Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

IMC Magnetics Site
Town of North Hempstead, Nassau County
Site Number 1-30-043A
Operable Unit - 02
On-Site Groundwater

March 2000

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

IMC Magnetics Inactive Hazardous Waste Disposal Site
Town of North Hempstead, Nassau County, New York
Site No. 1-30-043A
Operable Unit-O2: On-Site Groundwater

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the IMC Magnetics Class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the IMC Magnetics inactive hazardous waste disposal site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and the environment.

Description of Selected Remedy

Based on the results of the Focused Remedial Investigation/Feasibility Study for the IMC Magnetics site and the criteria identified for evaluation of alternatives, the NYSDEC has selected In-Situ Oxidation to remediate on-site groundwater contamination. The components of the remedy are as follows:

- *A pilot test will be conducted to ensure that the in-situ oxidation (hydrogen peroxide injection) achieves sufficient efficiency to achieve timely remediation. Should the results of the pilot test be deemed insufficient by the Department, another proven groundwater remediation technology will be implemented.*

- *As a part of the pilot study, additional groundwater data will be obtained to better define the scope of the remedy presented in this ROD.*

- *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. Any uncertainties identified during the RI/FS will be resolved,*

- *Installation of three well clusters, each containing six carbon-steel application (injection) wells.*

- *A minimum of two cycles of reagent application, each lasting approximately two weeks. Following the second round of treatment, a round of samples will be collected at all site monitoring wells to evaluate the effectiveness of the remedial technology and identify the need for additional applications.*

- *Semiannual sampling of all existing on-site groundwater monitoring wells would be conducted to monitor the effectiveness of the system for five years. This monitoring will also provide the data necessary to decide if the system reached its objectives and could be deactivated.*

- *Implementation of institutional controls and the recording of deed restrictions to restrict the future use of groundwater at this site.*

- *Off-site (downgradient) groundwater contamination will be addressed as a part of the overall investigation of the groundwater contamination that is migrating from all Class 2 sites in the NCIA.*

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/30/2000
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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SECTION 1: SUMMARY AND PURPOSE OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy to address the significant threat to human health and/or the environment presented by the presence of hazardous waste at the IMC Magnetics site, which has been designated a Class 2 site by the NYSDEC. A Class 2 site is a site that has been determined to pose a significant threat to human health and/or the environment and action to remediate the site is required.

The IMC Magnetics site is located at 570 Main Street and was occupied by IMC Magnetics from the early 1950s until 1992. Products made during IMC Magnetics' occupation of the site included induction motors, fans and blowers, stepper motors and other rotating machines. Investigations carried out at the site in the early 1990's indicated that unsaturated soils at the site were contaminated with chlorinated hydrocarbons, petroleum hydrocarbons and metals. Subsequent investigations indicated that the soil contamination consisted primarily of volatile organic compounds (VOCs) and was most concentrated near two leaching pools located at the northwestern corner of the property. In July of 1996 IMC Magnetics began to operate a soil vapor extraction (SVE) system at the site as an interim remedial measure. In January 1998 the NYSDEC issued a Record of Decision (ROD) selecting SVE as the final remedy for Operable Unit 01 (soils) at the site.

In addition to the soils contamination, significant groundwater contamination was found at the site. The Focused Groundwater Investigation for the site, carried out from June 1998 to September 1998, showed that groundwater at the site was heavily contaminated with VOCs. Of the chlorinated VOCs detected, tetrachloroethylene (PCE) was found at the highest concentrations: up to 2,680 ppb directly beneath a leaching pool located on the northwest corner of the property. Manufacturing processes at the site have resulted in the on-site disposal of PCE, a hazardous waste, which has migrated from the site and has contributed to the groundwater contamination in the New Cassel

Industrial Area (NCIA). These disposal activities have resulted in the following significant threats to the public health and the environment:

- a significant threat to human health and the environment associated with this site's contravention of groundwater standards in a sole source aquifer.

- a significant threat to human health and the environment associated with this site's contravention of soil cleanup objectives in soils overlying a sole source aquifer

The contaminated groundwater at the IMC Magnetics site, as well as in the entire NCIA, presents a potential route of exposure to humans. The area is served by public water, however, the underlying aquifer is the source of the water supply for the Bowling Green Water District customers. An air stripping treatment system was constructed in 1996 to mitigate the impact of the groundwater contamination on the Bowling Green public water supply wells. The Bowling Green water supply wells are routinely monitored for compliance with New York State drinking water standards. Presently, no site specific contaminants exceeding drinking water standards have been detected in water distributed to the public. Guard wells have been installed south of Old Country Road, in locations downgradient of the NCIA hazardous waste disposal sites and upgradient of the water supply wells as a precautionary measure. Therefore, use of the groundwater in the area is not currently considered to be an exposure pathway of concern.

The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA. The first action identifies source areas of contamination at each site which will be remediated; the second action fully investigates groundwater contamination at and beneath each site and takes appropriate remedial measures; and the third action is the ongoing effort by the Department to investigate groundwater contamination that is migrating from all Class 2 sites in the NCIA. Upon completion of this groundwater investigation, a proper remedy will be proposed to the public. After public review, a final groundwater remedy will be selected.

The site has been investigated to locate source areas of groundwater contamination and to evaluate the extent of groundwater contamination at the site. The selected remedy addresses the remediation of the on-site groundwater contamination. In order to restore the groundwater at the IMC Magnetics inactive hazardous waste disposal site to predisposal conditions to the extent feasible and authorized by law, but at a minimum to eliminate or mitigate the significant threats to the public health and/or the environment that the hazardous waste disposed at the site has caused, the following remedy is selected:

- *In-Situ Oxidation (Hydrogen Peroxide Injection). A detailed description of the remedy is found in section 8.*

In order to assure that the chosen remedy is effective in improving groundwater quality, on-site groundwater will be monitored for a period of five years.

The selected remedy, discussed in detail in section 8 of this document, is intended to attain the remediation goals in conformity with applicable standards, criteria, and guidance (SCGs).

SECTION 2: SITE LOCATION AND DESCRIPTION

The site is located at 570 Main Street in the NCIA, Town of North Hempstead, Nassau County, New York, and is Site # 1-30-043A in the New York State Registry of Inactive Hazardous Waste Disposal Sites (The Registry). The NCIA is an urban and industrial area, with level topography and is bounded to the north by a residential area and to the south by commercial and institutional establishments located along Old Country Road. Figure 1 shows the location of the NCIA, Figure 2 shows the location of the site within the NCIA, and Figure 3 is a site map showing leach pool, septic tank and SVE system locations. This property is slightly over two acres with one manufacturing building and a paved parking lot covering most of the area. The site has several floor drains, septic tanks and leaching pools, and the building has been connected to the Nassau County sewer system since approximately 1980.

