DECLARATION STATEMENT - RECORD OF DECISION

Elderlee, Inc. Inactive Hazardous Waste Site
Town of Phelps, Ontario County, New York
Site No. 835014

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Elderlee inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). 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 upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Elderlee Inactive Hazardous Waste Disposal Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography 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 threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Elderlee site and the criteria identified for evaluation of alternatives, the NYSDEC has selected containment (asphalt capping) and no further action (continued operation of the oxygen injection IRM) for two former waste disposal areas. The components of the remedy are as follows:

- asphalt capping at the former galvanizing waste treatment lagoons to prevent infiltration, sediment transport, dust generation, and direct contact with zinc waste and;
- no further action at the former paint solvent disposal area (an oxygen injection IRM to enhance biodegradation of contaminants, principally xylene, by native bacteria is operational);
- long-term monitoring of these former disposal areas; and
- administrative control of deed notifications for these former disposal areas.

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.

3/31/98
Date

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

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SECTION 1: SITE LOCATION AND DESCRIPTION

Elderlee is located on a 55-acre parcel at 729 Cross Road near the hamlet of Oaks Corners in the Town of Phelps, Ontario County (see Figure 1). Elderlee has manufactured highway bridge rails, guard rails, and road signs since 1968. The active facility is comprised of outdoor storage yards, parking lots, and five separate buildings: a galvanizing plant, two steel fabricating plants, a sign manufacturing plant, and an office building (see Figures 2 and 3). In addition to 103,000 square feet of manufacturing space, a large portion of the Site's acreage is dedicated to outdoor storage and staging of galvanized steel products prior to shipping. Site runoff and drainage is directed to an adjacent pond (Pond A), one of two ponds created by a former sand and gravel mining operation. Surrounding land uses include residential, agricultural and mining. Groundwater is used by the facility and area residents as a source of potable water.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Prior to 1922, the Site was reportedly farmland and, from 1922 to 1967, sand and gravel were mined at the Site. In 1968, the galvanizing operation began; major products include galvanized steel guide and bridge rails, posts, and highway signs. Former waste management practices led to the release of hazardous wastes in two areas of the Site (see Figures 2 and 3).

Area A - Galvanizing Waste Treatment Lagoons

The multi-step galvanizing process involves the cleaning, pickling, and fluxing of steel in basic and acidic solutions, hot-dipping in molten zinc alloy, and quenching in a chromic acid solution. The major waste stream is spent sulfuric acid with zinc and minor amounts of lead salts.

Two unlined treatment lagoons (see Figure 3; Area A) were used to store and neutralize the spent sulfuric acid prior to offsite disposal. The smaller western lagoon (lagoon #1) was reportedly used from 1968 to 1974 and the eastern lagoon (lagoon #2) until 1984. Spent sulfuric acid from galvanizing processes was a listed hazardous waste (K062*) until 1987; after a regulatory change in 1987, it has been tested for hazardous waste characteristics and manifested as appropriate (D002*, D008*) from 1988 to present.

Area B - Paint Solvent Disposal Area

Highway sign production involves application of vinyl reflective sheeting to painted plywood or aluminum. The aluminum sheets are cleaned with methanol prior to painting. Smaller signs are lettered using a silk-screen process; templates and painting tools are cleaned using xylene and naphtha. Waste paint and waste solvents (xylene, naphtha, and methanol; listed hazardous waste - F003* and characteristic hazardous waste - D001*) were reportedly disposed on the ground adjacent to the sign plant until 1990.

(* refers to EPA hazardous waste codes)

C and O Technologies

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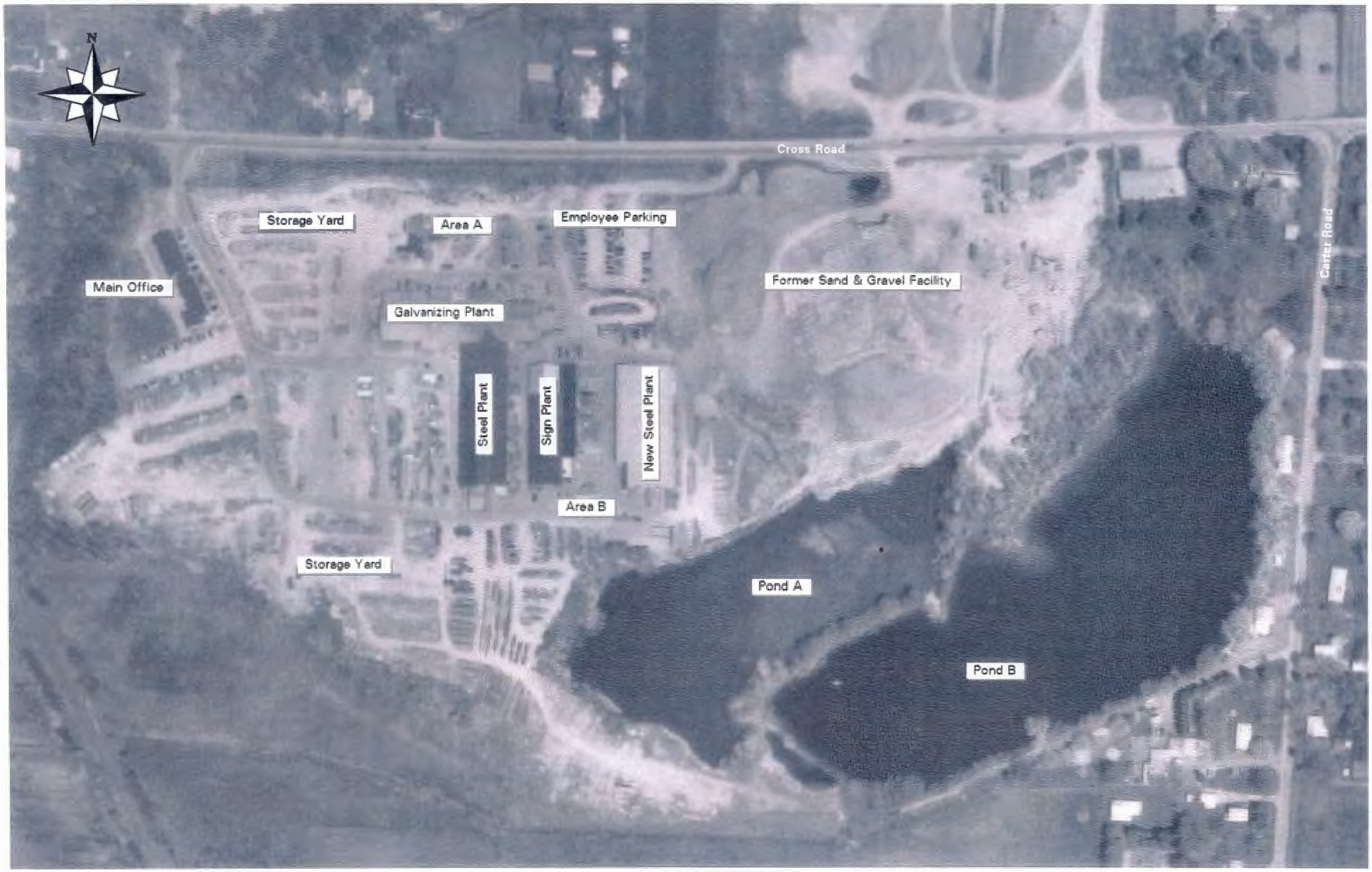
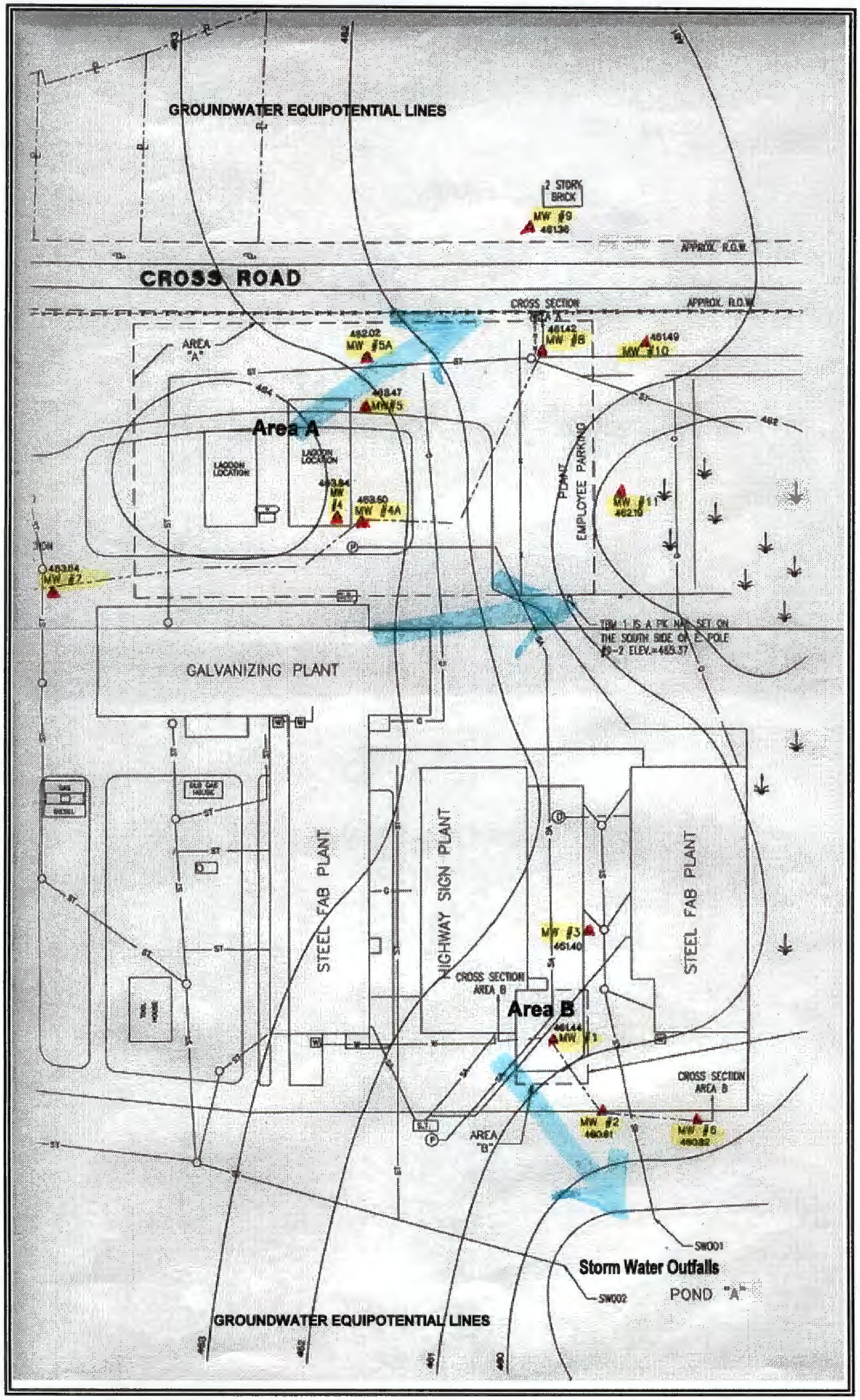
Figure 1

