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Department of Environmental Conservation

Division of Hazardous Waste Remediation

Record of Decision

VacAir Alloys Site
Town of Carroll, Chautauqua County
Site Number 9-07-016

March 1996

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION
VACAIR ALLOYS INACTIVE HAZARDOUS WASTE SITE
TOWN OF CARROLL, CHAUTAUQUA COUNTY, NEW YORK
SITE NO. 907016

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the VacAir Alloys 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 Substance Pollution Contingency Plan of March 8, 1990 (40 CFR 300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the VacAir Alloys 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 A.

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 or the environment.

Description of the Selected Remedy

Based upon the Remedial Investigation/Feasibility Study (RI/FS) for the VacAir Alloys Site and the criteria identified for the evaluation of alternatives, the NYSDEC has selected a Wellpoint Groundwater Extraction System (and treatment of groundwater), installation of a Soil Vapor Extraction System (to address contaminated soil), a NAPL recovery system (to address and remove free product in soils and/or groundwater) in conjunction with the excavation and off-site disposal of contaminated sediments in the lowland area, as the remedy for this site. The components of the remedy are as follows:

- Installation of a wellpoint extraction system designed to eliminate to the greatest extent possible the off-site migration of contaminated groundwater to Conewango Creek and the lowland area.

- Treatment of extracted groundwater using UV oxidation or other acceptable means with discharge to Conewango Creek.

- Excavation and disposal off-site of contaminated sediment in the lowland, adjacent to the existing drainage swale and leachate seeps.

- Treatment of contaminated soils on-site using In-situ soil vacuum extraction. Recent data indicates that vacuum extraction will not be effective in the "northern soils area." An alternative method of soil remediation will be identified.

- Construction of a NAPL extraction system to be installed in areas of the site where NAPL is detected during the remedial activities.

- Construction of an asphalt cap covering the active plant areas.
- Installation of sediment catch basins to collect runoff prior to discharge to the lowland or Conewango Creek.
- Implementation of a Best Management Practice Plan to require maintenance of the paved area and sediment collection basins.
- Implementation of deed restrictions on the site property to restrict site use and intrusive activities.
- Implementation of a long-term monitoring program which would allow the effectiveness of the selected remedy to be monitored. This long-term program would be a component of the operation and maintenance for the site and would be developed in accordance with the Remedial Design.

New Ynrk State Department of H

The New York Sate Department of Health concurs with the remedy selected for the 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.

3/29/96
Date

Michael J O'Toole
Michael J O'Toole
Director
Division of Hazardous Waste Remediation

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VACAIR ALLOYS, INC.
Town of Carroll, Chautauqua County, New York
Site No. 907016
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SECTION 1: SITE LOCATION AND DESCRIPTION

The VacAir Alloys facility is located on approximately 93 acres of land on the outskirts of the Hamlet of Frewsburg (Figure 1). Of the 93 acres, 15 acres are developed into the present VacAir facility. The remaining 78 acres consist of undeveloped low-lying and wooded areas, The plant site is bounded by Conewango Creek to the north, open fields, wooded and lowlying areas to the east, commercial and residential properties to the south, and Frewsburg-Falconer Road and the Frewsburg Water District Supply Well Field (wells #1 & 2A) to the west (Figure 2). The general land use of the area is commercial/light industrial. An unnamed, intermittent stream flows via a culvert, through the VacAir property and discharges to a low-lying area. This low-lying area drains to Conewango Creek.

The site is listed on the New York Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site, A Class 2 designation indicates the property poses a significant threat to public health and/or the environment and action is required.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The VacAir facility recycles stainless steel and other processed metals. VacAir Alloys began its operations in 1969. Prior to 1969, the site was used for the manufacturing of wafer board. Keywell Corporation purchased the facility in 1987, at which time it was renamed VacAir Alloys Division. As part of the recycling process, the facility uses trichloroethylene (TCE), a solvent, to clean and degrease metals. In 1990, Keywell conducted an environmental investigation of the property. Results of the investigation showed that on-site soils, surface water and groundwater are contaminated with TCE, its degradation (breakdown) products (such as 1,2-dichloroethene and vinyl chloride), petroleum products and metals. The exact method by which the chemicals were disposed is not known. However, it is alleged that former owners/operators improperly disposed plant waste by burying and/or disposing it through the plant sanitary system.

During monitoring of the municipal water supply (which is located across Frewsburg-Falconer Road from the site), TCE was detected in September 1991. This water supply was immediately discontinued in October 1991 and a back-up supply was put into use. Two groundwater wells were temporarily used as a back-up supply until a new well could be installed. One of these wells (No.3) was located approximately 0.25 miles north of the site and the other (No.4) was located approximately 1.5 miles southwest from the site and west of the Hamlet of Frewsburg (Figure 1). Both wells were sampled during their operation as required by the New York State Department of Health. No site contaminants were detected in either well. In 1993, the Town completed installation of a new water supply well that is located approximately 0.3 miles southeast of the site on Route 62, north of the Hamlet of Frewsburg (Figure 1).

In 1991, Keywell entered into a Consent Order (legal agreement) with NYSDEC to conduct a Remedial Investigation/ Feasibility Study (RI/FS) to determine the type(s) and location(s) of contamination attributable to the site, and to determine what actions are needed to remediate the property.

FIGURE 1
SITE LOCATION *MAP*

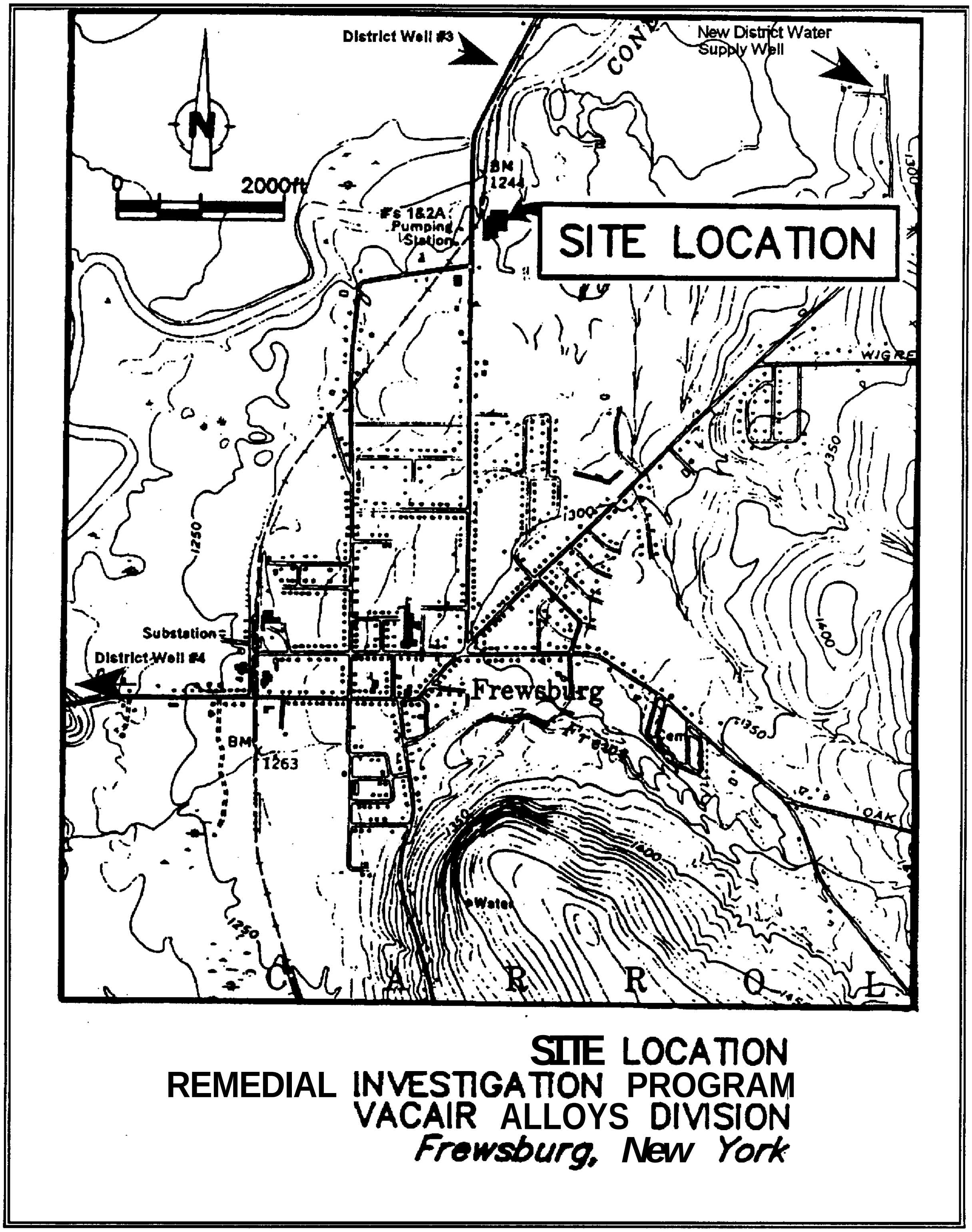
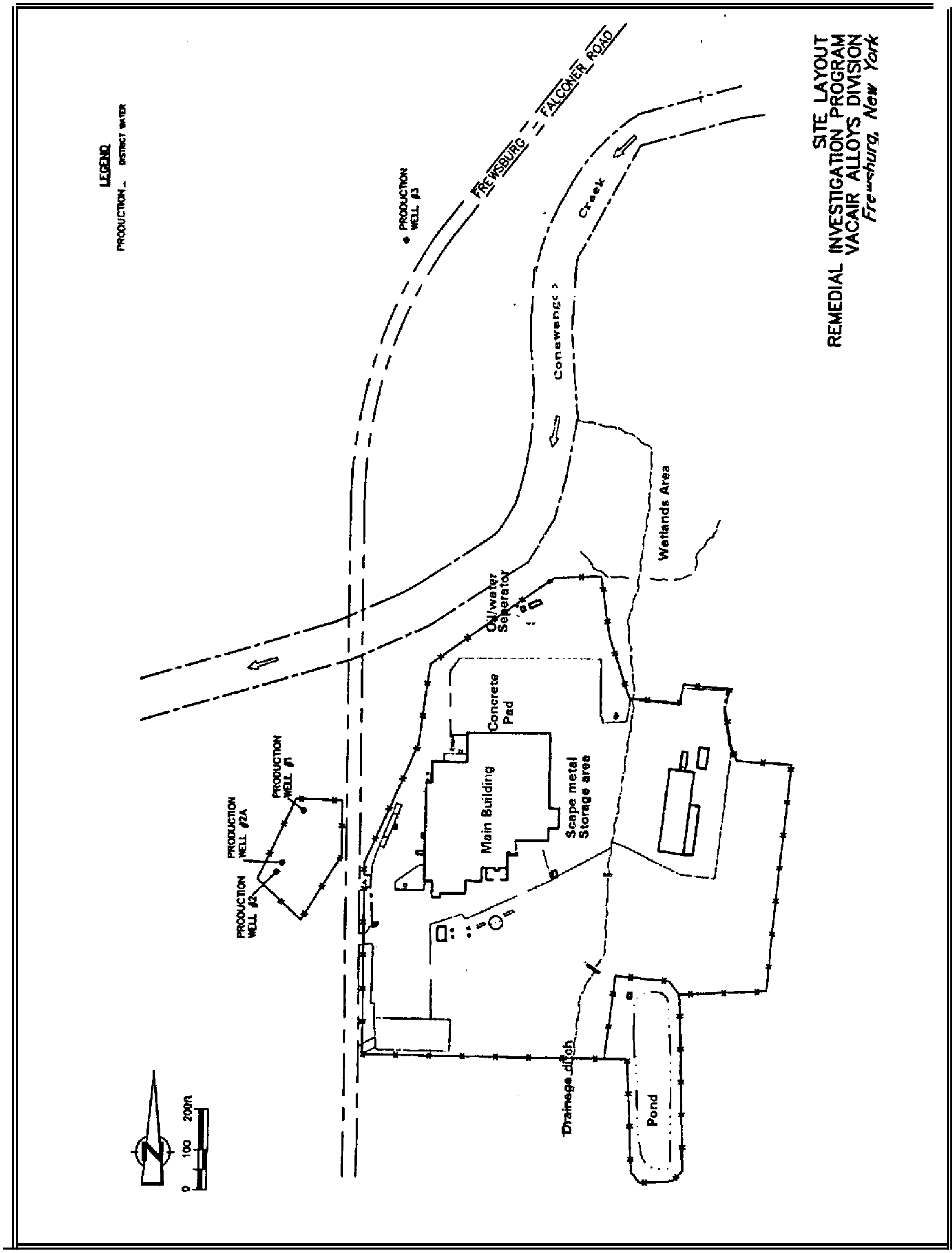


Figure 2
Site Layout



2.2: Remedial History

The following is a summary of the investigations completed or in progress at the VacAir Alloys Site. Several environmental studies of the property were conducted to determine if hazardous waste was present and if the site posed a significant threat to public health and/or the environment. The major investigative activity conducted at an inactive hazardous waste site is a Remedial Investigation/Feasibility Study (RI/FS). During the RI, the nature (type) and extent (locations) of the contamination at the site is determined. This information is then used during the FS to determine an appropriate remedial action that effectively eliminates any threat posed by the site.