The on-site soil contamination associated with this site has been designated as Operable Unit 01, and the groundwater contamination that would be treated by this remedial action plan is designated as Operable Unit 02. This subdivision of the site into two operable units was done to expedite the remediation of the site. Operable Unit 01 is presently being remediated using Soil Vapor Extraction. An operable unit represents a discrete portion of the remedy for a site which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release of exposure pathway resulting from the contamination present at the site. By remediating the on-site groundwater at this site as a separate unit, the removal of the source of the groundwater contamination was expedited and the overall time it will take to remediate the site in its entirety was shortened.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The site was occupied by IMC Magnetics Inc. from the early 1950's until 1992. The site is currently vacant except for a portion of the southern end of the building which is occupied by Castle Collision, an entity unrelated to IMC. Products made during IMC's occupation of the site included induction motors, fans and blowers, stepper motors and other rotating machines. Soils and groundwater at the site are contaminated with chlorinated hydrocarbons, petroleum hydrocarbons and metals. Investigations carried out in the early 1990's indicated that there were three areas on the site in which there were leaching pools and/or septic tanks. Area 1, which includes two leaching pools and one septic tank, is located at the northeastern corner of the property. Area 2, which includes two leaching pools, is located at the northwestern corner of the property, and Area 3, which includes one septic tank and two leaching pools, is located in the southwestern portion of the property. Additionally, five probable floor drain/penetration locations were identified inside the building. Groundwater contamination at the site is concentrated near and downgradient of Area 2.

3.2: Remedial History

In 1988, the entire NCIA, including this site, was listed in the Registry as a Class 2 site due to the presence of high levels of volatile organic compounds (VOCs) in the groundwater. The Class 2 classification indicates that the site poses a significant threat to the public health and/or the environment and action to remediate the site is required.

In the early 1990's, the septic tanks and leaching pools were exposed and soil samples taken from these structures for laboratory analysis. VOC contamination was observed, particularly in Area 2.

In February of 1995, a Site Investigation Report for the NCIA was completed by Lawler, Matusky and Skelly Engineers under the New York State Superfund program. Based on this report, in March 1995 the entire NCIA was removed from the Registry and seven individual properties, including IMC Magnetics, were listed as Class 2 sites in the Registry. This Site Investigation Report is available for review at the document repositories. There are currently thirteen Class 2 sites within the NCIA.

In October of 1997, IMC Magnetics began to operate a SVE system at the site to remediate soils contamination in Area 2. In January 1998, the NYSDEC issued a ROD selecting SVE as the final remedy for soils at the site. This SVE system is still operating, and has removed over 300 pounds of VOC contamination.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, the PRP, under DEC supervision, conducted a RI/FS.

4.1: Summary of the Remedial Investigation

The purpose of the groundwater Remedial Investigation (RI) was to define the nature and extent of groundwater contamination resulting from previous activities at the site. The groundwater RI was the second investigation to be conducted at the site by the PRP. The first investigation addressed both soil and groundwater contamination at the site, and was the basis for choosing Soil Vapor Extraction as an IRM for soil contamination currently being operated at the site. The report on the first investigation is titled "The Final Investigation Report for the Investigation and Design of the Interim Remedial Measure for the Vadose Zone," and was completed in February 1997. It is referred to hereafter as the IRM report, and is available for review in the document repositories. The groundwater RI focuses exclusively on groundwater contamination at the site, and was conducted between September 1998 and September 1999.

The RI included the following activities:

- *Installation of four groundwater monitoring well clusters in a line extending from the northwest corner of the site to a point near the site's southern property boundary, in the west right -of -way for Swalm Street. Each cluster consists of three wells screened at three different depths. See Figures 3 and 4.*

- *Sampling of the newly installed groundwater monitoring wells for VOC and metals contamination.*

- *Groundwater characterization and microbial studies to determine the site's suitability for natural bio-remediation.*

- *Sampling of drill cuttings for VOC and metals contamination.*

- *Data integration with previously obtained groundwater data.*

To determine whether the groundwater contained contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, surface water and drinking water SCGs identified for the IMC Magnetics site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of NYSDOH Sanitary Code.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, groundwater at the site requires remediation. These results are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb), or parts per million (ppm). For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1 Site Geology and Hydrogeology

The Upper Pleistocene deposits of poorly sorted sands and gravel that make up the Upper Glacial Aquifer (UGA) are found from the surface to a depth of approximately 80 ft bgs. The UGA is an unconfined aquifer consisting of poorly sorted sands and gravels. The Magothy consists of finer sands, silt and small amounts of clay.

At the site there are no other hydrogeologic units located between the UGA and the underlying Magothy formation. In general, the upper surface of the Magothy formation is found at least 100 ft bgs. However, based on observations during installation of wells for this investigation, the Magothy is found at significantly shallower depths (60 - 80 ft bgs) in the NCIA than in many other areas of Long Island. The UGA and the Magothy are in direct hydraulic connection; however, clay lenses are often found in the upper Magothy in this area. Depth of water is about 52 ft bgs in the

area of the site and groundwater flows in a southwesterly direction. Both the UGA and Magothy have been designated as sole source aquifers and are protected under state and federal legislation.

4.1.2 Nature of Contamination:

As described in the RI Report, many groundwater samples were collected at the site to characterize the nature and extent of contamination. The main categories of contaminants which exceed their SCGs are volatile organic compounds (VOCs).

The VOCs of concern are: trichloroethylene (TCE); tetrachloroethylene (PCE); benzene; 1,1dichloroethylene (1,1DCE); 1,1 dichloroethane (1,1 DCA); 1,1,1trichloroethane (1,1,1 TCA) and toluene.

4.1.3 Extent of Groundwater Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with the SCGs for the site. The following provides a summary of the findings of the investigation.

The IRM investigation carried out for the IMC Magnetics site sampled on-site groundwater utilizing geoprobe and existing monitoring wells. Figure 5 shows groundwater monitoring well locations for the IRM investigation. The highest concentrations of VOCs in groundwater detected during the IRM investigation were found in Area 2, located at the Northwest corner of the property. PCE at this location was detected at 2,680 ppb, at a depth of 60 ft bgs. PCE and TCE were detected in lesser amounts at MW-1, SB-65, MW-3, SB-63, MW-2 and SB-54, where MW indicates a sampled monitoring well, and SB indicates groundwater sampling by geoprobe. The second highest VOC concentrations were at MW-2 (PCE at 899 ppb and TCE at 206 ppb), which is on the northern edge of the site. Based on the soil boring data accumulated during the IRM investigation, it appears that there was a source of groundwater contamination in Area 2, which may have also contributed to the high concentrations observed in MW-2 (see Figure 5). SCGs for these contaminants are 5 ppb. As noted above, the soil contamination in this area is currently being remediated by SVE.

Three existing monitoring wells and several geoprobe locations were also sampled for metals. Barium was detected at concentrations from 47 to 79 ppb at all three wells and chromium was detected at levels from less than 10 ppb to 32 ppb at MW3. The groundwater standards for barium and chromium are 1,000 ppb and 50 ppb respectively. Although the metal concentrations from the geoprobe borings were higher than the monitoring well samples, the metal concentrations from the geoprobe borings are likely not representative of actual dissolved metal concentrations due to the turbidity of samples collected by this method.

During the RI, groundwater samples were taken from the previously installed wells MW-1 and MW-3, and from the four newly installed well clusters MW-4U,M,L, MW-5U,M,L, MW-6U,M,L, and MW-8U,M,L. Each well cluster contains three wells, screened at the water table (U), at about 90

ft bgs (M), and at about 140 ft bgs (L). Analytical results from these sampling events are summarized in Table 1. Detailed analytical reports and documentation of laboratory QA/QC are available in Appendix E of the RI for OU-2.