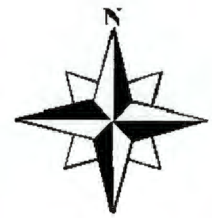
Site Location Map
Elderlee, Inc.
Oaks Corners, New York

Date: January 1997
Scale: 1:24000
Drawn by: TJR
Map source: USGS Quads. Phelps and Geneva, North



C and O Technologies 1100 University Avenue Rochester, New York 14607	**Figure 2** Facility Layout Elderlee, Inc. 1995 Aerial Photograph	Date: January 1997 Scale: None Drawn by: TJR Source: 1995 Aerial Photograph





KEY

MW = Monitoring Well
(▲ = well location)
(Groundwater elevation in each well, e.g., 461.49', measured on 12/12/96).

SW = Storm Water Outfall

ST = Storm Water Sewer

SA = Sanitary Sewer

SCALE: 1" = 150'

Figure 3: Groundwater Flow Map - Groundwater elevations measured in monitoring wells (MW-1 to MW-11; locations are highlighted) were used to draw lines of equal elevation (groundwater equipotential lines @ 464' - 460' above sea level). Groundwater flows perpendicular to the equipotential lines from high to low potential as shown by blue arrows; flow direction is largely eastward with northeast and southeast components.

2.2: Remedial History

Area A - Galvanizing Waste Treatment Lagoons

Lagoon #1 was reportedly closed and backfilled in 1977 without NYSDEC involvement.

Closure of lagoon #2 was mandated by a June 8, 1984 legal agreement (Order on Consent #840501) between Elderlee and NYSDEC. The order and associated $1500 fine was prompted by violations of hazardous waste regulations: spillage of corrosive pickling liquor (listed hazardous waste - K062) into an unlined and unpermitted surface impoundment (lagoon #2) and the lack of a contingency plan. Closure of the lagoon was delayed after a sludge sample for extraction procedure (E.P.) toxicity characteristics exceeded the regulatory limit of 5.0 parts per million (ppm) for lead (sludge sample=7.4 ppm of lead). Re-sampling at the four corners and the middle of the lagoon showed E.P. toxicity lead levels to be within regulatory limits (SE corner = 1.6 ppm; SW = 0.7 ppm; NE = 0.4; NW = 1.6 ppm; and Middle = 2.1 ppm). Closure began in January 1985 with placement of sand fill material in the lagoon. After some uneven settlement of the fill, the top level was scraped and over one foot of clay fill was reportedly placed over the lagoon.

Area B - Paint Solvent Disposal Area

In 1990, Elderlee removed two tons of visually-contaminated surficial soils from this area and paved the area with asphalt. The soil was manifested as hazardous waste (F003 and D001) and treated and disposed off-Site.

2.2.1 Previous Investigations

From 1991 to 1994, Elderlee independently conducted environmental investigations at the Site and shared the results with NYSDEC. Data generated from these investigations identified two primary areas of concern:

- Area A - the former galvanizing waste lagoon area located north of the galvanizing plant contains elevated levels of metals, primarily zinc, in soils and groundwater; and

- Area B - the former paint waste disposal area located southeast of the sign plant contains elevated levels of volatile organic compounds, primarily xylene, in soils and groundwater.

The Site was listed on New York's Registry of Inactive Hazardous Waste Disposal Sites as a class 2 in July 1993. A site classification of "2" is defined as a Site that poses a significant threat to public health and/or the environment and requires remedial action.

SECTION 3: CURRENT STATUS

In response to the determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, Elderlee has recently completed a Remedial Investigation/Feasibility Study (RI/FS).
The purpose of the RI was to determine the nature and extent of contamination and to evaluate health and environmental risks; the FS developed and evaluated potential remedies based on results of the investigation.

3.1: Summary of the Remedial Investigation

The RI was conducted in two phases. The first phase was conducted between August 1995 and February 1996; the second phase between September 1996 and December 1997. A report entitled,"Remedial Investigation Report - Elderlee, Inc. - January 1998", has been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- *Installation of 58 soil borings and 13 monitoring wells;*
- *Field screening techniques (e.g., a soil gas and photo ionization surveys for volatile organics and x-ray fluorescence for metals) to optimize data collection and sample selection;*
- *Collection and analysis of numerous samples of Site soil, groundwater, surface water, and sediment;*
- *Collection and analysis of samples from residential wells near the Site;*
- *Aquifer permeability testing and groundwater elevation measurements to assess groundwater flow conditions;*
- *Baseline health risk assessment and fish and wildlife impact analysis; and*
- *Ecological study of the ponds near the Site conducted by NYSDEC in cooperation with Elderlee.*

3.1.1 Site Hydrogeology:

The above work defined the hydrogeologic (subsurface) conditions at the Site which are summarized below. The subsurface at the Site is composed of 45 to 50 feet of soil overlying Onondaga Limestone bedrock. From the surface downward, the soil units consist of:

- 10 to 15 feet of fine to coarse sand;
- 15 feet of clay with thin silt layers;
- 20 feet of glacial till (mixture of clay and coarser particles).

