Supplemental Remedial Investigation Report

Burgess Brothers Superfund Site
Woodford and Bennington, Vermont

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EXECUTIVE SUMMARY

The Burgess Brothers Superfund Site is located in southern Vermont in the Towns of Woodford and Bennington. The site consists of a 2-3 acre area located in the northeastern section of a 60-acre parcel which is owned by Burgess Brothers, Inc. A site map is included as Figure ES-1. The United States Environmental Protection Agency (EPA) placed the site on the National Priority List (NPL) in March 1988. A Remedial Investigation (RI) was completed for the site, on behalf of the Burgess Brothers Steering Committee, by O'Brien and Gere Engineers, Inc. (OBG), which is documented in the RI Report, dated July 1996, herein referred to as the RI Report. Field activities under the RI were completed in fall 1993.

Anomalously high total metals concentrations were detected in groundwater samples collected under the RI, using conventional purge and sampling techniques. Conventional sampling consists of purging a minimum of three well volumes of water using either a bailer or submersible pump and then collecting groundwater samples with the same device. This method of sampling can produce groundwater samples which are relatively turbid, due to the turbulent dynamics created in the well during bailing or pumping. During the preparation of the Draft RI, it was suspected that the presence of metals in high concentrations was probably due to suspended sediment and not be reflective of metal concentrations that are mobile in groundwater. For this reason, EPA determined that the groundwater results in the RI, for inorganics only, may not provide an accurate representation of contaminant nature and extent.

PURPOSE AND SCOPE OF THE SUPPLEMENTAL RI

EPA provided approval of the RI Report, conditional that a Supplemental RI be performed using low flow sampling protocols to re-evaluate the nature and extent of inorganics in groundwater. Under the low flow methodology, the well is purged and sampled at the approximate rate at which the aquifer recharges and, therefore, should produce groundwater samples which are more representative of aquifer conditions. This Supplemental RI Report is based on data collected coincident with and from three rounds of low flow sampling under the Long Term Monitoring Plan (LTMP) for the site.

The focus of the Supplemental RI is to complete the evaluation of the nature and extent of contamination in groundwater and contaminant fate and transport, particularly for inorganics. However, the Supplemental RI also discusses sampling data from other media, including potential source areas, soil, sediment, leachate and surface water, in order to complete the site characterization and conceptual model. Sampling results from media not sampled under the Supplemental RI are summarized from the RI Report.

SUMMARY OF SITE GEOLOGY AND GROUNDWATER FLOW

Site geology consists of a kame sand and ablation glacial till unconsolidated overburden, underlain by a lodgement till, underlain by bedrock. Combined, the kame sand and ablation glacial till are up to 35 feet thick. The lodgement till, which separates the kame sand and ablation glacial till from the bedrock, is approximately 35 to 90 feet thick. Bedrock consists of shallow weathered bedrock, deep weathered bedrock, and competent bedrock.

Groundwater flow in the kame sand and ablation glacial till is generally from the landfill south-southeastward into the Marshy Area. Shallow groundwater in the Marshy Area discharges to drainage Swale 2. Based on groundwater quality data, Swale 2 is a barrier to lateral contaminant migration in the kame sand and ablation glacial till. Groundwater flow in the shallow weathered bedrock generally follows the hillslope topography, and is towards the east-southeast.

Groundwater elevation data indicate generally upward gradients in the kame sand and ablation glacial till in the Marshy Area, with groundwater discharging to surface water; vertical gradients in the Landfill Area appear to be slightly upward. The dense lodgement till between the ablation glacial till and bedrock, is described as "dry", and is a barrier to vertical migration of groundwater.

SUMMARY OF CONTAMINANT SOURCES

The primary source area for contaminants at the site is the Landfill Area, which includes two former Lagoon Cells, herein referred to as Lagoon Cells. Contaminants detected in these areas consist primarily of volatile organic compounds (trichloroethene (TCE), tetrachloroethene (PCE), vinyl chloride, 1,2-dichloroethene (1,2-DCE), and 1,1-dichloroethene (1,1-DCE)) and metals (lead, nickel, cadmium, chromium, mercury and zinc), with

some semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). The primary mechanism of contaminant migration is surface water infiltration through the Landfill Area and Lagoon Cells.

NATURE, EXTENT AND CONTAMINANT MIGRATION

Kame Sand and Ablation Glacial Till

Volatile Organic Compounds (VOCs)

VOCs, particularly 1,2-DCE, toluene, TCE, PCE and vinyl chloride, were detected in shallow soils at relatively low concentrations in the Landfill Area and Marshy Area. Chlorinated VOCs present in exposed soils would tend to volatilize to the air. A similar suite of VOCs are detected in subsurface soils in relatively high concentrations (up to 12,600,000 µg/kg), especially in the Lagoon Cells, and locally in the Landfill Area. VOCs tend to have relatively high water solubility, and may migrate to groundwater via rainwater infiltration. VOCs were also detected in Marshy Area soil. However, based on comparison of groundwater quality and soil quality, the VOCs detected in saturated soil may be associated with groundwater and would not represent a source of contaminants.

VOCs detected in groundwater above Federal Maximum Contaminant Levels (MCLs) or Vermont Enforcement Standards (VES) include, vinyl chloride, methylene chloride, benzene, 1,1-DCE, 1,2-DCE, 1,2-dichloroethane (1,2-DCA), TCE, PCE, and chlorobenzene. VOC migration in groundwater is through dissolved phase transport. The primary direction of VOC migration in groundwater is from the Landfill Area towards the south-southeast into the Marshy Area and the primary area of impact for groundwater contaminant migration is the Marshy Area, including soil, sediment and surface water.

The extent of the VOC plume in the south-southeast direction appears to be constrained by the discharge of groundwater to surface water (drainage Swale 2) and the attenuation of contaminated groundwater in Marshy Area soils. In addition, limited contaminant migration of dissolved phase VOC migration beyond the limits of the landfill is observed towards the west into the West of the Landfill Area.

DNAPL was not observed at the site. However, based on the maximum concentrations of VOCs detected in groundwater, a DNAPL could exist. The vertical and lateral distribution of VOCs indicates that the potential

for DNAPL appears to be contained within the kame sand in the immediate vicinity of the Landfill Area and Lagoon Cells.

VOCs detected in surface water above Federal Water Quality Standards (WQS) or Vermont Water Quality Criteria (Vt. WQC) included TCE, PCE, vinyl chloride, 1,1-DCE, and bromodichloromethane. VOCs in surface water would likely volatilize to the atmosphere or undergo biodegradation or photodegradation. Because VOCs in surface water tend to volatilize rapidly, they are not likely to partition to sediments. The highest concentrations of VOCs in Surface Water were detected in the Marshy Area and immediately downstream of the Marshy Area, in Swale 2. The most prevalent VOCs detected in surface water are TCE, PCE, and vinyl chloride, with maximum concentrations in the Marshy Area of 420 µg/l, 71 µg/l, and 800 µg/l, respectively. The downstream edge of the VOC plume in surface water, as defined by concentrations of VOCs above WQS or Vt. WQC, is between sample locations SW-15 and SW-04.

VOCs were detected in sediment samples from drainage Swale 2, in the Marshy Area, however, based on groundwater and surface water sampling results, the VOCs detected in sediment samples are likely associated with groundwater entrained in the soil particles, rather than contamination in the soil.

Semi-volatile Organic Compounds (SVOCs)

As discussed in the RI Report, SVOCs (primarily of polynuclear aromatic hydrocarbons (PAHs)), were detected in the former Lagoon Cells. These SVOCs were not detected in groundwater above MCLs or VES, suggesting that SVOCs are not mobile. SVOCs were not detected in groundwater above MCLs or VES during the Supplemental RI.

Pesticides/PCBs

As discussed in the RI Report, pesticides and PCBs were detected in surface and subsurface soils, primarily in the former Lagoon Cell areas. Pesticides and PCBs were not detected in groundwater or surface water indicating that these compounds are not mobile.

Metals

Metals were detected in soils in the Landfill Area and Lagoon Cells at two to four times background levels, during the RI. Metals detected which were elevated with respect to background include: lead, nickel, cadmium, chromium, mercury and zinc. The only metals detected above MCLs or

VES, during the Supplemental RI, beyond the landfill were iron, manganese, and thallium. These results indicate that metals in soils, with the exception of iron, manganese and thallium, are generally insoluble and immobile in groundwater. Other metals were detected in the kame sand, ablation glacial till and bedrock above MCLs or VES; however, these data are considered non-representative due to high sample turbidity, use of Grundfos pumps, or poor well construction.

The likely source of metals in groundwater is the Landfill Area, including the former Lagoon Cells. The lateral extent of the manganese plume, as defined by levels of manganese which exceed the EPA derived risk based standard of 840 µg/l, is within the Marshy Area, west of Swale 2 (approximately 120 feet southeast of the former Lagoon Cells); and south of the Lagoon Cells, to the W-25 and W-09 clusters (approximately 300 feet southeast of the Lagoon Cells). The distribution of thallium in groundwater is less widespread than manganese. Beyond the landfill, thallium was only detected in one Marshy Area well, W-11S1, and south of the former Lagoon Cells, at the W-25 and W-09 clusters.

The iron plume in groundwater extends from the landfill into the Marshy Area and West of the Landfill Area. Iron was detected at W-06D, east of Swale 2 in the Marshy Area. Migration of iron east of Swale 2 may be related to overland flow during high water levels. Because of the hillslope to the east of Swale 2 and groundwater flow patterns in the kame sand and ablation glacial till, migration of iron further east of Swale 2 would be limited.

Concentrations of lead, mercury, nickel, and zinc were detected above National Oceanic and Atmospheric (NOAA) Effects Range Low (ER-L) concentrations in stream sediments from the Marshy Area. Metals were not detected in the Downstream sediment sample locations above NOAA ER-L levels, indicating that these metals are relatively immobile. Metals in sediment may be naturally occurring or locally impacted from landfill leachate seeps.

Metals detected above WQS or Vt. WQC included: antimony, arsenic, copper, iron, lead, mercury, nickel, silver, zinc, and cyanide. The concentrations of metals above WQS or Vt. WQC were highest in the Landfill Area and decrease downstream in Swale 2 and the Unnamed Stream and Barney Brook. A similar suite of metals were detected in soil samples from the Landfill Area and Lagoon Cells, and Marshy Area soils. This trend suggests that the impact to surface water quality originates in the Landfill Area and is reduced as the stream flows toward Barney Brook. However, some metals, including antimony, arsenic, copper, lead

and silver are present at all locations at similar concentrations. The sources of these metals may be naturally occurring and, therefore, not reflective of impacts from the landfill.

Bedrock

VOC impacts to groundwater, above MCLs or VES, appear to be contained within the kame sand and ablation glacial till. Concentrations of VOCs above MCLs or VES in bedrock were only detected at three locations (W-04SI, W-07SI, and W-09B). These detections may be due to a laboratory or field sampling error and not representative of groundwater quality.

Metals, with the exception of iron, were not detected in bedrock based on representative data. While other metals were detected in the bedrock above MCLs or VES, these samples were determined to be non-representative due to sample turbidity, poor well construction, or use of Grundfos pumps. Iron is likely naturally occurring in bedrock.

The lodgment till layer between the ablation glacial till and bedrock is described as dense, of low permeability, and not water bearing. Therefore, the lodgement till is considered to be a barrier to vertical contaminant migration in groundwater. In addition, vertical hydraulic gradients in the kame sand and ablation glacial till appear to be upward. Therefore, migration of dissolved phase contaminants into the shallow and deep weathered bedrock and competent bedrock is not expected and has not been detected.

CONCLUSIONS

ERM makes the following conclusions, based on the results of this Supplemental RI.

1. *The primary source of contamination at the site is the Landfill Area, which includes two former Lagoon Cells.*
2. *Inorganic impacts to groundwater are limited to the kame sand and ablation glacial till and, with the exception of iron, manganese, and thallium, are contained within the Landfill Area and Lagoon Cells.*
3. *SVOCs, PCBs, and Pesticides detected in soils are generally immobile, as they are not detected in groundwater.*

4. *VOC impacts to groundwater are limited to the kame sand and ablation glacial till. Lateral migration of VOCs is primarily from the Landfill Area and Lagoon Cells into the Marshy Area.*

5. *VOC and inorganic impacts to bedrock are not observed.*

6. *The potential for DNAPL exists at the site; however, a DNAPL, if present, is likely contained within the kame sand and localized within the immediate vicinity of the Landfill Area and Lagoon Cells.*

7. *VOC and inorganic impacts to surface water and sediments is limited to the Marshy Area and Unnamed Stream downstream of the Marshy Area.*

RECOMMENDATIONS

Based on the results of the Supplemental RI, ERM makes the following recommendations for future work.

1. *Wells W-07SI should be resampled for VOCs.*

2. *Wells W-27T, W-07SI, and W-04DI should be resampled for metals, to confirm the limits of chromium and nickel in groundwater.*

3. *Wells W-08S1 and W-06 should be resampled for metals, to confirm the lateral extent of iron in groundwater, and wells W-26T and W-09 should be resampled to confirm the lateral extent of iron, manganese and thallium in groundwater.*

In summary, no additional assessment work is required to characterize the site; however, limited additional sampling should be performed to confirm conclusions presented in this Supplemental RI. Monitoring of groundwater and surface water should continue under the LTMP. The scope of the LTMP should be performed in accordance with the letter from *de maximis* to EPA dated 18 April 1996, with the addition of the following wells: W-07SI for VOCs and W-27T, W-07SI, W-04DI, W-08S1, W-06D, W-26T, and W-09S1 for metal. These eight wells should be included for one additional sampling round.

1.0 INTRODUCTION *1*

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1.0 INTRODUCTION

1.1 BACKGROUND

The Burgess Brothers Superfund Site (the site), located in the towns of Woodford and Bennington, Vermont, has been the subject of environmental investigation since 1984. Investigation were performed under the oversight of the Vermont Department of Environmental Conservation (VTDEC) and, more recently, the United States Environmental Protection Agency (EPA).

The site was placed on the National Priorities List (NPL) as a Superfund Site in March 1989. The Settling Parties signed an Administrative Order on Consent in 1991 and initiated a Remedial Investigation/Feasibility Study (RI/FS). O'Brien & Gere Engineers, Inc. (OBG) completed the Phase 1A RI activities in the fall of 1993. OBG submitted an Initial Site Characterization Report dated January 1994, which was approved by EPA.

A Phase IB RI was performed in early 1994 and interim sampling of surface water, sediments and groundwater was performed between the Phase IA and Phase IB activities. The results of the Phase IA RI, Interim Monitoring, and Phase IB programs are documented in the RI Report prepared by OBG and dated July 1996, herein referenced as the RI Report.

All groundwater sampling under the Phase IA, Interim Monitoring, and Phase IB programs was performed using conventional sampling techniques. Conventional purge and sampling is performed by removing a minimum of three well volumes of water from the borehole, using either a bailer or submersible pump, and then collecting groundwater samples with the same device. Conventional sampling techniques can produce groundwater samples which are turbid, because the purge and sampling methods cause sediment in the formation and/or borehole, which are immobile under hydrologic conditions, to become suspended.

The EPA approved a Long Term Monitoring Plan (LTMP) for the site, prepared by OBG and dated April 1994. The LTMP included sampling of groundwater, surface water, and leachate. OBG conducted the first round of LTMP sampling in November 1994 using conventional sampling techniques for groundwater.

During preparation of the RI Report, it was observed that the total metals concentrations in unfiltered groundwater samples were significantly higher than metals concentrations in filtered samples. The turbidity of these unfiltered samples was also high, typically exceeding 100 NTUs. In addition, the metals concentrations measured in the background wells were higher than what is observed elsewhere in New England. The higher total metals concentrations in unfiltered groundwater samples was likely due to the presence of suspended sediment in these samples, and may not be reflective of metal concentrations that are mobile in groundwater. For this reason, EPA determined that the groundwater results in the RI, for inorganics only, may not provide an accurate representation of contaminant nature and extent.

EPA provided approval of the RI Report, conditional that a Supplemental RI be performed using low flow sampling protocols. The scope of the Supplemental RI is documented in a letter to EPA, dated 28 February 1995 and modified in two letters from de maximis, inc. (de maximis) to EPA dated 13 April 1995 and 2 May 1996. ERM-New England, Inc. (ERM) conducted three Supplemental RI sampling events, in conjunction with the LTMP, in Spring 1995, Fall 1995, and Spring 1996. The results of these LTMP sampling events are documented in reports to EPA dated 8 September 1995, 20 February 1996 and 20 August 1996, respectively.

1.2 *PURPOSE AND SCOPE*

The purpose of this Supplemental RI is to complete the characterization of groundwater quality at the site. The Supplemental RI Report fills data gaps identified in the RI Report. Specifically, the Supplemental RI focuses on those contaminants for which analytical results may be affected by sample turbidity (i.e., inorganics or semi-volatile organic compounds (SVOCs)). Inorganics and SVOCs detected in groundwater under the RI, may be anomalously high because the detected constituents may be associated with suspended sediment, rather than dissolved or mobile in groundwater.

Low flow sampling methodologies were used in the Supplemental RI to collect groundwater samples, in order to minimize interference from suspended sediment. Theoretically, under low flow sampling, the well is purged and groundwater samples are collected at the approximate rate at which the aquifer recharges and, therefore, the groundwater samples are more representative of constituents which are mobile in groundwater.

Inorganics, SVOCs and polychlorinated biphenyls (PCBs) are generally known to have a geochemical affinity to sediment, especially sediment containing clay particles. The scope of the Supplemental RI sampling is presented in Table 1, and includes:

1. Low flow purging and sampling of two wells (SBW-10 and W-08SI) for SVOCs to evaluate detections of bis(2-theylhexyl)phthalate in groundwater.
2. Low flow purging and sampling of LTMP wells for VOCs and Target Analyte List (TAL) metals
3. Sampling of 3 leachate seeps
4. Sampling of 12 surface water locations

Characterization of volatile organic compounds (VOCs) in groundwater is adequately documented in the RI Report, using conventional sampling techniques. However, because this Supplemental RI includes all data collected under the LTMP, VOCs in groundwater will be updated from the RI Report.

This Supplemental RI Report will also update the RI for surface water and leachate quality sampling performed under the three LTMP sampling events. In addition, other media, such as contaminant source areas and soil and sediment quality, are summarized from the RI Report, because they are important to complete the site characterization and conceptual site model.

1.3 SITE BACKGROUND

1.3.1 Site Description

Site Location

The site is located in Woodford and Bennington, Vermont, between Burgess Road and the Walloomsac River. Access to the site is through the Burgess Brothers facility on Burgess Road, approximately 1.1 miles southeast of the junction of Burgess Road and State Highway 9. The Green Mountain National Forest borders the site to the north. The latitude of the site is 42°52′40″ and the longitude is 73°09′00″.

General Site Description

The site consists of a 2-3 acre area located in the northeastern section of a 60-acre parcel which is owned by Burgess Brothers, Inc. (Burgess Brothers). Burgess Brothers conducts sand and gravel mining and metal salvage operations at the property. The site location is shown in Figure 1 and the site topography is provided in Figure 2.

The Supplemental RI focused on the following six areas, as shown on Figure 2:

Landfill Area - which is the waste disposal area

Lagoon Cells -are located within the Landfill Area and consists of two former waste disposal cells, where solvent and battery wastes were reportedly disposed

West of the Landfill Area - includes the areas to the west of the Landfill Area, downslope of the landfill and in the vicinity of the Landfill Road

Marshy Area - is located downslope of the landfill and consists of a wetland area with hillslope drainage swales

Hillside Area - includes areas upslope and to the east of the Marshy Area and Landfill Area on Harmon Hill

Soil Staging Area - is located north of the landfill and is reported the area used as a tank salvage area

The landfill occupies approximately two acres and the two former Lagoon Cells, within the Landfill Area, occupy approximately 2,000-square feet. Both the lagoon and landfill have been covered with soils from the Burgess Brothers property and the Lagoon Cells are surrounded by a safety fence.