Chlorinated VOCs were detected in all groundwater monitoring wells. The highest PCE and TCE concentrations were detected in MW-5U (160 ppb and 34 ppb respectively), near Area 2. The highest 1,1,1 TCA concentration was detected at MW-5M (60 ppb). At least one of the typical biodegradation daughter products 1,1 dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA) and cis-1,2-dichloroethene (cis-1,2-DCE) was detected in all wells except MW-1. Toluene was found in several samples, with the highest concentrations detected in MW-6L and MW-6M (100 ppb and 45 ppb respectively). In general, concentrations of chlorinated VOCs were not sufficiently high to indicate the presence of dense nonaqueous phase liquid (DNAPL). In particular, concentrations of PCE in the MW-5 well cluster (located downgradient and within 80 feet of Area 2) were low given that the PCE concentration at geoprobe boring SB-25, installed in Area 2 during the soils IRM investigation, was 2,680 ppb. This may indicate that concentrations within this plume decrease significantly with distance. VOC concentrations in MW-1 and MW-3 decreased significantly between the May 1996 sampling event and the July 1998 sampling event. Figure 4 shows the vertical distribution of total chlorinated VOCs along Profile A-A', which runs along the western edge of the site (see Figure 5).

Analysis for metals yielded no detectable concentrations above reporting limits for cadmium and mercury. The highest barium and lead concentrations were detected at MW-7U (250 and 90 ppb respectively), located southwest of the building on Swalm Avenue's western right of way. The highest total chromium concentration was detected at MW-4U (223 ppb), located north of the site on Main Street's north right-of-way. The groundwater standards for barium, lead and chromium are 1,000, 50 and 50 ppb respectively. The high metal concentrations found in MW-4U (an upgradient well) suggest that on-site contributions to contamination of groundwater by metals may be minor compared to contributions from off-site sources.

4.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- Ingestion of contaminated groundwater. Since an active supplemental treatment system is in place that prevents the completion of this exposure pathway, no known completed exposure pathways exist.

The contaminated groundwater at the IMC Magnetics site, as well as in the entire NCIA, presents a potential route of exposure to humans. The area is served by public water, and the underlying aquifer is the source of the water supply for the Bowling Green Water District customers. A supplemental treatment system, air stripping followed by carbon polishing, was constructed in 1996 to mitigate the impact of the groundwater contamination on the Bowling Green public water supply wells. Bowling Green water supply wells are routinely monitored for compliance with New York State drinking water standards. As of today, no site specific contaminants exceeding groundwater or drinking water standards were detected in water distributed to the public. Guard wells have been installed south of Old Country road, downgradient of the contaminated areas in the NCIA, and upgradient of the water supply wells as a precautionary measure. Therefore, use of the groundwater in the area is not currently considered to be an exposure pathway of concern.

- Inhalation and Dermal Contact: Since contamination in the soil is at 8 to 18 ft bgs, the potential for human exposure via inhalation or dermal contact is very unlikely.

4.3 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. Due to the density of commercial and industrial buildings in the NCIA, there are no significant sources of surface water in close proximity to the site. Virtually every open space in the industrial area has been covered by asphalt, concrete or buildings. Since the industrial area is highly developed, no wildlife habitat exists in or near the site. The nearest surface water sources are several small ponds in and around Eisenhower Memorial Park, approximately two miles southwest of the site across Old Country Road.

However, site-related contamination has entered the groundwater. The contaminated groundwater at the site, as well as in the entire NCIA, presents a potential route of exposure to the environment.

There are no known exposure pathways of concern between the contaminated groundwater and the environment. The potential for plants or animal species being exposed to site-related contaminants is highly unlikely.

SECTION 5: ENFORCEMENT STATUS

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 PRP for the site, documented to date, include:

- IMC Magnetics Inc.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in the State Superfund Program Regulations (6 NYCRR Part 375-1.10). The overall remedial goal is to meet all Standards, Criteria and Guidances (SCGs) and be protective of human health and the environment.

The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA. First, sources of soil contamination at these sites are removed or remediated; second, groundwater contamination at and beneath each site is fully investigated and appropriate remedial actions are taken; and third, the Department is currently conducting a detailed investigation of groundwater contamination that is migrating from all Class 2 sites in the New Cassel Industrial Area. Upon completion of this groundwater investigation, a proper remedy will be proposed to the public. After public review, a final groundwater remedy will be selected.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to public health and/or 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, contamination in on-site groundwater which may eventually contribute to the contaminant plumes migrating from the NCIA*
- *Eliminate, to the extent practicable, ingestion of groundwater affected by the site that does not attain NYSDEC Class GA Ambient Water Quality Criteria*
- *Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.*

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the IMC Magnetics site were identified, screened and evaluated in the report entitled Focused Groundwater Feasibility Study for the 570 Main Street Facility dated September 1999.

A summary of the detailed analysis follows. As presented below, the time to construct does not include the time required to design the remedy or procure contracts for design and construction. The time to implement is the expected time for the alternative to reach remedial objectives.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated groundwater at the site. Groundwater contamination at shallow depth (less than 90 ft bgs) is predominant at the site, however, low levels of VOC contamination may be found at depths greater than 90 ft bgs. Downgradient groundwater contamination and deep groundwater contamination will be addressed as a part of the overall investigation of groundwater contamination that is migrating from all Class 2 sites in the NCIA.

Alternative #1: No Action

Present Worth:	*$ 50,000*
Capitol Cost:	*$ 0*
Annual O&M years 1-2	*$3,000*
Annual O&M years 3-30	*$2,300*
Time to construct	*none*
Time to implement	*30 years*

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. The site would remain as a Class 2 site.

Groundwater use restrictions would be implemented to prevent development of the underlying groundwater as a potable or process water source without the necessary water quality treatments. Semi-annual sampling of three existing groundwater monitoring wells would be carried out for the first two years, and annual sampling conducted for the subsequent 28 years. The monitoring program would be extended or discontinued based on new data received during this period.

Alternative #2 Groundwater Extraction with Air Stripping

Present Worth:	*$ 578,000*
Capital Cost:	*$ 216,000*
Annual O&M	*$ 27,300*
Time to Construct	*6 months*
Time to Implement	*20 years*

This alternative involves extraction of ground water from a pumping well screened in Area 2 and treatment of water using air stripping technology. The extraction well would create hydraulic containment within the source area, allowing intrinsic remediation of VOCs downgradient from Area 2 to occur. Based on physical characteristics of the aquifer determined during the IRM Investigation and Focused Groundwater Investigation, and considering the limited extent of high contaminant concentrations beneath the former leaching pool in Area 2, a single extraction well is expected to

achieve a sufficient radius of capture to contain the source area while pumping at a rate of 20 to 40 gallons per minute.

A packed column or low-profile tray stripper would be capable of treating groundwater extracted by the well. Treated water would be discharged in compliance with a discharge permit.

The system would be expected to operate for a period of twenty years. To confirm the system is achieving remedial objectives, groundwater quality would be monitored at three monitoring wells semiannually for a period of twenty years. The monitoring program would be extended or discontinued based on new data received during this period.