- December 14, 1990: Keywell entered into Consent Order (legal agreement) with NYSDEC to conduct a Site Investigation at the site.

- October 1991: Keywell completed the Site Investigation, which gathered information on the geologic profile, groundwater flow direction and the preliminary degree of soil and groundwater contamination in a report entitled Site Investigation, VacAir Alloys, Oct. 1991.

- August 6, 1991: Site listed on the New York State Registry of Inactive Hazardous Waste Site as a Class 2 site.

- January 7, 1992: Keywell signed an Order on Consent with NYSDEC to conduct an Interim Response Action at the site.

- July 1992: Completed the Interim Remedial Action (Described below).

- November 30, 1992: Keywell signed an Order on Consent with DEC to conduct an RI/FS at the site.

- March 1994: Keywell submitted completed Remedial Investigation Report.

- March 1995: Keywell submitted a draft Final Feasibility Study Report.

2.3: Interim Response Actions

An Interim Response Action (IRA) was implemented as part of the initial investigation of the site. An IRA is an action that can be immediately taken to mitigate a threat or correct a potential problem. The IRA consisted of:

1) Implementation of water supply monitoring of the Frewsburg Water District Water Supply Wells #3 & #4 for routine water quality analysis.

2) Evaluation and maintenance of District Well #3 for the purpose of determining the quality and quantity of the water from this well.

3) Compilation, review and evaluation of existing groundwater information from the Frewsburg area, to determine if a new water supply well can be installed.

4) Implementation of a study to determine the source of contamination in District Wells #1 & #2A and to determine the location of the Frewsburg aquifer near the site.

The results of the IRA are presented in the report entitled, "Interim Response Actions, Final Report, VacAir Alloys Division, Frewsburg, New York," dated July 21, 1992. The following is a summary of the conclusions:

1) Routine water quality monitoring was implemented at Frewsburg Water District wells #3 & #4. The monitoring concluded that wells #3 &#4 are suitable to be used as the District water supply source.

2) Maintenance and repairs were completed at District Well #3. It was determined that the well was capable of providing sufficient water quality and quantity to be used as a water supply source for the district.

3) Existing groundwater supply data was evaluated but was inconclusive. Additional investigation of local groundwater supply sources was recommended.

4) Although it was determined that the Frewsburg aquifer exists below a portion of the VacAir site, the exact extent could not be determined. No source or connection between the site contamination and the Frewsburg Aquifer and the contamination of the District water supply wells #1 & #2 could be determined at that time. Samples collected after September 1991 did not detect any contamination in the District wells #1 & #2 or the Frewsburg Aquifer. Since the source of contamination was not determined, the District wells (Nos. 1&2A) (Figure 1) remained inoperative to protect public health. Further investigation to determine the exact location of the Frewsburg Aquifer and the source of contamination would be pursued through a Remedial Investigation of the site.

2.4 Enforcement Status

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

The Potential Responsible Party (PRP) for the site is:
Keywell Corporation
11900 South Cottage Grove Avenue
Chicago, Ill. *60628*

The NYSDEC and Keywell entered into an Order on Consent on November **30,** 1992. The Order obligates Keywell to implement an **RI/FS** remedial program. Upon issuance of the Record of Decision, the NYSDEC will approach Keywell to implement the selected remedy under an Order on Consent for Remedial Design/Remedial Action.

The following is the chronological enforcement history of this site.

Date	Index	Subject
12114190	**B9-0333-90-05**	**Site Investigation**
01/07/92	**B9-0333-90-05**	**Interim Remedial Action**
11/30/92	**B9-0333-90-05**	**RI/FS**

Upon issuance of the Record of Decision (ROD), the NYSDEC will begin negotiations with Keywell to enter into a Remedial Design/Remedial Action (RD/RA) Order on Consent to implement the chosen remedial alternative at the **site.**

SECTION 3: CURRENT STATUS

Keywell, under the supervision of the NYSDEC, initiated a Remedial Investigation/Feasibility Study (RI/FS) in October 1992 to address the contamination at the VacAir site. The RI was completed in November 1993. A final FS was submitted in March 1995.

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the type and location of contamination resulting from previous activities at the site. The RI was conducted in two phases, from October 1992 until June 1993. A report entitled Remedial Investigation Report, VacAir Alloys, Frewsburg, New York, dated March 1994, has been prepared describing the field activities and findings of the RI in detail.

The RI activities consisted of the following:

- Site mapping, including an aerial photo, topographic map and the delineation of all structures on site.
- Survey of all known underground utilities and storage tanks
- Residential water well survey
- Soil Vapor Survey (analysis of the soil gas) at 187 locations on the site.
- Resistivity geophysical survey to determine the specific location of the Frewsburg Drinking water aquifer.
- Installation of six soil borings and monitoring wells on site to find the location of the drinking water aquifer near the site and to determine the quality of the groundwater.
- Surface water and sediment sampling in the lowland areas adjacent to the site and in Conewango Creek.
- Monitoring of air around the plant site
- Performed a biota (vegetation, fish and wildlife) survey.
- A Health Risk Assessment

The analytical data obtained from the RI was compared to applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the VacAir site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria, were used to develop remediation goals for soil.

Based upon the results of the RI, in comparison to the SCGs and potential public health and environmental exposure rates, certain areas and media (ie: soil, groundwater, air, sediments, etc.) of the site have been determined to require remediation. The following discussions summarize the extent of the contamination at the site.

Site Geology and Hydrology

The general geology consists of five specific geologic units beneath the site. These units, or layers of different types of materials, consist of Surficial Overburden; Upper Sand and Gravel; Confining; Lower Sand and Gravel; and Bedrock. The surficial overburden unit consists of varying materials, such as fill, topsoil and a mixture of sand/silt and gravel and is approximately 0 to 6 feet thick. This is followed by the Upper Sand and Gravel Unit, consisting of coarse sand and gravel, approximately 22 feet thick. This area also contains the upper groundwater zone (or Water Table Aquifer). Following the Upper Sand and

Gravel Unit is the Confining Unit. A confining layer is a layer of impermeable soil such as clay, that restricts the flow of water downward into a deeper soil zone. This layer of soil on site consists of silt and clay, which is approximately 92 feet thick. Within the Confining Unit is a Lower Sand and Gravel Unit. This unit, also referred to as the Frewsburg Aquifer, consists of a coarse sand and gravel. It is located within the clay confining layer, approximately 40 feet below the ground surface. The groundwater in this layer is artesian (meaning it is under pressure) and was the source of the drinking water in the area. This layer is not continuous below the entire site, but is located only below the west side of the property. Below the Confining Unit lies bedrock.

A wetland or lowland area is located directly adjacent to the active manufacturing area on the northeast side of the plant site. The surface grade of the active plant is approximately 15 feet above grade of the wetland area. This area drains directly to Conewango Creek and is prone to frequent flooding as the water level of Conewango Creek rises. The base of the wetland lies directly on the top of the confining clay unit below the site. A 1.5 foot thick layer of humus soil and decaying grass overlies the clay in this area.

The five classes of media sampled during the various investigations at the site are: groundwater; surface water; sediment; surface soils and subsurface soil. To varying degrees, all the media show levels of contamination from site operations. Selected results of the organic and inorganic analyses are summarized below for each media.

Groundwater

Two specific groundwater zones below the site were evaluated during the investigations. The two zones are the Water Table Aquifer, located in the Upper Sand and Gravel Unit, and the Frewsburg Aquifer located in the Lower Sand and Gravel Unit.

The groundwater samples collected and analyzed from the Water Table Aquifer were found to be contaminated With several volatile organic compounds (VOCs). These VOCs primarily consisted of trichloroethene, 1,2-dichloroethene and vinyl chloride. Several other VOCs, which are degradation (breakdown) products of TCE, were detected in low concentration as were petroleum contaminants. The primary contaminants detected in the Water Table Aquifer are:

Contaminant	Concentration Range (ppb)
trichloroethene	ND-170,000
1,2-dichloroethene	ND-62,000
vinyl chloride	ND-1200
1,1-dichloroethene	ND-170
1,1,2-trichloroethane	ND-29
tetrachloroethane	ND-57
xylene	ND-24
benzene	ND-11

ND-Nondetectable

The highest concentrations of contaminants were detected in MW-11 (TCE-170,000 parts per billion (ppb)) and MW-2 (DCE-62,000 ppb) (Figure 3). The general flow of the groundwater in the Water Table Aquifer beneath the site is to the northwest, which would direct contaminated groundwater into the Conewango Creek (Figure 3). Groundwater standards for the above chemicals are 5 ppb.

During the RI, groundwater samples were also collected from the only two monitoring wells (MW-4D & MW-5D) on the property that penetrated the Frewsburg Aquifer. As previously stated, the Frewsburg Aquifer has only been located below the western portion of the site. No VOCs were detected in this groundwater zone.

Soil

During the previous investigations and the RI, subsurface soil samples were collected at the site. These samples were collected during the installation of monitoring wells, soil borings and the excavation of test pits in the areas of suspected disposal.

The results of the sampling showed significantly high levels on VOCs in subsurface soils in the area of MW-2, and to a lesser extent MW-11. The primary contaminants detected in subsurface soil samples are as follows:

Contaminant	Concentration Range (ppb)
trichloroethene	ND-17,000,000
1,2-dichloroethene	ND-2,400,000
vinyl chloride	ND-5,000
xylene	ND-39,000
benzene	ND-470
ethylbenzene	ND-6,000
toluene	ND-5,900
PCBs	ND-12,000

ND=Non-detectable

Polychlorinated Biphenyls (PCBs) were detected at 12,000 ppb and 2200 ppb in two test pit soil samples collected near groundwater monitoring well MW-2. However, no other subsurface soil sample collected during the soil boring program detected PCBs on the site.

The high concentration of VOCs in both the groundwater and soil suggest that Non-aqueous phase liquid (NAPL) is present. No free NAPL was noted during any RI or IRA field activities at the site. NAPL was later detected during pre-design activities in the North SVE area near monitoring well MW-2.

Surface W

Samples of surface water and stream sediments were collected **from** Conewango Creek, the unnamed tributary stream and the lowland area. Samples were also collected from groundwater seeps into the lowland areas.

No VOCs were detected in either surface water or sediment samples collected from Conewango Creek. Soil samples along the Creek banks did detect vinyl chloride and dichloroethene in maximum concentrations of 2300 ppb and 610 ppb, respectively. **This** contamination is believed to be the result of the discharge of groundwater through the bank soil rather than the deposition of contaminants from the Creek. Surface water in the lowland area consists of a shallow meandering ditch that receives water from the unnamed tributary stream, site run-off and groundwater seeps. While this area periodically floods during high water levels in Conewango Creek, there is generally no standing water in the area.