Surrounding Land Use and Populations

The primary land use in the vicinity of the site is residential. Although Bennington, Vermont contains many historic structures, no cultural resources have been identified in the immediate vicinity of the Burgess Brothers Site.

Two municipal water supply systems, Ryder Spring and Morgan Spring, are located within one-mile of the site. These systems are operated by the Bennington Water Department. Four private drinking water wells have been identified within one-mile of the site.

The groundwater at the site is classified as Class III, which is defined as suitable for individual domestic supply, irrigation, agricultural use and industrial/commercial use. Class I and II waters are aquifers which are currently in use or have a high probability of use as a public drinking water supply.

1.3.2 *Site History*

Sand and gravel mining operations at the site began in the 1940s. Beginning in the late 1960s, the site was used as a metal salvage facility, and as a disposal area for construction debris, metals, sludges and liquid wastes. The Battery Products Division of Union Carbide disposed of liquid waste and sludge in the Lagoon Cells (an unlined bermed pit) from approximately 1967 to 1976. These wastes reportedly consisted of spent solvents (tetrachloroethane (PCE) and trichloroethene (TCE)) in 55-gallon drums and boxed battery waste. Anode gel and manganese dioxide cells (containing zinc and mercury) were also disposed. The Battery Products Division of Union Carbide was later purchased by Ralston Purina Company (Eveready Battery Co. Inc.) in 1986.

1.3.3 *Previous Investigations*

Numerous investigations have been performed at the site to evaluate the environmental impact of the disposal operation which occurred in the Landfill Area and former Lagoon Cells. A listing of previous site investigation activities is provided below. A more detailed discussion of the findings of the investigations is provided in Section 1.1 of the RI Report.

Summary of Previous Investigation Activities

Date	*Lead*	*Purpose/Activity*
1985	Eveready	Installed groundwater monitoring wells to characterize shallow subsurface conditions. Collected soil samples.
2/89	EPA	Collected surface water samples.
3/89	Eveready	Sampled existing monitoring wells and collected surface water samples.
4/89	EPA	Conducted soil gas survey and soil sampling in lagoon and marsh areas.
12/91 - 1/92	Settling Parties	Conducted Limited Field Investigation consisting of records review, ground-penetrating radar, air sampling and soil vapor screening.
9/92 - 8/94	Settling Parties	Conducted Phase 1A and 1B RI consisting of seismic refraction survey, soil gas sampling, installation of test pits, air monitoring, installation of monitoring wells and an ecological assessment. In addition, sampling and analysis of soils, surface water, sediments, leachate/seeps and groundwater.
11/94	Settling Parties	LTMP sampling of groundwater, surface water, and leachate sampling. Groundwater sampling conducted using conventional purging and sampling techniques.
5/95- 11/95	Settling Parties	Two rounds of LTMP sampling performed, including groundwater, surface water, and leachate sampling. Groundwater sampling conducted using low flow purging and sampling techniques.
5/96	Settling Parties	One round of LTMP sampling of groundwater and surface water, based on a reduced LTMP SOW. Groundwater samples collected using low flow purging and sampling techniques.

1.4 *REPORT ORGANIZATION*

The report is organized in accordance with the outline described in the EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. As such, the report contains the following sections:

Section 1.0 Introduction, background and scope.

Section 2.0 Study area investigations, including meteorological, groundwater, surface water, sediment, leachate, and air studies.

Section 3.0 Physical characteristics of the study area, including geology and hydrology.

Section 4.0 Nature and extent of contaminants in groundwater, surface water, sediment, and leachate.

Section 5.0 Contaminant fate and transport.

Section 6.0 Summary, conclusions and recommendations.

This report fills data gaps identified in the RI Report and, as appropriate, references the RI Report, rather than repeating information already provided.

2.0 STUDY AREA INVESTIGATIONS FOR SUPPLEMENTAL RI *1*

2.1 METEOROLOGICAL INVESTIGATIONS *1*

2.2 SURFACE WATER AND SEDIMENT INVESTIGATIONS *1*

2.3 GROUNDWATER INVESTIGATIONS *1*
2.3.1 Spring 1995 *2*
2.3.2 Fall 1995 and Spring 1996 *4*

2.4 LEACHATE *4*

2.5 PERFORM DATA QA/QC EVALUATION AND COMPILE AND ANALYZE DATA *5*

2.0 *STUDY AREA INVESTIGATIONS FOR SUPPLEMENTAL RI*

Since completion of OBG RI activities, ERM has performed three rounds of groundwater, surface water, leachate, and air sampling, in accordance with requirements set forth by the EPA. All sampling was performed in accordance with the LTMP Scope of Work, dated April 1995, and the Quality Assurance Project Plan (QAPP); as modified using low flow purge and sampling techniques for groundwater. In this section, a summary of the investigative methods used to evaluate each media is presented and any modifications from the proposed protocol are presented.

2.1 *METEOROLOGICAL INVESTIGATIONS*

Precipitation data was obtained from the Northeast Regional Climate Center (NRCC) recorded at the nearest monitoring station in Pownal, VT. This data is included in Appendix A. Precipitation data in the vicinity of the site was compared to groundwater gauging results to monitor seasonal fluctuations.

2.2 *SURFACE WATER AND SEDIMENT INVESTIGATIONS*

ERM collected twelve surface water samples as part of the LTMP during Spring and Fall 1995 sampling events and six surface water samples during the Spring 1996 sampling event. Surface water sample locations are shown on Figure 2 and summarized in Table 1. All surface water samples were collected directly into laboratory supplied bottles; therefore, equipment blanks were not required for this task.

Sediment sampling was not performed by ERM under the Supplemental RI. Sediment sampling and analysis performed at the site by OBG are summarized in the RI Report prepared by OBG.

2.3 *GROUNDWATER INVESTIGATIONS*

All monitoring wells were gauged for depth to water, prior to collecting groundwater samples. Gauging data for the Spring 1995, Fall 1995, and Spring 1996 sampling events are compiled in Tables 2A, 2B, and 2C, respectively.

2.3.1 *Spring 1995*

ERM collected groundwater samples from 27 wells using low flow purge and sampling techniques during the Spring 1995 sampling round. The well sample locations are shown on Figure 2 and laboratory analyses are summarized in Table 1. Groundwater samples were collected using dedicated and non-dedicated positive displacement Grundfos Redi-Flo II (Grundfos) or QED bladder (bladder) pumps. Dedicated teflon lined tubing was used to collect all groundwater samples. Non-dedicated pumps were decontaminated between wells and equipment blanks were collected, in accordance with the QAPP.

Grundfos pumps were initially used to sample 14 of the 27 wells at the site during Spring 1995. These pumps were unable to sustain flow rates low enough to achieve the stabilization parameters of drawdown and turbidity required at the site. At 12 of the 14 locations where Grundfos pumps were used for sampling, the groundwater turbidity was greater than 5 NTUs. Drawdown goals were not achieved at any of the wells sampled with Grundfos pumps, thus requiring a greater purge volume. Average drawdown in wells sampled with Grundfos pumps was 4.75 feet during Spring 1995.

ERM used bladder pumps to purge and sample the remaining 13 wells during Spring 1995. Bladder pumps were capable of sustaining flow rates low enough to achieve drawdown and turbidity requirements in most wells. The turbidity goal of 5 NTUs was achieved at 9 of the 13 locations sampled with bladder pumps. Average drawdown in wells sampled with bladder pumps was 1.4 feet during Spring 1995. Subsequent LTMP samplings events were performed using only bladder pumps (dedicated and non-dedicated).

Purging and sampling was performed in accordance with the *EPA Region I Low Flow (minimum stress) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* dated 10 August 1994 for the 1995, with the following exceptions.

- Aquifer stabilization indicators used were pH, specific conductance, temperature, and turbidity. Dissolved oxygen and eH indicators, which are optional under Region I protocols, were not used as aquifer stabilization indicators. The wells were purged using low flow purging techniques until the indicator parameters (pH, specific conductance and temperature) had stabilized to within 10% for three consecutive readings. In accordance with Region I protocols, a goal of 5 NTUs was used for turbidity.

- Due to difficult aquifer conditions at the site, a turbidity of less than 5 NTUs or a drawdown of less the 0.3 feet (as discussed in the Region I protocols) could not be achieved for some wells. Based on discussions and verbal agreements with Mr. Richard Willey of the EPA during October and November 1995, the following modifications to the Region I protocols were included in the low flow methodology at the site:

  - All wells were purged until a sufficient volume of water had been removed to document that pH, conductivity, temperature and turbidity had stabilized. If a turbidity of less than 5 NTUs could not be achieved, turbidity was considered stable if the values were relatively constant and it was apparent that a turbidity of less than 5 NTUs would not be achieved within a reasonable length of time.

  - If a turbidity of less than 5 NTUs could not be achieved, then a sample would be collected for dissolved TAL metals.

  - Wells were purged until a sufficient volume of water had been removed to document that the groundwater sample was representative of the formation and not being drawn from the borehole. Documentation of adequate purging included: removing approximately three screen volumes (for wells screened below the water table); three borehole volumes (for wells screened across the water table); and a minimum of three drawdown volumes (where feasible).

  - If a well was purged dry then a minimum of three well volumes was purged prior to sampling.

  - Stabilization parameters were measured and recorded at approximately five minute intervals. Tables with all stabilization measurements are provided in Appendix B. Final Stabilization parameters for the Spring 1995 sampling event are summarized in Table 3A.

2.3.2 *Fall 1995 and Spring 1996*

ERM collected groundwater samples from 24 wells during Fall 1995 and from 15 wells during Spring 1996 using low flow purge and sampling techniques. The well sample locations are shown on Figure 2 and laboratory analyses are summarized in Table 1. Groundwater samples were collected using dedicated and non-dedicated positive displacement bladder pumps. Dedicated teflon lined tubing was used to collect all groundwater samples. Non-dedicated pumps were decontaminated between wells and equipment blanks were collected, in accordance with the QAPP.

Purging and sampling was performed in accordance with the *EPA Region I Low Flow (minimum stress) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* dated 3 August 1995, and as outlined above for the Spring 1995 sampling event, with the following exceptions.

- For the Spring 1996 sampling event, the following guideline was used to determine if a sufficient volume of water had been purged from the aquifer; for wells with less than 0.3 feet of drawdown a minimum of one saturated screen volume was purged; for wells with greater than 0.3 feet of drawdown a minimum of one saturated screen volume plus one drawdown volume was purged.
- For the Spring 1996 sampling event, the following guideline was used to determine if a sufficient volume of water had been purged from the aquifer; a minimum of three drawdown volumes was purged from each well.
- For both the Fall 1995 and Spring 1996 sampling events, for wells that purged dry, samples were collected when the well had recharged sufficiently to collect a sample.

All modifications to the sampling protocol were based on meetings and telephone conversations with Mr. Richard Willey of EPA. Tables with all stabilization measurements are provided in Appendix B. Stabilization parameters for the Fall 1995 and Spring 1996 sampling events are summarized in Tables 3B and 3C, respectively.

2.4 *LEACHATE*

Leachate samples were collected from three leachate seeps under the Spring 1995 and Fall 1995 LTMP sampling events. Leachate seep samples

were collected by excavating a one foot deep pit and collecting the samples directly into laboratory supplied containers.

2.5 *PERFORM DATA QA/QC EVALUATION AND COMPILE AND ANALYZE DATA*

ERM validated all laboratory analytical data from the three LTMP sampling events, in accordance with EPA Region I protocols. Data validation reports for the Spring 1995, Fall 1995, and Spring 1996 LTMP sampling events were submitted to EPA in reports dated 8 September 1995, 20 February 1996 and 20 August 1996, respectively.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 METEOROLOGY

The site is located in a temperate climate. The annual mean temperature is 46°F and the temperature varies more in the winter than in the summer. The average annual rainfall and snowfall totals are 42 inches and 52 inches, respectively. The values are based on thirteen years of sampling (1979-1992) at the Pownal, Vermont National Oceanic and Atmospheric Administration (NOAA) weather station.

Vermont is located in a region of prevailing westerly winds, with winds generally out of the northwest in the winter and southwest in the summer. Locally winds may be directed by topography, with wind directions paralleling valleys.

3.2 SURFACE WATER HYDROLOGY

Drainage and Surface Waters

The site is located in a rural, wooded area on the western slope of Harmon Hill and is within the Walloomsac River drainage basin. The site topography is shown in Figure 2. There are at least three drainage swales, downslope to the east of the site, originating from Harmon Hill that discharge into an unnamed stream which flows southerly, to the south-southwest of the Landfill Area. Although the drainage swales may be dry in the summer, the unnamed stream typically flows throughout the year.

The unnamed stream continues approximately 1,200 feet into Barney Brook, which discharges into the Walloomsac River approximately 1.7 miles to the west of the site. Barney Brook and its tributaries are designated as Class B waters by the State of Vermont. Class B waters are defined as high quality waters which have aesthetic value and provide quality habitat for aquatic biota, agricultural uses and recreation.

The site is not located within the 100 or 500 year flood plain.

3.3 GEOLOGY

A conceptual model of the site was presented in the RI Report. A cross-section showing the site geology, from the Soil Staging Area through the Landfill Area, Lagoon Cells, and Marshy Area, is provided as Figure 3. As presented in the RI Report and shown on Figure 3, geology beneath the site consists of the following:

Thickness (feet)	*Description*
0-18	Landfill Material - miscellaneous paper, wood, municipal trash, cement blocks, and appliances with local areas (lagoons) containing battery waste sludges
0-36	Kame Sand - loose to medium dense fine sand with trace amounts of site and/or gravel
4-18	Ablation Glacial Till - medium dense till, transitional with the kame sand, consisting of medium to fine sandy silt with gravel and clay; generally poorly sorted
35-90	Lodgement Till - dense, poorly sorted till, consisting of sands and silts with clay, boulders, and gravel.
180-360	Weathered Bedrock - commonly referred to as "ocher", this layer consists of weathered quartz sandstone or arkosic quartz sandstone, with highly weathered layers of silty clay to clay, or loose medium to fine sand.
	Competent Bedrock - massive to thickly bedded quartzite with frequent high angle fractures.

The boundary between the kame sand and ablation till appears to be transitional, with the kame sand being more sand rich, with less fines, and the ablation glacial till being more poorly sorted and containing more fines and gravel. In addition, the hydraulic conductivities of the kame sand and ablation glacial till are similar (see Section 3.4.3), although the ablation glacial till is lower. The lodgement till is very dense, poorly sorted, and has very low permeabilites. Boring logs through this unit describe the unit has dry, suggesting that it is a barrier to contaminant migration.

Porosity in the weathered bedrock units, shallow weathered bedrock and deep weathered bedrock, is associated with the weathered layers between the bedrock and fractures in the bedrock. Porosity in the competent bedrock occurs mainly in fractures.

3.4 HYDROGEOLOGY

3.4.1 Horizontal Flow

A cross-section through the Landfill Area, Lagoon Cells, and Marshy Area is provided as Figure 3, to illustrate general hydrogeologic conditions at the site. Groundwater within the landfill ranges in depth from approximately 14 to 26 feet below ground surface (bgs). Groundwater in the Marshy Area is relatively close to the ground surface, and during high water levels artesian conditions exist.

All monitoring wells at the site were gauged and groundwater flow maps constructed for the Spring 1995, Fall 1995 and Spring 1996 LTMP sampling events. Gauging data for these LTMP sampling events are compiled in Tables 2A, 2B and 2C, respectively.

Groundwater flow maps were constructed for the kame sand, ablation glacial till, and shallow weathered bedrock units, to confirm groundwater flow patterns identified in the RI Report. Groundwater flow maps were not constructed for the deep weathered bedrock or competent bedrock, however, based on regional geology and topography, groundwater flow is likely towards the west.

Groundwater flow directions for the Spring 1995, Fall 1995, and Spring 1996 gauging events were similar. Groundwater flow maps for the Spring 1995 sampling event are included as Figures 4A, 4B, 4C, and 4D.

Groundwater flow maps for the kame sand, ablation glacial till, and weathered bedrock confirms groundwater flow interpretations identified in the RI Report. As shown in Figure 4A, groundwater flow in the kame sand generally follows the topography, with flow from the Landfill Area and Hillside Area into the Marshy Area. Groundwater flow in the ablation glacial till is similar to the kame sand (Figure 4B), with flow from the Landfill Area and Hillside Area into the Marshy Area.

Groundwater flow in the shallow weathered bedrock, Figure 4C, generally follow the hillslope regional topography, with flow from northeast to southwest.

3.4.2 Vertical Gradients

Based on groundwater elevations, the vertical gradient in the shallow water table and ablation glacial till in the Marshy Area are generally upward, indicating that the drainage swales and the unnamed stream are generally gaining streams with groundwater discharging to surface water.

Seasonally, however, during low water levels in the summer and fall, the streams may locally be an area of recharge.

Limited data exists regarding vertical gradients within the landfill; however, based on water level measurements at the W-27 well cluster, groundwater flow is upward from the ablation glacial till into the kame sand.

According to the RI Report, groundwater in the ablation glacial till and weathered bedrock may discharge to Barney Brook; however, this has not been confirmed. Topographically higher areas, upslope on Harmon Hill, are reportedly an area of recharge for the competent bedrock. In these areas, the kame sand and till is reportedly absent. According to the RI Report, the groundwater in the competent bedrock may discharge to the Walloomsac River system in the Bennington Valley area to the west.

3.4.3 *Hydraulic Conductivity and Groundwater Flow Velocity*

OBG performed hydraulic conductivity (slug) tests on all monitoring wells. The following table summarizes the hydraulic conductivities, horizontal velocities and vertical velocities, for each of the defined hydrogeologic units.

Hydrogeologic Unit	*Range Horizontal K (ft/day)*	*Mean Horizontal K(ft/day)*	*Horizontal Velocity (ft/year)*	*Estimated Vertical K (ft/day)*	*Estimated Vertical Velocity Kame Sand-Ablation Glacial Till (ft/year)*
Kame Sand	0.01 - 0.56	0.12/0.19(a)	10-30	0.015	
Ablation Glacial Till	0.03 - 0.7	0.05	7	0.005	1-2
Shallow Weathered Bedrock	0.04-0.49	0.19	5-8	0.019	Not Calculated
Deep Weathered Bedrock	<0.001-0.13	Not Calculated	Not Calculated	0.065	Not Calculated
Competent Bedrock	0.46-2.88	1.67	Not Calculated	Not Calculated	Not Calculated

Notes: (a) Values listed are for the kame sand in the Landfill Area/kame sand in the Marshy Area

As indicated in the above table, the hydraulic conductivities are similar between the kame sand and ablation glacial till. As discussed previously, these two units are transitional at the site. The vertical hydraulic conductivities are estimated to be approximately one order of magnitude lower than the horizontal hydraulic conductivities. Also, between the

kame sand and ablation glacial till, the vertical velocities are up to one order of magnitude lower than the horizontal velocities, indicating that most of the flow in the kame sand and ablation glacial till at the site is in a horizontal direction.

4.0 NATURE AND EXTENT OF CONTAMINATION

This section presents the results of the nature and extent of contamination detected in groundwater, surface water, and leachate. The focus of the Supplemental RI is to further characterize the nature and extent of contaminants in groundwater. Surface water and leachate are also discussed because these media are directly affected by groundwater quality. Discussions on the nature and extent of contamination in other media (i.e., soils, sediment and air) are adequately characterized in the RI Report, and are briefly summarized in this section for completeness.