Alternative #3 Groundwater Extraction with Liquid-Phase Carbon Treatment

Present Worth:	*$ 640,000*
Capital Cost:	*$ 216,000*
Annual O&M (years 1-20):	*$ 32,000*
Time to Construct	*6 months*
Time to Implement	*20 years*

This alternative would involve extraction of contaminated groundwater followed by carbon adsorption and discharge of treated water. The extraction well would create hydraulic containment within the source area, allowing intrinsic remediation of VOCs downgradient from Area 2 to occur. The configuration of the system would be similar to that used in Alternative 2, with the only significant difference being the method of treatment of extracted groundwater.

This system would be expected to stay in operation for twenty years. To confirm the system is achieving remedial objectives, groundwater quality would be monitored at three monitoring wells semiannually for a period of twenty years. The monitoring program would be extended or discontinued based on new data received during this period.

Alternative #4 In-Situ Oxidation (hydrogen peroxide injection)

Present Worth:	*$ 394,000*
Capitol Cost	*$ 288,000*
Annual O&M (years 1-5)	*$13,000*
Time to Construct	*6 months*
Time to Implement	*5 years*

This alternative would involve installing carbon steel application wells in the vicinity of the former leaching pool in Area 2, injecting hydrogen peroxide at controlled flows into the source area, and thereby inducing oxidation-reduction reactions that degrade organic contaminants in groundwater and saturated soil. The technology results in the degradation of organic contaminants into carbon dioxide and water. This technology has demonstrated effectiveness on dissolved VOCs.

The radius of effective treatment around an application well is expected to be on the order of 15 to 20 feet in granular soils as found at the site. Well screen lengths would be fifteen feet. In order to achieve sufficient vertical and horizontal coverage of the source area beneath the leaching pool, three well clusters of six application wells each would be installed, with the deepest well extending approximately 90 feet below the water table. Progressively more shallow application wells would be screened at regular intervals above the deepest well such that the shallowest well crosses the water table. One of the well clusters would be positioned directly beneath the leaching pool in Area 2, and the other clusters would be located downgradient of the leaching pool. Pilot testing would be required to ensure that sufficient treatment efficiency and coverage are being attained.

Two cycles of reagent application would take place, with each application occurring over a two week period. Following the second round of treatment, a round of samples would be collected at all site monitoring wells to evaluate effectiveness of the remedial technology and identify the need for additional applications.

Periodic groundwater sampling would be carried out over a five year period to evalute the effectiveness of the treatment. The monitoring period may be extended or discontinued on the basis of data acquired during the monitoring period.

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 of the criteria, 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 included in the Feasibility Study.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The data for the site shows that SCGs are exceeded for VOCs in on-site soils and groundwater. The remedy selected for this site must remediate the groundwater to Class GA standards, and soils to the cleanup objectives in TAGM #4046-Determination of Soil Cleanup Objectives and Cleanup Levels.

Since no remedial actions are included in Alternative 1, SCGs would not be met and concentrations of groundwater contaminants would remain at unacceptable levels. Achievement of groundwater SCGs could be obtained by Alternatives 2, 3 and 4.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 1 offers the least protection to human health and the environment because no active remediation would be undertaken. Alternatives 2, 3, and 4 all provide good overall protection of human health and the environment, with alternative 4 attaining site-specific cleanup levels more quickly than alternatives 2 and 3.

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/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 1 offers no short term effectiveness. Alternatives 2, 3 and 4 all offer excellent short term effictiveness.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. 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.

Alternative 1 offers little long term effectiveness. VOCs would be bio-degraded over time, however this may increase the levels of the breakdown compounds in the soil and groundwater. Alternatives 2, 3 and 4 offer excellent long -term effectiveness and permanence.

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.

Alternative 1 offers no reduction in toxicity, mobility or volume. Alternatives 2 and 3 reduce the toxicity, mobility and volume of contaminated media by removing contaminants from the groundwater. Alternative 4 achieves the same overall effect by destroying the contaminants.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

Alternative 1 requires no implementation. Alternatives 2 and 3 are well proven and easily implemented. Alternative 4 is also easily implemented, although less commonly used than alternatives 2 and 3.

7. Cost. 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 presented in Table 2.

The estimated present worth costs range from $50,000 (Alternative 1) to $640,000 (Alternative 3). Alternatives 2 and 4 have estimated present worth costs of $578,000 and $394,000, respectively.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. The "Responsiveness Summary" included in Appendix A presents the public comments received and the Department's responses to the concerns raised.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA. First, sources of contamination at these sites are removed or remediated; second, groundwater contamination at and beneath each site is fully investigated and appropriate remedial actions are taken; and third, the Department is currently conducting a detailed investigation of groundwater contamination that is migrating from all Class 2 sites in the New Cassel Industrial Area. Upon completion of this groundwater investigation, a remedy will be proposed to the public. After public review, a final groundwater remedy will be selected.

In accordance with this strategy the Department has selected, based on the results of the RI and the FS and the evaluation presented in section 7, Alternative 4: In-Situ Oxidation (hydrogen peroxide injection) as the remedy for the shallow on-site groundwater contamination at the IMC Magnetics site. This alternative requires the installation of application wells in the vicinity of the former leaching pool in Area 2, injecting hydrogen peroxide at controlled flows into the source area, and thereby inducing oxidation-reduction reactions that degrade organic contaminants in groundwater and saturated soil. Pilot testing will be conducted to ensure that the system is operating at sufficient efficiency to achieve timely remediation. Should the results of the pilot test be deemed insufficiently effective by the Department, another proven groundwater remediation technology will be chosen. Alternative 4 provides for effective remediation of groundwater contamination at the site in a timely fashion. Other alternatives are less efficient or more time consuming. Downgradient (off-site) and deeper (below 90 ft bgs) groundwater contamination will be addressed as a part of the overall investigation of the groundwater contamination that is migrating from all Class 2 sites in the NCIA.

This choice of remedial measure is based upon the evaluation of the four (4) alternatives developed for this site. Alternative 1 would not provide protection for human health or the environment. This is considered a threshold criteria, and therefore Alternative 1 was dropped from consideration. Alternative 2, Groundwater Extraction with Air Stripping Treatment met all essential criteria but would take longer and be more costly than Alternative 4. Similarly, Alternative 3, Groundwater Extraction with Liquid-Phase Carbon Treatment was less efficient and be more costly than Alternative 4. Alternative 4, In-Situ Oxidation (hydrogen peroxide injection) would be protective of human health and the environment, provides a permanent solution for on-site groundwater

contamination, provides both short and long term effectiveness, and is the least costly of the alternatives that satisfy all criteria.

The estimated present worth cost to complete the proposed remedy is $344,000 which includes a capitol cost of $288,000. Annual Operation and Maintenance (O&M) costs for the first five years would be $13,000.