Samples collected from the two major groundwater seeps detected VOCs at concentrations of 197,300 ppb to 14,515 ppb. These groundwater seeps are located on the east side **of** the site and drain over land to the shallow ditch that runs through the lowland area. Dichloroethene made up the **majority** of the contamination. **TCE** and vinyl chloride were also detected at significantly lesser amounts. Sediment samples of the seeps also detected high levels of VOCs, consistent with the water sample results.

The highest concentration of VOCs in the ditch was located in the vicinity of the groundwater seeps and the discharge of the unnamed tributary to the lowland. The tributary is contained across the site below grade in a corrugated steel conduit. Samples collected of the bedding **of** the conduit have shown contamination to be present. It is expected that because of the design of the conduit, contamination is

FIGURE 3
GROUNDWATER MONITORING WELL LOCATIONS and GROUNDWATER FLOW CONTOURS (JUNE 1993)

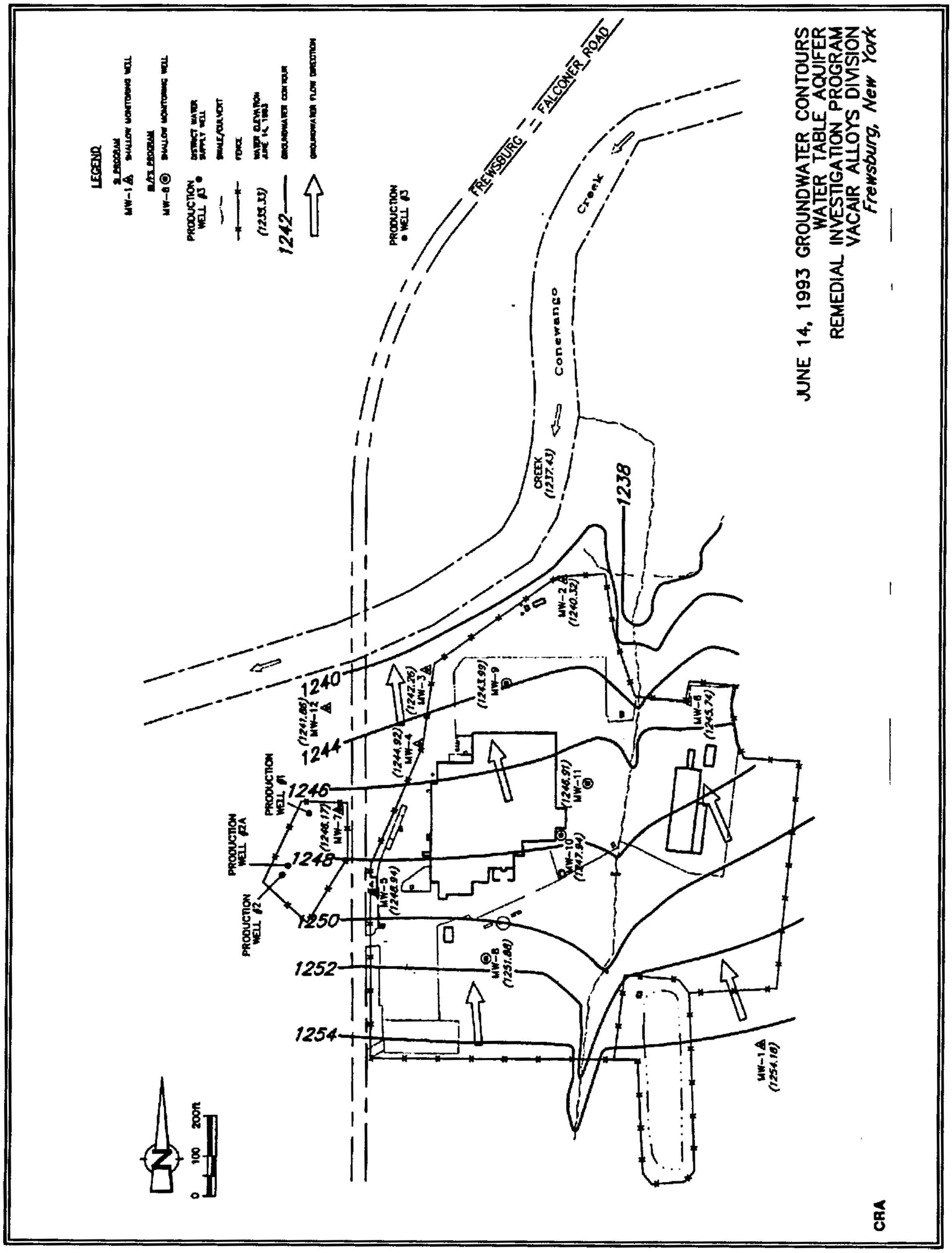
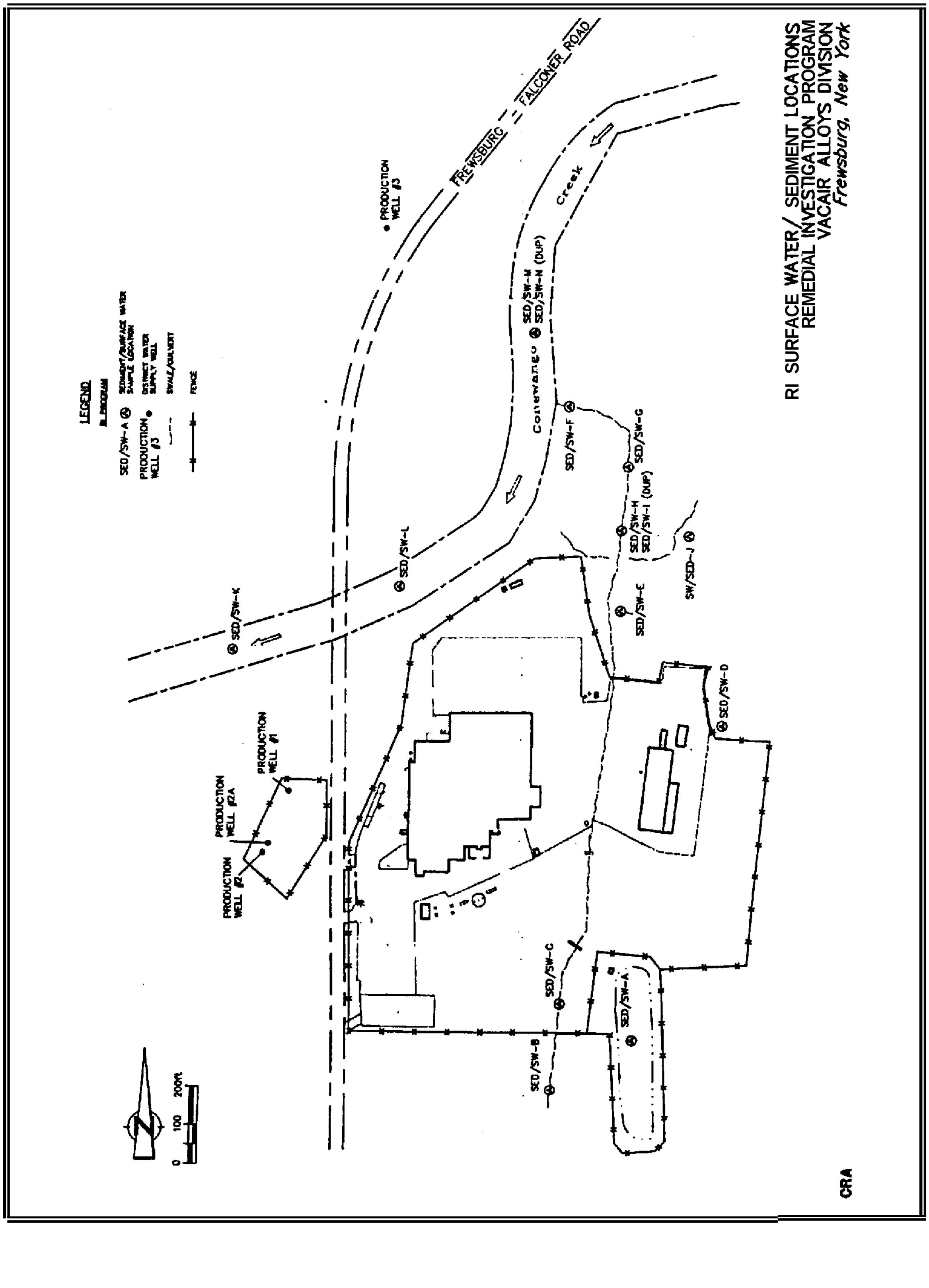


FIGURE 4
SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS



entering the conduit when groundwater is **high** and being discharged to the lowland area. Concentrations of VOCs at this location ranged from 1,100 ppb to 1,620 ppb and consisted of relatively equal amounts of TCE and dichloroethene. The degree of contamination decreased as the ditch flowed through the lowland, reducing VOC levels to 330 ppb at the discharge to Conewango Creek. Water quality standards for TCE is 5 ppb. Sediment samples also contained the highest values near the seeps at concentrations of **4,949** ppb to 239,000 ppb. These values decreased to 706 ppb at the discharge. **Soil** guidance clean-up values for TCE is 700 ppb. The decrease in concentration is most likely the result of the natural volatilization of the chemicals. Water samples taken in the lowland area, away from the ditch, showed trace levels of VOCs at 11 ppb.

Several metal parameters were detected in lowland soils/sediment that exceeded the Fish and Wildlife "severe effect" criteria guidance. These parameters consisted of: cadmium, chromium, copper, lead, manganese, mercury and nickel. While the highest sediment concentrations **of** these metals were located near the seeps and tributary plant drainage discharges, lower concentrations were evenly distributed throughout the lowlands area. Analyses of surface water samples for metals detected high levels at only two locations: the discharge of the tributary stream, and the drainage conduit from the Remelt Building area near sediment sample location SED/SW-D (Figure **4).** Metal concentration from these areas exceeded surface water quality standards. Unlike the VOCs, the metals contamination appears to be the result of stormwater runoff from the facility's manufacturing areas into the lowland and is not related to groundwater. The primary contaminants detected in surface water and sediment are as follows:

SURFACE WATER

Contaminant	Concentration Range (ppb)
trichloroethene	ND-62,000
1,2-dichloroethene	ND-130,000
vinyl chloride	ND-5,300
1,l-dichloroethene	ND-10
cadmium	ND-166
chromium	ND-2,900
copper	ND-1,850
lead	ND-1,390
manganese	ND-11,000
mercury	ND-10.7
nickel	ND-5,670

ND-Non-detectable

SEDIMENT

Contaminant	Concentration Range (ppm)
trichloroethene	ND-1,000
1,2-dichloroethene	ND-230,000
vinyl chloride	ND-31,000
1,1-dichloroethene	ND-1,300
cadmium	ND-49
chromium	ND-1,130
copper	8.8-796
lead	15.2-800
manganese	211-3,960
mercury	ND-8
nickel	11.8-1,720

ND-Non-detectable

Air Pathways Analysis

The concentrations of the volatile organic compounds, detected at the site, assumed to have one hundred percent volatilization from the soil to the air, and were compared to the ambient guideline concentration **(AGC)** established in the **NYSDEC Air Cleanup Criteria.** The results of modeling of the potential air discharge concluded that all VOCs identified at the site are below the ambient guideline concentration established in the **NYSDEC Air Cleanup Criteria** and do not pose a threat to air quality. In addition, no air monitoring conducted during the remedial investigation detected any site related materials above background readings.