The framework for discussing the nature and extent of contamination is as follows:

1. Sources of contamination are summarized.
2. The nature and extent of contamination is discussed by media type.
3. Characterization of each media type is discussed by analysis type (i.e., VOCs, inorganics etc.).
4. For groundwater, the characterization is discussed by hydrogeologic unit (unconsolidated kame sand/ablation till and bedrock).
5. Each contaminant type is then discussed in terms of lateral and vertical distribution.
6. The contaminants detected are discussed in terms of site history and potential sources, and the levels of contaminants detected are compared with applicable or potentially applicable standards (i.e., federal maximum contaminant levels (MCLs) and Vermont Enforcement Standards (VES) for groundwater), if available.

For each media, "hits" tables were prepared, which compile only those compounds or elements detected above method detection limits and for which a promulgated standard or guideline exists. The contract required quantitation limit (CRQL) or contract required detection limit (CRDL) is also presented. Complete summary tables of validated data, including compounds detected and not detected are included in Appendix C. Tables in Appendix C also include sample specific quantitation limits and, for inorganics, instrument detection limits (IDLs).

4.1 SOURCES

Sources of contamination at the site are summarized in the RI Report, Section 4.1. This section provides a summary of the primary sources of contamination as presented in the RI Report. The primary source of contamination at the site is the Landfill Area, including the two former Lagoon Cells. The former Lagoon Cells occupy over 2,000 square feet. The former Lagoon Cells consisted of two unlined bermed pits excavated approximately eight feet into the kame sand deposit. A topographic depression is present in the area of the lagoons. Wastes such as lead plater sludge, battery processing waste and spent solvents were disposed in the Lagoon Cells from approximately 1967 to 1976. Alternating layers of sludge-like material and kame sand indicated that wastes were disposed and covered on a periodic basis.

The primary contaminants detected in the former Lagoon Cells are chlorinated VOCs (primarily TCE, PCE, vinyl chloride, 1,1-DCE and 1,2-DCE) and metals (primarily lead, nickel, cadmium, chromium, mercury and zinc). An indication of potential non-aqueous phase liquid (NAPL), petroleum or solvent based liquids, was identified in lagoon soil samples. Concentrations of TCE and PCE were detected in lagoon soils, up to 6,900,000 µg/kg and 8,100,000 µg/kg, respectively.

The areas of Lagoon Cell 1 and 2 were estimated to be 960 square feet and 3,168 square feet, respectively. The average depth of each Lagoon Cell is estimated to be 8.5 feet. Residues have migrated an additional five feet, to the top of the water table. The volume of impacted materials from Lagoon Cells 1 and 2 were estimated to be 19,200 cubic feet and 27,000 cubic feet, respectively. Therefore, the total extent of Lagoon Cell impacted material is estimated to be 46,200 cubic feet or approximately 1,700 cubic yards.

The landfill is located within the kame sand deposit. As shown in Figure 3, the majority of the landfill debris appears to be located above the water table. The landfill reportedly received municipal-type refuse, such as wood, newspaper, steel, cardboard and cinders, as well as demolition debris (not liquid wastes). Sampling indicates that localized areas contain residues similar to those found in the former Lagoon Cells, but the concentrations of the residues are lower.

The Landfill Area is also considered a potential source of contamination. The surface area of the landfill is approximately 60,000 square feet and the depth of the landfill ranges from 8 to 18 feet. Assuming an average depth of 13 feet, the volume of the landfill is estimated to be 30,000 cubic yards.

4.2 SOILS

Soil sampling results are presented in the RI Report, Section 4.1.1. Soil sampling locations are summarized on attached Figure 5. The sampling results are summarized below.

Surface Soil Samples

Surface soil samples consisted of grab samples collected from a depth of up to seven inches. The highest VOC concentrations in surface soil samples were detected in the Marshy Area at a concentration of 89,154 µg/kg (SP-07). The primary VOCs in the Marshy Area were 1,2-DCE, toluene, TCE, PCE and vinyl chloride. Trace levels of VOCs were detected in background surface samples, as well as in samples from the Landfill Area, Lagoon Cells, Soil Staging Area, Hillside Area, and West of the Landfill Area. SVOCs (coal tar derivatives, possibly present due to the disposal of asphalt debris) were detected in one sample from the Marshy Area. Metals, primarily lead and nickel, were detected in the Marshy Area and Landfill Area at up to two orders of magnitude above background.

Soil Boring Samples

Soil boring samples were collected from split spoon samples from a depth of up to 34 feet. The highest concentrations of VOCs in the subsurface were detected in the former Lagoon Cells at a concentration of 12,600,000 µg/kg (SBW-15), between a depth of two and six feet. VOCs detected in lagoon soils included, TCE, PCE, and 1,2-DCE.

VOC concentrations generally decreased with depth in the former Lagoon Cells. An evaluation of how the VOC concentrations decrease with depth is provided below.

Depth Range (feet)	*SBW-14 TVOCs (µg/kg)*	*SBW-1 TVOCs (µg/kg)*	*SBW-18A TVOCs (µg/kg)*	*Median TVOCs (µg/kg)*
2-4	NA	10,500,000	NA	10,500,000
4-6	NA	12,600,000	56	6,300,000
6-8	530	NA	NA	530
8-10	266	540,000	16,200	185,000
12-14	22	NA	163	93

Notes: TVOC = Total VOCs
NA = Not Analyzed

VOCs were detected in the Marshy Area at concentrations of up to 1,048 µg/kg (W-11, at a depth of eight to 10 feet). The primary VOCs detected in Marshy Area soil samples included, TCE, PCE, vinyl chloride, 1,2-DCE, and acetone. A similar suite of VOCs is detected in groundwater at the site. VOCs from groundwater may become adsorbed onto the soil particles. However, a comparison of the soil sampling data with groundwater sampling data indicate that the analytical results for soil may also be indicative of groundwater entrained in the soil. The following table illustrates this point.

Soil Boring/ Monitoring Well	*Depth of Highest TVOCs in Soil (feet)*	*Highest TVOCs in Soil (µg/kg)*	*TVOCs in Groundwater (µg/kg)*
W-03	10-12	592	41,800
W-04	9-11	142	5,570
W-11	8-10	1,048	10,010
W-22	6-8	192	44,400

Note:
TVOC = Total VOCs

SVOCs were detected in the former Lagoon Cells at concentrations up to 41,120 µg/kg (SBW-15) and in the landfill at up to 3,170 µg/kg (SBW-19). SVOCs in soils consisted primarily of polynuclear aromatic hydrocarbons (PAHs), including benzo(a)pyrene, benzo(bk)fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, and fluoranthene, phenanthrene.

PCBs were detected in one soil sample from the former Lagoon Cells at a concentration of 25 mg/kg (SBW-15). PCBs were detected in other soil borings, but at concentrations less than 1 mg/kg.

Metals were detected in soils from the former Lagoon Cell at concentrations up to four times background levels and in the Landfill Area at up to two times background levels. Metals detected in lagoon and/or landfill soils, at least one order of magnitude above background levels, included: antimony, cadmium, copper, lead, mercury, nickel, silver, and zinc.

Lead and nickel were detected in Marshy Area sediments at up to two orders of magnitude above background. Metals detected in the Marshy Area soils at least one order of magnitude above background levels included: cadmium, copper, lead, mercury, nickel, and zinc. Soils in the Marshy Area are likely finer grained than the background samples collected by OBG from Harmon Hill. This is because the Marshy Area soils are flood plain/overbank deposits from the drainage swales.

Concentrations of metals would likely be higher in the fine grained fraction of a soil sample than in the coarser sandy material, which is generally more quartz-rich. Therefore, the concentrations of metals detected in Marshy Area soils may be within the range of concentrations expected for this type of soil. However, soil may be locally impacted by leachate seeps from the landfill.

4.3 *GROUNDWATER*

4.3.1 *Introduction*

This section discusses the nature and extent of contamination identified in groundwater at and near the site. To be consistent with the RI Report and Risk Characterization, groundwater monitoring wells were divided into two hydrogeologic units:

- kame sand/ablation glacial till, including:
  - landfill material wells
  - kame sand wells
  - ablation glacial till wells
- bedrock, including:
  - shallow weathered bedrock wells
  - deep weathered bedrock wells
  - competent bedrock wells

A listing of the wells included in each hydrogeologic unit is presented in Table 1. The kame sand and ablation glacial till are in hydraulic connection and are transitional, therefore, it is logical to discuss these as one hydrogeologic unit, in terms of contaminant nature and extent. This is further discussed in Section 3.3. The kame sand/ablation glacial till and bedrock are separated by an apparent aquiclude/aquitard, a dense lodgment till. Therefore, the nature and extent of contamination in the bedrock is discussed separately from the kame sand/ablation glacial till.

Levels of contaminants detected in groundwater are compared with MCLs and VES, in order to evaluate groundwater quality. The groundwater plume is defined as levels of contaminants above MCLs or VES. "Hits" tables for VOCs and metals in groundwater are attached as Tables 6A-D and 7A-D, respectively, and present only those compounds or elements detected above method detection limits and for which a promulgated standard or guideline exists.

4.3.2 *Volatile Organic Compounds*

Introduction

Evaluation of the nature and extent of VOC impacts to groundwater includes data from all sampling events, including low flow and conventional sampling data.

Evaluation of Organics Data Quality

ERM reviewed the low flow sampling results for each well and compared the analytical results with past conventional sampling data. This comparison generally included 2-3 rounds of low flow data and up to five rounds of conventional sampling data. Low flow sampling results were consistent with conventional sampling data. Low flow sampling results are expected to be consistent with conventional sampling results, because suspended sediment should not impact analytical results for VOCs. Therefore, all VOC data from the RI and LTMP sampling events were used evaluate the nature and extent of contamination.

Kame Sand/Ablation Glacial Till Nature and Lateral Extent of Contamination

As discussed above, the unconsolidated overburden includes landfill material wells, kame sand wells, and ablation glacial till wells. Maximum concentrations of specific VOCs detected in the shallow kame sand and ablation glacial till wells are shown on Figures 6 and 7, respectively. These maps include only those compounds detected above method detection limits.

VOCs were not detected in any upgradient wells above MCLs or VES. One VOC, acetone, was detected at well W-01S1 at a maximum concentration of 4.5 µg/l. Acetone was detected at this location in Fall 1993 and Winter 1994 sampling events, but was not detected in the two subsequent LTMP sampling rounds.

The following table summarizes the maximum concentration of specific VOCs detected above MCLs or VES in the kame sand/ablation glacial till, by area:

Compound	MCL/VES (µg/l)	Maximum Concentration in µg/l				
		Soil Staging Area	Hillside Area	Landfill Area	Marshy Area	West of Landfill Area
Vinyl Chloride	2/2	-	-	2,000	2,300	3
Methylene Chloride	5/5	-	-	22	-	-
Benzene	5/5	7	-	-	550	-
1,1-DCE	7/7	-	-	360	620	1
1,2-DCE	70/70	-	-	8,700	22,000	31
1,2-DCA	5/5	-	-	-	18	-
TCE	5/5	20	-	15,000	40,000	660
PCE	5/0.7	-	-	19,000	10,000	380
Chlorobenzene	NSA/100	-	-	-	580	-

Notes: - Indicates that the compound was not detected above method detection limits.

As shown on Figure 6 and 7 and summarized in the above table, the highest concentration of VOCs were detected within the Landfill Area and Marshy Area. Within the landfill the highest concentration of VOCs in groundwater were detected in the former Lagoon Cells (W-TP12). Concentrations of VOCs detected in the Marshy Area, downgradient of the former Lagoon Cells (wells W-02, W-03, W-04 cluster, W-05, and W-06 cluster), are at similar or higher concentrations than were detected in the former Lagoon Cells.

As indicated on Figure 5, a second area of elevated VOCs was identified in the vicinity of SBW-21, within the Landfill Area, and the Marshy Area downgradient of SBW-21, in the vicinity of W-22S1 and W-22T.

VOCs were not detected above MCLs or VES in the Hillside Area. Two VOCs were detected in the Hillside Area below regulatory standards, toluene at a maximum concentration of 12 µg/l and xylene at a maximum concentration of 5 µg/l. The source of these VOCs is not known.

The lateral extent of VOC impacts to groundwater is within the Soil Staging Area, the Landfill Area, the West of the Landfill Area, and the Marshy Area. With the exception of the Soil Staging Area, the likely

source of VOCs in groundwater is the Landfill Area, and in particular the former Lagoon Cells. The highest concentrations of VOCs in groundwater, outside the Landfill Area, are located adjacent to and downgradient of the former Lagoon Cells. Potential localized source areas for VOCs in groundwater outside the Lagoon Cells are evident by the levels of VOCs detected at locations SBW-21, in the Landfill Area, and W-22S1 and W-22T, located downgradient of SBW-21 in the Marshy Area.

The southeastern edge of the VOC plume in the kame sand/ablation glacial till is approximately at drainage Swale 2. VOC impacts to groundwater were not identified to the east of Swale 2 at locations W-06S and W-06D. West of Swale 2, VOC impacts to groundwater, above MCLs or VES were identified as far south and downgradient as W-09S1. The levels of VOCs at W-09S1 generally were below or slightly above the MCL or VES, indicating that W-09S1 is near the approximate southern limit of the VOC plume.

West of the Landfill and Swale 2, VOCs were not detected at location W-26T above method detection limits. VOCs were detected above MCLs or VES at locations W-27S1, W-27T, W-08S1, W-25S1 and W-09S1. Therefore, the western limit of the VOC plume in the kame sand/ablation glacial till is between the landfill road and W-26T.

VOCs detected in the Soil Staging Area (W-07S1) consist primarily of petroleum related VOCs (benzene, toluene, ethylbenzene, and xylene (BTEX)) compounds, with the exception of 1,1,1-trichloroethane (1,1,1-TCA) and TCE. The Soil Staging Area was reportedly used as a fuel tank salvage area, which is consistent with the contaminants detected in groundwater. The Soil Staging Area is located upgradient or cross-gradient of the landfill. Based on hydrogeologic location and past use, contaminants detected in groundwater in the Soil Staging Area are likely from a source within the Soil Staging Area, and not from the landfill.

Potential for Dense Non-Aqueous Phase Liquid (DNAPL)

The RI Report noted that concentrations of TCE were detected in the former Lagoon Cell sludges above the solubility limit for TCE, suggesting the possibility for a dense non-aqueous phase liquid (DNAPL). The highest concentration of VOCs in groundwater were detected in the shallow kame sand. The following table summarizes the maximum concentrations of specific VOCs detected in groundwater relative to the solubility limit for that compound:

Compound	Location Maximum Concentration	Maximum Concentration Detected (µg/l)	Solubility Limit (µg/l)	% of Solubility Limit Detected
TCE	W-22S1	40,000	1,100,000	4%
PCE	W-TP12	21,000	150,000	14%
vinyl chloride	W-11S1	2,300	2,670,000	0.1%

As indicated in the above table, concentrations of TCE and PCE were detected in groundwater within the kame sand at 4% and 14% of their solubility, respectively. As a general guideline, concentrations of specific chlorinated solvents above 1-10% of their solubility limits may be indicative of a DNAPL. DNAPL was not observed at any well locations.

The following table summarizes the maximum concentrations of TCE, PCE, and vinyl chloride detected in well clusters W-04, W-03 and W-22:

Compound	W-04S (µg/l) W-T Kame Sand	W-04D (µg/l) Base Kame Sand	W-04T (µg/l) Ablation Glacial Till	W-03 (µg/l) W-T Kame Sand	W-03T (µg/l) Ablation Glacial Till	W-22S1 (µg/l) W-T Kame Sand	W-22T (µg/l) Ablation Glacial Till
TCE	2,000	9,500	2,500	12,000	47	40,000	8,800
PCE	640	3,300	41	10,000	81	-	4
Vinyl Chloride	1,500	620	54	-	-	250	6

Notes: - = Compound not detected above method detection limits.
W-T = Well is screened across the water table.

As shown in the above table, concentrations of VOCs were lower in the ablation glacial till than in the kame sand, by up to two orders of magnitude. Concentrations of specific VOCs detected in the ablation glacial till are less than 1% of the solubility limit for specific compounds. The levels of VOCs detected in the ablation glacial till indicate that if a DNAPL is present then it is likely limited to the kame sand aquifer.

Based on the distribution of VOCs in groundwater, groundwater flow in the kame sand and ablation glacial till, and topography at the top of the ablation glacial till, the likely location of DNAPL, if present, would include the former Lagoon Cells and the Landfill Area, between well SBW-21 and the W-22 cluster. Based on the distribution of VOCs, a

DNAPL, if present, appears to be localized within the immediate vicinity of the former Lagoon Cells and the Landfill Area.

Bedrock Nature and Lateral Extent of Contamination

As discussed previously, the bedrock includes shallow and deep weathered bedrock wells and competent bedrock wells. Maximum concentrations of specific VOCs detected in the shallow and deep weathered bedrock wells and competent bedrock wells are shown on Figures 8 and 9, respectively. These maps include only those compounds detected above method detection limits. No bedrock wells were installed in the Landfill Area or Hillside Area.

VOCs were detected in the bedrock above MCLs or VES at three well locations, W-04SI, W-27SI, and W-09B. Two VOCs were detected above MCLs or VES in the deep aquifer, TCE and PCE. The VOCs results for detections of VOCs above MCLs or VES in bedrock were not repeatable between sampling events and therefore, may be due to laboratory or field sampling errors and not representative of groundwater quality.

VOCs were detected above MCLs or VES in the Marshy Area only at location W-04SI. TCE, PCE, and 1,2-DCE were detected at location W-04SI in the Spring 1995 LTMP sampling event. Well W-04SI has been sampled for VOCs on eight occasions, 10 samples total with duplicate samples, including three rounds using low flow purge and sampling techniques, and VOCs were below method detection limits for all sampling events except Spring 1995.

Concentrations of TCE were detected in two wells in the West of the Landfill Area, W-07SI and W-04B, above MCLs and VES. Concentrations of TCE were detected at location W-07SI (22 μg/l) above MCLs and VES in the Fall 1995 LTMP sampling event. This well has been sampled on seven occasions and VOCs were either not detected or below MCLs and VES for all sampling events. TCE was also detected in the competent bedrock above MCLs and VES at location W-09B (14 μg/l), in Fall 1994. Well W-09B was sampled for VOCs on seven occasions. TCE was detected at this location only on this one occasion.

As discussed in Section 3.3 and 3.4, the lodgement till is a barrier to dissolved phase vertical contaminant migration. As indicated above, the detections of VOCs above MCLs or VES at locations W-04SI, W-07SI, and W-04B were not repeated in other sampling events. Therefore, these detections may be due to laboratory or field sampling errors and not representative of groundwater quality.

Vertical Extent of VOCs in Groundwater

VOC impacts to groundwater above MCLs or VES are contained within the kame sand and ablation glacial till. Concentrations of VOCs above MCLs or VES in the bedrock were only detected at two locations, within the shallow weathered bedrock and one location within the competent bedrock. As discussed in the previous section, the concentrations of VOCs above MCLs or VES at these three locations may be due to a laboratory or field sampling error and are not considered to be representative of groundwater quality.

4.3.3 *Semi-Volatile Organic Compounds*

SVOCs detected in groundwater during the RI included bis(2-ethylhexyl)phthalate, pyrene, and 1,4-dichlorobenzene. As presented in the letter from de maximis to EPA dated 13 April 1995 (included in Appendix D), the only SVOCs detected in groundwater which may pose a risk were detections of bis(2-ethylhexyl)phthalate detected at locations SBW-10 and W-08SI.