The elements of the selected remedy are as follows:

- *A pilot test will be conducted to ensure that the in-situ oxidation (hydrogen peroxide injection) achieves sufficient efficiency to achieve timely remediation. Should the results of the pilot test be deemed insufficient by the Department, another proven groundwater remediation technology will be chosen.*

- *As a part of the pilot study, additional groundwater data will be obtained to better define the scope of the remedy presented in this ROD.*

- *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. Any uncertainties identified during the RI/FS will be resolved,*

- *Installation of three well clusters, each containing six carbon-steel application (injection) wells.*

- *A minimum of two cycles of reagent application, each lasting approximately two weeks. Following the second round of treatment, a round of samples will be collected at all site monitoring wells to evaluate the effectiveness of the remedial technology and identify the need for additional applications.*

- *Semiannual sampling of all existing on-site groundwater monitoring wells will be conducted to monitor the effectiveness of the system for five years. This monitoring will also provide the data necessary to decide if the system reached its objectives and could be deactivated.*

- *Implementation of institutional controls and the recording of deed restrictions to restrict the future use of groundwater at this site.*

- *Off-site (downgradient) groundwater contamination will be addressed as a part of the overall investigation of the groundwater contamination that is migrating from all Class 2 sites in the NCIA.*

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A site mailing list was established which included nearby property owners and residents, local political officials, the New Cassel Environmental Justice Project, local community groups, local media and other interested parties.
- Fact sheets were distributed to an extensive public contact list and conducted public meetings in May 1995, January 1996, May 1996, October 1996, May 1997, December 1997, May 1998, December 1998, May 1999, September 1999 and February 2000.
- Details of the remedial investigation were presented to the public at the September 1999 meeting. The PRAP was presented at the February 3, 2000 public meeting held at the Park Avenue School in Westbury, New York.
- In March 2000 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

Table 1
IMC Magnetics
Site # 1-30-043A
Nature and Extent of Contamination
Sampling Results for Groundwater
Area 2 Geoprobe Sampling, IRM Report
Sampled in May 1996

MEDIA	CLASS	CONTAMINANT OF CONCERN	MAXIMUM OBSERVED CONCENTRATION (ppb)	SCG (ppm)
Groundwater	Volatile Organic Compounds (VOCs)	Trichloroethylene	110	5
		Tetrachloroethene	2680	5

ppb: Parts per Billion
ND: Not Detected
SCG: Standards, Criteria and Guidances

Table 1 Cont.
IMC Magnetics
Site 3 1-30-043A
Nature and Extent of Groundwater Contamination
Upgradient Sampling Results in ppb
Sampled July 1998

Contaminant	Concentration in ppb				SCGs in ppb
	MW-1	MW-4U	MW-4M	MW-4L	
Trichloroethene (TCE)	1	12	ND	1.5	5
Tetrachloroethene (PCE)	2.1	2.1	ND	ND	5
1,1,1 Trichloroethane	ND	7.7	11	1.8	5
cis-1,2 Dichloroethene	ND	ND	ND	ND	5
Toluene	ND	ND	1.3	1.2	50
Bromoform	ND	ND	ND	ND	5
1,1 Dichloroethene	ND	1.1	2.3	ND	5
1,1 Dichloroethane	ND	1.2	4.5	2.1	5

Table 1 Cont.
On-Site Sampling Results in ppb.
Sampled in July 1998

Contaminant	Concentration in ppb						SCGs in ppb
	MW-5U	MW-5M	MW-5L	MW-6U	MW-6M	MW-6L	
Trichloroethylene (TCE)	34	10	ND	ND	20	ND	5
Tetrachloroethylene (PCE)	160	21	2.1	51	1.6	ND	5
1,1,1 Trichloroethane	14	60	ND	2.4	5.6	1.3	5
cis-1,2 Dichloroethene	2	ND	ND	2.2	ND	ND	50
Toluene	2	ND	ND	1.9	45	100	5
Bromoform	ND	ND	ND	ND	ND	ND	5
1,1 Dichloroethene	2	18	ND	ND	1.7	ND	5
1,1 Dichloroethane	2.1	12	4.1	1.4	4.2	4.4	5

Table 1 cont.
Downgradient Sampling Results in ppb,
Sampled in July 1998

Contaminant	Concentration in ppb				SCGs in ppb
	MW-3	MW-7U	MW-7M	MW-7L	
Trichloroethene (TCE)	ND	3	ND	ND	5
Tetrachloroethene (PCE)	19	19	3.5	ND	5
1,1,1 Trichloroethane	7.6	2.3	ND	4.5	5
cis-1,2-Dichloroethene	7.7	ND	ND	ND	50
Toluene	ND	3.6	6.1	32	5
Bromoform	ND	ND	ND	1.2	5
1,1-Dichloroethene	1.1	ND	ND	1.2	5
1,1-Dichloroethane	1.2	3.3	2.1	2.0	5

Footnotes: MW- 1 Monitoring Well 1
U-upper M-middle L-lower
ppb: parts per billion

ND: Not Detected
SCGs: Standards, Criteria and Guidances

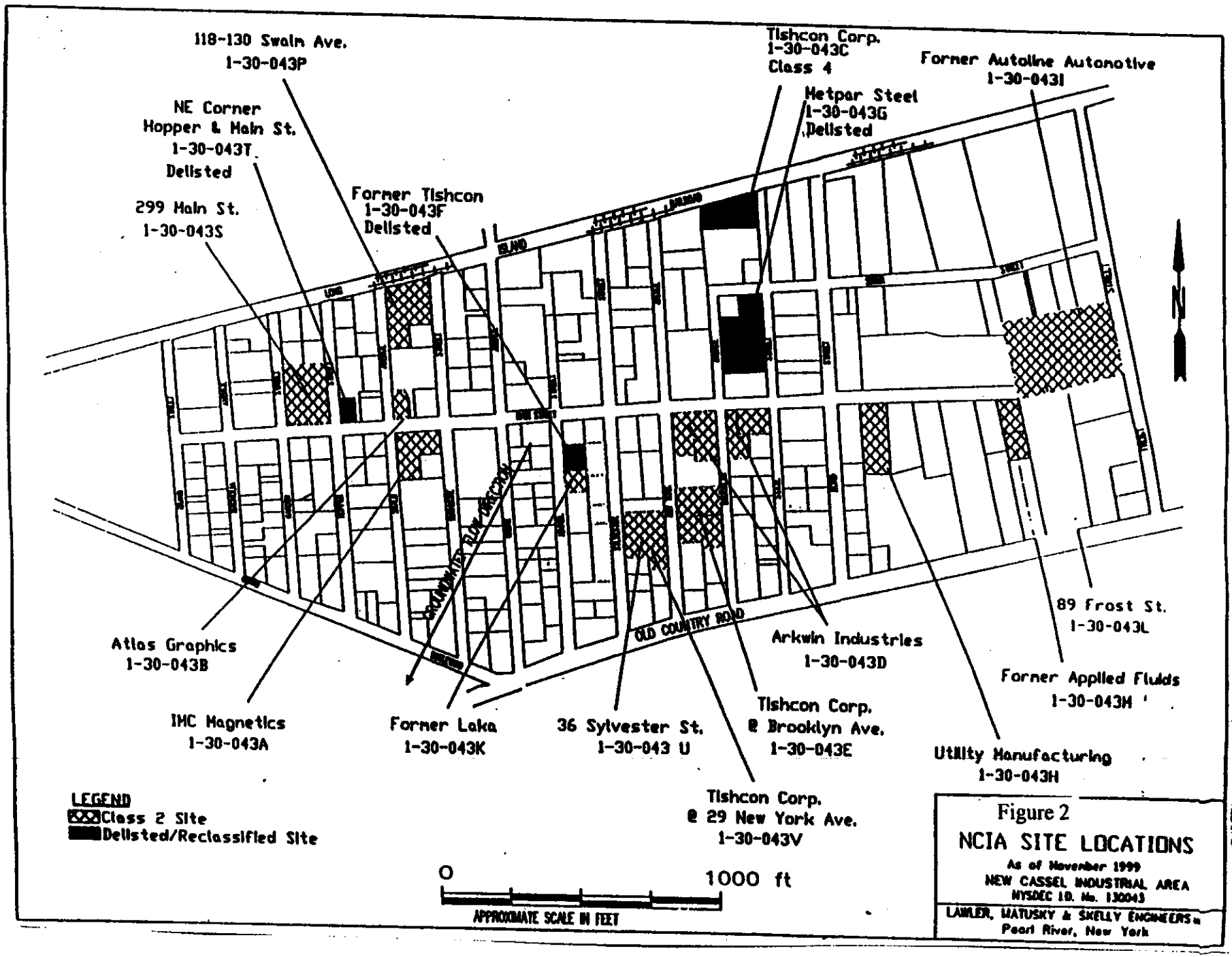
Table 2
IMC Magnetics
Site # 1-30-043A
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Alt. #1 No Action	$0	$2,300 to $3,000	$50,000
Alt. #2 Groundwater Extraction with Air Stripping	$216,000	$27,300	$578,000
Alt. #3 Groundwater Extraction with Liquid-Phase Carbon Treatment	$216,000	$32,000	$640,000
Alt. #4 In-Situ Oxidation (hydrogen peroxide injection	$288,000	$13,000	$394,000