3.2 Summary of Human Exposure Pathways:

This section describes the types of human exposure that may present added health risks to persons at or around the site. A more detailed discussion of the health risks associated with the site can be found in the section of the Remedial Investigation Report, dated March 1994, entitled "Risk Assessment". An exposure pathway is the process by which an individual comes into contact with a contaminant. The five elements of an exposure pathways are 1) the source **of** contamination; **2)** the environmental media and transport mechanism (e.g. air); ***3)*** the point of exposure and uptake mechanism; **4)** the route of exposure (e.g. inhalation, ingestion, etc.); and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Completed pathways (i.e: ways in which people come in contact with contaminants) which are known to, or may, exist at the site include:

- Dermal (skin) contact or ingestion of (eating) surface soil,
- Dermal contact or ingestion of sediments in the lowland areas,
- Ingestion of or dermal contact with surface water in the lowlands area,
- Ingesting of (drinking) groundwater in the Water Table Aquifer,
- Ingesting of (drinking) groundwater in the Frewsburg Aquifer, (Although this source is not currently used as drinking water supply)
- Ingestion of or dermal contact with excavated subsurface soils,
- Inhalation of (breathing) contaminants by on-site workers during excavation **of** subsurface soils.

The Risk Assessment selected eighteen chemicals of concern **(COCs)** which included five volatile organic compounds (VOCs), four semi-volatile organic compounds (SVOCs) and nine metal parameters in the various media (groundwater, soil, sediment and surface water). A summary of the Chemicals of Concerns (COCs) is found on Table 1.

The results of the Risk Assessment concluded that the risks associated with exposure to soils, groundwater, sediments and surfacewater for current and future land **uses** and the exposure pathways previous discussed, are marginally above the accepted 1×10^{-6} to 1×10^{-4} range as established by United States Environmental Protection Agency (1.12 x 10-4 and ***5.65*** x 10-4 for the average and reasonable maximum exposure scenarios, respectively) . The hazard indices associated with exposures to surficial soils, sediment and surfacewater are also all below the level of concern of 1.0. Risk calculations for the various media can be found in the RI Report.

The RI concluded that investigative activities performed to date could not identify any physical and/or hydraulic connection between the contaminated, upper Water Table Aquifer and the lower Frewsburg Aquifer, that will have resulted in the contamination detected in September 1991. However, based on the proximity of the aquifer to the site and the contaminants that were detected at the site and the aquifer, the most likely source of contamination in the aquifer remains to be the Vac Air Site. **Therefore, recontamination of the Frewsburg Aquifer may occur if proper conditions exist.** A new water supply well, that was installed approximately 3000 feet northeast of the property, is currently in use. Although the quality of the Frewsburg Aquifer is routinely monitored, the aquifer is no longer used as a potable water supply. The risk assessment did not incorporate the future use of the Frewsburg Aquifer into the analysis of risks associated with the site. This was because the potential risks associated with the possible future use of the aquifer could not be predicted or quantified due to the isolated case of contamination detected in the Frewsburg Aquifer prior to the RI.

3.3 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposure which may be presented by the site. The Ecological Assessment included in the RI was performed in accordance with requirements of the NYSDEC guidance document, "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites", dated June 18, 1991, and presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

Major natural resources within two miles of the plant site include freshwater wetlands and Conewango Creek. There are portions of three NYS freshwater wetlands and a number of mapped federal wetland areas within this area.

As previously described in Section 4.1, site contaminants (VOCs and metals) have been detected in these protected wetland areas adjacent to the site. Release of site contaminants to the environment include: the infiltration of contaminants into the below grade culvert that carries the unnamed stream across the property. This water is eventually discharged to the lowland area; contaminated groundwater release to Conewango Creek; contaminated groundwater release to the lowland area; and discharge of contaminated site runoff to the lowland area. These releases have resulted in the contamination of off-site surface water and sediments.

Contamination has also been confirmed in creek bank soil and the lowland discharge to Conewango Creek, although no VOCs were detected in water or sediment samples collected from Conewango Creek itself. Based on the results of the Assessment, several potential pathways of contaminant migration could exist. An exposure pathway is the process by which an individual species comes into contact with a contaminant which includes in this case: (1) direct contact with affected surface water and/or sediments; (2) ingestion of contaminated surface water as a drinking water source; (3) ingestion of contaminated sediments with food materials; and (4) ingestion of affected terrestrial and/or aquatic animals and plants. The potential exposure of wildlife to site contaminants is high since the lowland area is isolated from the site and contains the type of environmental setting that draws animal attendance to such easily accessible water and shelter for protection.

SECTION 4: SUMMARY OF THE REMEDIATION GOALS

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

TABLE 1
SELECTED CHEMICALS OF CONCERN

Soils

trichloroethene (TCE)
1,2-dichloroethene (1,2-DCE)
PCBs (total)
beryllium
cadmium
copper
nickel
thallium
vanadium

Surface water

trichloroethene (TCE)
1,2-dichloroethene (1,2-DCE)
Vinyl chloride (VC)
cadmium
copper
lead
manganese
nickel

Groundwater

trichloroethene (TCE)
1,1-dichloroethene (1,1-DCE)
1,2-dichloroethene (1,2-DCE)
Vinyl chloride (VC)
manganese

Sediment

trichloroethene (TCE)
1,1-dichloroethene (1,1-DCE)
1,2-dichloroethene (1,2-DCE)
Vinyl chloride (VC)
benzo(a)anthracene
benzo(b)fluoranthene
benzo(a)pyrene
bis(2-ethylhexyl)phthalate
cadmium
copper
lead
manganese
mercury
nickel

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 media-specific Remedial Action Objectives (RAOS) are intended to be objectives and that the ability to meet the specified RAOs are limited by the remedial technology and the nature of the contamination at the Site.

The goals selected for this site are:

General:

- Provide for the attainment of Remedial Action Objectives (RAOs) (Table 2) for groundwater, surface and subsurface soil, surface water and sediment to the maximum extent practicable.

Groundwater:

- To restore groundwater in the Frewsburg Aquifer (lower sand and gravel) to levels acceptable for future use (ie. drinking water supply).
- To prevent the existing or future exposure of human receptors to contaminated groundwater.
- To prevent via groundwater, releases to surface water bodies.
- To prevent or mitigate contaminant migration from the Water Table Aquifer to the Frewsburg Aquifer.

Soil:

- To prevent or mitigate the migration of contaminants in the soil that will cause groundwater and surface water contamination above standards.
- Eliminate, to the maximum extent practicable, the potential for direct human or animal contact with contaminated soil.

Surface Water/Sediment:

- To prevent direct contact/ingestion of contaminated surface water and sediments.
- To prevent off-site migration of contaminated surface water and sediment.
- To prevent the release of contaminants from sediments that will result in the exceedance of surface water standards.
- To prevent adverse impacts to human or fish and wildlife from contact and/or ingestion.

Air:

- To prevent or mitigate the release and inhalation of airborne contaminants above acceptable standards.

SECTION 5: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the VacAir site were identified, screened and evaluated in a three-phase Feasibility Study. This evaluation is presented in the report entitled Feasibility Study Report, VacAir

TABLE 2
REMEDIAL ACTION OBJECTIVES

Media	Remedial Goal
Groundwater	**Maximum Concentration (ppb)**
trichloroethene	5
1,2-dichloroethene	5
vinyl chloride	5
1,l-dichloroethene	5
1,1,2-trichloroethane	5
tetrachloroethane	5
xvlene	5
benzene	5

Soil	Maximum Concentration (ppb)
trichloroethene	1.0
1,2-dichloroethene	1.0
vinyl chloride	0.2
xylene	1.2
benzene	0.06
ethylbenzene	5.5
toluene	1.5
PCBs	1.0 (surface soil) 10.0 (subsurface soil)

Surfacewater	Maximum Concentration (ppb)
trichloroethene	11
1,2-dichloroethene	5
vinyl chloride	2
1,l-dichloroethene	5
cadmium*	1.3
chromium*	240
copper*	13.8
lead*	4.0
manganese	300
mercury	0.2
nickel*	110

Sediments	Maximum Concentration** (ppb)
cadmium	9
chromium	110
copper	110
lead	110
manganese	1100
mercurv	1.3
nickel	50

* Goal calculated based on a surfacewater hardness of 120 ppm (mg/l)
** Target values based upon preliminary guidance. Final goals will be established during design in accordace with the sediment remediation goals given in Section 4 above.

Alloys Division, Frewsburg, New York, (CRA, March 1995) and subsequent revisions. A summary of the detailed analysis follows.

5.1: Description of Alternatives

Alternative 1 : **No** Action

Present Worth:	$ 0
Capital Cost:	$ 0
Annual O&M:	$0
Time to Construct	0 years

The "No Action" alternative would provide no active remedial measures **to** improve the environmental conditions at the site be taken.

This is an unacceptable alternative as the site would remain in its present condition, and human health and the environment would not be adequately protected. Natural attenuation (dilution) and biodegradation would be the only action that would reduce VOC levels in site soil and groundwater.

Alternative **2:** Institutional Controls and Monitoring

Present Worth:	$ 815,00
Capital Cost:	**$ 10,000**
Annual O&M:	$144,200
Time to Construct	0.25 year

Alternative **2** is the Institutional Controls and Monitoring alternative. This alternative includes the implementation of institutional controls to restrict exposure to contaminated soil and groundwater. **Institutional** controls may consist of fencing, deed restrictions, and paving of exposed soil areas. This alternative would also require implementation of a groundwater monitoring program. This program would be used to monitor groundwater conditions and provide a **data** base for periodically reevaluating the risks and assessing whether future remedial actions may be required. However, contaminated groundwater would continue to impact the lowland area and off-site groundwater.

Alternative **3A:** Wellpoint Extraction **System**

Present Worth:	**$3,614,800**
Capital Cost:	**$1, 059,600**
Annual O&M:	$285,200
Time to Construct	1 year

Alternative 3A, Wellpoint Extraction System consists of **a** wellpoint extraction system which would be designed to eliminate **off-site** migration **of** contaminated groundwater. The system would consist of a number of wells spaced approximately 100 feet apart. The wells would be positioned within physically low surface areas or dips in the underlaying clay surface. Additional wells would be located in the concentrated areas of contamination near MWs **2** & 11 (Figure ***5).*** The groundwater extracted from the system, would be treated using Ultra Violet (UV) oxidation or other acceptable **means,** such as activated carbon or air stripping, and discharged to Conewango Creek in accordance with limitation imposed by DEC to protect water quality. This remedy would also include asphalt paving of the active plant areas. The paving activity would serve **to:** 1) control stormwater run-off from the manufacturing areas, **2)** inhibit percolation of rain and snow melt into the contaminated soil, **3)** inhibit the release of contaminants in the air through volatilization, and **4)** eliminate direct contact with contaminated soils. Sediment catch basins air through volatilization, and 4) eliminate direct contact with contaminated soils. Sediment catch basins would be installed to collect run-off prior to discharge to the lowlands or Conewango Creek. A Best Management Practice Plan (currently in the facilities State Pollutant Discharge Elimination System (SPDES) permit) would be modified to require maintenance of the paved area and sediment collection basins. This alternative would also include a groundwater monitoring program. This monitoring program would evaluate the effectiveness of the extraction system by monitoring both contaminant reduction and groundwater flow patterns, created by the system. The highest levels of contaminated sediment in the lowland, are adjacent to the existing drainage swale through this area and at the discharge points from the tributary stream and the plant facilities. Excavation of sediment in the wetland would be limited , to reduce damage to the natural habitat. Therefore sediment excavations would only be performed adjacent to the drainage ditch and in the areas of the discharge points from the tributary stream, the plant facilities, and the groundwater seeps. Deed restrictions would be placed on the property noting that contamination exists in subsurface soil and groundwater. Proper precautions would be required to be taken when performing intrusive activities on the site. The deed restriction would also prevent the site from being used for anything but industrial activities.