SVOC levels in groundwater may be anomalously high, because SVOCs may be associated with suspended sediment rather than dissolved in groundwater or mobile in groundwater. Therefore, ERM resampled locations SBW-10 and W-08SI for SVOCs under the Supplemental RI, using low flow purge and sampling techniques. SVOCs were not detected at W-08SI above method detection limits. Bis(2-ethylhexyl)phthalate was not detected at SBW-10 above method detection limits. 4-Chloro-3-methylphenol was the only SVOC detected at SBW-10, at a concentration of 0.8 µg/l. A MCL or VES does not exist for 4-chloro-3-methylphenol. However, these concentrations are not expected to pose a risk.

4.3.4 *Inorganics*

Introduction

Evaluation of the nature and extent of inorganic impacts to groundwater is based on low flow sampling data. Only low flow sampling data are used in order to reduce potential interference on inorganic analytical results from suspended sediment. For purposes of determining the nature and extent of inorganics impacts to groundwater, only representative data, as discussed below, were considered. Low flow and conventional sampling results are compared, because the low flow data significantly changes the conceptual site model for inorganic impacts to groundwater.

Evaluation of Inorganics Data Quality

As part of the Supplemental RI, ERM analyzed stabilization data collected from individual wells, for the three LTMP sampling rounds, to determine the whether inorganic analytical results are representative of groundwater quality. A summary of data quality for the three low flow groundwater sampling events performed under the LTMP is included in Table 4. In this table a the data from each of the three LTMP sampling rounds is classified as either representative, and used to evaluate groundwater quality, or non-representative, and not used to evaluate groundwater quality. Results of the data quality evaluation are summarized in Table 4. Following is a discussion of the procedures used to evaluate data quality and a summary of the data quality.

Data Quality Evaluation Parameters

Turbidity, total aluminum concentration, drawdown, and other stabilization parameters (i.e., pH, specific conductance, and temperature) were used to evaluated whether samples are representative of groundwater quality. A description of the effects each of these parameters has on data quality is presented below:

- **Turbidity** - Turbidity is used to measure the amount of suspended sediment in groundwater. Analytical results from samples with high turbidity may not be representative of metal concentrations that are mobile in groundwater. Low flow purging and sampling is intended to minimize suspended sediment in groundwater samples by purging and sampling at the same rate as aquifer recharge. In accordance with EPA Region I low flow sampling protocols, a turbidity of less than 5 NTU was considered representative. Turbidity values between 5 and 100 NTU were evaluated in conjunction with other data quality parameters to determine if the data is representative. Samples with turbidity levels greater than 100 NTU were flagged as non-representative.
- **Aluminum** - Concentrations of total aluminum are used as a representative element to evaluate whether inorganic analytical results are likely to be representative of aquifer conditions. Aluminum is essentially insoluble in groundwater under normal aquifer conditions. Aluminum is a naturally occurring metal in soil and rock. Elevated aluminum values detected in groundwater samples would be a function of high turbidity. Aluminum concentrations in upgradient wells, for samples with a turbidity less than 5 NTU, ranged from not detected to 544 µg/l with a mean of 112 µg/l. The federal drinking water guideline for aluminum is 50 to 200 µg/l. Samples with aluminum concentration less than 200 µg/l were

considered acceptable. Samples with aluminum concentrations greater than 200 µg/l were considered questionable and were re-evaluated in conjunction with turbidity.

- **Drawdown** - Drawdown measures the how much the water level in a well is lowered during purging and sampling, and indicates the degree to which groundwater is being drawn from storage in the well and not from the surrounding aquifer. Low flow sampling is intended to minimize the amount of drawdown in a well. If drawdown is greater than 0.3 feet, then the data quality is evaluated by comparing the volume of water purged verses the volume of drawdown, to determine if the groundwater sample is coming from the formation. If greater than three drawdown volumes was purged from a well, then the groundwater sample was assumed to be coming from the formation.
- **Other Stabilization Parameters** - pH, specific conductance, and temperature stabilization parameters were reviewed to determine if any were anomalously high or low and may indicate that the samples collected are not representative of aquifer conditions. Evaluation of these stabilization parameters is somewhat subjective and was performed by comparing stabilization data with past sampling events, and nearby wells.

Data Quality Evaluation

Based on the four evaluation criteria (turbidity, aluminum concentration, drawdown, and other stabilization parameters), groundwater data was classified as representative and used to evaluate the nature and extent of contamination and fate and transport, or non-representative and not used to evaluate groundwater quality. Evaluation of data quality was performed as follows:

1. If all data quality parameters for a sample were met, including pH, temperature, specific conductance, turbidity, drawdown, and aluminum concentrations, then the data was determined to be representative.
2. If turbidity was greater than 100 NTU and aluminum concentrations were greater than 200 µg/l , then the detections from these sample were determined to be non-representative. This interpretation is further discussed below.
3. If groundwater pH values were not within normal range or an insufficient volume of water was purged to document that the sample was coming from the formation (rather than from storage in the borehole), then the data was considered non-representative. This is because the effects on data quality cannot be determined.

4. If pH, temperature, and specific conductance stabilization requirements were met, but only one of the following stabilization parameters were achieved, turbidity less than 5 NTU or aluminum concentrations less than 200 μg/l, then the data quality was evaluated in more detail, on a sample specific basis. In this evaluation, the historical conventional sample data were reviewed, both filtered and unfiltered data, other metals concentrations (i.e., iron concentrations), and plots of drawdown/turbidity verses volume purged/time (included in Appendix B), to determine if the data is representative of aquifer conditions.

It should be noted that, for samples where the data is flagged as non-representative because the aluminum concentrations were elevated or sample turbidity was high, the inorganics analytical results from these wells are likely biased high. Therefore, groundwater quality evaluations based on these data would be conservative. For wells with high turbidity and/or high aluminum concentrations, in which all metals were either not detected or below MCLs or VES, these results can be used to determine the nature and extent of contamination and contaminant fate and transport.

Summary of Inorganics Data Used to Determine Nature and Extent of Contamination

Table 4 summarizes the results of the data quality evaluation. Samples that were categorized as representative were used to evaluate the nature and extent of contamination. Detections of metals from samples with high turbidity and high aluminum concentrations were not used because they are not considered representative of naturally static conditions. Use of this data would lead to inaccurate or misleading conclusions. Table 5 summarizes the metals detected above MCLs or VES, using low flow purge and sample techniques, and qualifies the data as either representative or non-representative.

Samples from wells W-25SI and W-25DI were considered non-representative because of the high pH in these wells, with pH values ranging from 10.66 to 11.04 and 11.60 to 11.46, respectively. The construction of these wells is questionable, as grout may have penetrated the well screen, causing the high pH values. The effects of the high pH on data quality cannot be determined. ERM redeveloped well W-25SI, to attempt to bring the pH within normal range. Well redevelopment including jetting borehole water through the well screen and then overpumping the well. ERM was not able to lower the groundwater pH in the well and, for this reason, EPA recommended that wells W-25SI and W-25DI not be included in the LTMP sampling program.

As shown in Table 5, following is a summary of the samples which had both high turbidity and high levels of aluminum in the sample, and therefore, the detections above MCLs or VES were determined to be non-representative of groundwater quality and not used to evaluate the nature and extent of contamination:

- Spring 1995 W-TP12, SBW-21, W-03, W-04D, W-06D, W-08S1, W-27T, W-07SI, W-01DI
- Fall 1995 W-03, W-04D, W-08S1
- Spring 1996 W-06D

Well W-08S1 was re-developed prior to the Spring 1996 sampling event. As indicated in Table 5, the turbidity after re-development was 0.58 and aluminum was not detected. Samples collected prior to well re-development had high turbidities and high aluminum concentrations and interpretations of inorganics groundwater quality would been non-representative.

Kame Sand/Ablation Glacial Till Nature and Lateral Extent of Contamination

As discussed above, the unconsolidated overburden includes landfill material wells, kame sand wells and ablation glacial till wells. A comparison of low flow sampling results verses conventional sampling results for the kame sand and ablation glacial till wells are shown on Figures 10 and 11, respectively. These maps include only those elements detected above method detection limits and for which a Federal or state standard or guideline exists. For conventional sampling data, the maps show the maximum concentration of each metal detected at that location. The low flow groundwater data are shown for each sampling event at each well.

Table 5 summarizes the metals detected in the kame sand/ablation glacial till above MCLs or VES. This table also indicates which data are considered representative to evaluate the nature and extent of contamination. The following table summarizes the maximum concentration of metals detected above MCLs or VES in the kame sand/ablation glacial till, by area, based on representative data only:

Element	MCL/VES (µg/l)	Maximum Concentration in µg/l				
		Upgradient	Hillside	Landfill	Marshy	West of Landfill
Iron	300*/300*	-	-	no data representative	128,000	17,200
Manganese	840(a)	-	-	no data representative	5,220	8,860
Thallium	2/NSA	-	-	no data representative	6.4	6.3

Notes: - = concentrations of metals in this area were either not detected or detected at concentrations below MCLs or VES
* = the standard is a secondary MCL
NSA = no standard available
(a) = EPA derived risk based drinking water standard.

Groundwater data for both Landfill Area wells were considered non-representative." For comparison purposes, concentrations of chromium, iron, lead, manganese, nickel and thallium were detected from wells within the Landfill Area and former Lagoon Cells, above MCLs or VES. These results are likely biased high, because the sample turbidity and aluminum concentrations for these wells was high. As indicated in the above table and Table 5, iron, manganese and thallium were detected in wells beyond the limits of the landfill above MCLs.

Iron, manganese and thallium were detected in the Marshy Area above MCLs or VES. Manganese was detected at the following locations, in the Marshy Area, above the EPA derived risk based drinking water standard for manganese: W-11S1 and W-22S1. Thallium was detected at one location in the Marshy Area above MCLs, W-11S1. Iron was detected in the Marshy Area above MCLs or VES, at locations W-11S1, W-22S1, and W-22T. Iron, manganese and thallium were detected above MCLs or VES in the West of the Landfill Area at wells W-25S1 and W-09S1.

Based on representative data, the lateral extent of the metals plume, with the exception of iron, manganese and thallium, appears to be contained primarily within the Landfill Area.

The lateral extent of the manganese plume is within the Marshy Area, west of Swale 2 (approximately 120 feet southeast of the Lagoon Cells); and south of the Lagoon Cells, to the W-25 and W-09 clusters (approximately 300 feet southeast of the Lagoon Cells). The distribution of thallium in groundwater is less widespread than manganese. Beyond

the landfill, thallium was only detected in one Marshy Area well, W-11S1, and south of the Lagoon Cells, at the W-25 and W-09 clusters.

The iron plume extends from the Landfill Area and Lagoon Cells into the Marshy Area and West of the Landfill Area. Iron was detected at W-06D, east of Swale 2 in the Marshy Area. Migration of iron east of Swale 2 may be related to overland flow during high water levels. Because of the hillslope to the east of Swale 2 and groundwater flow patterns in the kame sand/ablation glacial till, migration of iron east of Swale 2 would be localized to the immediate vicinity of Swale 2.

The likely source of iron, manganese, and thallium in groundwater is the Landfill Area, including the former Lagoon Cells. Iron and manganese are common landfill constituent. The source of thallium is not known for certain. Thallium may be associated with landfill waste, or may be a sampling artifact. According to Pradyot Patnaik, 1992, thallium is used in photoelectric cells, in semiconductor studies, and in low-range glass thermometers; thallium salts are used as rodent poisons.

Kame Sand/Ablation Glacial Till - Comparison of Low Flow Verses Conventional Sampling

Figures 12, 13, and 14 show the lateral extent of the groundwater plume for lead, chromium, and nickel, respectively, identified using low flow versus conventional sampling techniques. The extent of the plume is defined as levels which exceed either MCLs or VES. As shown on this figure, the upgradient and downgradient edge of the lead and chromium plumes and the downgradient edge of the nickel plume were not delineated using conventional sampling. Based on representative low flow sampling data, the lead, chromium and nickel plumes have not migrated beyond the limits of the landfill and these metals are not detected upgradient of the landfill.

Bedrock Nature and Lateral Extent of Contamination

As discussed above, the bedrock includes shallow and deep weathered bedrock wells and competent bedrock wells. A comparison of low flow sampling results verses conventional sampling results for the shallow and deep weathered bedrock and competent bedrock wells are shown on Figures 15 and 16, respectively. These maps include only those elements detected above method detection limits and for which a Federal or state standard or guideline exists. For conventional sampling data, the maps show the maximum concentration of each metal detected at that location. The low flow groundwater data are shown for each sampling event.

Table 5 summarizes the metals detected in the bedrock above MCLs or VES. This table also indicates which data were considered representative and are used to evaluate the nature and extent of contamination. Iron was the only metal detected in the shallow and deep weathered bedrock or competent bedrock above MCLs or VES. Iron is a common naturally occurring element in bedrock. The shallow weathered bedrock is described as having "ocher" layers consisting of weathered quartz sandstone or arkosic quartz sandstone, with highly weathered layers of silty clay to clay, or loose medium to fine sand. This would be a likely natural source of iron in bedrock.

Concentrations of chromium were detected in the Marshy Area at location W-04DI above the VES of 50 µg/l, but below the MCL of 100 µg/l. Iron was detected at this location at a concentration of 809 µg/l, which exceeds the secondary MCL/VES of 300 µg/l. While this sample did not meet the screening criteria in Section 4.3.2, to indicate the data should not be used in the evaluation of the nature and extent of contamination, the following observations suggest that this detection may not be representative:

- The sample collected was collected using a Grundfos pump and it was difficult to sustain a constant low flow using a Grundfos pump. Grundfos pumps were only used in the Spring 1995 LTMP. At 6 of the 8 well locations where concentrations of metals exceeded MCLs or VES, the samples were collected using Grundfos pumps.
- The turbidity during purging was erratic, as shown in the cross-plot of turbidity verses volume purged/time, included in Appendix B.
- Metals were not detected above MCLs or VES in the Fall 1995 sample collected from this location using a bladder pump.
- W-04DI was sampled on seven occasions. For each sampling event both total and filtered metals samples were collected. Chromium was not detected in any other samples, including both low flow and conventional sampling data, above MCLs or VES

In summary, an inorganics plume is not identified in the deep aquifer. The detection of metals in the bedrock above MCLs or VES, with the exception of iron, is concluded to be an artifact of groundwater sampling (i.e., use of Grundfos pumps which resulted in samples with elevated turbidities, or poor well construction). Iron is likely naturally occurring in bedrock.

Bedrock - Comparison of Low Flow Verses Conventional Sampling

Metals detected above MCLs and VES in the bedrock using conventional sampling techniques included antimony, beryllium, chromium, copper,

lead, manganese, nickel, and thallium. Metals were detected above MCLs or VES in all bedrock wells using conventional sampling techniques. Using low flow sampling techniques the only metal detected in the bedrock above MCLs or VES, based on representative data, was iron. The source of iron is likely naturally occurring from the bedrock.

Vertical Extent of Inorganics in Groundwater

Based on representative data, inorganic impacts to groundwater above MCLs or VES appear to be contained within the kame sand and ablation glacial till. Metals detected beyond the landfill above MCLs or VES in the kame sand/ablation glacial till include iron, manganese and thallium. Inorganics, with the exception of iron, were not detected in the bedrock above MCLs or VES. Iron is likely naturally occurring in the bedrock.

As discussed in the previous section, other metals were detected in the kame sand/ablation glacial till and bedrock above MCLs or VES; however, these data were considered non-representative due to high sample turbidity, use of Grundfos pumps, or poor well construction.

4.4 *RESIDENTIAL WELL/RYDER SPRING SAMPLING*

One round of residential well sampling, sampling at Ryder Springs, was performed under the Supplemental RI, to confirm data from previous sampling events. The results are discussed in the following sections.

4.4.1 *Volatile Organic Compounds*

VOCs were not detected in the sample from Ryder Springs above method detection limits. One VOC was detected in the groundwater sample from the Olin well; tetrahydrofuran (THF) was detected at a concentration of 2 µg/l. A MCL or VES does not exist for THF. For comparison purposes, Massachusetts has a drinking water guideline for THF of 1,300 µg/l. The levels of THF detected in the Olin well are three orders of magnitude lower than the Massachusetts drinking water guideline. THF was not detected at the site.

VOCs detected in the Dickinson well included acetone (5 µg/l) and chloroform (14 µg/l). The MCL for chloroform is 100 µg/l; therefore, the concentrations detected in the Dickinson well are below the drinking water standard. A VES does not exist for chloroform. A MCL or VES does not exist for acetone. However, for comparison purposes, the Massachusetts Drinking Water Guideline for Acetone is 3,000 µg/l.

In summary, the levels of VOCs detected in the Olin and Dickinson wells are below existing drinking water standards or guidelines.

4.4.2 *Inorganics*

The Dickinson private water supply well was analyzed for total lead, because the lead concentration detected in the November 1993 sampling event, under the RI, exceeded the MCL for lead. The sample from the Dickinson well was collected directly from the well using a PVC bailer, in order to eliminate potential impacts to the well sample from piping in the house. Lead was not detected above method detection limits in the Supplemental RI sample.

4.5 *SURFACE WATER*

4.5.1 *Introduction*

Surface water quality was characterized in the RI Report. ERM conducted three additional rounds of surface water sampling under the LTMP, including Spring 1995, Fall 1995 and Spring 1996. Spring 1995 and Spring 1996 were wet weather flow conditions and Fall 1995 was dry weather flow conditions. This section provides a summary of the nature and extent of contamination in surface water as discussed in the RI Report and incorporates the three recent LTMP sampling events.

Revised surface water standards have been promulgated by EPA and the state of Vermont, as follows:

- Federal Water Quality Standards (WQS) were promulgated under 40 CFR Ch. 1 Part 131, dated 1 July 1995
- Vermont Water Quality Criteria (Vt. WQC), dated 13 February 1996

For purposes of evaluating surface water quality and the nature and extent of impacts to surface water, the RI data and Supplemental RI data are compared with both WQS and Vt. WQC. Comparison to these standards is not intended for risk assessment purposes. TRC Environmental Corporation (TRC), under contract to EPA, has conducted both a Human Health and an Ecological Risk Assessment for site surface waters.

Seven rounds of surface water sampling have been conducted at the site. Results of the surface water data for VOCs and TAL metals are summarized in Tables 8A/8B and 9, respectively. These tables summarize the VOCs and metals detected in surface water above method detection

limits. For comparison purposes, this table also lists the WQS and Vt. WQC, where available. A complete summary of the VOCs and metals detected in surface water, including method detection limits for those compounds/elements not detected, are proved in Appendix C.

For evaluation purposes, the surface water samples are sub-divided into the following areas:

1. Upstream sample locations (SW-01B, SW-08, and SW-13), which include sample locations from Swales 1, 2, and 3, upstream of those portions of the drainage swales located downgradient and downslope of the landfill.
2. Marshy Area sample locations (SW-09, SW-10, SW-11, SW-12, and SW-02), which are located downgradient and downslope of the landfill.
3. Downstream Swale 2 (SW-03 and SW-14), includes surface water locations immediately downstream of the Marshy Area.
4. Unnamed Stream (SW-15 , SW-04, and SW-07), which includes surface water sample locations downstream of where Swales 1 and 2 converge.
5. Upstream Barney Brook (SW-05), which evaluates surface water quality upstream of where the Unnamed Stream discharges to Barney Brook.
6. Downstream Barney Brook (SW-06, SW-16, and SW-17), which includes sample locations in Barney Brook located downstream of where the Unnamed Stream discharges to Barney Brook.

4.5.2 *Evaluation of Data Quality*

The Fall (November) 1994 LTMP surface water data appears anomalous when compared with the six other rounds of surface water data, especially for TAL metals. Metals, particularly iron and manganese were detected in Fall 1994 at concentrations up to four orders of magnitude greater than the six other sampling events. In addition, metals were detected in the Fall 1994 sampling event at several locations, which were not detected in any of the other seven sampling events. For example, beryllium, mercury, nickel, selenium, and thallium were detected in the Fall 1994 sampling event, for sample locations in the Marshy Area; these metals were below method detection limits in this area for the six other sampling events.