The low permeability of the clay and till impedes groundwater flow through and within these units. Bedrock groundwater is confined by these deposits such that the groundwater in some wells drilled into bedrock actually flows at the surface (artesian conditions, such as present in a well south of the office building at the Site). This upward hydraulic pressure coupled with the low permeability and thickness of the clay and till units inhibits downward migration of contamination. Hence, the uppermost sand unit, which is quite permeable ($>10^{-3}$ centimeters/second) was the focus of the subsurface investigation. Groundwater in this unit occurs within 3 to 4 feet of the surface and flows generally eastward with northeast and southeast components (see Figure 3) at a velocity of about one foot/day.

3.1.2 Nature of Contamination:

As described in the RI Report, many soil, groundwater, sediment and surface water samples were collected and analyzed to characterize the nature and extent of contamination. The analytical data were compared to environmental Standards, Criteria, and Guidance (SCGs) to determine which media (soil, groundwater, sediment, and surface water) contain contamination at levels of concern. Groundwater, drinking water and surface water SCGs identified for the Elderlee Site were based on NYSDEC Part 703 Water Quality Regulations and NYSDOH Part 5 Drinking Water Supply Regulations. NYSDEC Technical Administrative and Guidance Memorandum (TAGM) 4046 (soil cleanup guidelines) was used as SCGs for soil.

Based upon the results of the RI in comparison to the SCGs and potential public health and environmental exposure routes, Area A (former lagoon area) and Area B (former paint solvent disposal area) at the Site require remediation. The contaminants, affected media, and relevant SCGs are summarized below. Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). More complete information can be found in the RI Report.

The main contaminants of concern at the Site are the metal, **zinc**, in Area A and the volatile organic compound (VOC), **xylene**, in Area B. Other minor contaminants, found largely in onsite soils, include the metals: lead, cadmium, and chromium and the VOCs: ethylbenzene and toluene. A brief narrative on the properties and nature of zinc and xylene follows below.

Zinc is a trace metal of relatively low toxicity that is essential for plant and animal metabolism. The NYS drinking water quality standard of 5000 ppb for zinc is significantly higher than most trace metals. Even at this level, the standard is based largely on aesthetics; above this limit a significant number of people can detect zinc by taste. However, zinc can be detrimental at relatively low concentrations to fish, particularly during key stages of their life cycle such as reproduction. Accordingly, the surface water quality standard for zinc (225 ppb) is much lower than the drinking water quality standard.

Note: The water quality standards for zinc vary considerably. The drinking water standard is 5000 ppb (per Part 5 of NYS sanitary code) whereas the groundwater standard is 300 ppb (per 6 NYCRR Part 703; this standard is under revision and is expected to reflect the Part 5 standard). The groundwater cleanup objective for the Site will follow the health-based drinking water standard of 5000 ppb. The surface water standard for zinc and other trace metals vary with water "hardness" (a measure of dissolved solids) and is based on protection of fish (propagation and survival). The hardness of pond A averaged 325 ppm, therefore the zinc standard for surface water is 225 ppb (per 6 NYCRR Part 703). In soils, the site background level for zinc ranges up to 100 ppm, therefore, 100 ppm is the soil cleanup objective.

Other trace metals such as lead, cadmium, and chromium are of potential concern. Lead and cadmium are known to occur naturally in ore minerals with zinc but typically are very minor constituents. Chromium is a constituent of chromic acid solutions which are used in the final quenching step of the galvanizing process at Elderlee. These elements have been detected sporadically in various media, largely in two soil borings in Area A. As a group, metals are relatively immobile under normal (relatively neutral pH and some oxygen) subsurface conditions; their fate and transport in the environment is dominated by sorption, reaction, and precipitation processes.

Xylene, the other major contaminant of concern, is a volatile organic compound (VOC) with the formula, $C_6 H_4 (CH_3)_2$. It exists in three isomeric forms: ortho-, meta-, and para-xylene. Commercial xylene is a colorless, flammable liquid mixture of these three isomers and may also contain ethylbenzene as well as small amounts of toluene and other organic compounds. These minor constituents of commercial xylene mixtures likely explain the presence of ethylbenzene and toluene in Area B at the Site. Xylene is used as a paint solvent at Elderlee; it also finds use as a constituent of paints, inks, adhesives and fuels, such as gasoline. It is classified as a hazardous substance and hazardous waste.

Physical properties which affect the fate and transport of organic contaminants include:

- solubility in water;
- density;
- volatility (vapor pressure);
- soil-water partitioning coefficient; and
- biodegradation potential.

The solubility of xylenes in water is about 157 ppm which indicates a low dissolution potential and hence persistence in the disposal area.

The density is about 0.87 g/cm^3 which is less than water (=1.0 g/cm^3). Therefore, xylene, in pure form, is expected to float on the groundwater table and lessen the vertical extent of contamination in the disposal area.

High volatility is characteristic of VOCs (high vapor pressure - evaporates rapidly) but once below the ground surface, available air is greatly reduced (particularly with the high water table present at this Site) and the air present in pore spaces quickly becomes saturated to equilibrium.

The soil-water partitioning coefficient (K_{oc}) is a key parameter which measures the tendency of organic contaminants to partition or adhere to organic carbon in soil. The K_{oc} of the xylene isomers average about 500 which indicates a tendency to sorb to organic carbon in soil and hence a low to moderate mobility.

The biodegradation potential of xylenes in the subsurface is high where sufficient oxygen is present for aerobic bacteria to metabolize (consume and break down) the contaminant. Very high concentrations may be toxic to bacteria and/or deplete available oxygen rapidly (the subsurface in the paint solvent disposal area is deficient in oxygen).

The other two VOCs detected at much lower concentrations, ethylbenzene and toluene, exhibit very similar properties. In summary, the physical properties of these VOCs indicate that these contaminants are relatively persistent, exhibit low to moderate migration potential and are amenable to biodegradation.

The water quality standard for xylene, ethylbenzene, and toluene is 5.0 ppb. The soil cleanup objectives for xylene, ethylbenzene, and toluene are 1.2 ppm, 5.5 ppm, and 1.5 ppm, respectively.

3.1.3 Extent of Contamination

Data generated from the RI and previous investigations indicate that the contamination at the two former waste disposal areas is limited in extent. Whereas soils and groundwater data show considerable contamination at the former disposal areas, the groundwater surrounding these areas do not show migration of contaminants of concern. The natural processes noted above (sorption, reaction, and biodegradation) likely limit the migration potential of the contaminants.

In addition to the former waste disposal areas, site-wide surface soils, surface water, and sediment are of concern. These media appear to be interrelated as follows. Surface soils in outdoor product storage areas contain metals from galvanized products. Such soils are susceptible to transport by surface runoff to the storm water drainage system and into Pond A via two outfalls. Metal contaminants, mainly zinc, with minor amounts of lead, chromium, cadmium, and manganese, have been found concentrated in sediment near the stormwater outfalls in Pond A. Surface water in the vicinity of the outfalls has also shown some impact, largely from zinc. However, the pond waters and system as a whole have not shown adverse impact as discussed below.

An ecological study of the ponds, conducted by NYSDEC in cooperation with Elderlee, found that except for localized sediment toxicity at these two stormwater outfalls in pond A, the overall aquatic ecology of the ponds was not adversely affected by storm water discharges. Storm water management issues are being addressed under a State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharge associated with industrial activity. Elderlee has completed a Storm Water Pollution Prevention Plan which defines existing storm water discharges and develops best management practices to reduce water quality impacts from storm water flows. Accordingly, and since impacts to surface water and sediments are unrelated to hazardous waste disposal activities, these issues will not be addressed by this Record of Decision.