Alternative 3B: Barrier Wall and Extraction Wells

Present Worth:	**$4,393,400**
Capital Cost:	$ **1,490,800**
Annual O&M:	**$313,200**
Time to Construct	1 year

Alternative **3B, Barrier Wall and Extraction Wells,** would use a nonexcavated type barrier wall to control the release of contaminated groundwater from the site to Conewango Creek. A barrier wall would create a physical barrier that would prevent the discharge of contaminated groundwater from entering Conewango Creek. The barrier wall would be made of materials such as High Density Polyethylene Sheets or steel sheet piling that are driven through the surficial overburden soil and anchored into the upper confining layer clay soil. ***An*** extraction well system would be constructed to remove groundwater upgradient of the barrier wall. The well system would consist of approximately seven wells located adjacent the barrier wall and in areas of concentrated contamination near **MWs 2 & 11.** Additional remedial aspects of Alternative **3B** such as the method of groundwater treatment, control and management of stormwater runoff, removal of lowland sediments, and implementation of deed restrictions would be the same as those described in Alternative **3A.**

Alternative 4A: Well **Point Extraction System and In-situ Soil Vapor Extraction**

Present **Worth:**	**$4,234,100**
Capital Cost:	$ **1,385,000**
Annual **O&M:**	**$443,200**
Time to Construct	**1** year

Alternative 4A, **Wellpoint Extraction System and Soil Vapor Extraction,** is an enhancement of Alternative **3A.** In addition to the well point extraction system as discussed in Alternative **3A,** Alternative **4A** would include installation of an in-situ (in place) **soil** vapor extraction system. Soil vapor extraction (SVE) systems would be installed in areas where soil contamination exceeds RAO values. These areas are located primarily in the vicinity of **MWs 2 & 11** (Figure 5). SVE technology utilizes a vacuum to remove the air contained between the soil particles. Contaminants within the soil are volatilized, transported with the air, and removed from the **soil.** The extracted soil **gas** would be treated and discharged to the atmosphere. Data from a recent pilot study indicates that SVE may not be effective in the northern soils area. Therefore, an alternative to SVE would be necessary to address soils in this area. The alternative remedy may be one of those considered in the **FS,** or a combination of alternatives suggested by the results of the treatability study. In addition to the groundwater extraction system a Non-Aqueous Phase Liquid (NAPL) extraction system would be installed in areas **of** the site **if** and when NAPL is detected during the remedial activities. **This** system would be used to remove the highly concentrated NAPL from the soil and groundwater to expedite attainment **of** RAOs for the site.

Alternative 4B: Barrier Wall, Extraction Wells and In-Situ Soil Vapor Extraction

Present **Worth:**	**$5,012,700**
Capital Cost:	$ **1,816,200**
Annual O&M:	**$471,200**
Time to Construct	1 year

Alternative 4B, **Barrier Wall, Extraction Wells and In-Situ SVE,** consists of the remedial components of Alternative **3B** with the addition of SVE. SVE systems would be installed in areas where soil contamination exceeds RAO values. These areas are located in the vicinity of **MWs 2 & 11.** The extracted soil gas would be treated and discharged to the atmosphere. **A** NAPL extraction system **(as** described in Alternative **4A** above) would be installed.

Alternative 5: Soil Excavation with Off-site Disposal

Present Worth:	**$ 26,869,900**
Capital Cost:	**$24,314,700**
Annual **O&M:**	**$285,200**
Time to Construct:	**2** years

The excavation of soil would include the removal **of** all soil and debris containing contaminants above soil cleanup objectives from the areas of **VOC** contamination. Contaminated soil at the site would be disposed off-site at an appropriate permitted disposal facility. Excavated materials would be transported by **truck** to the disposal facility concurrent with the excavation activities. Proper disposal of the soil would consist of either incineration or landfilling in a regulated disposal facility. The disposal method would depend on the concentration of the soil. At the conclusion **of** the excavation activities, a groundwater extraction system would be installed to remove residual contamination in the groundwater.

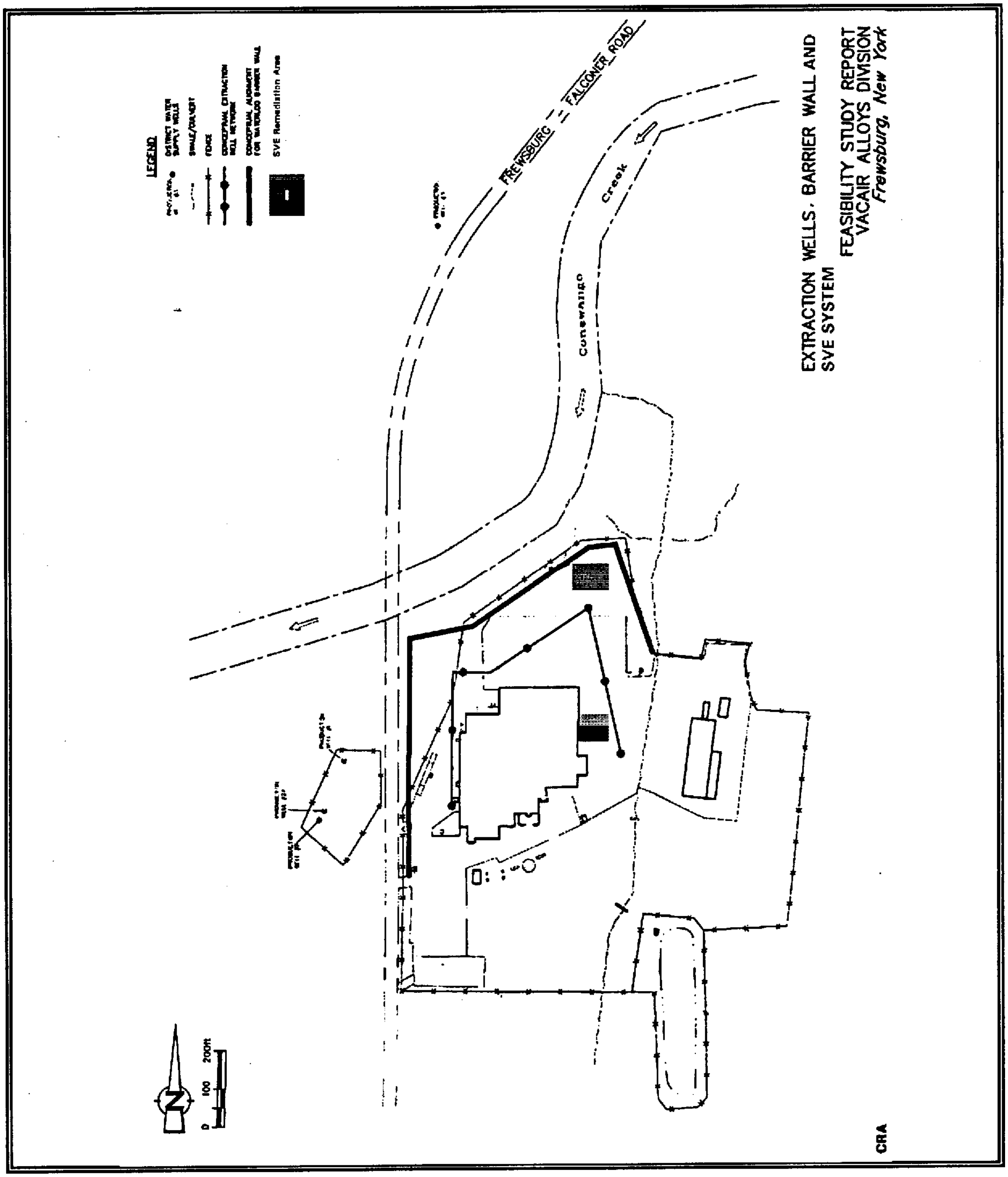
5.2 EVALUATION OF REMEDIAL ALTERNATIVES

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 Regulation (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 GUIDANCES (SCGs.**
Compliance with ***SCGs*** addresses whether or not a remedy would meet applicable environmental laws, regulations, standards, and guidance.

Alternatives 1 and 2 would **not** comply with chemical-specific ***SCGs.*** Alternatives 3A, **3B,** 4A and **4B** would result in compliance with chemical-specific ***SCGs.*** Alternatives **3A** and **3B** may require a longer time than Alternatives **4A, 4B** and **5** to comply with chemical-specific ***SCGs* for** groundwater since this alternative would rely solely on attenuation/leaching/degradation to remove soil contamination. Alternatives 4A and **4B** would treat contaminants, by **SVE,** in areas **of** the site where the contaminant in the **soil** exceed established cleanup goals. Alternative 5 would remove all contaminated soil, which would

FIGURE 5
WELL POINT EXTRACTION SYSTEM
and
SOIL VAPOR EXTRACTION SYSTEM LOCATIONS



eliminate the primary source of contaminants to the groundwater and result in the quicker remediation of the Water Table Aquifer.

All seven remedial alternatives would comply with ***SCGs*** for air emissions. Alternatives 4A and **4B** would require a treatment system to remove VOCs from the air streams generated by the SVE. Alternative 5 would result in the generation of fugitive dust emissions and volatilization of contaminants during the excavation and handling of contaminated soils which would need to be controlled.

Alternative 5 would comply with action-specific ***SCGs,*** such as the land disposal restrictions regulations. Proper disposal and/or treatment of the soil at regulated disposal/treatment facility would be required. All of the other alternatives would comply with the action-specific and location-specific ***SCGs.***

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.

The range of protectiveness of the seven alternatives range from no protection provided by Alternative 1, to maximum protection provided by Alternative 5.

Alternatives 3A, **3B,** 4A and 4B are equally protective of human health with respect to preventing potential exposure to contaminated media by use of institutional controls. Alternative **2** would only be equally protective if the use of the Frewsburg aquifer **was** prohibited for drinking use.

Alternatives 3A, 3B, 4A and 4B are equally protective of the environment, while Alternative ***5*** provides the maximum protection of the environment by removing all of the contaminated soils. Alternatives 3A, 3B, 4A and 4B provide for the collection and treatment of contaminated groundwater and the hydraulic containment of groundwater to minimize off-site migration of contaminants. Alternative 5 provides for the maximum protection since all contaminated soil would be removed from the site.

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

The short-term effectiveness of the remedial alternatives range from no risk to community, workers or the environment during implementation of Alternatives **1** and **2** to **low** potential risk from Alternatives 3A, 3B, **4A** and 4B and to the greatest potential for short-term risk from Alternative ***5.*** Alternative 5 would pose the greatest additional short-term risk to the community and the workers due to the potential of exposure to contaminated soils during excavation activities. Alternatives **3A, 3B, 4A** and **4B** present a limited short-term risk of exposure to contaminants during the installation of the groundwater extraction system, non-excavating type barrier wall and/or soil vapor extraction systems. Alternative ***5*** presents the greatest potential risk of exposure due to the large extent **of ground** intrusive activities required. Alternatives 1 and **2** present no risk since no remedial actions would be performed. All the alternatives could be constructed and begin operation in less than two years. However, the period of time to obtain the remedial action objectives would vary based on the technology(ies) used.

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

The long-term effectiveness and permanence of Alternatives 1 and **2** are minimal, since no effective remediation would be conducted. Alternatives 3A, 3B, 4A, 4B and ***5*** provide long-term effectiveness and permanence for prevention of migration of contaminated groundwater,

Alternatives 3A and 3B rely on attenuation, degradation, and active leaching to address sohyl contamination and would rely on institutional controls in the long-term to effectively prevent exposure to contaminants in the soils. The attenuation and leaching processes would be more effective with Alternatives 3A, 3B, 4A, 4B and 5 than in Alternatives 1 and **2** since extraction wells would be installed and pumped to increase the flow of groundwater through the contaminated areas.

Alternatives 4A and 4B provides for the use of in-situ **SVE** for removal of VOCs in soils with the highest levels of contaminants in order to reduce the overall volume of contaminants remaining in the soil. It is anticipated that within five years the in-situ SVE would remove enough contaminants in the source areas to achieve the soil RAOs and/or to the greatest extent feasible. Since Alternatives 4A & 4B utilize active soil remedial technologies **(SVE),** they provide a greater long-term effectiveness than Alternatives 3A & 3B.

Alternative 5 would remove the bulk of contaminated soil but leaves the clean backfilled **soils** subject to passive recontamination unless all residual contamination is removed.