The Fall 1994 LTMP samples were collected by OBG; therefore, ERM could not verify the field procedures used. The source of elevated metals could be related to sample collection procedures (i.e., stirring up of sediment

prior to sampling). In addition, the Fall 1994 surface water data was collected under the LTMP, and therefore, was not validated for potential laboratory errors.

4.5.3 *Volatile Organic Compounds*

One VOC was detected in the Upstream sample locations, carbon disulfide at a concentration of 10 µg/l. A WQS or Vt. WQC does not exist for carbon disulfide. Carbon disulfide is not related to the site.

The following table summarizes the VOCs detected in surface water, above WQS or Vt. WQC, downslope and downgradient of the site. For purposes of this table only the most stringent of the WQS or Vt. WQC is listed. This table also lists the other VOCs detected in each area, for which no surface water quality standard exists.

Compound	*Most Stringent Standard ** µg/l)*	*Marshy Area (µg/l)*	*Downstream Swale 2 (µg/l)*	*Unnamed Stream (µg/l)*
TCE	2.7	420	140	40
PCE	0.8	58 (71)	21 (34)	10
Vinyl Chloride	2	290 (800)	49	4
1,1-DCE	0.057	2	2 (2.5)	(0.7)
Bromodichloro-methane	0.27	10	BDL	BDL
List of other VOCs detected, for which no WQS or Vt. WQC exists	n/a	dichlorofluoromethane, 1,2-DCE, acetone, carbon disulfide, xylene, toluene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, 4-methyl-2-pentanone	1,2-DCE, acetone, carbon disulfide	acetone, 2-DCE, acetone, carbon disulfide, (cis-1,3-dichloro-propane)

Notes: ( ) values or compounds in parenthesis are from the Fall 1994 sampling event, concentrations from this round were anomalously high and compounds were detected that were not detected in other sampling events
BDL compound was not detected above method detection limit
n/a Not applicable
** value listed is the most stringent standard between the WQS and Vt. WQC

As shown in the above table, VOC concentrations in surface water were highest in the Marshy Area and decreased downstream in Swale 2 and the Unnamed Stream. Also, the number of VOC compound detected were highest in the Marshy Area and decreased downstream in Swale 2 and the Unnamed Stream.

VOCs were not detected in Barney Brook above WQS or Vt. WQC. VOCs detected in Barney Brook included trace levels of TCE, 1,2-DCE, acetone, and carbon disulfide. VOCs detected in Barney Brook upstream of where the Unnamed Stream discharges into Barney Brook included acetone and 1,2-DCE.

Seasonal variations in the compounds and concentrations of VOCs in surface water were not observed.

4.5.4 *Inorganics*

The following table summarizes the maximum concentration of metals detected in surface water above WQS or Vt. WQC. For purposes of this table only the most stringent of the WQS or Vt. WQC is listed. This table also lists the other metals detected in surface water, for which no surface water quality standard exists.

	(µg/l)	Maximum Concentration (µg/l)					
Metal	*Most Stringent Standard*	*Upstream*	*Marshy*	*Downstream Swale 2*	*Unnamed Stream*	*Barney Brook Upstream*	*Barney Brook Downstream*
Antimony	14	BDL	**19 (60)**	**20.2**	**29**	**25**	**60**
Arsenic	0.018	**6**	**10 (49)**	BDL	BDL	BDL	BDL
Copper *	8	**12.2**	**4.9 (37.6)**	4.6	5.2	6	4.4
Iron	1,000	**209,000**	**593,000 (765,000)**	**3,150**	943	699	786
Lead *	1.5	**7.5**	**6.6 (50.5)**	**3.5 (3.7)**	**2.1**	**2.2**	**3.1**
Mercury	0.012	BDL	**0.49**	**0.05**	**0.22**	BDL	0.04
Nickel *	106	BDL	**383**	**587**	(13.7)	(1.1)	(1.5)
Selenium	5	BDL	**(85.8)**	4.1	3.2	BDL	3.8
Silver *	1.6	**5.9**	**5**	**7.9**	**5.8**	**12**	**6.9**
Thallium	1.7	BDL	**(97.6)**	BDL	BDL	BDL	BDL
Zinc *	71	**170**	**62.7 (644)**	4.9	4.3	4.5	4.9
Cyanide	5.2	BDL	**6**	5	BDL	BDL	BDL
Other Metals Detected	n/a	Al, Ba, Ca, Cr, Co, Mg, Mn, K, Na, V	Al, Ba, Cd, Ca, Cr, Co, Mg, Mn, K, Na, V, (Be)	Al, Ba, Be, Cd, Ca, Cr, Co, Mg, Mn, K, Na, V, (Be)	Al, Ba, Cd, Ca, Cr, Mg, Mn, K, Na, (V)	Al, Ba, Cd, Ca, Cr, Mg, Mn, K, Na	Al, Ba, Cd, Ca, Cr, Mg, Mn, K, Na, V

Notes: ( ) Values or compounds in parenthesis are from the Fall 1994 sampling event, concentrations from this round were anomalously high and compounds were detected that were not detected in other sampling events

BDL Compound was not detected above method detection limit

n/a Not applicable

* Standard is calculated using a hardness of 63 mg/l, which is the average hardness for surface water measurements collected at the site.

Shaded cells/values printed in bold exceed either the WQS or Vt. WQC.

** value listed is the most stringent standard between the WQS and Vt. WQC

As shown in the above table, several metals were detected in surface water upgradient of the Marshy Area, which exceeded the most stringent WQS or Vt. WQC, including arsenic, copper, iron, lead, silver, and zinc. The detections of arsenic, copper, silver, and zinc, which exceeded the WQS or

Vt. WQC were from location SW-08. This location may be impacted operations associated with the landfill.

The concentrations of metals above WQS or Vt. WQC were highest in the Marshy Area and decrease downstream in Swale 2 and the Unnamed Stream and Barney Brook. This trend suggests that the impact to surface water quality originates in the Marshy Area and decrease as the stream flows toward Barney Brook. The source of metals is likely a combination of naturally occurring and impacts from leachate seeps. However, some metals, including antimony, arsenic, copper, lead and silver are present in background samples and/or at all locations at similar concentrations. The source of these metals may be naturally occurring, and not related to impacts from the landfill.

Seasonal variations in the compounds and concentrations of VOCs in surface water were not observed.

4.6 *SEDIMENT*

4.6.1 *Introduction*

Sediment sampling in the vicinity of Swale 2 and the Unnamed Stream was performed under the RI. This section provides a summary of the results of the RI sampling. RI sediment sample locations are divided into three areas, as follows:

1. Upstream samples collected at locations SED-01A, SED-01B, and SED-08
2. Marshy Area samples collected at locations SED-02 and SED-09 through SED-12
3. Downstream samples collected at SED-03 through SED-07, and SED-13 through SED-15

The sediment sample results are discussed in the RI Report, Section 4.1.3 and the data are compiled in Appendix 15, Tables 20 through 23.

4.6.2 *Organics*

The only VOC detected at the Upstream sample locations was acetone, with a maximum concentration of 300 μg/kg. SVOCs and PCB/pesticides were not detected above method detection limits.

The results of the VOC sediment analyses from the Marshy Area and Downstream sample locations are summarized in the following table. For each VOC, a range of concentrations is presented for each area.

Compound	Range Detected in Marshy Area (µg/kg)	Range Detected in Downstream Area (µg/kg)
Acetone	42-400	26-79
2-Butanone	16-73	BDL
Carbon disulfide	BDL-1.9	BDL-2.6
1,2-DCE	47-1,700	10-35
Ethyl benzene	2.9-16	BDL
Methyl chloride	BDL-4.2	BDL-2.5
Toluene	4.6-190	BDL
TCE	27-520	8-56
PCE	BDL-72	9-130
Xylene	2.5-64	BDL
Vinyl Chloride	86-430	BDL

Notes: BDL = Compound was not detected above method detection limits.

As shown in the above table, VOCs were detected in both the Marshy Area and Downstream Sediment sample locations. A similar suite of VOCs were detected in sediments, as were detected in groundwater and soil samples at the site. The concentration of VOCs was highest downslope of the landfill and decreases from the Marshy Area to the Downstream Area. No applicable standards or guidelines are available for VOCs in sediment. TRC, under contract to EPA, has conducted an Ecological Risk Assessment for the site, which address potential risks associated with sediment.

4.6.3 *Inorganics*

As presented in the RI Report, inorganics results are compared with National Oceanic and Atmospheric Administration (NOAA) Effects Range Low (ER-L) and Effects Range Medium (ER-M) values. The following table summarizes the inorganic constituents detected in sediment above the NOAA ER-L values. Inorganics sediment results are presented for the

Upstream, Marshy Area and Downstream sample locations. For each metal detected above the ER-L, a range of concentrations is presented for each area. This table also identified other metals which were detected in sediment at least one order of magnitude above upstream levels, but did not exceed the ER-L.

Metal	Range NOAA ER-L/ER-M (µg/kg)	Range Detected Upstream (µg/kg)	Range Detected Marshy Area (µg/kg)	Range Detected Downstream (µg/kg)
Lead	35/110	5.1-21.5	7.3-70.3	6.4-22.5
Mercury	0.160/1.3	BDL	0.18-0.31	0.14-0.31
Nickel	30/50	1.7-6.2	4.1-59.8	2.7-24.2
Zinc	120/270	21.4-49.8	0.77-176	24.1-79.9
Other Metals Detected			Al, Cr, Zn, Ba, Be, Co, Cu, Mn, V	Al, Ba, Co, Mn, Ni, V

Notes: BDL = Metal was not detected above method detection limits.

As shown in the above table, metals were not detected in the upstream sediment sample locations above the NOAA ER-L. Concentrations of lead, mercury, nickel, and zinc were detected above NOAA ER-L concentrations in the Marshy Area. Metals were not detected in the Downstream sample locations above NOAA ER-L levels, indicating that the extent of impacts to sediment is limited to within the Marshy Area downslope and downgradient of the landfill.

4.7 *LEACHATE*

Leachate was characterized in the RI Report. Three leachate seeps are observed at the site on the east flank of the landfill; LS-01, LS-02, and LS-03. OBG conducted one round of leachate sample. ERM conducted two additional rounds of leachate sampling under the LTMP, including Spring and Fall 1995. Spring 1995 was wet weather flow conditions and Fall 1995 was dry weather flow conditions. This section provides a summary of the nature and extent of contamination identified in leachate as discussed in the RI Report and incorporates the two recent LTMP sampling events.

Three rounds of leachate sampling have been conducted at the site. Results of the leachate sample data for VOCs and TAL metals are

summarized in Tables 10 and 11, respectively. These tables summarize the VOCs and metals detected in leachate above method detection limits. A complete summary of the VOCs and metals detected in leachate, including method detection limits for those compounds or elements not detected are proved in Appendix C. For comparison purposes, laboratory results from the leachate samples are compared with WQS and Vt. WQC. WQS and Vt. WQC are only provided for comparison purposes, and are not necessarily an applicable standard for leachate.

4.7.1 *Organics*

VOCs were detected at all three leachate seep sample locations. The following table summarizes the VOCs detected in leachate, above WQS or Vt. WQC. For purposes of this table only the most stringent of the WQS or Vt. WQC is listed.

Compound	*Most Stringent Standard ** (µg/l)*	*LS-01 (µg/l)*	*LS-02 (µg/l)*	*LS-03 (µg/l)*
Vinyl chloride	2	30	70	460
TCE	2.7	570	51	44,000
PCE	0.8	-	-	18,000
1,1-DCE	0.057	-	5	-
Bromodichloromethane	0.27	3	-	-

Notes: - concentrations of VOCs in this area were not detected.
n/a not applicable
** value listed is the most stringent standard between the WQS and Vt. WQC

As shown, VOCs detected in leachate above WQS and/or Vt. WQC included: vinyl chloride, TCE, PCE, and 1,2-DCE. These VOCs were also detected in Landfill Area and particularly Lagoon Cell soil and groundwater samples. The highest concentrations of VOCs in leachate were at location LS-03, which is situated immediately downslope and downgradient of the Lagoon Cells. The source of VOCs in leachate is the Landfill Area, and particularly the Lagoon Cells.

As presented in the RI Report, PCBs and pesticides were not detected in any leachate samples above method detection limits. SVOCs were only detected at location LS-03. 1,4-dichlorobenzene was detected at a concentration of 15 µg/l.

4.7.2 *Inorganics*

Inorganics were detected at all three leachate seep sample locations above WQS and Vt. WQC. The following table summarizes the inorganics detected in leachate, above WQS or Vt. WQC. For purposes of this table only the most stringent of the WQS or Vt. WQC is listed.

Metal	Most Stringent Standard (µg/l)	LS-01 (µg/l)	LS-02 (µg/l)	LS-03 (µg/l)
Antimony	14	-	39.7	-
Arsenic	0.018	16.9	-	-
Copper *	8	29	206	122
Iron	1,000	42,100	260,000	31,900
Lead *	1.5	82.1	998	314
Mercury	0.012	-	2.7	0.86
Nickel *	106	19.5	235	390
Silver *	1.6	-	4.1	-
Thallium	1.7	5.3	4.7	2.4
Zinc *	71	8,180	1,810	236
Cyanide	5.2	8	-	-

Notes:
- \- concentrations of VOCs in this area were not detected.
- n/a not applicable
- * Standard is calculated using a hardness of 63 mg/l, which is the average hardness for surface water measurements collected at the site.
- Shaded cells/values printed in bold exceed either the WQS or Vt. WQC.
- ** value listed is the most stringent standard between the WQS and Vt. WQC

A similar suite of metals as was detected in leachate were also detected in soils from the Landfill Area and Lagoon Cells. The source of some of the inorganics detected in leachate is likely the Landfill Area, and particularly the Lagoon Cells. However, all leachate samples were turbid and therefore, analytical results for the total metals samples from leachate seeps are likely impacted by suspended sediment.

5.0 CONTAMINANT FATE AND TRANSPORT

This section presents an evaluation of the fate and transport of contaminants identified at the site. This section focuses on groundwater contaminant fate and transport, but also discusses other media (i.e., leachate, surface water etc.), as appropriate. This discussion of fate and transport either amends or revises the site model presented in the RI Report, based on the low flow sampling results. The discussion of contaminant fate and transport is presented in two sections, as follows:

- contaminant mobility and persistence
- contaminant fate and transport

5.1 CONTAMINANTS OF POTENTIAL CONCERN, CONTAMINANT PERSISTENCE, AND FACTORS THAT AFFECT MOBILITY

5.1.1 Contaminants of Potential Concern

Site-related inorganic and organic contaminants have been detected in environmental media principally in shallow hydrogeologic units (kame sand and ablation glacial till). Section 4.0 provides a detailed summary of detections by media.

The VOCs that were the most prevalent in groundwater and surface water onsite were TCE, PCE, acetone, vinyl chloride, 1,2-DCE, and 1,1-DCE. A similar suite of VOCs was also detected in other media, including soil, sediments, and surface water. Relatively low concentrations SVOCs were detected in the RI sampling events in soil and groundwater.

Inorganics were detected in soils from the Landfill Area and Lagoon Cells and Marshy Area soils/sediments, that were elevated with respect to background concentrations. Inorganics that were most prevalent include, cadmium, copper, iron, lead, manganese, mercury, nickel and zinc. Few organics were detected in groundwater beyond the landfill boundary, and consisted primarily of iron, manganese and thallium.

5.1.2 Physical and Chemical Properties Affecting Mobility

General Properties

The physical and chemical properties of contaminants directly affect the mechanisms of their migration through environmental media. The

following chemical-specific properties can be indicative of the relative mobility, retardation, and persistence of chemicals in the environment:

- Solubility in Water;
- Vapor Pressure;
- Henry's Law Constant;
- Viscosity and Density/Specific Gravity;
- Soil Adsorption Coefficient (K_{OC}); and
- Octanol Water Coefficient (K_{OW}).

The solubility of a solid (or miscibility of a fluid) with water is the maximum concentration of pure chemical dissolved in pure water at neutral pH within a temperature range of 20-30°C. Greater solubility/miscibility generally indicates a greater potential for contaminant mobility in water under equilibrium conditions. Soluble compounds may be leached from wastes and soils and thereby become mobile in groundwater. The solubility of a chemical may be altered by the presence of other contaminants. For example, pure metals are generally insoluble, but they may also form salts and complexes which can be soluble. Alternatively, a soluble compound may become less soluble in a solution with less soluble compounds.

The ability of a compound to volatilize is dependent on the vapor pressure, Henry's Law Constant, and solubility. Vapor pressure is an indicator of volatility and is based on pure chemical partitioning into air, at a given temperature (usually between 20° and 30°C). Contaminants with low vapor pressure are in liquid or solid state, whereas contaminants with high vapor pressure are primarily gaseous. Henry's Law Constant, which is derived from vapor pressure, solubility, and molecular weight, measures partitioning across the liquid-gas interface in equilibrium. A contaminant with a low Henry's Law Constant will remain dissolved in water while a contaminant with a high Henry's Law Constant will probably volatilize. Compounds with high vapor pressures, high Henry's Law Constants, and high solubility are generally mobile.

Viscosity and density will affect the flow of a fluid. A liquid which is more viscous than water will tend to migrate more slowly than water, and liquid with high viscosity will generally be less mobile than a liquid with low viscosity. Density may counteract the influence of viscosity on mobility. For example, denser pure phase contaminants will migrate downward in an aquifer faster than less dense pure phase contaminants with equivalent viscosity's.

The Organic Carbon Partition Coefficient (K_{OC} or soil partition coefficient) reflects the mobility of organic contaminants relative to adsorption. Soil with a high organic carbon content will adsorb organic contaminants, therefore retarding mobility. The K_{OC} indicates the degree of partitioning of the contaminant across the solid-liquid interface. Low K_{OC} values indicate lower potential for adsorption, and therefore greater mobility through soil.

The Octanol/Water Partition Coefficient (K_{OW}) is a measure of the distribution of a contaminant between water and octanol. A compound with a negative log K_{OW} is more hydrophilic and therefore more likely to become mobile in water. A compound with a positive log K_{OW} is considered hydrophobic and therefore is more likely to adsorb onto organic matter, therefore reducing mobility.

Properties of Chemical Groups Detected

The VOCs of potential concern at the site are predominately chlorinated aliphatic compounds. The most frequently detected VOCs at the site are TCE, PCE, vinyl chloride, 1,1-DCE, 1,2-DCE, and acetone. These VOCs are characterized by a relatively high vapor pressure and solubility. The VOCs have aqueous solubilities ranging from approximately 100 mg/l to 10,000 mg/l under specific laboratory conditions. VOCs also have the highest vapor pressures (ranging from approximately 10 mm_{Hg} to 6000 mm_{Hg}) and Henry's Law Constants (0.01 to 0.1 atm-m^3/mol), compared to other compound types. Therefore, they are likely to be the most mobile contaminants.

The SVOCs detected in soils at the site are predominately PAHs and phenols. In general, PAHs have low aqueous solubilities, ranging from less than 10^{-3} mg/L to 40 mg/l. The vapor pressures and Henry's Law Constants are also low, ranging from less than 10^{-10} to 10^{-2} mm_{Hg} and 10^{-10} to 10^{-4} atm-m^3/mol, respectively. The PAHs have significantly higher soil adsorption coefficients than the VOCs. The mobility of PAHs is generally related to molecular weight, with two-ring PAHs (such as naphthalene) being more mobile than four- and five-ring PAHs (such as benzo(a)pyrene). The majority of PAHs are relatively immobile. Other SVOCs detected at the site, such as chlordane and PCBs, also have very low solubilities and vapor pressures, and therefore are relatively immobile.