Table 1 (see next page) summarizes the extent of contamination for the contaminants of concern in soil and groundwater and compares the data with the remedial action levels (SCGs) for the Site. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

Soils at Area A (former lagoon area) show zinc with minor lead and cadmium contamination. Over 150 samples were collected and analyzed by field x-ray fluorescence and off site laboratories; zinc concentrations ranged up to 32,000 ppm, lead ranged up to 1500 ppm, and cadmium ranged up to 22 ppm. The affected area is approximately 45,000 square feet and extends to about the bottom of the sand layer approximately 11 feet below the surface.

Soils at Area B (paint solvent disposal area) contain volatile organic contaminants; xylenes range up to 2410 ppm and ethylbenzene ranges up to 1250 ppm. The affected area is about 2,500 square feet and up to about 11 feet deep.

Groundwater

Groundwater within Area A (samples from monitoring wells: MW-4, 4A, 5, 5A, and 8; see Figure 3) shows elevated levels of zinc (up to 32 ppm). Perimeter groundwater monitoring wells (MW-9, 10, and 11) show greatly reduced levels of zinc (up to 0.5 ppm). The fate and transport of metals, particularly zinc, in the subsurface is dominated by sorption and reaction/precipitation processes.

Groundwater from Area A flows northeast and east. Sampling of three residential wells located across Cross Road north of Area A and a well to the east on Carter Road have not shown impact from site-related contaminants.

Groundwater in Area B shows elevated levels of xylenes (up to 30.5 ppm), ethylbenzene (up to 6.4 ppm), and toluene (up to 0.063 ppm) in monitoring well MW-1 (see Figure 3). However, downgradient wells MW-2 and MW-6, located southeast of MW-1, have not shown contamination except for 0.46 ppm of xylene and 0.074 ppm of toluene detected in MW-2 during one sampling event in 1994 (subsequent testing has not shown contamination).

The fate and transport of these contaminants appears to be dominated by biodegradation; subsurface bacteria are likely limiting the extent (transport) of the contaminants in groundwater. However, within the source (former solvent disposal) area, the lack of oxygen and high VOC concentrations in soils appears to be inhibiting bacterial degradation of contaminants. As contaminated groundwater migrates away from the source area, recharge with well-oxygenated rainfall and snowmelt evidently facilitates biodegradation.

Surface Water and Sediment

Surface water at the Site consists of two ponds created by the former sand and gravel mining operation at the Site (see Figure 2). Pond A receives storm water runoff via a subsurface drain system and two outfalls (see Figure 3). An earthen berm, which is sometimes breached during high water, separates Pond A from Pond B. As shown in Figure 1, Pond B drains into a wetland and a tributary of Canandaigua Outlet (which is designated Ont. 66-12-52-35-P271). The ponds are classified as Class C fresh surface waters. Per NYS water quality regulations (NYCRR Part 701.8): "The best usage of Class C waters is fishing. The waters shall be suitable for fish propagation and survival and the water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes." Pond A is on Elderlee property, is quite shallow, and is essentially a storm water retention pond, all of which limit recreation. Pond B is partially bordered by residences on Carter road and is subject to recreational use.

Concerns about surface water at the Site date back to reports of fish kills in Pond A in the springs of 1971, 1979, and 1980. Investigations of these fish kills by NYSDEC concluded that spawning stress was the likely cause but that sub-lethal chronic exposure to metals was a possible contributory factor. To further evaluate the effects of storm water discharges on the ponds, NYSDEC, with the cooperation and financial support of Elderlee, conducted a study of the ponds' ecology in 1996. Evaluation of pond water and sediment chemistry, freshwater biota, and laboratory toxicity testing showed the aquatic ecology to be largely unaffected by discharges from Elderlee. Sediment near the storm water outfalls in Pond A showed moderate toxicity but the extent of this effect appeared to be localized. No evidence of any widespread acute or chronic toxicity effect on aquatic organisms living in the water column of Ponds A or B was encountered during the study. Periodic low dissolved oxygen concentrations in Pond B, which appears to limit the abundance and diversity of bottom-dwelling organisms, is attributed to natural aging of the pond (eutrophication).

3.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. In an effort to expedite site cleanup, Elderlee decided in mid-1997 to implement an IRM to address the VOC source area at Area B. After further delineation of the source area and evaluation of several alternatives (e.g., excavation and treatment, soil vapor extraction, air sparging, bioventing, ozone injection, and oxygen injection), Elderlee selected and installed a direct oxygen injection system which became operational in January 1998. This innovative bioremediation technology involves the generation and injection of oxygen into the subsurface (below the water table) to stimulate native bacteria which metabolize the contaminants. As an insitu technology, extraction and treatment of vapors and groundwater is unnecessary.

The oxygen injection system consists of an oxygen generator, compressor, piping, and six strategically-placed injection points (see Figure 4 on the following page); pure oxygen is injected below the water table under low pressure in timed pulses. Use of pure oxygen is a significant enhancement over atmospheric air (20% oxygen) used in more conventional approaches, such as bioventing. Oxygen levels measured in groundwater have

Table 1

Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCGs (ppm)
Soils (Area A)	Metals	Zinc	25 - 32000	42 of 47	100
		Lead	4 - 1500	8 of 40	100
		Cadmium	0.07 - 22	14 of 40	1
		Chromium	3.7 - 126	6 of 40	40
Soils (Area B)	Volatile Organic Compounds (VOCs)	Xylenes	ND - 2410	14 of 32	1.2
		Ethylbenzene	ND - 1250	8 of 32	5.5
		Toluene	ND - 1.2	0 of 32	1.5
Groundwater (Area A)	Metals	Zinc	0.024 - 54.6	13 of 33	5
		Lead	ND - 0.089	1 of 33	0.025
		Cadmium	ND - 0.023	1 of 33	0.010
		Chromium	ND - 0.161	2 of 33	0.050
Groundwater (Area B)	VOCs	Xylenes	ND - 30.5	8 of 30	0.005
		Ethylbenzene	ND - 6.4	6 of 30	0.005
		Toluene	ND - 0.063	3 of 30	0.005

ND = Not Detected

ppm = parts per million

SCGs = Standards, Criteria, and Guidance increased from near zero to 20 ppm within 30 days at Area B, where groundwater contaminant concentrations have been relatively stable. Ongoing monitoring will determine the effectiveness of the system by measuring oxygen levels in the groundwater and its impact on contaminant concentrations in Area B.

3.3 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. A discussion of the health risks can be found in Section 7 of the RI Report.

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.

Potential complete pathways which are known to or may exist on-Site and off-Site include:

On-Site pathways:

- ingestion of contaminated groundwater from onsite supply wells;
- inhalation of VOC vapors released to air from soil;
- inhalation of dusts generated by fork-lifts and vehicles; and
- dermal contact or ingestion of soil.

Off-Site pathways:

- ingestion of contaminated groundwater by nearby residents.

Based upon the data that has been collected and evaluated, human exposure to site-related contamination by drinking groundwater is not presently occurring and is not expected to occur in the future. Furthermore, the proposed remedies are expected to further reduce the potential for exposure. VOC vapors have not been detected in ambient air in Area B; the proposed remedy will further reduce the exposure potential. Contaminant exposure to onsite workers by inhalation of dust or direct contact with contaminants at Area A does not appear significant and the proposed asphalt cap will further reduce the potential. However, any substantial changes to the disposal areas, such as excavation, may significantly increase the potential for exposure.

3.4 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the Site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the Site to fish and wildlife resources. As an active industrial property that is largely paved or occupied by buildings, the Site has an overall low value as wildlife habitat. The ponds are the primary exposure pathway for fish and wildlife. As noted above, extensive sampling and study of the ponds has shown no significant adverse effects from the Site except for localized sediment toxicity near the storm water outfalls. Operational controls developed under Elderlee's Storm Water Pollution Prevention Plan are expected to minimize future inputs of metals to Pond A.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and Elderlee entered into a Consent Order on August 21, 1995. The Order obligates the responsible party (Elderlee) to implement a remedial program. Upon issuance of the Record of Decision, the NYSDEC will approach Elderlee to implement the selected remedy under an Order on Consent.

The following is the chronological enforcement history of this Site.