5. <u>REDUCTION OF TOXICITY, MOBILITY AND VOLUME</u> Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 1 and **2** would result in minimal reduction of toxicity, mobility or volume of Contaminants in the groundwater as a result of natural attenuation and biodegradation. Alternatives 3A, 3B, 4A, 4B and 5 would reduce the toxicity, mobility and volume of contaminants in groundwater and/or soil.

The mobility of contaminants would be reduced in Alternatives 3A, 3B, 4A, 4B and ***5*** due to the hydraulic containment of the on-site Water Table Aquifer. However, during certain times of the year when the water level in Conewango Creek is below the water level in the Water Table Aquifer, some groundwater in the Water Table Aquifer may flow off site into Conewango Creek. However, the quantity and impact to the water quality in the Creek **is** expected to be minimal. **It** is expected that the effectiveness of the proposed wellpoint extraction system (Alternatives 3A, 4A and ***5)*** to achieve hydraulic containment and reduce the mobility of groundwater contaminants would be similar to that of a traditional extraction well network combined with a barrier wall (Alternatives 3B and 4B). The toxicity and volume of contaminants in the groundwater would be reduced by Alternatives 3A, 3B, 4A, 4B and 5 by the groundwater extraction and treatment systems.

Alternatives 3A and 3B would reduce toxicity and volume of contaminants in the soil by the active leaching and natural biodegradation processes. These processes are aided by the operation of the groundwater extraction and treatment system. Because well points would be located with source areas, contaminant removal from the soil and groundwater with the highest levels of VOCs would be accelerated. Alternatives 4A and 4B provide for the removal of contaminants in the soil by **SVE.** SVE is used to remove volatile contaminants that are contained in the unsaturated soils (soils above the water table). Since this upper soil consists primarily of granular fill, SVE **should** be effective in the treatment of these types of soil. A treatability study would be required to determine the actual degree of effectiveness at the site and if effective, SVE would result in a quicker removal of contaminants in the source areas.

Alternative 5 provides for the maximum reduction in the toxicity, mobility and volume of contaminants at the **site,** but would not permanently destroy the contaminants unless all contaminated soils are incinerated/treated at an off-site disposal facility.

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

All of the alternatives, except for Alternative **5**, are readily implementable. Required services and materials are generally available and the technologies rely on standardized construction methods and demonstrated technologies.

Alternatives 3A and 4A, which include a wellpoint extraction system, could be readily modified by the addition of wellpoints or implementation of a barrier wall contingency plan, if required.

Alternative **5** would be difficult to implement at the site due to the large volume of soil requiring excavation and the condition of the site. Excavation activities would impact and may in fact require the shutdown of daily plant operations. In addition, **it** may be difficult to obtain disposal approvals from Treatment Storage & Disposal Facilities (TSDFs) due to the limited number and capacities of TSDFs, and this alternative may not comply with action specific SCGs (e.g., the RCRA land disposal restrictions).

Alternatives 3A, **3B,** 4A and 4B would require bench scale testing during the Remedial Design to determine the design parameters required for the UV oxidation system. Alternatives 4A and 4B would require development of an alternative to SVE for the northern **soils** area.

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

The cost associated with the implementation of the remedial alternatives are lowest for the "No Action" alternative and increase successively for Alternatives **2,** 3A, 4A, 3B, 4B and 5. Table **3** presents a comparison of the estimated capital and Operation & Maintenance cost for each of the remedial alternatives evaluated.

Long-term operation and maintenance costs are based on **30** years of groundwater extraction and treatment, five years **of** SVE operation and **30** years **of** groundwater monitoring. The estimated net present worth ranges **from** $0 **for** Alternative 1 to approximately $27M for Alternative **5.**

8. <u>COMMUNITY ACCEPTANCE</u> Concerns of the community regarding the RI/FS report and the Proposed Remedial Action Plan (PRAP) have been evaluated. A "Responsiveness Summary" **was** prepared that describes public comments received and is attached as Appendix C. The Responsiveness Summary describes public comments received during the public comment period an the meeting held on February 14, 1996, regarding the Proposed Remedial Action Plan, and how the Department would address the concerns raised.

SECTION 6.0 <u>SUMMARY OF THE SELECTED REMEDY</u>

Based upon the results of the RI/FS, and the evaluation presented in Section 5, **the NYSDEC is selecting Alternative 4A; a Wellpoint Groundwater Extraction System (and treatment of groundwater), installation of a Soil Vapor Extraction System (to address contaminated soil), a NAPL recovery system (to address and remove free product in soils and/or groundwater) in conjunction with the excavation and off-site disposal of contaminated sediments in the lowland area, as the remedy for this site.**

If, after a three to five year evaluation period, it is determined that the RAOs cannot be met, then a barrier wall contingency plan will be implemented which will result in a final remediation program similar to Alternatives 4B.

Selection of the Recommended Remedial Alternative

Remedial Alternative **5** provides the most effective reduction of site contaminants in the shortest time frame, but also **has** the highest short-term risk of exposure of site workers and the community. In addition, it would be difficult to implement Alternative **5** due to the amount of soil requiring excavation and off-site disposal and the location of contaminated soils within active plant operation areas. Therefore, Alternative **5** was not selected as the preferred remedial alternative.

Alternatives 3A, 3B, 4A and 4B are equally protective of human health and all should achieve the remedial action objectives.

The only difference between Alternatives 3A/4A and 3B/4B is the type of groundwater collection and containment technology. Alternatives 3A/4A include the use of a wellpoint extraction system, and Alternatives 3B/4B use a nonexcavating **type** barrier wall and a traditional groundwater extraction well network. Both of these technologies have the same capability of achieving the groundwater RAOs for the site and both may result in some loss of hydraulic containment when the water level in the Conewango Creek is lower than the water level in the Water Table Aquifer. The incremental benefits, with respect to the Alternatives 3B and 4B ability to achieve the groundwater RAOs, are minimal and cannot justify the increased cost of approximately $780,000 to install a barrier wall at this time. If the wellpoint extraction system does not achieve the degree of containment required to meet the RAO's and protect public health and the environment, a barrier wall can added. The effectiveness of the extraction well system will be evaluated on its ability to prevent contaminant release to Conewango Creek and the lowland areas and to capture groundwater on the site to achieve groundwater standards. The following aspects of the proposed wellpoint extraction system will ensure that hydraulic containment is achieved and that the groundwater RAOs are met:

i) close spacing and more extraction wellpoints will allow for increased capture between extraction wellpoints;

ii) installation of wellpoints within **source** areas will create a zone of capture within the areas of highest VOCs level and minimize the migration and contribution of contaminants from the source areas;

iii) wellpoints will be installed ("sumped") **into** the Clay Confining Unit and operated that the pumping levels are at or below the top of the clay;

iv) additional wellpoints will be added, as necessary, to the system to increase capture of groundwater;

v) wellpoints will be installed within low points or dips in the top of the Clay Confining Unit to enhance contaminant capture; and

vi) when the water level in the Conewango Creek drops below the water table or pumping level, there may be some loss **of** hydraulic containment (this will be true even if a barrier wall will be in place). However, the magnitude and the impact to the water quality in the Creek are expected to be minimal.

In addition, to provide further assurance that the wellpoint extraction system technology will be effective, a monitoring and effectiveness evaluation program will be performed as part of Alternative 4A. If, after a three to five year evaluation period, it is determined that the RAOs cannot be met, then a barrier wall contingency plan will be implemented, which will result in a final remediation program similar to Alternative 4B.

The total costs for implementing Alternative 4A with the barrier wall contingency plan are similar to the total net present worth costs for Alternative 4B. Alternative 4A includes all the components of Alternative 3A plus the installation and operation of an in-situ SVE remedial system and the recovery of any NAPL found during the remedial activities. Alternative 4A costs approximately $620,000 more than Alternative 3A.

The long-term effectiveness and performance of SVE has been evaluated in a recent pilot study. Preliminary results indicate that SVE may not be effective in the northern soils area. *Therefore, an alternative remedy will be developed to address contamination in this area. The alternative remedy may be one of those considered in the FS, or a combination of alternatives suggested by the results of the treatability study. If upon completion of this evaluation, another soil treatment technology is to be used at the site, the DEC will notify the public of the change. If a fundamental change in the scope, performance, or cost of the site remedy is needed to remediate the northern soils area, a proposal to amend the Record of Decision will be made and the community will be given an opportunity to comment on the change.*

The estimated present worth cost to implement the remedy is $4,234,100. The cost to construct the remedy is estimated to be $1,385,000 and the estimated average annual operation and maintenance cost for 30 years is $443,200.

The elements of the proposed remedy are as follows:

- Installation of a wellpoint extraction system designed to eliminate to the greatest extent possible the off-site migration of contaminated groundwater to Conewango Creek and the lowland area.

- Treatment of extracted groundwater using UV oxidation or other acceptable means with discharge to Conewango Creek.

- Excavation and disposal off-site of contaminated sediment in the lowland, adjacent to the existing drainage swale and leachate seeps. The limits of sediment removal will be defined during design.

- Treatment of contaminated soils on-site using In-situ soil vacuum extraction. Recent data indicates that vacuum extraction will not be effective in the "northern soils area," *An* alternative method of soil remediation will be identified.

- Construction of a NAPL extraction system to be installed in areas of the site where NAPL is detected during the remedial activities.

- Construction of an asphalt cap covering the active plant areas.

- Installation of sediment catch basins to collect runoff prior to discharge to the lowland or Conewango Creek.

- Implementation of a Best Management Practice Plan to require maintenance of the paved area and sediment collection basins.

- Implementation of deed restrictions on the site property to restrict site use and intrusive activities.

TABLE 3

SUMMARY OF PRELIMINARY COST ESTIMATES

Alternative No.	Description	Capital Cost	Annual O&M cost	Estimated Present Worth
1	- No Action	$0	$0	$0
2	- Institutional Controls - Long Term Monitoring	$10,000	$144,200	$815,000
3A	- Institutional Controls - Wellpoint Extraction System - Sediment Excavation and Disposal - Long Term Monitoring	$1,059,600	$285,200	$3,614,800
3B	- Institutional Controls - Barrier Wall - Wellpoint Extraction System - Sediment Excavation and Disposal - Long Term Monitoring	$1,490,800	$313,200	$4,393,400
4A	- Institutional Controls - Wellpoint Extraction System - Soil Vapor Extraction - Sediment Excavation and Disposal - NAPL Extraction - Long Term Monitoring	$1,385,000	$443,200	$4,234,100
4B	- Institutional Controls - Barrier Wall - Wellpoint Extraction System - Soil Vapor Extraction - Sediment Excavation and Disposal - NAPL Extraction - Long Term Monitoring	$1,816,200	$471,200	$5,012,700
5	- Soil Excavation and Disposal - Institutional Controls . Wellpoint Extraction System . Long Term Monitoring	$24,314,700	$285,200	$26,869,900

- Implementation of a long term monitoring program which will allow the effectiveness of the selected remedy to be monitored. This long-term program will be a component of the operation and maintenance for the **site** and will be developed in accordance with the Remedial Design.

SECTION 7: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a Citizen Participation Plan, dated September 1992, was developed for the VacAir Alloys site project. The objectives of the plan are: promote public understanding of the NYSDEC's responsibilities, planning and remedial activities; provide opportunities for the **NYSDEC** to learn from the public; and provide information that would facilitate a comprehensive remedial program protective of both public health and the environment.

The following public participation activities have been conducted as part of the project:

* A Citizen Participation Plan dated September 1992 was developed.

* A document repository was established at the Town of Carroll Town Hall, Town Clerk's Office.

* Held a public meeting on January 9, 1992 to discuss the results of the Site Investigation and additional investigative work to be conducted as part of the proposed Interim Remedial Action.

* Held **a** public meeting on September **30,** 1992 to discuss the proposed investigative work to be conducted as part of the Remedial Investigation.

* Developed and mailed Fact Sheets to all interested parties concerning the status of activities on the site dated:
  December 1991, September 1992, December 1993, May 1994 and January 1996.