SOURCE: USGS 7.5 MIN. QUADRANGLE
HICKSVILLE, NEW YORK - 1967
(PHOTOREVISED - 1979)

FIGURE 1

Hull & Associates, Inc.
DUBLIN, OHIO
FORMER IMC MAGNETICS CORP. MANUFACTURING FACILITY
FINAL INVESTIGATION REPORT
SITE LOCATION MAP
WESTBURY, NEW YORK
DATE: FEBRUARY 1997 NMB 004


118-130 Swain Ave.
1-30-043P
NE Corner
Hopper & Main St.
1-30-043T
Delisted
299 Main St.
1-30-043S
Former Tishcon
1-30-043F
Delisted
Tishcon Corp.
1-30-043C
Class 4
Metpar Steel
1-30-043G
Delisted
Former Autoline Autonotive
1-30-043I
89 Frost St.
1-30-043L
Former Applied Fluids
1-30-043H
Arkwin Industries
1-30-043D
Tishcon Corp.
@ Brooklyn Ave.
1-30-043E
Utility Manufacturing
1-30-043H
Tishcon Corp.
@ 29 New York Ave.
1-30-043V
36 Sylvester St.
1-30-043 U
Former Laka
1-30-043K
IMC Magnetics
1-30-043A
Atlas Graphics
1-30-043B
OLD COUNTRY ROAD
LEGEND
Class 2 Site
Delisted/Reclassified Site
0
1000 ft
APPROXIMATE SCALE IN FEET
Figure 2
NCIA SITE LOCATIONS
As of November 1999
NEW CASSEL INDUSTRIAL AREA
NYSDEC I.D. No. 130043
LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