Date	Index No.	Subject of Order
6/8/84	RCRA Case#840501	Closure of Hazardous Waste Treatment Lagoon
8/21/95	B8-0428-9304	Development and Implementation of RI/FS

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

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

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to 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:

- Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site;
- Eliminate the potential for direct human or animal contact with the contaminated soils on site;
- Mitigate the impacts of contaminated groundwater to the environment; and
- Provide for attainment of SCGs for groundwater quality at the limits of the areas of concern to the extent practicable.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled: Feasibility Study Report - Elderlee, Inc. - January 1998.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1: Description of Alternatives

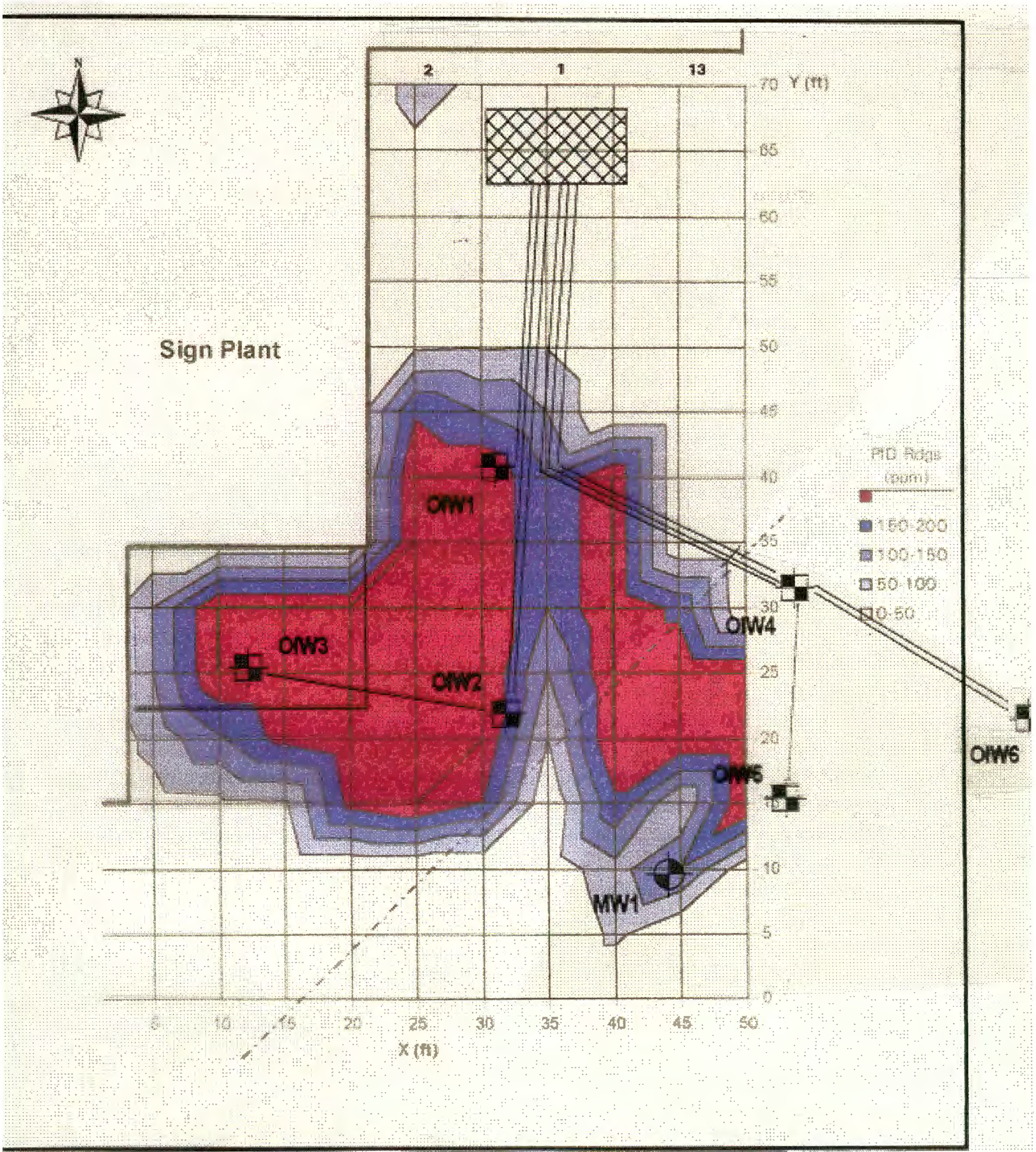


Figure 4

Area B - Oxygen Injection System

OIW = Oxygen Injection Well
MW1 = Monitoring Well #1

The potential remedies described below are intended to address the contaminated soils and groundwater at the site.

Alternatives for Area A

Alternative A1: No Action

Present Worth:	*$ 14,000*
Capital Cost:	*$ 0*
Annual O&M:	*$ 1000*
Time to Implement:	*0 months*

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.

Alternative A2: Containment via Asphalt Capping

Present Worth:	*$ 215,000*
Capital Cost:	*$ 180,000*
Annual O&M:	*$ 2,500*
Time to Implement	*1 month*

Capping with asphalt pavement is considered a practical approach for containing metal residuals within the former galvanizing waste treatment lagoon area. Other cap materials (e.g., clay or geosynthetics) were considered adequate barriers but were deemed less amenable and less durable under current plant operations. Likewise, vertical barriers (e.g., impermeable slurry walls or groundwater interceptor trenches), which would contain or intercept groundwater at considerable expense, were considered unnecessary as monitoring has not shown significant contaminant migration.

An asphalt cap would prevent water infiltration, dust and sediment production, and direct contact with wastes as well as reduce the mobility of the contaminants. Long-term groundwater monitoring would also be implemented.

Alternative A3: Waste Stabilization

Present Worth:	*$ 971,000*
Capital Cost:	*$ 957,000*
Annual O&M:	*$ 1,000*
Time to Implement:	*3 months*

Stabilization technologies involve mixing contaminated soil with binding agents which immobilize metal contaminants. Such binding agents include: (1) alkaline (high pH) materials (e.g., lime kiln dust) which alter the pH and/or oxidation potential to cause precipitation and fixation reactions and (2) solidification agents (e.g., cement) which chemically and physically incorporate the metals into a solid mass. This alternative would include excavation of the contaminated soils in Area A, mixing with binding agents, replacement of the soils, covering with an impermeable cap, and long-term monitoring.

Alternative A4: Excavation and Off-Site Disposal

Present Worth:	*$ 2,000,000*
Capital Cost:	*$ 1,986,000*
Annual O&M:	*$ 1,000*
Time to Implement	*1 month*

This alternative would include excavation and offsite disposal of contaminated soils, groundwater management (dewatering), filling the excavation with clean soils, and long-term monitoring.

Alternative for Area B

Alternative B1: No Further Action - Continued Operation of the Oxygen Injection System

As noted above in Section 3.2, *Interim Remedial Measures,* and as detailed in the feasibility study, Elderlee evaluated several alternatives for the former paint solvent disposal area: excavation with onsite or offsite treatment; soil vapor extraction; soil vacuum extraction with air sparging; bioventing; ozone injection; and oxygen injection. Elderlee selected oxygen injection, installed the system in December 1997 and began operation in January 1998.

Oxygen injection is an innovative and permanent remedy which relies on natural bacteria in the soil to consume the contaminants in place. With the addition of pure oxygen, biodegradation of VOCs is significantly enhanced and extraction and treatment of vapors and groundwater is not necessary. It is estimated that the bulk of the VOCs can be treated within six months and that cleanup objectives can be achieved within one year.

Continued monitoring is necessary to evaluate the effectiveness of the system. If this technology proves ineffective, other alternatives will be considered. In the following section, oxygen injection will be evaluated against the respective criteria but the other alternatives considered for Area B will not be discussed further. A complete evaluation of the various alternatives for Area B is available in the FS.

6.2 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 (6NYCRR 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 contained 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.