* Held a public meeting on February 14, 1996 to present the Proposed Remedial Action Plan (PRAP) for the site. Comments received during the meeting and the public comment period (from February 1, 1996 to March 1, 1996) and the Department's responses are presented in the Responsiveness Summary in Appendix C. The selected remedy is the same as proposed in the PRAP.

APPENDIX A

ADMINISTRATIVE RECORD

1. Consent Order No. **B9-0333-90-05,** dated December 14, 1990: Required Keywell to conduct a Site Investigation at site.

2. Site Investigation **Work** Plan, VacAir Alloys Corporation, Frewsburg, New **York,** dated December 1990.

3. Site Investigation Report, VacAir Alloys Division, Frewsburg, New York, dated October. 1991.

4. VacAir Alloys plant property listed on the New York State Registry of Inactive Hazardous Waste Site as a Class 2 site, August 6, 1991

5. Consent Order No. **B9-0333-90-05,** dated January **7,** 1992: Required Keywell to conduct **an** Interim Response Action at the site.

6. Interim Response Actions **Work** Plan, VacAir Alloys Division, Frewsburg, New **York,** dated January 1992

7. RI/FS Health and Safety Plan, VacAir Alloys Division, Frewsburg, New **York,** dated August 1992.

8. RI/FS Quality Assurance Project Plan (QAPP), VacAir Alloys Division, Frewsburg, New York, dated August 1992.

9. Remedial Investigation/Feasibility Study Work Plan, VacAir Alloys Corporation, Frewsburg, New **York,** dated August 1992

10. Citizen Participation Plan, dated September 1992

11. Consent Order No. **B9-0333-90-05,** dated November **30,** 1992: Required Keywell to conduct **an** Remedial Investigation/Feasibility Study at the site.

12. RUFS Preliminary Remedial Action Objectives Technical Memorandum No.1, VacAir Alloys Division, Frewsburg, New **York,** dated June 1993.

13. Remedial Investigation Report, VacAir Alloys Division, Frewsburg, New **York,** dated March 1994

14. Feasibility Study Report, VacAir Alloys Division, Frewsburg, New **York,** dated June 1994.

15. NYSDEC - Region 9 Correspondence files

APPENDIX B

GLOSSARY OF TERMS

COCs:	Chemicals of Concern
DCE:	Dichloroethylene
ECL:	Environmental Conservation Law
IRM:	Interim Remedial Measure
NAPL:	Non-Aqueous Phased Liquid
NYCRR:	New York Codes, Rules, and Regulations
NYSDEC:	New York State Department of Environmental Conservation
NYSDOH:	New York State Department of Health
O&M:	Operation and Maintenance
ppb:	Parts per billion
ppm:	Parts per million
PRAP:	Proposed Remedial Action Plan
PRP:	Potential Responsible Party
RAO:	Remedial Action Objectives
RCRA:	Resource, Conservation, Recovery Act
RI/FS:	Remedial Investigation/Feasibility Study
ROD:	Record of Decision
SCG:	Standards, Criteria and Guidances
SVE:	Soil Vapor Extraction
TCE:	Trichloroethylene or Trichloroethene
UST:	Underground Storage Tank
VC:	Vinyl Chloride
vocs:	Volatile Organic Compounds

APPENDIX C

RESPONSIVENESS SUMMARY
for the
PROPOSED REMEDIAL ACTION PLAN

VACAIR ALLOYS SITE INACTIVE HAZARDOUS WASTE SITE
CARROLL(T), CHAUTAUQUA COUNTY
SITE NO. 907016

The Proposed Remedial Action Plan (PRAP) was prepared by the New **York** State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on February 1, **1996.** This Plan outlined the measures for the remediation of the VacAir Alloys Site. The selected remedy consists of:

- Installation of a wellpoint extraction system designed to eliminate to the greatest extent possible the off-site migration of contaminated groundwater to Conewango Creek and the lowland area.

- Treatment of extracted groundwater using W oxidation or other acceptable means with discharge to Conewango Creek.

- Excavation and disposal off-site of contaminated sediment from the lowland, adjacent to the existing drainage swale and leachate seeps.

- Treatment of contaminated soils on-site using in-situ soil vacuum extraction.

- Construction of a Non-Aqueous Phase Liquid **(NAPL)** extraction system to be installed in areas of the site where NAPL is detected during the remedial activities.

- Construction of **an** asphalt cap to cover the active plant areas.

- Installation of sediment catch basins to collect runoff prior to discharge to the lowland or Conewango Creek.

- Implementation of a Best Management Practice Plan, providing maintenance of the paved area and sediment collection basins.

- Implementation of deed restrictions on the site property to restrict future site use and intrusive activities.

- Implementation **of** a long term monitoring program which would allow the effectiveness of the selected remedy to be monitored. **This** long-term program would be a component of the operation and maintenance for the site and would be developed in accordance with the Remedial Design.

The release of the PRAP was announced via a notice to the mailing list on January 30, 1996, which informed the public of the PRAP's availability and the time, date and location of the public meeting.

The public meeting was held on February **14, 1996** at the Frewsburg Central School Auditorium and included a presentation of the PRAP and a discussion of the proposed remedy. Comments on the proposed remedy were received from the public at the meeting and by writing during the comment period. The comment period closed March 1, **1996.**

This Responsiveness Summary responds to all questions and comments raised at the February **14,** 1996 public meeting and received in writing by **NYSDEC.** Comments received have become part of the Administrative Record for this site.

The following are comments related to the PRAP and the State's responses:

1. ***Q.*** Regarding the map showing contamination under the building - does that map show how deep the contamination is? If not, what do the numbers 50, 100, etc. mean?

A. The diagram (see attachments 1 & 2) presented during the PRAP public meeting displayed the general locations of the highest levels of groundwater contamination on the site. The numbers 50, 100, and 150 indicate the level of groundwater contamination of a particular contaminant in parts per million (ppm). The depth of groundwater at the site is generally 5 feet below ground surface, but may fluctuate seasonally.

2. **Q.** What is the building in the bottom corner of the site map (Figure 2)?

A. The building in the east side of the plant site (or bottom of the map) is the "Remelt Building". The building is used for receiving, off-loading and storage of materials brought in by truck to the facility. (see figure No.3)

3. **Q.** How deep is the aquifer? How far below the contamination is the groundwater?

A. The Frewsburg Aquifer **is** located approximately 40 feet below the ground surface. This aquifer is separated **from** the contamination above it by approximately 25 feet of clay.

4. **Q.** **Is** the Town continuing to monitor Wells Nos. 1 **&** 2a for TCE?

A. No. The Town of Carroll is no longer monitoring Town wells Nos. **1 &** 2a since the wells are no longer in use and are no longer part of the public drinking water system.

5. **Q.** What **is** the time frame, for both construction and in terms of actual cleanup?

A. Prior to initiation of construction activities Keywell and NYSDEC must enter in a legal order (Consent Order). This document is presently being negotiated and is expected to be completed this summer, After the Order is signed, design documents, such as plans and specifications must be developed. **This** is expected to take six to nine months. It is therefore expected that construction will not begin until mid **1997.** The time frame to complete construction is approximately one year. The time to clean-up the site will vary based on the effectiveness of the clean-up technologies being implemented at the site. Since groundwater extraction is passive technology a clean-up duration of 30 years was used as a base for the long term cost analysis on.

6. Q. What are costs associated with the remedy?

A. The chosen remedy is estimated to cost $1,816,200 to construct and $471,200 per year to operate, maintain and monitor. The estimated present worth of the project over a 30 year period is $5,012,700. Once the design of the remedial system has been completed, a more accurate cost figure can be calculated.

7. Q. Do you plan to monitor the site for 30 years? If you get clean results for several years, would the monitoring end?

A. **A** specific long term monitoring plan for the site will be developed during the design and construction of the remedy on the site. VacAir will be required to perform any monitoring on the site necessary to assess the performance of the treatment systems and gauge the effectiveness of the remediation at the site. Monitoring will continue until the clean-up goals have been met.

8. *Q*. Who is responsible for the costs -- the State, the taxpayers, the current owners or the previous owners?

A. Keywell Corporation, the current owner of the property and is responsible for the cost of remediation at the site.

9. Q. If this site goes under the State Superfund, would it be a prevailing rate job? And, as such, would the contractor be required to have certified payrolls?

A. Yes, both the prevailing job rate and certified payrolls would be required if the remediation was to be conducted under the State Superfund program using State taxpayers money.

10. Q. Who would do the monitoring - **NYSDEC, NYSDOH,** or the company? And, how often would it be done?

A. The company would be required to perform any long term monitoring required at the site. NYSDEC and/or **NYSDOH** will periodically split samples with VacAir and analyze them separately to confirm the company's results. The company will also be required to use a **NYSDOH** certified laboratory for all analyses.

11. Q. Would they monitor the groundwater for TCE as well as for metals?

A. Specific parameters to be monitored in the groundwater will **be** determined during the preparation of a long term monitoring program. At a minimum, analyses of groundwater for volatile organic compounds (VOCs) such **as** TCE, will be required.

12. **Q.** Right now, are you saying that you do not know what will be done? Could any of the listed plans be implemented? Where is the State headed? Will this be a big State Superfund job, or just one where you drill a couple wells and be done with it?

A. All of the remedial actions presented in the Proposed Remedial Action Plan as Alternative **4B** will be implemented at the site. The remedy will be implemented by Keywell Corp.; not the State.

13. **Q.** At what point would it be decided that sheet piling would be installed?

A. After the extraction wells are installed, the system will be operated for a minimum of one year to determine if the goals of the remediation have been met. If it is determined that the goals cannot be met with the existing system, a backup plan for the installation of **a** physical barrier wall will be implemented. The estimated cost of the construction of the wall is $1 million.

14. **Q.** There is still a lot of product remaining in the groundwater at the site. Why hasn't it all run into the creek by now? Why is there such slow movement? Will the pumping wells speed up the contaminant movement process?

A. In general, groundwater naturally moves through soil very slowly. **As** it passes through the soil it picks up contamination based on the concentration and solubility of the material. Some contamination may also be above the water table and is only transported into the groundwater when precipitation runs down through this soil, bringing the contaminant with it. There **is** also free product (or non-aqueous phase liquid, NAPL), in the vicinity of monitoring well No. 2. This material would naturally adhere to the soil particles and not readily flow into the creek. However, there is a flow of contaminated groundwater into the creek, evidenced by the high concentration of contaminants in groundwater seeps into Conewango Creek and the lowland area. It is expected that installation of extraction wells will expedite remediation of the site. To increase the removal rate of contaminants, the wells will: 1) be located in low points or dips in the clay layer, and 2) be "sumped" into the clay and additional wells will be added in areas where pockets of contamination has been detected, in an effort to remove the greatest amount of Contamination.

15. **Q.** In regard to the proposed asphalt cap - will that speed **up** or slow down the percolation rate of water down through the contamination? Will the cap help or hinder the clean up of the contamination? The contamination has been there a long time.

A. The installation of the asphalt cap will slow down, if not eliminate the percolation of precipitation into the subsurface contamination. The cap will help the overall remediation of the site by controlling run-off from the site.

16. **Q.** Will the list of 9 to 10 remedial actions shown at the meeting be taken, or are they just proposed?

A. Please see the response to question No. 12.

17. **Q.** Are you confident that the clay base extends all over the aquifer? There has to be some way the TCE got down into the aquifer. Every time there is a climate change (i.e.: a flood or a drought) could the aquifer become contaminated again?

A. An extensive number of monitoring wells were installed on the site to determine the location and depth of the clay layer. These wells determined that this barrier layer extends across the site and appears to be prevalent throughout the local area. We know that on at least one occasion, environmental conditions were such that site contaminants entered the lower Frewsburg Aquifer. In that case, a severe drought was in effect, which resulted in the Frewsburg Aquifer losing its artesian condition and the Town was pumping the aquifer at a high rate. It is speculated that a hole in the clay layer may have been caused when a well or soil boring was drilled at the site when the plant was first constructed, resulting in pathway for the contamination to follow. However, there are no records to specifically confirm this.