The SVOCs detected using low flow sampling at the site consisted of bis(2-ethylhexyl)phthalate and 4-chloro-3-methylphenol. In general, phenolic compounds are relatively hydrophilic and have significantly higher water solubilities than other SVOCs. Phenol has an aqueous solubility of

approximately 100,000 mg/L, and is the most soluble of the phenolic compounds.

A variety of inorganics were detected in soil, sediments, groundwater, and surface water at the site. Metals are not readily volatile, tend to adsorb to soils, and are generally insoluble in water under neutral or slightly alkaline conditions. Metals can become more soluble under increasingly acid conditions. The cationic salts of most metals are also relatively insoluble, including many hydroxides, sulfates, and sulfides. The notable exceptions are the Group I metals such as sodium which are generally soluble. Some metal-containing anions can also be soluble under certain conditions. For example, hexavalent chromium as dichromate ($Cr_2O_7^{=}$) is water soluble, whereas trivalent chromium ($CrO_4^{=}$) is insoluble. However, under reducing conditions, the hexavalent form will readily convert to trivalent chromium. Hexavalent chromium was not detected at the site.

5.1.3 *Contaminant Persistence*

Persistence refers to a contaminant's ability to resist physical, chemical, and biological environmental conditions that tend to reduce its presence. The persistence of contaminants is influenced by the properties described in the previous section as well as molecular structure, site-specific factors such as the characteristics of soil, water, and other media in which contaminants occur, the hydrogeological characteristics of the site, and climactic conditions. For example, most organic compounds will degrade due to photoloysis, but this mechanism only applies to compounds immediately on the soil surface.

The VOCs are likely to be the least persistent contaminants in soil. VOCs are relatively water soluble, and may leach from soil to groundwater due to infiltration of precipitation. In both soil and groundwater, but particularly in soil, the VOCs may be transformed through biological reactions. The end product(s) of the biodegradation is dependent on several factors, including pH, temperature, dissolved oxygen content, and nutrient levels. For example, both PCE and TCE can be biologically transformed into dichloro- and monochloro-ethenes or ethanes, and may ultimately be mineralized (CO_2, H_2O, Cl^-, etc.) and converted into biomass. The daughter products are generally more mobile, and are therefore more likely to be found away from the source of the original contamination. Aromatic compounds such as benzene may also undergo biodegradation, although by different pathways.

SVOCs, with the exception of phenols, are generally persistent in soil due to their molecular structure, low aqueous solubilities, low vapor pressure,

and high soil adsorption coefficients. Phenols have relatively high solubilities and low soil adsorption coefficients, and are therefore generally less persistent in soil. Phenols may readily biodegraded because of there solubility. Phenols may also be biodegradation by-products of aromatic compounds, including PAH.

Most metals will persist in soils at neutral pH, with the exception of those metal salts which are water soluble. Metals are not subject to biodegradation, but may change valence state due to biological or physical processes to become more or less water soluble, thereby affecting persistence.

5.2 *FATE AND TRANSPORT*

5.2.1 *Summary of Groundwater Flow*

Groundwater flow in the unconsolidated overburden (kame sand and ablation glacial till) is generally from the Landfill Area south-southeastward into the Marshy Area. Shallow groundwater in the Marshy Area discharges to drainage Swale 2. No evidence of contaminant impacts to groundwater were observed to the east of drainage Swale 2 suggesting that Swale 2 is a barrier to lateral contaminant migration in the kame sand and ablation glacial till.

Vertical flow paths indicate generally upward gradients in the unconsolidated overburden (kame sand and ablation glacial till) in the Marshy Area, with groundwater discharging to surface water. Limited data on vertical gradients in the Landfill Area indicate a slightly upward gradient in this area. A dense lodgement till separates the kame sand and ablation glacial till from the bedrock (shallow and deep weathered bedrock and competent bedrock). The presence of a dense till between the kame sand/ablation glacial till and bedrock and generally upward gradients in the kame sand and ablation till indicates that dissolved phase contaminant migration from the kame sand/ablation glacial till into the bedrock is not expected. The lodgement till, as a vertical barrier to migration, is confirmed by bedrock groundwater quality.

According to the RI Report, groundwater in the till and weathered bedrock may discharge to Barney Brook. No impacts from the landfill were observed in residential wells or Ryder Spring downgradient of the landfill. Topographically higher areas, upslope on Harmon Hill, are an area of recharge for the competent bedrock, according to the RI Report. In these areas, the kame sand and till is reportedly absent. According to

the RI Report, the competent bedrock may discharge to the Walloomsac River system in the Bennington Valley area to the west.

5.2.2 *Summary of Contaminant Sources*

The primary source area for contaminants at the site is the Landfill Area, and in particular the two Lagoon Cells. As discussed above contaminants in the Landfill Area, and particularly the Lagoon Cells, consist primarily of VOCs and metals, with some SVOCs. The primary mechanism of contaminant migration is surface water infiltration through the Landfill Area, including the Lagoon Cells, and subsequent release to groundwater. Once in the groundwater, the contaminants follow the localized flow pattern into the Marshy Area and towards drainage Swale 2. Drainage Swale 2 flows southward towards the Unnamed Stream, which eventually discharges into Barney Brook.

Groundwater data indicate that the potential for DNAPL exists in the Landfill Area, and particularly within the Lagoon Cells. The potential for DNAPL appears to be limited to within the kame sand and has not migrated into the ablation glacial till.

5.2.3 *Contaminant Migration*

Kame Sand/Ablation Glacial Till

<u>VOCs</u>

Soil

VOCs were detected in shallow soils at relatively low concentrations. This is because chlorinated aliphatic compounds present in exposed soils would tend to volatilize to the air. VOCs are detected in subsurface soils in relatively high concentrations (up to 12,600,000 µg/kg at SBW-15), especially in the Lagoon Cells, and in the vicinity of SBW-21. Because VOCs tend to have relatively high water solubility, residues in soils may migrate to groundwater.

Concentrations of VOCs in Marshy Area sediments do not appear to be a source of contamination. Rather, the Marshy Area soils are a receptor, in which VOCs in groundwater may be adsorbed onto soil particles.

Groundwater

VOCs detected at the site are more dense than water. VOC contaminant migration in groundwater may be by dissolved phase transport, separate

phase transport, or volatilization from groundwater to subsurface soils of the vadose zone with subsequent escape to the atmosphere. At high concentrations, higher density, lower solubility chlorinated aliphatics (PCE and TCE) may form DNAPLs in groundwater, potentially acting as long term sources of groundwater contamination.

Observed VOC contaminant migration in groundwater is primarily dissolved phase transport. The primary direction of VOC contaminant migration is from the Landfill Area towards the south-southeast into the Marshy Area. The southeastern edge of the VOC plume in the kame sand/ablation glacial till is approximately at drainage Swale 2. VOCs are not detected in groundwater to the east of drainage Swale 2. The southern edge of the VOC plume is approximately at W-09S1. The extent of the VOC plume in the south-southeast direction is likely constrained by discharge of contaminated groundwater to surface water and attenuation of contaminated groundwater in Marshy Area sediments.

Limited contaminant migration beyond the landfill is observed towards the west into the West of the Landfill Area. The levels of VOCs detected in West of the Landfill Area wells are lower than observed in the Marshy Area, generally by two orders of magnitude, suggesting the primary direction of groundwater contaminant migration is towards the Marshy Area. This is consistent with groundwater flow maps for the kame sand and ablation glacial till (Figures 4A and 4B). The western edge of the VOC plume is between the landfill road an W-26T.

DNAPL was not observed at the site. However, the concentrations of VOCs detected in groundwater were up to 14 percent of the solubility limit for that compound (for PCE), suggesting that DNAPL could exist. The nature of the overburden material (kame sand and ablation glacial till) would significantly impact DNAPL migration. The kame sand and ablation glacial till are transitional, with the ablation glacial till having a higher silt and clay content, poorer sorting, and lower hydraulic conductivities.

Based on dissolved concentrations of VOCs, DNAPL appears to be contained within the kame sand. DNAPL migration in the kame sand would be downward under gravity, however, because of the fine grained nature of the kame sand, lateral migration along silt and clay layers would occur, as well as adsorption onto the fine grained material. This lateral dispersion and adsorption would occur along with the downward migration and would continue until a confining layer is encountered.

DNAPL would migrate downward to the ablation glacial till. The ablation glacial till does not appear to be a complete confining layer, but may

locally direct the DNAPL migration. Based on the top of till structure contour map, presented in the RI Report, a DNAPL in the Landfill Area or Lagoon Cells would locally be directed towards the Marshy Area. However, DNAPL would also be adsorbed onto soil particles in the ablation glacial till. Based on the distribution of VOCs, a DNAPL, if present, appears to be localized within the immediate vicinity of the Landfill Area and Lagoon Cells.

Surface Water and Sediments

Groundwater at the site discharges to surface water in the vicinity of drainage Swale 2. VOCs in surface water would likely volatilization to the atmosphere or undergo biodegradation or photodegradation. Because VOCs in surface water tend to volatilize rapidly, they are not likely to partition to sediments. The downstream edge of the VOC plume in surface water, as defined by concentrations of VOCs above WQS or Vt. WQC, is between SW-15 and SW-04.

VOCs were detected in sediment samples from drainage Swale 2, in the Marshy Area, however, as discussed in Section 4.2, the VOCs detected in sediment samples are likely associated with groundwater entrained in the soil particles, rather than contamination in the soil.

SVOCs

SVOCs were detected in the Lagoon Cells at concentrations up to 41,120 µg/kg (SBW-15) and in the Landfill Area at up to 3,170 µg/kg (SBW-19). SVOCs in soils consisted primarily of PAHs, including benzo(a)pyrene, benzo(bk)fluoranthene, indeno(1,2,1-cd)pyrene, pyrene, and fluoranthene, phenanthrene. These SVOCs were not detected in groundwater above MCLs or VES, suggesting that SVOCs are not mobile. In general, PAHs have low aqueous solubilities, low vapor pressures and low Henry's Law Constants. PAHs also have significantly higher soil adsorption coefficients than the VOCs.

SVOCs detected in groundwater at the site included low levels of bis(2-ethylhexyl)phthalate, 4-chloro-3-methylphenol, pyrene, and 1,4-dichlorobenzene. Based on low flow sampling results, the bis(2-ethylhexyl)phthalate is likely associated with sample turbidity and not mobile in groundwater. No MCLs or VES are available for the SVOCs detected. The concentrations of all other SVOCs detected were below available risk derived standards (i.e., Massachusetts risk based GW-1 standards). Therefore, SVOCs in groundwater do not appear to pose a risk at the site.

Pesticides/PCBs

Contaminant migration of pesticides and PCBs was summarized in the RI Report. As presented in the RI Report, pesticides and PCBs are not considered to be contaminants of concern in groundwater or surface water at the site. PCBs were detected locally in surface and subsurface soils, primarily in the former Lagoon Cells. Pesticides and PCBs were not detected above the quantitation limits in groundwater or surface water. Based on these data, the small quantities or pesticides and PCBs detected do not indicate the presence of a pesticides or PCBs source area which would result in impacts to groundwater, surface water or sediments.

Inorganics

Discussion of the fate and transport of inorganics in groundwater is based on representative data as discussed in Section 4.3.4. While additional metals were detected above MCLs or VES, these data were determined to be non-representative due to high sample turbidity, poor well construction, or use of Grundfos pumps, and therefore, are not used to evaluate contaminant fate and transport.

Soil

Metals were detected in Lagoon Cell soils at concentrations up to four times background levels and in the Landfill Area at up to two times background levels. Metals detected in lagoon and/or landfill soils, at least one order of magnitude above background levels, included: antimony, cadmium, copper, lead, mercury, nickel, silver, and zinc.

Lead and nickel were detected in Marshy Area sediments at up to two orders of magnitude above background. Metals detected in the Marshy Area soils at least one order of magnitude above background levels included: cadmium, copper, lead, mercury, nickel, and zinc.

Soils in the Marshy Area are likely finer grained than the background samples collected by OBG from Harmon Hill. This is because the Marshy Area soils are flood plain/overbank deposits from the drainage swales. Concentrations of metals would likely be higher in the fine grained fraction of a soil sample than in the coarser sandy material, which is generally more quartz-rich. Therefore, the concentrations of metals detected in Marshy Area soils may be within the range of concentrations expected for this type of soil. However, soil may be locally impacted by leachate seeps from the landfill.

In summary, the metals detected in soils, beyond the Landfill Area and Lagoon Cells, may be naturally occurring, associated with the fine grained fraction, or may locally be impacted by leachate seeps. The Marshy Area sediments would be a receptor to leachate discharge, but are not considered a source.

Groundwater

Metals are generally insoluble in groundwater under neutral or slightly alkaline conditions. Metals can become more soluble under increasingly acidic conditions. Groundwater pH in the kame sand/ablation glacial till at the site ranged from 5.54-9.27, with pH's generally between 6-8, indicating relatively neutral to slightly alkaline conditions. Therefore, metals are not expected to be mobile in groundwater.

A similar suit of metals were detected above MCLs or VES in groundwater samples from Landfill Area and Marshy Area wells, using conventional sampling techniques, as were detected in soils. None of these metals was detected above MCLs or VES using low flow sampling techniques. Figures 11, 12, and 13 show the lateral extent of the groundwater plume for lead, chromium, and nickel, respectively, identified using low flow verses conventional sampling techniques. As shown on this figure, the upgradient and downgradient edge of the lead and chromium plumes and the downgradient edge of the nickel plume were not delineated using conventional sampling. Based on the low flow sampling results the lead, chromium and nickel plumes have not migrated beyond the limits of the landfill and these metals are not detected upgradient of the landfill. These data suggests that the metals in soils are insoluble and immobile in groundwater.

The lateral extent of the metals plume, with the exception of iron, manganese and thallium, appears to be contained primarily within the Landfill Area.

The likely source of metals in groundwater is the Landfill Area, including the Lagoon Cells. The lateral extent of the manganese plume is within the Marshy Area, west of Swale 2 (approximately 120 feet southeast of the Lagoon Cells); and south of the Lagoon Cells, to the W-25 and W-09 clusters (approximately 300 feet southeast of the Lagoon Cells). The distribution of thallium in groundwater is less widespread than manganese. Beyond the landfill, thallium was only detected in one Marshy Area well, W-11S1, and south of the Lagoon Cells, at the W-25 and W-09 clusters.

The iron plume extends from the Landfill Area and Lagoon Cells into the Marshy Area and West of the Landfill Area. Iron was detected at W-06D, east of Swale 2 in the Marshy Area. Migration of iron east of Swale 2 may be related to overland flow during high water levels. Because of the hillslope to the east of Swale 2 and groundwater flow patterns in the kame sand/ablation glacial till, migration of iron east of Swale 2 would be localized to the immediate vicinity of Swale 2.

Manganese and iron are common landfill constituent. The source of thallium is not known for certain. As discussed in Section 4.3.4.2, thallium may be associated with landfill waste, may be a sampling artifact, or may be a thallium salt associated with landfill waste (i.e., rodent poison).

Surface Water and Sediment

Concentrations of lead, mercury, nickel, and zinc were detected above NOAA ER-L concentrations in sediments from the Marshy Area. Metals were not detected in the Downstream sediment sample locations above NOAA ER-L levels, indicating that the extent of impacts to sediment is limited to within the Marshy Area drainage Swale 2, downslope and downgradient of the landfill.

The concentrations of metals above WQS or Vt. WQC were highest in the Marshy Area and decrease downstream in Swale 2 and the Unnamed Stream and Barney Brook. Metals detected above WQS or Vt. WQS included: antimony, arsenic, copper, iron, lead, mercury, nickel, silver, zinc, and cyanide. A similar suit of metals were detected in soil samples from the Landfill Area and Lagoon Cells, as wells as leachate seep samples. The source of metals in surface water is likely from leachate seeps.

Impact to surface water quality appear to originate in the Landfill Area, and is decrease as the stream flows toward Barney Brook. However, some metals, including antimony, arsenic, copper, lead and silver are present at all locations at similar concentrations. The source of these metals may be background and not related to impacts from the landfill.

Bedrock

Migration of dissolved phase contaminants into the shallow and deep weathered bedrock and competent bedrock is not expected. Site geology consists of an approximately 35 to 90 foot thick dense lodgement till, situated between the kame sand/ablation glacial till and bedrock. This till is described in drill logs as being dry and is likely a barrier to vertical migration. Vertical gradient in the kame sand and ablation glacial till

appear to be upward, which would also inhibit downward migration of dissolved phase contaminants.

VOC impacts to groundwater above MCLs or VES are limited to unconsolidated overburden (kame sand and ablation glacial till). Concentrations of VOCs above MCLs or VES in the bedrock were only detected at two locations, within the shallow weathered bedrock and one location within the competent bedrock. As discussed in Section 4.3.3, the concentrations of VOCs above MCLs or VES at these locations may be due to a laboratory or field sampling error and not representative of aquifer conditions.

Metals, with the exception of iron, were not detected in bedrock above MCLs or VES, based on representative sample data. While additional metals were detected above MCLs or VES, these data were determined to be non-representative due to high sample turbidity, poor well construction (i.e., grout penetrating the well screen), or use of Grundfos pumps, and therefore, are not used to evaluate contaminant fate and transport. Iron is a common element in bedrock and is likely naturally occurring in bedrock.

6.0 SUMMARY AND CONCLUSIONS

6.1 SUMMARY

6.1.1 Introduction

The Burgess Brothers Superfund Site was placed on the NPL in March 1989. An RI Report was completed for the site in July 1995, following completion of field work in the fall of 1993. Long Term Monitoring at the site began in Spring 1994 and is currently performed semi-annually. In general, total metals concentrations in unfiltered groundwater samples were significantly higher than metals concentrations in filtered samples. The turbidity of these samples was also high, typically exceeding 100 NTUs. In addition, the metals concentrations measured in the background wells were higher than what is observed elsewhere in New England. The higher total metals concentrations in unfiltered groundwater samples is likely due to the presence of suspended sediment in these samples, and not be reflective of metal concentrations that are mobile in groundwater. For this reason, EPA determined that the groundwater results in the RI, for inorganics only, may not provide an accurate representation of contaminant nature and extent.

To complete the RI, EPA required that a Supplemental RI be performed using low flow sampling protocols, in order to obtain and use data more representative of groundwater conditions. The scope of the Supplemental RI is documented in a letter to EPA, dated 28 February 1995 and modified in two letters from de maximis to EPA dated 13 April 1995 and 2 May 1996. ERM-New England, Inc. (ERM) conducted three Supplemental RI sampling events, in conjunction with the LTMP, in Spring 1995, Fall 1995, and Spring 1996. The results of these LTMP sampling events are documented in reports to EPA dated 8 September 1995, 20 February 1996 and 20 August 1996, respectively.

The focus of this Supplemental RI is to address the nature and extent of contamination in groundwater and contaminant fate and transport, particularly for inorganics. To provide a complete document addressing groundwater, the characterization of other media (i.e., source areas, soils, sediments, leachate and surface water) from the RI, Supplemental RI, and LTMP have been summarized and interpreted.

6.1.2 *Nature and Extent of Contamination*

The following is a summary of the nature and extent of contamination identified at the site by media.

Source Areas

The primary source of contamination at the site is the Landfill Area, which includes two former Lagoon Cells. The Lagoon Cells consist of two unlined bermed pits excavated approximately eight feet into the kame sand deposit. Wastes such as lead plater sludge, battery processing waste and spent solvents were disposed in the Lagoon Cells from approximately 1967 to 1976.

