternatives 2-5, groundwater pump and treat would most likely be required for a period of 20-30 years before groundwater objectives are met. For soil remediation, vapor extraction (Alt. 2), would require an estimated one year to achieve RAOs.

Soil flushing (Alt. 3) and the bioremediation/flushing combination (Alt. 4), would achieve RAOs in 5 years and 3 years, respectively. Provided remedial objectives are eventually met for groundwater, little contamination would be left at the site and little to no long-term operation, maintenance, and monitoring would be required. Limited sampling of the soil beneath the plant as well as site groundwater would be required to confirm that remedial-action objectives were met.

Under Alternative 1 (No Further Action), little treatment of the contaminated media at the site would occur. Thus, contamination would remain on-site, and the continued existence of the contaminant source in the southern area would mean the risk of future contaminant releases to groundwater. This alternative would not be effective in reducing contamination at the site and would not be permanent. Off-site treatment at the municipal wells would continue indefinitely.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 2-5 incorporate elements of destruction (bioremediation), treatment, and control and isolation technologies. Implementation of these alternatives would provide for a reduction in contaminant toxicity, mobility, and volume at the site.

For addressing contaminated groundwater, Alternatives 2-5 are basically the same. All would provide for the irreversible treatment of contaminated groundwater at the site. Alternative 5, which includes air sparging, would be expected to achieve RAOs for groundwater in a shorter time frame. The goal of the groundwater remediation would be the treatment of site groundwater until groundwater standards were met. Only a small portion of the downgradient plume would escape treatment and the risk posed be this would be mitigated by the municipal treatment system. The treatment residuals would consist of spent (contaminated) carbon from the groundwater polishing system and vapor phase carbon unit. These residuals would be managed through offsite carbon regeneration.

For source area soil treatment, Alternatives 2-5 would be expected to significantly reduce the toxicity, mobility, and volume of the soil contamination. The three technologies, vapor extraction (Alt. 2 and 5), soil flushing (Alt. 3), and bioremediation (Alt. 4), would provide for irreversible treatment of soil contamination. Vapor extraction would provide the highest level of confidence that all the contaminated soil would be treated and offers the highest reliability, since a pilot test of this technology has already been conducted. Bioremediation and soil flushing would provide a lower level of confidence regarding the volume of contaminated media treated. Bioremediation might also produce contaminant byproducts which would pose problems. Levels of contamination would be reduced, but the area effected by the bioremediation and soil flushing treatment might not encompass the entire contaminated soil volume.

Alternative 1 would only slightly reduce the mobility and volume of contamination present in the northern area groundwater. Contaminant toxicity, mobility, or volume would not be reduced in the southern area.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and equipment is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

Alternative 1 would be the most easily implemented alternative but would not meet the remedial goals for the site.

For groundwater treatment, Alternatives 2-4 pose the same implementation difficulties. Permit requirements would have to be met for discharge of treated water. Permit requirements for the air discharge may also be involved. No serious difficulties in the acquisition of needed hardware would be anticipated. Installation of recovery wells, pipelines to convey the water to the treatment facility, construction of the building to house the treatment system, construction of the air stripper, and the pipelines to convey water to the discharge point, would all pose some construction difficulties. None of these are expected to be outside the realm of normal engineering and construction problems and should be easily managed. Alternative 5, which in addition to the steps in Alternatives 2-4, incorporates air sparging, would be the most difficult alternative to implement due to the additional construction required. Pilot testing would be required to design an appropriate system. Additional controls would be needed to collect the volatiles removed from groundwater. Air sparging would necessitate the installation of sparging wells below the watertable paired with vapor collection wells above the watertable. The complexity of the subsurface stratigraphy at this site makes the implementation of this alternative problematic. This alternative would, if all the difficulties were overcome, be expected to achieve groundwater RAOs somewhat more quickly than the other alternatives and no future remedial actions would be anticipated.