18. **Q.** Would you, as a member of NYSDEC, feel comfortable living here with this remedy?

A. Yes, based on the information available, there is no current route of exposure to site contaminants for the residents in the Hamlet of Frewsburg because 1) drinking water is safe; and 2) access to contamination is controlled by fence.

19. **Q.** A woman said she understands that TCE is a cumulative poison, and she is concerned about what the potential consumption rate or level was for people at the time the contamination was found in the well.

A. TCE causes cancer in laboratory animals exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels over long periods of time. Whether or not TCE causes cancer in humans is unknown. Some humans exposed to large amounts of this chemical have had nervous system, liver and kidney damage. Exposure to high concentrations of TCE causes liver and kidney damage and effects the immune system and blood in laboratory animals. The concentrations of TCE detected in the Towns well and the duration of potential exposure were not sufficient enough to cause the health impacts associated with this chemical.

20. **Q.** What were the levels of TCE found in the well in Sept. 91?

A. Six separate sampling events took place during September 1991. The concentration of TCE detected in the wells ranged from non-detectable to 465 parts per billion (ppb). The drinking water standard is 5 ppb. A sample collected in October 1991 had a concentration of TCE of 3.5 ppb. Monthly samples, collected and analyzed until April 1993, did not detect any TCE in this well.

21. **Q.** Will water samples continue to be monitored, from the current drinking water source, and if so, for how long?

A. As per NYS Department of Health regulations, for all municipal water supplies, the Town's new well (No.5) is monitored on an yearly basis. The analysis will include a complete chemical analysis, including the volatile organic compounds found at the VacAir site.

22. Q. Are the Town's backup wells (Well Nos. **3 & 4),** monitored.

A. Since these wells are only used as a backup, monitoring requirements are less stringent than for the main well. These wells are monitored periodically for bacteria, metals and other general parameters as required by the NYSDOH.

23. Q. Did you say how often the new drinking water well will be monitored for TCE? Does the scan run on the well include VOCs?

A. Please see the response to question No. **21**.

24. Q. What about the area around the school? The elementary school is relatively close to the area of contamination at the Plant. Do your studies **look** any farther than the Plant boundaries to determine if other areas are contaminated? Is there any reason for nearby properties, such as the school, to be concerned?

A. During the investigation of the site, numerous samples of surface soil were collected and analyzed for site contaminants. No VOCs were detected in these samples. It should also be noted that VOCs readily evaporate into the air so that they are generally not found in surface soils. Therefore, it is not expected that any properties outside the plant boundaries are affected by the contamination at the site.

25. Q. How long will the new supply well be chlorinated?

A. The town has said they will continue to chlorinate for at least one more year because New York State Department of Transportation (NYSDOT) is replacing water lines in the Town where chlorination would be needed to disinfect new pipes prior to them being connected into the Town's system.

26. Q. Is the State working with the company to find the best and least expensive clean-up at the site or is it trying to drive them out of business?

A. The purpose of the remediation is to protect both the community and environment. That is the NYSDEC's responsibility and priority. At the same time, we are also interested in keeping the company here. The remedy selected will accomplish both of these goals.

27. Q. The community, through no fault of their own, is out two wells. This is something to consider.

A. The contamination of the Town's former water supply was considered during the evaluation of remedial alternatives for the site. However, the issue that should be noted is that the Town investigated for a location of a new well with funds provided by Keywell Corp. and installed the new well with funds provided by the Farmers - Home Administration so little cost for the new well was borne by the Town itself

28. Q. The longer it takes to clean up, the longer it takes the Town to get those wells back - and they may never get them back.

A. True. However, if the former wells are needed to be placed back into service a treatment system could be installed and an appropriate monitoring program implemented to insure that the water was being treated to acceptable limits. **A** proposal such as this would require **NYSDOH** approval. This is a common option utilized in many municipalities throughout the State.

29. Q. What type of system does Olean use, an aeration system? Would that type of system pull the VOCs down low enough?

A. The City of Olean's water is supplied by groundwater that **is** also contaminated with volatile organic compounds. Air strippers, which volatilize the contaminants, have been installed to treat the water prior to use in the public water supply system. Air stripping is a common treatment method and is capable of meeting drinking water standards.

30. *Q*. Why did they start testing water in 1989? Did they suspect something or was it just a coincidence?

A. In 1989, NYSDOH began to require all municipal water supplies to begin monitoring for a variety of organic contaminants. This was in response to the reduction in the value or the addition of drinking water standards for various contaminants.

31. Q. Does DEC have any reporting responsibilities to the public? Is there any format for continued communication? This meeting has been very good, has given them a lot of good information. But there hasn't been a meeting in a long time. What about the future?

A. The NYSDEC under requirements of Part **375** regulations must implement a Citizen Participation program at **all** inactive hazardous waste sites such as VacAir. It is the **NYSDEC** intention to update all persons on the site mailing list (i.e.; local/regional officials, citizens etc.) of all major events at the site. It is anticipated that a Fact Sheet, similar to the one issued for the public meeting will be sent out at the issuance of the Record of Decision (April **1996)** and again prior to the start of construction activities at the site.

32. Q. When was the last mailing?

A. The last mailing that was conducted by the Department was in September **1994.**

33. Q. On what date did you say the State will submit the ROD?

A. If no significant comments are received on the **PRAP,** it is anticipated that the ROD will be approved by the State in late March **1996.**

34. Q. You mentioned there will be some excavation and disposal of contaminated material.

Which material, the TCE contamination or the metals contamination? You also spoke of concern about short term exposure if excavation occurred. Please explain where the excavation will be done and how it will be done.

A. It is anticipated that only soil from the lowland area will be excavated and disposed off-site at an approval disposal facility. This soil **is** contaminated with both VOCs, such as TCE, and metals. The exact method of excavation and handling will be determined during the design phase of the project. However, it is anticipated that common excavation methods will be employed, such as the use of a back hoe and front end loader. The soil would be loaded directly onto trucks, covered with a tarp and trucked to the disposal facility. During all remedial activities, including excavation, air monitoring will be performed to insure that the release of contaminants to the air is controlled to below acceptable levels.

35. Q. Originally there was talk of buried barrels. Did you find any? How would you deal with this if some were found? If the TCE material is found to be in barrels, why not just excavate it?

During initial investigations of the site several test pits were dug in the area where drums were suspected to have been disposed. Only remnants of drums were found. Because of the high groundwater table it **is** suspected that any drums disposed of have decomposed leaving only the contaminated material left. **If** whole drums are found during the remedial activities, they will be removed and properly disposed of.

36. Q. What is the company doing with the fbmes?

A. TCE fbmes discharged from degreasing units at the facility are captured and treated in vapor granulated carbon units installed on the roof of the facility in accordance with DEC air standards and permits.

37. Q. Did anyone do any health surveys or cancer surveys?

A. The only identified route of exposure off-site was the short period of time that the Town's well was impacted in September 1991. This route of exposure was immediately eliminated. Consequently, no health studies have been performed at this time.

38. Q. In light of the fact that the completed pilot study with the SVE method in the North hot zone shows **TCE** concentrations are too high for the successful use of the SVE method, I assume the DEC will issue a modification to the Action Plan to the public when the final method of TCE removal for that area is decided upon.

A. The ROD notes that a treatability study will be conducted to determine the effectiveness of SVE/Air Sparging as **a** soil treatment technology for the site. This study has been recently completed and the results are currently under review. Preliminary results have indicated that due to high concentrations of contaminants in the north area, SVE will not be effective in reducing contamination for this area. The company has been required to reevaluate soil remedial technologies for this area in accordance with the requirements of the ROD. If upon completion of this evaluation, another soil treatment technology is to be used at the site, the DEC will notify the public of the change and provide them an opportunity to comment on the change.

39. Q. Based on depositions from the former plant owners, it is known that the former owners had disposed of plant wastes containing trichloroethylene (TCE) by burial in the northern portion of the plant Site. In addition, the former owners may have also improperly disposed of plant wastes through the plant's former sanitary system (which has since been replaced). After Keywell purchased the facility in 1987, all plant wastes generated at the facility have been disposed of in accordance with the applicable rules and regulations.

A. No response required.

40. Q. Although Keywell has taken the primary responsibility of addressing the environmental issues at the Site, the former owners from VacAir Alloys Inc. should also be identified as a Potentially Responsible Party.

A. This issue is addressed by the attorneys for the various parties.

41. Q. As a point of clarification, it is suggested that the second sentence in Section 4.1, Paragraph 4, be replaced with the following: "The general flow of the groundwater in the Water Table Aquifer beneath the site is to the northwest, which would direct contaminated groundwater into the Conewango Creek."

A. Agree, this sentence will be changed.

42. Q. Paragraph 4, Page 11, Section 4.2, should be revised to reflect that the risk assessment concluded that **risks** associated with the ingestion of groundwater in the Water Table Aquifer marginally exceed the accepted **1** x 10-6 to 1 **x** 10-4 (1.12 x 10-4 and 5.65 x 10-4 for the average and reasonable maximum exposure scenarios, respectively). The hazard indices associated with the ingestion of groundwater from the Water Table Aquifer was below the level of concern of **1**.0. *Also* as a point of clarification, it should be noted that exposure to soils, sediments, and surface waters for future and current land uses does not post a significant threat to public health since the associated **risks** are below the accepted risk range and the level of concern.

A. The purpose of the PRAP was to **only** provide a summary of the results of the Risk Assessment conducted for the Site. The language included in the PRAP provides this summary. **A** detailed discussion of the evaluation as noted in the above comment can be found in the Risk Assessment Section of the Remedial Investigation Report.

43. Q. The data collected during all the investigative activities have not shown any physical or hydraulic connection between the Site and the wellfield. In fact, the evidence collected indicates the Site was not the source of contamination in the municipal wells. Therefore, **we** suggest the underlined sentence in the paragraph **be** replaced with the following: "Recontamination of the Frewsburg Aquifer <u>in the immediate vicinity of the VacAir site</u> may occur if the proper conditions exist."

A. ***As*** stated in the PRAP, although the investigation's at the site could not determine the physical or hydraulic connection of the site to the Frewsburg Aquifer, there was no evidence that would suggest that it came from a source other than the VacAir site.

44. Q. Replace the sixth sentence in Section **4.3,** paragraph **2** with the following: "Based on the results of the Assessment, several potential pathways of contaminant migration could exist." Although there is potential for exposure of wildlife to Site contaminates in the lowland areas, it should be noted that the environmental risk assessment performed concluded that the exposure would not significantly impair the wildlife population in the area.

A. Noted, the addition of the word **"could"** will be added to the ROD.

45. Q. On Page 13, Section ***5,*** General Goals: Under the general goals for the Site, please add a statement noting that the media-specific Remedial Action Objectives (RAOS) are intended to be objectives and that the ability to meet the specified RAOs are limited by the remedial technology and the nature of the contamination at the Site. As noted in the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, the RAOs may prove to be unattainable. Therefore, the phrase 'to the maximum extent practicable' should also be added to the end of the sentence under the General heading.

In addition, it should be noted that the media-specific RAOs presented in Table **2** may change in the future based on whatever the current rules, regulations and guidance are in place at the time.

A. Noted, the above clarification, concerning the attainability of the media-specific RAO's, will be added to the ROD.

46. Q. Extensive investigations were conducted by Keywell to locate and sample the Frewsburg Aquifer on and off Site. The Frewsburg Aquifer was found to be extremely discontinuous. In addition, groundwater in the Frewsburg Aquifer at the Site was not contaminated and the source of the one-time occurrence **was** never conclusively identified. Based on all of this, Keywell believes the inclusion of a remedial action goal for the Frewsburg Aquifer as stated, is inappropriate, and unfairly exposes Keywell to fbture liability. It is believed that this goal should be removed or at the very least revised as follows: "To restore contaminated groundwater, attributable to the VacAir site, in the Frewsburg Aquifer (lower sand and gravel) to levels acceptable for future use (i.e. drinking water supply), to the maximum extent practicable."

A, Please see the response to Question **43.**