Groundwater

As an industrial facility in an area where groundwater is used for drinking water, the primary threat presented by the disposal of hazardous wastes at the site is to groundwater resources and public health. The primary concern then is compliance with drinking water standards at the boundaries of the areas of concern. Whereas groundwater within the areas of concern (Areas A and B) exceeds standards, at the boundaries of the areas of concern, monitoring data indicate that contaminants of concern are below drinking water standards (i.e., Area A - zinc, lead, and cadmium and Area B - xylene, ethylbenzene, and toluene; the groundwater contaminants demonstrate low mobility). All remedial alternatives presently meet the groundwater standards criterion outside of the areas of concern.

Soil

Soil cleanup objectives are based on criteria which are protective of health and the environment. Criteria include human health-based concerns (e.g., ingestion, inhalation, direct contact hazards). Barring any disturbance to the areas of concern after remedy implementation, all alternatives, except A1 (the no-action alternative), would meet these criteria.

Another soil criterion is environmental concentrations which are protective of groundwater/drinking water quality. For organics, soil cleanup objectives are established based on soil/water partitioning. For metals, site or natural background levels of metals is usually the soil cleanup objective. The remedy implemented in Area B is expected to achieve the soil cleanup objectives for the organic contaminants of concern: xylene (1.2 ppm); ethylbenzene (5.5 ppm); and toluene (1.5 ppm).

For Area A, the zinc soil cleanup objective was set at 100 ppm but natural site background at an industrial facility can be difficult to establish. Given that galvanized products are stored outside, many areas of the site are above this level. Only one alternative, A4 (excavation and offsite disposal @ an estimated $2 million) could possibly meet this criterion but it would not address any inaccessible areas such as potential contamination adjacent to or below building foundations and floor slabs. Since the contaminants of concern have shown low mobility and no adverse impact beyond the areas of concern, achieving a level of soil cleanup to background levels in the subsurface at Area A would provide little substantial benefit. Given the above, the industrial land use, and no present or future adverse groundwater impacts (as determined by long-term monitoring), the closed lagoons and residual galvanizing wastes will remain undisturbed and soil cleanup to background levels will not be required in Area A.

2. **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. As discussed in some detail above, all alternatives, except A1 (the no-action alternative), would meet this criterion.

3. **Short-term Impacts and 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.

With minimal disturbance to the subsurface, alternatives A1 (no action), A2 (asphalt cap), and B1 (oxygen injection) would present little or no short-term risk to the community, workers, or the environment. Conversely, the other alternatives involving excavation (A3 - stabilization and A4 - excavation) would present considerable short-term risk due to potential exposure. Except for A1 (no action), all alternatives would achieve remedial objectives in a similar time frame.

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.

Removal of all waste, if possible, (A4 - excavation) would best meet this criterion but all alternatives, except A1 (no action), sufficiently and reliably contain or treat the wastes such that no impacts/risk are expected outside of the areas of concern.

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 A1 (no action) would have no ameliorative effect. Alternatives A2 (asphalt cap) and A3 (stabilization) would not reduce the volume or toxicity of the soil contaminants but the reduced infiltration afforded by capping or waste stabilization would reduce dissolution of metals and hence the volume and mobility of contaminated groundwater. Groundwater monitoring has shown that the low overall mobility of metals in groundwater mitigates the threat of contaminant migration and impact to local groundwater resources. Alternative A4 (excavation) would significantly reduce the toxicity, mobility, and volume of waste at the Site. However, there is a risk that excavation activities would change subsurface conditions such that the mobility of any remaining residuals would increase.

Alternative B1 is expected to permanently and significantly reduce the toxicity, mobility, and volume of the wastes at Area B.

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, and related concerns.

Alternatives A1 (no action) and A2 (asphalt cap) would be readily implementable (B1 was readily implemented). Alternatives A3 (waste stabilization) and A4 (excavation) would present considerable challenges for groundwater dewatering and control as well as interruptions of plant operations during excavation.

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. Ranked in order of increasing cost, the cost (present worth) estimates for the alternatives are: A1 ($14,000), A2 ($215,000), A3 ($971,000), A4 ($2,000,000). The costs for each alternative are presented in Table 2 (see next page).

8. **Community Acceptance** - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to concerns raised.

A number of questions were raised at the public meeting which focused on the quality of the groundwater, surface water, and air in the vicinity of the Site. As noted at the public meeting, data collected to date does not indicate off-Site groundwater or surface water impacts. Further, NYSDOH collected names and addresses of local residents interested in having their well water tested; NYSDOH will conduct this sampling event in the near future. Regarding air quality issues, local residents were encouraged to document and report any air quality problems to the Avon Division of Air Resources staff. A comment letter requested that alternative A-4 (excavation) be chosen over A-2 (capping), based on the belief that A-2 had already occurred and that the problem should be cleaned up completely. However, there is no evidence of an effective cap over the lagoons and evaluation of the alternatives showed excavation to be less feasible than capping.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is selecting alternatives A2 (asphalt cap in Area A) and B1 (no further action with ongoing oxygen injection in Area B) as the remedy for this site. Since the oxygen injection system (alternative B1) has been implemented in Area B (where groundwater concentrations have been relatively stable), it is not included in the discussion below. However, if oxygen concentrations in groundwater are not maintained and groundwater concentrations at MW-1 do not decline, other technologies will be evaluated.

At Area A, waste residuals will be left in place since the overall exposure risk is not significant due to low mobility and since none of the alternatives, with the possible exception of A4 (excavation), would assure complete removal of the waste. Since alternative A1 (no action) was not sufficiently protective of human health, it was eliminated. Of the remaining alternatives, A2 (asphalt cap) ranked highest in short-term effectiveness, implementability, and cost. Whereas A3 (stabilization) and A4 (excavation) ranked somewhat higher in long-term effectiveness and reduction in the toxicity and volume of waste, the difference was not significant and the costs were considerably higher. Since alternative A2 is protective of human health and the environment and readily implemented at reasonable cost, it has been selected.

The estimated present worth cost to implement the remedy is $215,000. The cost to construct the remedy is estimated to be $180,000 and the estimated average annual operation and maintenance cost for 30 years is $2,500.

The elements of the selected 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. Any uncertainties identified during the RI/FS will be resolved.

2. The remedy consists of asphalt capping the former galvanizing waste treatment lagoons (Area A) and vicinity and the continued operation and maintenance of the oxygen injection system at paint solvent disposal area (Area B). Further, administrative controls (deed notifications) will be implemented for Areas A and B.

   Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program will be instituted. This program will allow assessment of the effectiveness of the selected remedy and will be a component of the operation and maintenance for the site.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) 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:

- A repository for documents pertaining to the site was established.

- A site mailing list was established which included nearby property owners, local political officials local media and other interested parties.

- Fact sheets were issued to announce:
  - RI/FS start in November 1995;
  - IRM installation/operation and RI/FS report availability in January 1998; and
  - PRAP availability (2/26/98), public comment period (2/26/98 - 3/27/98), and public meeting (3/12/98) in February 1998.

- On March 12, 1998, a public meeting was held at the Oaks Corners Fire Hall to present the PRAP and solicit public comments and questions.

- In March 1998, a Responsiveness Summary was prepared and made available to the public as Appendix A of this ROD, which follows below, to address the comments received during the public comment period for the PRAP.

Table 2

Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
A1 - No Action	$0	$1000	$14,000
A2 - Asphalt Capping	$180,000	$2500	$215,000
A3 - Waste Stabilization	$957,000	$1000	$971,000
A4 - Excavation	$1,986,000	$1000	$2,000,000
B1 - Oxygen Injection	$57,600	$1000 (+$11K for first year)	$82,000

Capital Cost = Estimated cost of construction in current dollars

O&M = Operation and Maintenance over a 30 year period

Total Present Worth = Cost of the total remedy in current dollars assuming a 6% discount rate over 30 years

APPENDIX A

RESPONSIVENESS SUMMARY

Elderlee, Inc.
Town of Phelps, Ontario County, New York
Site Number 835014

The following responsiveness summary outlines the comments and questions received by the NYSDEC on the Elderlee proposed remedial action plan (PRAP) and provides responses from the NYSDEC. The public comment period opened on February 26, 1998 and closed on March 27, 1998. A public meeting was held on March 12, 1998 at the Oaks Corners Fire Hall to describe the PRAP and to receive verbal comments and questions. The NYSDEC would like to thank all those who took the time and effort to attend the public meeting and to submit comments on the PRAP. Below, the summaries of the comments/questions are followed by *NYSDEC responses in italics.*

Q1. The water in Pond A flows into Pond B and then to a culvert and eventually to the Canandaigua Outlet. The water that runs off the area where Elderlee stores galvanized metal and flows into Pond A must be contaminated with galvanized metal.