Alternative 2, which includes vapor extraction treatment of the southern source area soils, would require the installation of vacuum piezometers in the vicinity of the plant waste water treatment facility to measure the effectiveness of the system. However, use of two of the existing monitoring wells/recovery wells as vacuum wells would limit the intrusive activities performed in the area. Vapor extraction has been shown to be a proven and reliable technology, and results of the pilot test conducted in the southern area indicated that it would be an effective technology at the site. Few administrative problems would be expected.

Alternatives 3 and 4, which include soil flushing and bioremediation, respectively, would be slightly more difficult to implement. Pilot testing would be required to prove their effectiveness. In addition, some future remedial actions may be necessary if access to all contaminated soils cannot be gained by water flushing through the area and the soil continues to be a source of groundwater contamination. Administratively, both of these remedies may pose some problems. Each requires the reintroduction of treated water to the areas of soil contamination. This is effectively a reinjection process and appropriate permits may be required.

7. <u>Cost</u>. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are:

Alt.	Capital Cost	Annual O&M	Total
I.	$ 15,000	$ 99,000	$1,129,522
II.	$ 1,502,400	$ 394,200	$5,985,502
III.	$ 1,471,900	$ 402,500	$5,942,864
IV.	$ 1,553,300	$ 494,200	$6,248,835
V.	$ 2,081,400	$ 672,300	$7,062,065

This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. <u>Community Acceptance</u> - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A "Responsiveness Summary" will be prepared that describes public comments received and how the Department will address the concerns raised. If the final remedy selected differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 2 as the remedy for this site.

This proposal is based upon the conclusion that this alternative would meet all of the remedial goals for the site and would best achieve the threshold and balancing criteria as described above. The alternative would be protective of human health and the environment by containing and collecting the groundwater plume in both the northern and southern areas of the site. The alternative would meet SCGs through groundwater treatment and soil treatment, and would meet appropriate discharge criteria. This alternative would have limited and manageable risks associated with construction and would in the long-term reduce contamination in the impacted media at the site. It would further be readily implemented and with regard to vapor extraction, pilot testing has verified technical feasibility. While this alternative would be slightly more costly than Alternative 3 it would be more readily implemented and effective.

The estimated present worth cost to carry out the remedy is $5,985,502. The cost to construct the remedy is estimated to be $1,502,400 and the estimated average annual operation and maintenance cost for 30 years is $394,200.

The elements of the proposed remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Uncertainties identified during the RI/FS will be resolved.

2. a groundwater collection system consisting of 13 recovery wells located such that they would intercept and contain the contaminant plumes;

3. a groundwater treatment system which would reduce contamination in the collected water to levels acceptable for surface discharge;

4. a vapor extraction system to reduce soil contamination in the southern source area to levels protective of groundwater;

5. monitoring of the vapor extraction area of influence sufficient to assess the effectiveness of the system;

6. monitoring of groundwater levels to assess the range of the influence of the recovery wells; and,

7. appropriate groundwater collection and analysis to assess the effectiveness of the groundwater collection and treatment systems, including a comprehensive round of groundwater sampling and analysis to establish baseline conditions prior to the implementation of the preferred alternative.

8. the continued operation of the public water treatment facility is an integral part of the selected remedy.

THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

The NYSDEC solicits input from the community on all Proposed Remedial Action Plans. A public comment period has been set for **November 28 - December 30, 1994** to encourage public participation in the selection process for the site. We encourage you to review the PRAP and attend the PRAP meeting. The public meeting is scheduled for **December 7, 1994** at the **Fulton City Hall, 141 South First Street, Fulton, New York beginning at 7:00 p.m.**. The results of the RI and FS Reports will be described and the proposed site remedy will be presented to the public. After the presentation, a question and answer period will be held, during which you can submit verbal or written comments on the PRAP.

Comments will be summarized and responses provided in the Responsiveness Summary section of the Decision Document. The Decision Document presents the NYSDEC's final selection for cleanup. To send written comments, contact (between 8:30 a.m. and 4:45 p.m. (Monday - Friday)):

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