The primary contaminants detected in the former Lagoon Cells are chlorinated VOCs (TCE, PCE, vinyl chloride, 1,1-DCE and 1,2-DCE) and metals (lead, nickel, cadmium, chromium, mercury and zinc). The area of Lagoon Cell 1 and 2 were estimated to be 960 sq. ft. and 3,170 sq. ft., respectively. The average depth of each lagoon cell is estimated to be 8.5 feet. Therefore, the extent of fill material in the lagoons is approximately 1,700 cubic yards.

The landfill is located within a kame sand deposit. The majority of the landfill debris appears to be located above the water table. The landfill reportedly received municipal-type refuse, as well as demolition debris (not liquid wastes). Sampling indicates that localized areas contain residues similar to those found in the Lagoon Cells. The surface area of the landfill is approximately 60,000 square feet and the depth of the landfill ranges from 8 to 18 feet. Assuming an average depth of 13 feet, the volume of the landfill is estimated to be 30,000 cubic yards.

Soil

The primary areas of impacts to soil were in the Landfill Area, and particularly the Lagoon Cells within the Landfill Area, and the Marshy Area located downslope and downgradient of the landfill. The following table summarizes the maximum concentration of total VOCs, SVOCs, and PCBs detected in soils within the Landfill Area and Marshy Area.

Parameter	Maximum Concentration from Landfill and Lagoon Areas (µg/kg)	Landfill Area	Maximum Concentration from Marshy Area (µg/kg)	Marshy Area
VOCs	12,600,000	TCE, PCE, 1,2-DCE	89,154	TCE, PCE, vinyl chloride, 1,2-DCE, toluene
SVOCs	41,120	benzo(a)pyrene, benzo(bk)fluoranthene, indeno(1,2,1-cd)pyrene, pyrene, and fluoranthene, phenanthrene		benzo(a)pyrene, benzo(bk)fluoranthene, indeno(1,2,1-cd)pyrene, pyrene, chrysene, fluoranthene, phenanthrene
PCBs	25,000	Aroclor 1260	BDL	n/a

Notes: BDL All compounds were below method detection limits.
n/a Not applicable

A comparison of the soil with groundwater sampling data indicates that the analytical results for soil may be indicative of groundwater entrained in the soil particles, rather than contamination of the soil itself.

Metals were detected in the Lagoon Cell soils at concentrations up to four times background levels and in the Landfill Area at up to two times background levels. Metals detected in lagoon and/or landfill soils, at least one order of magnitude above background levels, included: antimony, cadmium, copper, lead, mercury, nickel, silver, and zinc. Metals detected in the Marshy Area soils, at least one order of magnitude above background levels, included: cadmium, copper, lead, mercury, nickel, and zinc.

Groundwater

VOCs

Kame Sand/Ablation Glacial Till Nature and Lateral Extent of Contamination

VOCs were detected in the kame sand/ablation glacial till in the Soil Staging Area, Landfill Area, and particularly the Lagoon Cell areas, the Marshy Area and West of the Landfill Area. The following table summarizes the maximum concentrations of VOCs detected in each area, for those compounds which exceeded MCLs or VES.

		Maximum Concentration in Groundwater µg/l				
Compound	*MCL/VES (µg/l)*	*Soil Staging Area*	*Hillside Area*	*Landfill Area*	*Marshy Area*	*West of Landfill Area*
Vinyl Chloride	2/2	-	-	2,000	2,300	3
Methylene Chloride	5/5	-	-	22	-	-
Benzene	5/5	7	-	-	550	-
1,1-DCE	7/7	-	-	360	620	1
1,2-DCE	70/70	-	-	8,700	22,000	31
1,2-DCA	5/5	-	-	-	18	-
TCE	5/5	20	-	15,000	40,000	660
PCE	5/0.7	-	-	19,000	10,000	380
Chlorobenzene	NSA/100	-	-	-	580	-

Notes: - Indicates that the compound was not detected above method detection limits.

The highest concentration of VOCs were detected within the Landfill Area and Marshy Area. Two areas were identified within the Landfill Area, one in the Lagoon Cells and the other in the vicinity of SBW-21. Concentrations of VOCs detected in the Marshy Area, downgradient of the former Lagoon Cells, are at similar or higher concentrations than were detected in the Lagoon Cells.

The likely source of VOCs in groundwater is the Landfill Area, and in particular the Lagoon Cells. The southeastern edge of the VOC plume in the kame sand/ablation glacial till is approximately at drainage Swale 2. VOC impacts to groundwater were not identified to the east of Swale 2. West of Swale 2, the VOC plume extends approximately to the W-09 cluster (approximately 300 feet southwest of the Lagoon Cells). The western limit of the VOC plume in the kame sand/ablation glacial till is between the temporary well access road (see Figure 1) and W-26T.

Potential for DNAPL

The RI Report noted that concentrations of TCE were detected in the Lagoon Cell sludges above the solubility limit for TCE, suggesting the potential for a DNAPL. The highest concentration of VOCs in groundwater were detected in the shallow kame sand. Concentrations of VOCs were detected in groundwater at up to 14% of their solubility,

which may be indicative of a DNAPL. However, DNAPL was not observed at any well locations.

Concentrations of VOCs were lower in the ablation glacial till than in the kame sand, by up to two orders of magnitude. The levels of VOCs detected in the ablation glacial till indicate that if a DNAPL is present then it is limited to the kame sand. Based on the distribution of VOCs, the potential for DNAPL appears to be localized within the immediate vicinity of the Lagoon Cells and possibly the Landfill Area.

Bedrock Nature and Lateral Extent of Contamination

VOCs (TCE and/or PCE) were sporadically detected in three bedrock wells (W-04SI, W-27SI, and W-09B), above MCLs or VES. Two of these wells have been sampled on seven occasions and one well was sampled on eight occasions. Concentrations of VOCs above MCLs or VES, at each of these wells, were only detected in one sampling event. Therefore, the VOCs detected are likely due to a field sampling or laboratory error and not representative of aquifer conditions.

Vertical Extent of VOCs in Groundwater

VOC impacts to groundwater above MCLs or VES are contained within the kame sand and ablation glacial till.

SVOCs

The only SVOC detected in groundwater that indicated potential human health risk was bis(2-ethylhexyl)phthalate (at locations SBW-10 and W-08S1). SVOC levels in groundwater may be anomalously high, because SVOCs may be associated with suspended sediment rather than dissolved in groundwater or mobile in groundwater. Low flow samples from both of these wells did not detect bis(2-ethylhexyl)phthalate above method detection limits. 4-Chloro-3-methylphenol was the only SVOC detected at SBW-10, at a concentration of 0.8 µg/l. These concentrations are not expected to pose a risk.

Inorganics

Evaluation of the nature and extent of inorganic impacts to groundwater is based on low flow sampling data, in order to reduce potential interference on inorganic analytical results from suspended sediment. For purposes of determining the nature and extent of inorganics impacts to groundwater, only representative data were considered, as discussed in Section 4.3.2.

Kame Sand/Ablation Glacial Till Nature and Lateral Extent of Contamination

The following table summarizes the maximum concentration of specific total metals detected above MCLs or VES in the kame sand/ablation glacial till, by area:

		Maximum Concentration in Groundwater (µg/l)				
Element	*MCL/VES (µg/l)*	*Upgradient Area*	*Hillside Area*	*Landfill Area*	*Marshy Area*	*West of Landfill Area*
Iron	300*/300*	-	-	no data representative	128,000	17,200
Manganese	840(a)	-	-	no data representative	4,730	8,860
Thallium	2/NSA	-	-	no data representative	6.4	6.3

Notes: - = concentrations of metals in this area were either not detected or detected at concentrations below MCLs or VES
* = the standard is a secondary MCL
NSA = no standard available
(a) = EPA derived risk based drinking water standard.

As shown in the above table, concentrations of metals above MCLs or VES were contained primarily within the Landfill Area and Lagoon Cells. Iron, manganese, nickel, and thallium were detected in wells beyond and downgradient of the landfill above MCLs. Iron and manganese are common landfill constituent. The source of thallium is not known for certain. Thallium may be associated with landfill waste (i.e., rodent poison) or may be a sampling artifact.

Bedrock Nature and Lateral Extent of Contamination

The only metal detected in the bedrock, based on representative data was iron. Iron is likely naturally occurring in bedrock. Therefore, an inorganics plume is not identified in the bedrock.

Vertical Extent of Inorganics in Groundwater

Inorganic impacts to groundwater above MCLs or VES appear to be contained within the kame sand and ablation glacial till.

Residential Wells and Ryder Spring

Groundwater from the Olin and Dickenson residential wells and Ryder Springs were analyzed for VOCs. The Dickenson well was also analyzed for lead, to confirm previous results. Concentrations of all VOCs and lead were below MCLs and VES.

Leachate

VOCs detected in leachate above WQS and/or Vt. WQC included: vinyl chloride, TCE, PCE, and 1,2-DCE. These VOCs were also detected in Landfill Area and particularly Lagoon Cell soil and groundwater samples. The highest concentrations of VOCs in leachate were at location LS-03, which is situated immediately downslope and downgradient of the Lagoon Cells. The source of VOCs in leachate is the Landfill Area, and particularly the Lagoon Cells.

PCBs and pesticides were not detected in any leachate samples above method detection limits. SVOCs were only detected at location LS-03. 1,4-dichlorobenzene was detected at a concentration of 15 µg/l.

A variety of metals were detected in leachate above WQS and/or Vt. WQC, including antimony arsenic, copper, iron, lead, mercury, nickel, silver, thallium, zinc, and cyanide. A similar suite of metals as was detected in leachate were also detected in soils from the Landfill Area and Lagoon Cells. The source of some of the inorganics detected in leachate is likely the Landfill Area, and particularly the Lagoon Cells. However, the leachate sample were all turbid and therefore, analytical results for the total metals samples from leachate seeps are likely impacted by suspended sediment.

Surface Water and Sediments

<u>VOCs</u>

The following table summarizes the VOCs detected in surface water above the most stringent of the WQS or Vt. WQC.

Compound	*Most Stringent Standard (µg/l)*	*Landfill Area (µg/l)*	*Downstream Swale 2 (µg/l)*	*Unnamed Stream (µg/l)*
TCE	2.7	420	140	40
PCE	0.8	71	34	10
Vinyl Chloride	2	800	49	4
1,1-DCE	0.057	2	2.5	0.7
Bromodichloro-methane	0.27	10	BDL	BDL

Notes: BDL compound was not detected above method detection limit
n/a Not applicable

As shown in the above table, VOC concentrations in surface water were highest in the Landfill Area and decreased downstream in Swale 2 and the Unnamed Stream. VOCs were not detected in Barney Brook above WQS or Vt. WQC.

A similar suite of VOCs were detected in sediments including acetone, 2-butanone, carbon disulfide, 1,2-DCE, ethylbenzene, methyl chloride, toluene, TCE, PCE, xylenes, and vinyl chloride. VOCs were detected in both the Landfill Area and Downstream Sediment sample locations. The concentration of VOCs were highest downslope of the landfill and decrease from the Landfill Area to the Downstream Area.

The likely source of VOCs in surface water and sediment is from landfill leachate seeps and groundwater discharge to surface water.

Inorganics

The following table summarizes, by area, the metals detected in surface water above WQS or Vt. WQC.

Area	*Metals Detected in Surface Water above the most stringent of the WQS or Vt. WQC*
Upstream	Arsenic, copper, iron, lead, silver and zinc
Landfill	Antimony, arsenic, copper, iron, lead, mercury, nickel, selenium, silver, thallium and zinc
Downstream Swale 2	Antimony, iron, lead, mercury, nickel, silver, thallium and zinc
Unnamed Stream	Antimony, lead, mercury, and silver
Barney Brook Upstream	Antimony, lead, and silver
Barney Brook Downstream	Antimony, lead, and silver

The concentrations of metals above WQS or Vt. WQC were highest in the Landfill Area and decrease downstream in Swale 2, the Unnamed Stream and Barney Brook. This trend suggests that the impact to surface water quality originates in the Landfill Area and is reduced as the stream flows toward Barney Brook. The likely source of metals in surface water is from landfill leachate seeps. However, some metals (antimony, lead and silver) are present at all locations at similar concentrations. The source of these metals may be natural material and not related to impacts from the landfill.

Inorganics results are compared with NOAA ER-L. Concentrations of lead, mercury, nickel, and zinc were detected above NOAA ER-L concentrations in the Landfill Area. Metals were not detected in the Downstream sample locations above NOAA ER-L levels, indicating that the extent of impacts to sediment is limited to within the Marshy Area downslope and downgradient of the landfill. The likely source of metals in sediment is from landfill leachate seeps and from surface transport of soils downslope from the landfill, via surface water runoff.

6.1.3 *Fate and Transport*

Summary of Groundwater Flow

Groundwater flow in the unconsolidated overburden (kame sand and ablation glacial till) is generally from the Landfill Area south-southeastward into the Marshy Area. Shallow groundwater in the Marshy Area discharges to drainage Swale 2. Swale 2 appears to be a barrier to lateral contaminant migration in the kame sand/ablation glacial till.

Vertical flow paths indicate generally upward gradients in the kame sand and ablation glacial till in the Marshy Area, with groundwater discharging to surface water. Limited data on vertical gradients in the Landfill Area indicate a slightly upward gradient in this area. A dense lodgement till separates the kame sand/ablation glacial till from the bedrock. The presence of a dense till between the kame sand/ablation glacial till and bedrock and generally upward gradients in the kame sand and ablation till indicates that dissolved phase contaminant migration from the kame sand/ablation glacial till into the bedrock is not expected.

Summary of Contaminant Sources

The primary source area for contaminants at the site is the landfill, primarily the two former Lagoon Cells. Contaminants in the Landfill Area and Lagoon Cells consist primarily of VOCs and metals, with some SVOCs. In addition, a DNAPL source potentially exists within the Lagoon Cells and the Landfill Area. The primary mechanism of contaminant migration is believed to be surface water infiltration through the Landfill Area and Lagoon Cells and subsequent release of leachate to groundwater.

Contaminant Migration

Kame Sand/Ablation Glacial Till

<u>VOCs</u>

VOCs were detected in shallow soils at relatively low concentrations, because chlorinated aliphatic compounds present in exposed soils would tend to volatilize to the air. VOCs are detected in subsurface soils in relatively high concentrations (up to 12,600,000 µg/kg), especially in the Lagoon Cells, and in the vicinity of SBW-21. Because VOCs tend to have relatively high water solubility, residues in soils may migrate to groundwater via infiltrating surface/rain water.

VOC migration in groundwater is primarily through dissolved phase transport. The primary direction of VOC contaminant migration is from the Landfill Area towards the south-southeast into the Marshy Area. The extent of the VOC plume in the south-southeast direction is likely constrained by discharge of contaminated groundwater to surface water (drainage Swale 2) and attenuation of contaminated groundwater in Marshy Area sediments. In addition, limited contaminant migration of dissolved phase VOCs, beyond the landfill, is observed towards the west into the West of the Landfill Area.

DNAPL was not observed at the site. However, the concentrations of VOCs detected in groundwater indicate that the potential for DNAPL exists. Based on dissolved concentrations of VOCs, potential for DNAPL appears to be contained within the kame sand and within the immediate vicinity of the Landfill Area and Lagoon Cells. DNAPL migration in the kame sand would be downward under gravity. However, because of the fine grained nature of the kame sand, lateral migration along silt and clay layers would occur, as well as adsorption onto the fine grained material. This lateral dispersion and adsorption would occur along with the downward migration would continue until a confining layer is encountered.

The ablation glacial till would locally direct a DNAPL migration. Based on the top of till structure contour map, presented in the RI, a DNAPL in the Landfill Area or Lagoon Cells would locally be directed towards the Marshy Area. However, DNAPL would also be adsorbed onto soil particles in the ablation glacial till.

VOCs in surface water would likely volatilization to the atmosphere or undergo biodegradation or photodegradation. Because VOCs in surface water tend to volatilize rapidly, they are not likely to partition to sediments. The downstream edge of the VOC plume in surface water, as defined by concentrations of VOCs above WQS or Vt. WQC, is between SW-15 and SW-04.

VOCs were detected in sediment samples from drainage Swale 2, in the Marshy Area, however, as discussed in Section 4.2, the VOCs detected in sediment samples are likely associated with groundwater entrained in the soil particles, rather than contamination in the soil.

SVOCs

SVOCs were detected in the Lagoon Cells and consisted primarily of PAHs. These SVOCs were not detected in groundwater above MCLs or VES, suggesting that SVOCs are not mobile.

Pesticides/PCBs

Pesticides and PCBs detected in surface and subsurface soils, primarily in the former Lagoon Cell areas, were not detected in groundwater, suggesting that these compounds are not mobile. Pesticides and PCBs were not detected above the quantitation limits in groundwater or surface water. Based on these data, the small quantities or pesticides and PCBs detected do not indicate the presence of a pesticides or PCBs source area

which would result in impacts to groundwater, surface water or sediments.

Metals

The likely source of metals in groundwater is the landfill, primarily the Lagoon Cell areas. Low flow groundwater sampling indicates that metals in soils, with the exception of iron, manganese and thallium, are generally insoluble and immobile in groundwater. The groundwater metals plume, with the exception of iron, manganese, and thallium, is approximately limited to the immediate vicinity of the landfill.

The lateral extent of the manganese plume is within the Marshy Area, west of Swale 2 (approximately 120 feet southeast of the Lagoon Cells); and south of the Lagoon Cells, to the W-25 and W-09 clusters (approximately 300 feet southeast of the Lagoon Cells). The distribution of thallium in groundwater is less widespread than manganese. Beyond the landfill, thallium was only detected in one Marshy Area well, W-11S1, and south of the Lagoon Cells, at the W-25 and W-09 clusters.

The iron plume extends from the Landfill Area into the Marshy Area and West of the Landfill Area. Iron was detected at W-06D, east of Swale 2 in the Marshy Area. Migration of iron east of Swale 2 may be related to overland flow during high water levels. Because of the hillslope to the east of Swale 2 and groundwater flow patterns in the kame sand/ablation glacial till, migration of iron east of Swale 2 would be localized to the immediate vicinity of Swale 2.

Iron and manganese are likely a common landfill constituent. The source of thallium may be from landfill waste (i.e., rodent poison), or a sampling artifact.

Concentrations of lead, mercury, nickel, and zinc were detected above NOAA ER-L concentrations in stream sediments from the Landfill Area. Metals were not detected in the Downstream sediment sample locations above NOAA ER-L levels, indicating that these metals are relatively immobile. The source of metals is likely from leachate seeps in the landfill.

The concentrations of metals above WQS or Vt. WQC were highest in the Landfill Area and decrease downstream in Swale 2 and the Unnamed Stream and Barney Brook. Metals detected above WQS or Vt. WQS included: antimony, arsenic, copper, iron, lead, mercury, nickel, silver, zinc, and cyanide. A similar suit of metals were detected in soil samples from the Landfill Area and Lagoon Cells, and Marshy Area soils. This

trend suggests that the impact to surface water quality originates in the Landfill Area and is reduced as the stream flows toward Barney Brook. However, some metals, including antimony, lead and silver are present at all locations at similar concentrations. The source of these metals may be background and not related to impacts from the landfill.

Bedrock

VOC impacts to groundwater above MCLs or VES are contained within the kame sand and ablation glacial till. Concentrations of VOCs above MCLs or VES in the bedrock were only detected at three locations. These detections may be due to a laboratory or field sampling error and not representative of aquifer conditions.

Metals, with the exception of iron, were not detected in the bedrock based on representative data. Iron is likely a naturally occurring element in the bedrock. While some metals were detected in the bedrock above MCLs or VES, these samples were determined to be non-representative due to sample turbidity, poor well construction, or use of Grundfos pumps.