A1. Data collected during the RI indicate that zinc and other trace metals leach from galvanized products staged in the outdoor storage yards and that storm water runoff transports such metals to Pond A via Elderlee's storm water drainage system. Metal contaminants, mainly zinc, with minor amounts of lead, chromium, and cadmium have been found concentrated in sediment near the storm water outfalls in Pond A. Surface water in the vicinity of the outfalls has also shown some impact during storm events, largely from zinc. However, an ecological study of the ponds has shown the impact of these releases to Pond A (essentially a storm water retention pond) to be localized in the vicinity of the storm water outfalls. The ecological study, conducted by NYSDEC in cooperation with Elderlee during 1996, found that except for localized sediment toxicity at these two storm water outfalls in pond A, the overall aquatic ecology of the ponds was not adversely affected by storm water discharges.

Furthermore, such storm water management issues are being addressed under permit with NYSDEC (i.e., State Pollutant Discharge Elimination System General Permit for Storm Water Discharge Associated with Industrial Activity). Under this permit, Elderlee has completed a Storm Water Pollution Prevention Plan which defines existing storm water discharges and develops best management practices to reduce water quality impacts from storm water flows.

Q2. I've been told that groundwater runs from northwest to southeast toward Seneca Lake. I live east of the site and I'm concerned about my drinking water. I've been drinking this water for 20 years. Could it be contaminated by the galvanized metal wastes? My concern is that you tested residential wells to the north of the plant but no wells on Carter Road.

Where did you look for residential wells to test?

Did you test the Firehouse well? It would be a good one to sample.

Whose well on Carter Road did you test? Did you test the actual residential well, or a sample from a boring you put in on their property? If you told us who you sampled maybe we wouldn't be so concerned and wouldn't want our well tested.

A2. Regarding the potential for off-Site groundwater impacts, groundwater data collected over the past several years shows that contaminated groundwater is restricted to the immediate area of the onsite waste disposal areas; no off-Site impacts have been observed. The main contaminants (zinc and xylene) show low mobility and limited extent as discussed in sections 3.1.2 and 3.1.3 (pages 7-10).

Regarding groundwater flow direction, shallow groundwater flow generally follows surface topography (flows downhill) and discharges into surface water bodies (streams, lakes, ponds, etc.) which intercept the groundwater table. At the Elderlee site, data indicate that groundwater flows northeast, east, and southeast. The southeast direction of groundwater flow toward Pond A at the Site appears to be quite localized and shallow groundwater is intercepted by the pond. On a much larger regional scale, groundwater flow is expected to be generally northward reflecting general topographic and drainage trends.

Regarding questions on residential well testing, initial concern focused on the nearest drinking water wells. Off-Site, the closest wells are located at residences immediately north of the Site; testing showed no Site-related contaminants above naturally-occurring levels. A Carter Road resident requested that his well be sampled in response to the November 1995 fact sheet mailed to local residents. While his well did not appear at risk due to its distance from the Site and presence of a pond (Pond B) between his well and the Site, it was sampled and no contaminants were found. As additional Site data were gathered, it became clear that groundwater contamination is quite limited in extent and restricted to on-Site areas. The remedy for the Site includes long-term sampling of key monitoring wells which will assess the extent of groundwater contamination over time. To supplement existing data, the NYSDOH will sample nearby residential wells this Spring. This round of sampling will include the wells of two concerned residents and the Firehouse.

Q3. I'm more concerned about air emissions from the plant than the groundwater. I base my beliefs on the galvanized fences and posts on the perimeter of the site; they rust in a relatively short time. Maybe acid releases to the air from the plant are causing this.

Once I was working near the post office and a sulfuric acid smell came from the plant and choked me. When something causes you to choke it worries you. It only happened once, but if it happens again it could affect a lot more people.

A3. The galvanizing plant has seven permitted emission points which are in compliance for sulfuric acid, zinc, and lead according to the NYSDEC Region 8 Division of Air Resources. Whether acid emissions from the plant are causing more rapid rusting of plant fences/posts than that caused by ambient acidic precipitation is an interesting question but, without collection of considerable data (e.g., local and regional rainfall/mist pH data), likely unanswerable. While the observation is keen and the suggested interpretation plausible, the bigger question is: are the emissions affecting nearby residents, if only occasionally, as suggested part two of the question (acid smell/choking). As recommended at the public meeting, any air release should be well documented and immediately reported to the Region 8 Division of Air Resources for follow up. Without reporting, incidents cannot be investigated/corrected.

Q4. The lagoons on the east used to overflow and run into a little pond to the east. I have pictures showing rusty sediment there. What do they do with the excess pickling acid now?

A4. The spent acids used in the galvanizing process are hazardous wastes and are handled, transported, treated, and disposed off-Site as required by federal and state hazardous waste management regulations.

Q5. What was the depth at which zinc contaminants were found in the soil samples (shown on the first contour map)? It appears there are two isolated patches of contamination. How do you explain this?

You showed a map giving ranges for the depth of samples. What do the ranges mean?

How far down and how deep is the clay layer?

A5. The maximum zinc concentrations in soil were found in the seven to nine-foot depth interval in the former lagoon area. The contouring of the soil concentration data does give the impression of an isolated area around MW-8 but it may be more a function of the sampling grid (less dense in this area) than an actual isolated area. In any case, MW-8 is located in the same general area as the former lagoons and it may reflect an old lagoon overflow mentioned in question 4 above.

Regarding ranges of sampling depths, soil samples are collected with 2-foot samplers (split-spoons) which yield data in 2-foot intervals. For example, the maximum concentration interval noted above (7-9 feet) corresponds to the transition from sand to clay in the former lagoon area. The depth to the clay layer varies from 9 to 12 feet and the layer is about 15 feet thick (below the clay is about 20 feet of glacial till followed by Onondaga limestone bedrock).

Q6. What is the production well? Is it used by the plant? Did you test that well?

Is the production well the artesian well? There was an old gas well there years ago, too.

A6. The production well, shown on the cross-section overhead at the public meeting, is used by the sign plant. This well and two other production wells on-Site have been sampled and no contamination have been detected. The sign plant well is screened in bedrock (about 50-60 feet below ground surface) and while the static water level is above the top of rock (and, therefore, an "artesian" well), it does not flow at the surface (i.e., "flowing artesian" well). However, another well (unused) at the Site located south of the office building is a "flowing artesian" well.

Q7. Did you find any elevated levels of manganese during your testing?

My well was tested 15 years ago and had levels of manganese above the recommended level at that time.

Did you find 1% manganese? I've lived near the plant for 38 years. Every two to three years my well has to be cleaned because manganese covers the well point. I used to go years without having to clean them. Now all of a sudden we have a problem, and our neighbor has a manganese problem too. Where is the manganese coming from?

A7. Testing has shown manganese to be at naturally occurring levels except for two groundwater analyses deemed unreliable. It is quite common for naturally-occurring manganese and iron to exceed groundwater standards.

No, 1% manganese was not found. Rather, the mention of 1% at the public meeting was in reference to naturally-occurring levels of iron in soils. Manganese, while one of the more abundant metals in the earth's crust, typically occurs at levels 1/50th those of iron (i.e., about 200 to 500 ppm). Extensive sampling of soils at the former lagoon area found only naturally-occurring levels of manganese and iron.
As groundwater slowly moves through pores and fractures within soil and rock, naturally abundant elements/compounds such as, iron, manganese, calcium, magnesium, potassium, sodium, carbonate, sulfate, among others become dissolved in groundwater with each element/compound eventually reaching a state of equilibrium. Where equilibrium conditions change or are disturbed in an aquifer system, minerals may precipitate out of solution. For example, iron and manganese exhibit a strong tendency to precipitate (or "drop") from solution under oxidizing conditions. Pumping groundwater from a well can introduce oxygen into an aquifer system and reduce hydrostatic pressure in the vicinity of well (liberate dissolved carbon dioxide) which, in turn, can disturb equilibrium conditions and precipitate natural minerals, such as calcium carbonate, and hydroxides and oxides of iron and manganese. So-called "iron bacteria" can also facilitate such reactions, oxidizing iron and manganese into gel-like masses which can, over time, harden into scale deposits on well points and screens.