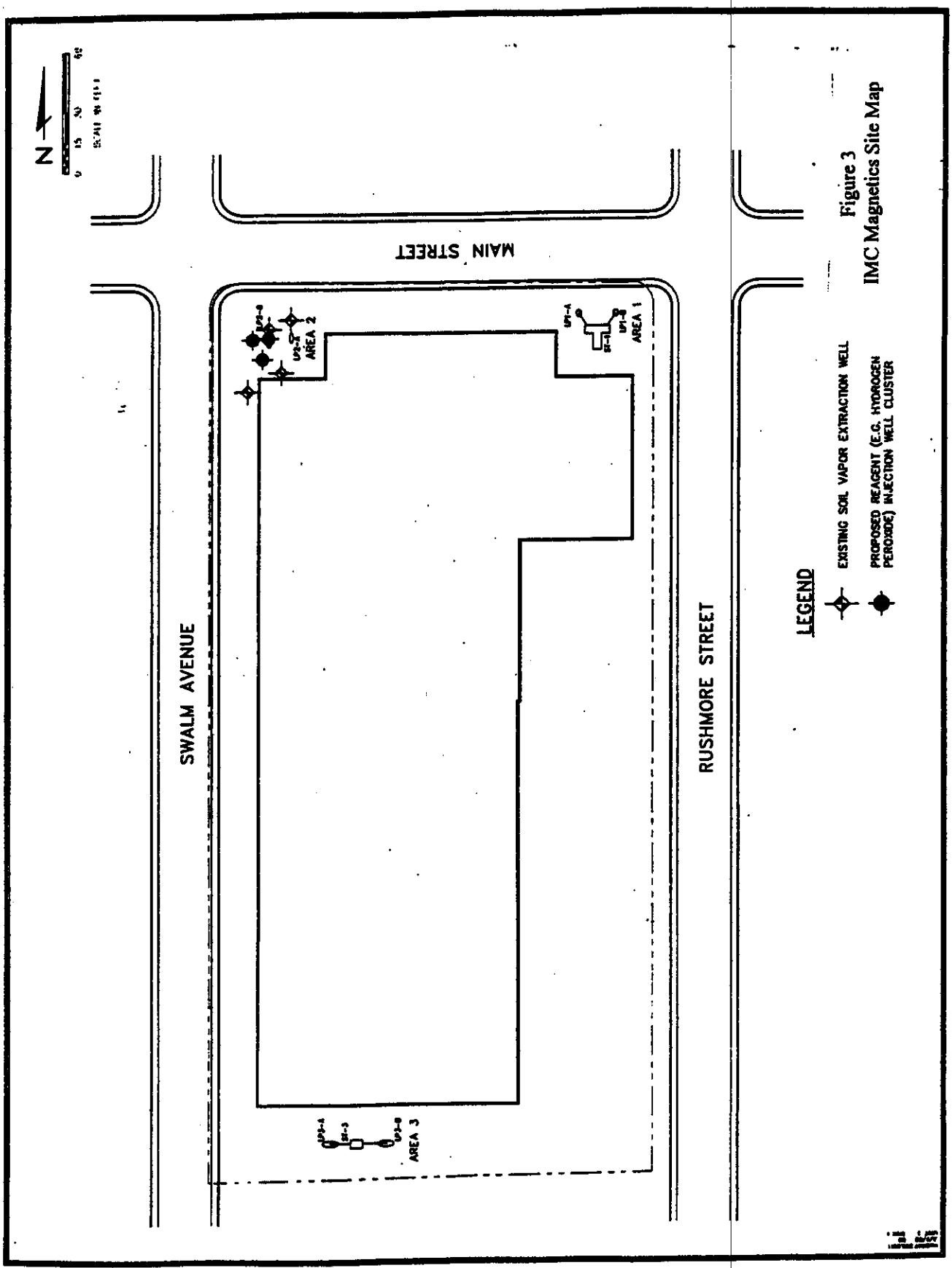


Figure 3
IMC Magnetics Site Map

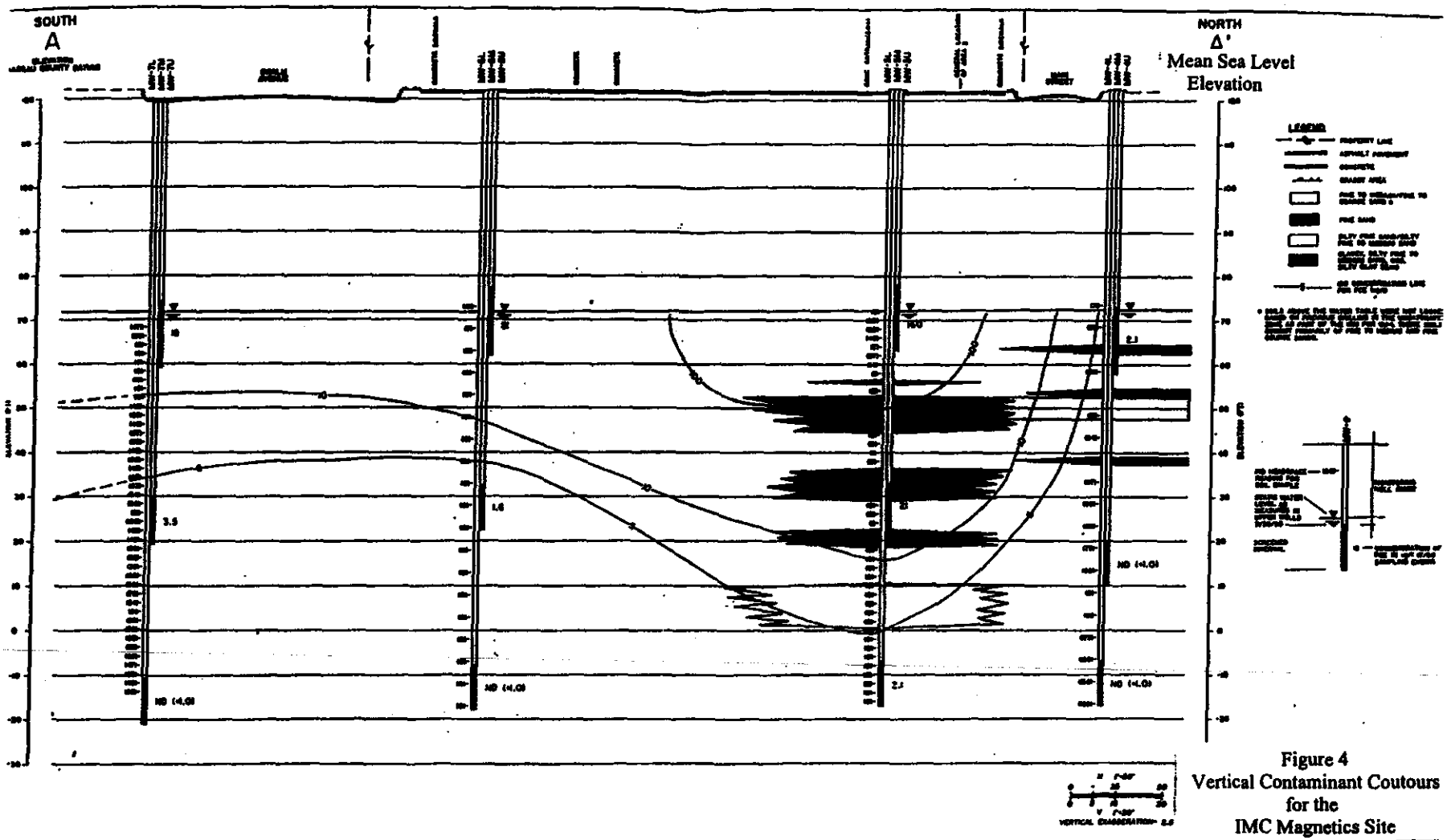


Figure 4
Vertical Contaminant Coutours
for the
IMC Magnetics Site

VERTICAL DISTRIBUTION OF
PCE IN GROUND-WATER
WESTBURY, NEW YORK
SEPTEMBER 1999

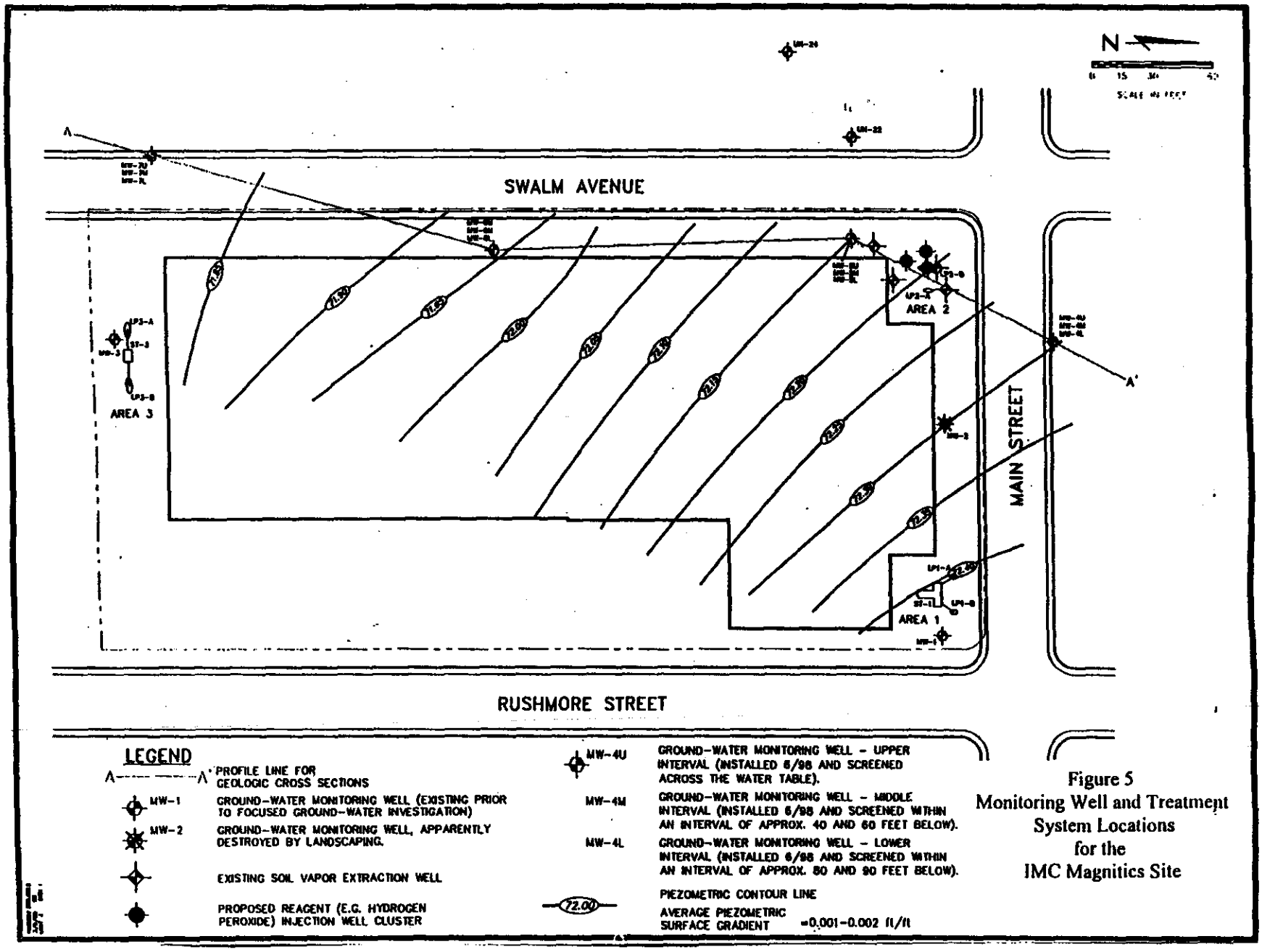


Figure 5
Monitoring Well and Treatment System Locations for the IMC Magnitics Site