The apparent temporally-variable screen clogging noted above may be related to increased exposure of well screens to atmospheric oxygen with increased tendency for chemical precipitation. Possible causes of fluctuating/declining water tables over time include increased water use in the home, human-induced decline in the water table over a localized area (more residents drawing from the same aquifer) and/or weather-related declines in the water table such as periodic "dry" seasons or longer time periods. If so, a possible solution would be setting the well point/screen deeper to avoid atmospheric exposure or otherwise ensuring that the water level in the well does not drop below the top of the screen. If the clogging is related to iron bacteria, periodic treatment of the well with oxidants (e.g., bleach) can help reduce screen clogging. Clogging/mineral precipitation due to pumping-related reductions in hydrostatic pressure (liberation of carbon dioxide; carbonate disequilibrium) would be very difficult to control.

Q8. I attended the meeting at the Oaks Corners Fire House Monday, March 16, 1998 for the Proposed Remedial Action Plan for the waste at the Elderlee facility. I have talked with several neighbors about the action DEC recommends. We believe A-4 (excavation) is the only acceptable action that should be initiated. We believed they caused the problem and they should clean it up completely.

When they closed the lagoons and other areas there was a clay cap put over it. There also appears to have blacktop over the area. What more are they going to do? Alternate A-2 has already taken place.

We are concerned that in the future, if rules or legislation change or if they should leave the area, the hazardous waste will remain for the taxpayers to clean up. The people at Elderlee have little regard for the people in the community when it comes to pollution. They all live out of the area.

Over the years I have been concerned with the emissions from the facility. My property is just to the south of the facility. You just have to look at the roofs of the different buildings. Anything that is metal or wire fence rusts after a short period of time; sulfuric acid mist in the emissions. I have enclosed some of the materials that I have received and photos I have taken.

A8. Thank you for your letter and photos (the photos were quite interesting). On its face, alternative A-4 (excavation) does appear most desirable since waste is removed from the Site and disposed elsewhere. However, several impediments to this action are apparent. Excavation difficulties/dangers include dust control/worker protection, excavation dewatering (storage, treatment, and disposal of large quantities of contaminated groundwater pumped from the excavation), protection of building foundations (saturated sands are inherently unstable; shoring/sheet piling would likely be required and some contamination would likely remain near the foundations), possible interruptions of plant operations, and possible mobilization of groundwater contaminants due to changes in the source area.

The cost of alternative A-4 is estimated at $2 million. Since the contaminants of concern have shown low mobility and no adverse impact beyond the areas of concern, achieving a level of soil cleanup to background levels in the subsurface at Area A would provide little benefit at substantial cost. Furthermore, the waste residuals that remain have not shown hazardous characteristics (acids were treated in the lagoons with lime and the remaining metals do not exceed hazardous regulatory levels); hence, these wastes would not be considered hazardous by current definition. In view of the foregoing and Section 6 of the ROD, excavation of these wastes is not justified.

Regarding the comment that the preferred alternative A-2 has already taken place, the presence of a continuous clay cap over lagoon #2 has not been documented and closure of lagoon #1 was not specified. Soil borings in Area A do not show a surface clay layer. About three-quarters of acre in Area A is bare ground; this area would be paved under alternative A-2.

Regarding the comment on air emissions, see question/response Q3/A3 above.

APPENDIX B

ADMINISTRATIVE RECORD

Elderlee, Inc.
Town of Phelps, Ontario County, New York
Site Number 835014

PRAP, Citizen Participation, Consent Orders, Registry

PRAP - February 1998

Fact Sheet - PRAP availability/Public Meeting Announcement - February 1998

Fact Sheet - IRM and RI/FS report - January 1998

Fact Sheet - RI/FS Start - November 1995

RI/FS Consent Order - August 1995

Registry Listing - July 1993

Work Plans and Reports

RI/FS Report - January 1998

IRM Work Plans - July/December 1997

NYSDEC Ecological Report on Site Ponds - February 1997

RI/FS Work Plan - July 1995

Groundwater Investigation Report - October 1993

PSA Reports (27-1307 request) - April 1993

Correspondence

3/24/98 letter to Craft (NYSDEC) from citizen - PRAP comments

1/29/98 letter to Craft (NYSDEC) from Campbell (C&O) - Final RI/FS edits

1/20/98 letter to Craft (NYSDEC) from Campbell (C&O) - RI/FS progress report

1/8/98 letter to Campbell (C&O) from Craft (NYSDEC) - Approval of RI/FS

1/6/97 letter to Craft (NYSDEC) from Campbell (C&O) - Response to NYSDEC 10/29/97 Comments

12/16/97 letter to Campbell (C&O) from Craft (NYSDEC) - Approval of IRM Oxygen Injection System

12/15/97 letter to Craft (NYSDEC) from Campbell (C&O) - Response to NYSDEC Comments

12/11/97 letter to Campbell (C&O) from Craft (NYSDEC) - Comments on IRM

12/8/97 letter to Craft (NYSDEC) from Campbell (C&O) - IRM proposal/changes

10/29/97 letter to Campbell (C&O) from Craft (NYSDEC) - IRM/RI/FS Comments

8/26/97 letter to Campbell (C&O) from Craft (NYSDEC) - IRM Comments

8/26/97 letter to Craft (NYSDEC) from Ruggieri (C&O) - IRM Specifications

8/22/97 letter to Campbell (C&O) from Craft (NYSDEC) - IRM Comments

7/14/97 letter to Craft (NYSDEC) from Campbell (C&O) - IRM SVE proposal

1/21/97 letter to Craft (NYSDEC) from Campbell (C&O) - RI/FS progress report

12/12/96 letter to Campbell (C&O) from Craft (NYSDEC) - Groundwater sampling report

10/31/96 letter to Campbell (C&O) from Craft (NYSDEC) - RI Report Comments

10/30/96 letter to Campbell (C&O) from Craft (NYSDEC) - Comments on RI field work

10/30/96 letter to Craft (NYSDEC) from Campbell (C&O) - RI field work proposal

10/25/96 letter to Campbell (C&O) from Craft (NYSDEC) - Comments on RI field work

9/30/96 letter to Campbell (C&O) from Craft (NYSDEC) - Comments on IRM excavation proposal

9/25/96 letter to Craft (NYSDEC) from Campbell (C&O) - Soil sampling results

7/22/96 letter to Craft (NYSDEC) from Campbell (C&O) - IRM excavation proposal

5/2/96 letter to Craft (NYSDEC) from Campbell (C&O) - draft RI report

2/14/96 letter to Craft (NYSDEC) from Campbell (C&O) - RI progress report

1/2/96 letter to Craft (NYSDEC) from Campbell (C&O) - RI progress report

12/4/95 letter to Craft (NYSDEC) from Campbell (C&O) - RI progress report

11/3/95 letter to Craft (NYSDEC) from Campbell (C&O) - RI progress report

9/29/95 letter to Craft (NYSDEC) from Campbell (C&O) - RI progress report

7/25/95 letter to Campbell (C&O) from Craft (NYSDEC) - Approval of RI/FS work plan

7/21/95 letter to Craft (NYSDEC) from Campbell (C&O) - Response to 6/6/95 RI/FS comments

6/6/95 letter to Campbell (LaBella) from Craft (NYSDEC) - Comments on RI/FS work plan

3/20/95 letter to Craft (NYSDEC) from Campbell (LaBella) - Response to 11/18/94 RI/FS comments

11/18/94 letter to Campbell (LaBella) from Craft (NYSDEC) - Comments on RI/FS work plan