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

IMC MAGNETICS
Record of Decision
Town of North Hempstead, Nassau County
Site No. 1-30-043 A
Operable Unit - 02: On-site Groundwater

The Proposed Remedial Action Plan (PRAP) for the IMC Magnetics site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repositories on January 6, 2000. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated groundwater at the IMC Magnetics site. The preferred remedy will utilize In-Situ Oxidation to induce oxidation-reduction reactions to degrade organic contaminants in groundwater.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was scheduled to be held on January 20, 2000; however due to sever winter weather the public meeting was rescheduled and conducted on February 3, 2000 and the original public comment period was extended an additional two week to February 17, 2000. A presentation of the Focused Remedial Investigation/ Feasibility Study (FRI/FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the PRAP ended on February 17, 2000.

This Responsiveness Summary responds to all questions and comments raised at the February 3, 2000 public meeting.

The following are the comments received at the public meeting, with the NYSDEC's responses:

Comment 1: You have stated that groundwater in the New Cassel Industrial Area is contaminated. Is my family drinking contaminated groundwater?

Response 1: You are not drinking contaminated groundwater. The water that is delivered to consumers from the Town of Hempstead Department of Water is drawn from the aquifer at a depth in excess of five hundred feet below the ground surface, much deeper than the level at which the greatest levels of contamination are found (high levels of contamination are detected at depths of fifty to one hundred and twenty feet below ground surface). The groundwater that is pumped from the aquifer is then treated by an air stripper followed by carbon filtration to remove any contaminants. The water is also tested at regular intervals to ensure that the water meets drinking water standards before it is distributed to consumers.

Comment 2. The term "present worth" has been used in the discussion of the costs of remediation. What does this term mean as used in these discussion?

Response 2. Present worth is the total of capital cost and operation and maintenance (O&M) cost in today's dollars. A five percent discount rate is used to calculate cost of future O&M cost in today's dollars. Present worth is used to compare the relative costs of each alternative evaluated in the PRAP.

Comment 3. What is the groundwater standard for 1,1,1-TCA?

Response 3. The groundwater standard for 1,1,1-TCA is five (5) parts per billion (ppb).

Comment 4. Will the proposed remedy remediate the contaminated groundwater south of Old Country Road?

Response 4. The proposed remedy is designed to address contaminated groundwater up to the border of the New Cassel Industrial Area (NCIA) and Old Country Road. The remaining groundwater south of this boundary will be addressed as part of the overall NCIA off-site groundwater. The remedial systems that are already in place will result in improved groundwater quality south of Old Country Road.

Comment 5. Do you have any results from the wells located south of Old Country Road?

Response 5. Results from wells south of Old Country Road are available. They will be presented in a comprehensive Remedial Investigation report in early Spring 2000. Early warning monitoring wells south of Old Country Road and upgradient of the Bowling Green Water supply wells are sampled on a quarterly basis as a precautionary measure. Recent results from the early warning monitoring wells screened at 500 feet below ground surface (approximately the depth at which the Bowling Green supply wells draw their water) show volatile organic contamination to be non-detect. This means the contaminants of concern are at concentrations below the level of detection (<1 ppb), and well below the federal and New York State drinking water standards.

Comment 6: Has the State recovered any money from the PRPs for any of the state superfund moneys spent in the investagation and cleanup of any of the New Cassel Industrial Area sites?

Response 6: The Office of the Attorney General has negotiated a cost recovery settlement with the property owner of the Former LAKA site (Site # 1-30-043K) for $310,000. The consent decree was signed by the United States District's Judge (Eastern New York District) on December 30, 1999. This amount will reimburse the State for money spent on the Preliminary Site Assessment and Remedial Investigation/Feasibility Study (RI/FS). In addition, this money will cover former LAKA's portion of the New Cassel Industrial Area off-site groundwater RI/FS and the supplemental treatment system for the Bowling Green water supply wells.

Comment 7: Does IMC still operate at the site?

Response 7: IMC does not currently either own the property or operate a facility at the site.

Comment 8: Is the Auto Body Shop causing contamination?

Response 8: None of the investigations carried out to date have discovered contamination which could be attributed to the operations of the body shop located in the south end of the site building.

Comment 9: What are the chemical end-products of the hydrogen peroxide injection process proposed for the site?

Response 9: The technology results in the degradation of organic contaminants into carbon dioxide and water.

APPENDIX B

Administrative Record

IMC MAGNETICS
Record of Decision
Town of North Hempstead, Nassau County
Site No. 1-30-043A

1. New York State Superfund Contract, Site Investigation Report, New Cassel Industrial Area Site, Work Assignment No. D002676-2.2, Lawler, Matusky and Skelly Engineers, February, 1995.

2. Comprehensive citizen Participation Plan, New Cassel Industrial Area Site , Site ID: 1-30-043 A-K, New York State Department of Environmental Conservation, November 1995.

3. Order on Consent Index # 1-W1-0750-96-02: In the Matter of the Development and Implementation of an Interim Remedial Measure Program for an Inactive Hazardous Waste Disposal Site, New York State Department of Environmental Conservation, February 1996.

4. New York State Superfund Contract, PSA Report, New Cassel Industrial Area Site, Work Assignment No. D002676-2.2. Lawler Matusky & Skelly Engineers, March 1997.

5. Work Plan for the Investigation and Design of the Interim Remedial Measure for the Vadose Zone at the former IMC Magnetics Corp. Manufacturing Facility, Westbury, New York, Hull & Associates, March 1996.

6. Soil Vapor Extraction System Operations, Maintenance, and Monitoring Plan for the 570 Main Street Property, Westbury, New York, Hull & Associates, November 1996.

7. Final Investigation Report for the Investigation and Design of the Interim Remedial Measure for the Vadose Zone at the 570 Main Street Manufacturing Facility, Westbury, New York, Hull & Associates, Inc., February 1997

8. New York State Superfund Contract, Multisite PSA Task 4 Report, New Cassel Industrial Area Site, Work Assignment D002676-12B-1, Lawler Matusky & Skelly Engineers, March 1997.

9. Order on Consent Index # 1-W1-0750-96-02, In the Matter of the Development and Implementation of a Focused Remedial Investigation/Focused Feasibility Study of Operable Unit 2 of an Inactive Hazardous Waste Disposal Site, New York State Department of Environmental Conservation, April 1998.

10. Focused Groundwater Investigation Report at the 570 Main Street Manufacturing Facility, Westbury, NY, Hull & Associates, September 1998.

11. Focused Groundwater Feasibility Study for the 570 Main Street Manufacturing Facility, Westbury NY, Hull & Associates, September 1999.