The dense lodgement till layer between the overburden material and bedrock is likely a barrier to vertical migration. In addition, vertical gradient in the kame sand and ablation glacial till appear to be upward. Therefore, migration of dissolved phase contaminants into the shallow and deep weathered bedrock and competent bedrock is not expected.

6.2 *CONCLUSIONS*

ERM makes the following conclusions, based on the results of this Supplemental RI.

1. ***The primary source of contamination at the site is the Landfill Area, which includes two Lagoon Cells.***

   Industrial waste was disposed of in the Landfill Area and Lagoon Cells. VOCs (primarily TCE, PCE, vinyl chloride, 1,1-DCE and 1,2-DCE) and metals (primarily lead, nickel, cadmium, chromium, mercury and zinc) were detected in the Lagoon Cells and locally within the Landfill Area.

2. ***Inorganic impacts to groundwater are limited to the kame sand and ablation glacial till and, with the exception of iron, manganese, and thallium, are contained within the Landfill Area and Lagoon Cells.***

   Inorganics data was evaluated in detail to determine if the data is representative of aquifer conditions. Detections of metals from

samples with high turbidity and high aluminum concentrations were not used because they are not considered representative of naturally static conditions. Use of this data would lead to inaccurate or misleading conclusions.

Inorganic impacts to groundwater are contained within the kame sand and ablation glacial till. Metals, with the exception of iron, manganese, and thallium, are limited to the Landfill Area and Lagoon Cells. Lateral migration of iron, manganese and thallium is primarily from the Landfill Area and Lagoon Cells, into the Marshy Area, with limited migration into the West of the Landfill Area.

3. ***SVOCs, PCBs, and Pesticides detected in soils are generally immobile.***

   VOCs, PCBs, and pesticides were detected in Lagoon Cell soils. These compounds were either not detected or detected in low concentrations in groundwater, indicating that these compounds are relatively insoluble and immobile.

4. ***VOC impacts to groundwater are limited to the kame sand and ablation glacial till. Lateral migration of VOCs is primarily from the Landfill Area and Lagoon Cells into the Marshy Area.***

   VOCs are present in the groundwater within the kame sand and ablation glacial till in the immediate vicinity of the landfill. The migration of VOCs is primarily from the Landfill Area into the Marshy Area, east of Swale 2, and southwestward approximately 300 feet, to the W-09 cluster. Limited VOC migration is observed to the West of the Landfill Area.

5. ***VOC and inorganic impacts to bedrock are not observed.***

   Vertical migration of contaminants into bedrock is not expected because a dense lodgement till is situated between the kame sand/ablation glacial till and bedrock. Based on representative data, VOCs and metals are not detected in groundwater in bedrock, with the exception of iron. Iron is a common naturally occurring mineral in bedrock.

6. ***The potential for DNAPL exists at the site; however, a DNAPL, if present, is likely contained within the kame sand and localized within the immediate vicinity of the Landfill Area and Lagoon Cells.***

   Concentrations of VOCs were detected in the kame sand which are potentially indicative of DNAPL. Based on concentrations of VOCs, a DNAPL, if present, is contained within the kame sand and within the immediate vicinity of the Landfill Area and Lagoon Cells, with limited lateral migration.

7. ***VOC and inorganic impacts to surface water and sediments is limited to the Marshy Area and Unnamed Stream downstream of the Marshy Area.***

   VOCs and metals are detected in surface water and sediment in the Marshy Area, which are elevated with respect to background. VOCs and metals are not detected in sediments downstream of the Marshy Area. VOCs and metals in surface water are contained primarily within Marshy Area and Swale 2. The lateral extent of impact from VOCs and metals to surface water is within the Unnamed Stream prior to discharge to Barney Brook.

6.3 *RECOMMENDATIONS*

Based on the results of the Supplemental RI, ERM makes the following recommendations for future work.

1. ***Wells W-07SI should be resampled for VOCs.***

   Anomalous detections of VOCs, above MCLs or VES, in bedrock have been identified at three locations, W-04SI, W-07SI, and W-04B. The detection of VOCs at well W-07SI only occurred in 1 of 7 sampling events, the Fall 1995 low flow sampling event. The well has been sampled once since VOCs were detected, using low flow protocols, and VOCs were not detected in this sample. This well should be resampled one time to confirm the groundwater quality at this location.

   The anomalous detection of VOCs at W-04SI occurred in 1 of 10 samples collected at that location, the Spring 1995 low flow sampling event. VOCs were detected not detected in two subsequent low flow sampling events, since Spring 1995. This well is included in the LTMP scope and should be monitored annually, in accordance with the LTMP, but should not be resampled in Fall 1996.

   VOCs were detected at W-09B, above MCLs or VES, in 1 of 7 sampling events. VOCs were detected not detected in two subsequent low flow sampling events; therefore, this well should not be resampled.

2. ***Wells W-27T, W-07SI, and W-04DI should be resampled for metals, to confirm the limits of chromium and nickel in groundwater.***

   The turbidity and aluminum concentrations for wells W-27T, W-07SI, and W-04DI were high for one of two sampling events; the Spring 1995 sampling event. Concentrations of chromium and/or nickel were detected in the Spring 1995 sampling event, but not in the subsequent Fall 1995 sampling event, suggesting that the detections of

metals are associated with suspended sediment and not representative of groundwater quality. Therefore, these three wells should be resampled for metals to confirm the representative data and the conclusions presented in this Supplemental RI.

3. ***Wells W-08S1 and W-06D should be resampled for metals, to confirm the lateral extent of iron in groundwater, and wells W-26T and W-09 should be resampled to confirm the lateral extent of iron, manganese and thallium in groundwater.***

   The lateral extent of iron detected in groundwater is defined by wells W-06D, W-08S1, W-26T and W-09. The downgradient edge of the thallium and manganese plumes, to the south and west of the Landfill Area, is defined by wells W-09S1 and W-26T. For well locations, W-06D, W-26T, and W-09, at least one of the two sampling events had high turbidities and high concentrations of aluminum, indicating that the inorganics data is biased high. Therefore, these wells should be resampled for metals, to confirm the representative data.

   At W-08S1, the concentrations of aluminum were high for the Spring and Fall 1995 sampling events, conducted prior to redeveloping the well. The sample collected after well redevelopment, Spring 1996, had low turbidity and aluminum was not detected. Therefore, the Spring and Fall 1995 sample data is biased high. W-08S1 should be resampled to confirm the representative data.

In summary, no additional assessment work is required to characterize the site; however, limited additional sampling should be performed to confirm conclusions presented in this Supplemental RI. Monitoring of groundwater and surface water should continue under the LTMP. The scope of the LTMP should be performed in accordance with the letter from *de maximis* to EPA dated 18 April 1996, with the addition of the following wells: W-07SI for VOCs and W-27T, W-07SI, W-04DI, W-08S1, W-06D, W-26T, and W-09S1 for metal. These eight wells should be included for one additional sampling round.

7.0 *LIST OF REFERENCES*

ERM-New England, Inc.

----. 20 August 1996. Spring 1996 - Long Term Monitoring Plan Report. Burgess Brothers Superfund Site.

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O'Brien and Gere Engineers, Inc. July 1996. Remedial Investigation Report. Burgess Brothers Superfund Site

Patnaik, Pradyot. 1992. A Comprehensive Guide to the Hazardous Properties of Chemical Substances.

U.S. EPA Region I. 3 August 1995. Low Flow (minimum stress) Purging and Sampling Procedure for the Collection of Ground Water Samples From Monitoring Wells.

U.S. EPA Region I. 10 August 1994. Ground Water Sampling Procedure Low Flow Purge and Sampling.

Tables

Table 1A
Summary of Monitoring Wells by Area
Supplemental Remedial Investigation
Burgess Brothers Superfund Site

Well Identification	Reference Area	Spring 1995		Fall 1995		Fall 1995	
		TCL VOCs	TAL Metals	TCL VOCs	TAL Metals	TCL VOCs	TAL Metals
Kame Sand - Shallow Water Table Wells							
W-01	Upgradient	X	X	X	X	X	X
W-01-S1	Upgradient	X	X	X	X	-	-
SBW-10	Soil Staging Area	-*	-*	-	-	-	-
W-TP-12	Landfill Area	X	X	-	-	-	-
SBW-21	Landfill Area	X	X	-	-	-	-
W-08-S1	West of Landfill	X	X	X	X	X	X
W-09-S1	West of Landfill	X	X	X	X	X	-
W-25-S1	West of Landfill	X	X	X	X	X	X
W-27-S1	West of Landfill	X	X	-	-	X	X
W-03	Marshy Area	X	X	X	X	-	-
W-04D	Marshy Area	X	X	X	X	X	X
W-06D	Marshy Area	X	X	X	X	X	-
W-11-S1	Marshy Area	X	X	X	X	-	-
W-22-S1	Marshy Area	X	X	X	X	X	X
Ablation Glacial Till Wells							
W-04T	Marshy Area	X	X	X	X	X	-
W-22T	Marshy Area	X	X	X	X	X	-
W-23T	Hillside Area	-	-	X	X	-	-
W-26T	West of Landfill	X	X	-	-	X	-
W-27T	West of Landfill	X	X	X	X	X	-
Weathered Bedrock - Shallow Intermediate Wells							
W-07-SI	Upgradient	X	X	X	X	X	-
W-08-SI	West of Landfill	-*	-*	-	-	-	-
W-09-SI	West of Landfill	X	X	X	X	X	X
W-25-SI	West of Landfill	X	X	X	X	-	-
W-04-SI	Marshy Area	X	X	X	X	X	X
Weathered Bedrock - Deep Intermediate Wells							
W-01-DI	Upgradient	X	X	X	X	-	-
W-07-DI	Soil Staging Area	-	-	-	-	-	-
W-25-DI	West of Landfill	X	X	X	X	-	-
W-04-DI	Marshy Area	X	X	X	X	-	-
Competent Bedrock - Bedrock Wells							
W-01B	Upgradient	X	X	X	X	-	-
W-09B	West of Landfill	X	X	X	X	-	-
W-04B	Marshy Area	X	X	X	X	-	-

Notes:
X - Sample analyzed for this parameter during specified sampling round.
- - Sample not analyzed for this parameter during specified sampling round.
* - W-08SI and SBW-10 were sampled for Semi-Volatile Organic Compounds (SVOCs) during Spring 1995 sampling round.

Table 1B
Summary of Surface Water and Leachate Sampling by Area
Supplemental Remedial Investigation
Burgess Brothers Superfund Site

Sampling Location	Spring 1995			Fall 1995			Fall 1995		
	TCL VOCs	524.2 VOCs	TAL Metals	TCL VOCs	524.2 VOCs	TAL Metals	TCL VOCs	524.2 VOCs	TAL Metals
Surface Water Sampling Locations									
SW-02	X	-	X	X	-	X	X	-	X
SW-04	X	-	X	X	-	X	X	-	X
SW-05	X	-	X	X	-	X	X	-	X
SW-07	X	-	X	X	-	X	-	-	-
SW-11	X	-	X	X	-	X	-	-	-
SW-12	X	-	X	X	-	X	-	-	-
SW-14	X	-	X	X	-	X	-	-	-
SW-03	-	X	X	-	X	X	-	-	-
SW-06	-	X	X	-	X	X	-	X	X
SW-15	-	X	X	-	X	X	-	X	X
SW-16	-	X	X	-	X	X	-	-	-
SW-17	-	X	X	-	X	X	-	X	X
Leachate Sampling Locations									
LS-01	X	-	X	X	-	X	-	-	-
LS-02	X	-	X	X	-	X	-	-	-
LS-03	X	-	X	X	-	X	-	-	-

Notes:
X - Sample analyzed for this parameter during specified sampling round.
- - Sample not sampled for this parameter during specified sampling round.

Table 2A
Summary of Groundwater Gauging and Field Screening Results, May 1995
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point (PVC/Top of Casing)	Measuring Point Elevation (PVC/Top of Casing) (feet)	Depth to Water 5/8/95 (feet)	Total Depth (PVC/TOC) 5/8/95 (feet)	Groundwater Elevation 5/8/95 (feet)	Well Diameter (Inches)	PID Reading (PPM) 5/8-31/95	Comments/Observations
Kame Sand Deposits - Shallow Water Table Wells									
W-01		PVC/TOC	-/1150.2	7.19/7.39	19.87/20.10	1142.81	2	0.0	Casing in tact and cover locked.
W-01-S1		PVC/TOC	1122.69/1122.93	9.71/10.01	13.7/13.98	1112.92	2	0.0	No tampering evident.
W-02		PVC/TOC	1083.79/1084.27	.39/.84	19.54/20.00	1083.43	2	99.3	No tampering evident.
W-03		PVC/TOC	1081.81/1082.01	2.04/2.25	19.57/19.77	1079.76	2	0.0	No tampering evident.
W-04S		PVC/TOC	1079.18/1079.38	.87/1.09	4.91/5.14	1078.29	2	17.7	No tampering evident.
W-04D		PVC/TOC	1081.81/1081.25	.71/.95	16.54/16.80	1080.30	2	1.5	No tampering evident.
W-05		PVC/TOC	1083.01/1083.18	1.45/1.61	16.22/16.39	1081.57	2	0.0	No tampering evident.
W-06S		PVC/TOC	1079.40/1079.51	1.16/1.24	5.51/5.59	1078.27	2	20.0	No tampering evident.
W-06D		PVC/TOC	1080.43/1080.92	1.16/1.64	18.44/18.92	1079.28	2	0.0	No tampering evident.
W-07-S1		PVC/TOC	1117.43/1117.74	9.82/10.09	16.52/16.79	1107.65	2	0.0	Lock undone. Casing marked with well ID.
W-08-S1		PVC/TOC	1110.10/1110.38	21.21/21.84	27.73/28.03	1088.54	2	0.0	Lock undone. Casing marked with well ID.
W-09-S1		PVC/TOC	1078.95/1079.35	5.11/5.55	11.69/12.12	1073.80	2	0.0	Lock undone. Well marked. No tampering evident.
W-11-S1		PVC/TOC	1085.01/1085.19	3.16/3.34	9.73/9.91	1081.85	2	0.6	No tampering evident.
W-12-S1		PVC/TOC	1098.26/1098.3	2.19/2.26	9.70/9.77	1096.04	2	0.6	No tampering evident.
W-22-S1		PVC/TOC	1090.63/1090.97	2.81/3.14	11.01/11.33	1087.83	2	44.3	No tampering evident.
W-25-S1		PVC/TOC	1089.22/1089.32	6.20/6.30	12.08/12.18	1083.02	2	0.0	No tampering evident.
W-27-S1		PVC/TOC	1114.41/1114.71	17.14/17.31	21.40/21.56	1097.40	2	0.0	Replaced lock on well.
W-TP-12		Steel/TOC	1112.62/1112.95	24.44/24.8	29.43/29.79	1088.15	2	21.0	Replaced lock on well. Well ID marked.
SBW-10		PVC/TOC	1131.58/1131.91	13.72/14.12	18.04/18.44	1117.79	2	0.0	Casing surrounded with algae/water.
SBW-15		Steel/TOC	1100.93/1101.30	DRY	19.98/20.3	-	2	171.0	No tampering evident.
SBW-20		Steel/TOC	1114.35/1114.65	DRY	8.82/9.21	-	2	0.0	No tampering evident.
SBW-21		Steel/TOC	1113.41/1113.67	16.87/17.19	19.96/20.28	1096.48	2	0.0	No tampering evident.
	Ablation Glacial Till Wells								
W-03T		PVC/TOC	1081.58/1081.74	1.20/1.36	28.97/29.13	1080.38	2	0.0	No tampering evident.
W-04T		PVC/TOC	1080.35/1080.68	.42/.74	29.6/29.9	1079.94	2	26.7	No tampering evident. Well ID marked.
W-22T		PVC/TOC	1089.91/1090.2	2.04/2.36	31.64/32.0	1087.84	2	10.1	No tampering evident.
W-23T		PVC/TOC	1099.57/1099.74	2.02/2.18	9.64/9.79	1097.56	2	0.0	No tampering evident.
W-24T		PVC/TOC	1091.01/1091.15	2.78/2.90	17.85/17.96	1088.25	2	0.0	No tampering evident.
W-26T		PVC/TOC	1093.65/1093.77	14.39/14.52	22.02/22.13	1079.25	2	0.0	Replaced lock on well casing.
W-27T		PVC/TOC	1114.75/1115	16.89/17.23	36.40/36.74	1097.77	2	0.0	Silt on probe. Lock replaced. Well ID marked.

Table 2A
Summary of Groundwater Gauging and Field Screening Results, May 1995
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point (PVC/Top of Casing)	Measuring Point Elevation (PVC/Top of Casing) (feet)	Depth to Water 5/8/95 (feet)	Total Depth (PVC/TOC) 5/8/95 (feet)	Groundwater Elevation 5/8/95 (feet)	Well Diameter (Inches)	PID Reading (PPM) 5/8-31/95	Comments/Observations
Weathered Bedrock - Shallow Intermediate Wells									
W-04-SI		PVC/TOC	1085.52/1086.06	8.43/8.98	115.7/115.24	1077.08	2	0.0	No tampering evident. Casing marked with well ID.
W-07-SI		PVC/TOC	1118.48/1118.49	51.29/51.29	104.22/104.22	1067.20	2	0.0	No tampering. DTW measured with pump in well.
W-08-SI		PVC/TOC	1111.07/1111.07	37.31/37.31	128.7/128.7	1073.76	2	1.3	No tampering. Well ID marked. Lock replaced.
W-09-SI		PVC/TOC	1078.83/1078.94	8.53/8.64	109.64/109.76	1070.30	2	0.0	No tampering. Casing marked with well ID.
W-25-SI		PVC/TOC	1090.54/1090.88	16.28/16.66	129.78/130.16	1074.22	2	0.0	Well not locked. Casing marked with well ID.
Weathered Bedrock - Deep Intermediate Wells*									
W-01-DI		PVC/TOC	1150.25/1150.51	65.46/65.78	233.04/233.36	1084.73	2	0.0	Lock replaced. DTW measured with pump in well.
W-04-DI		Steel/TOC	1085.62/1086.12	4.61/5.11	157.00	1081.01	2	0.0	No tampering. DTW measured with pump in well.
W-07-DI		PVC/TOC	1117.87/1118.33	192.59/193.6	229.34/229.82	924.73	2	0.0	No tampering evident.
W-25-DI		PVC/TOC	1090.24/1090.71	20.14/20.63	203.00	1088.08	2	0.0	Casing broken. DTW measured with pump in well.
Competent Bedrock - Bedrock Wells*									
W-01B		PVC/TOC	1123.06/1123.56	54.19/54.68	362.8/363.3	1068.88	4	0.0	No tampering. DTW measured with pump in well.
W-04B		PVC/TOC	1085.89/1086.19	15.48/15.83	475.00	1070.36	2-3	0.0	No tampering. DTW measured with pump in well.
W-08B		PVC/TOC	1110.57/1110.72	41.58/41.78	448.00	1068.94	2	0.0	No tampering. DTW measured with pump in well.
W-09B		PVC/TOC	1078.65/1079.09	8.66/9.12	466.00	1069.97	2	0.0	No tampering. DTW measured with pump in well.
Stream Piezometers									
P-01		TOC	1077.90	1.67	5.70	1076.23	2	1.7	No tampering evident.
P-02		TOC	1081.58	1.94	9.13	1079.64	2	0.0	No tampering evident.
P-03		TOC	1084.68	2.38	6.18	1082.30	2	0.0	No tampering evident.

Notes:
- = Not Screened
* - Well depth for wells in these aquifers was not measured during May 1995 gauging round. Recorded depth taken from O'Brien & Gere Engineers Remedial Investigation Report dated February 1995.

Table 2B
Summary of Groundwater Gauging and Field Screening Results, October 1995
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point (PVC/Top of Casing)	Measuring Point Elevation (PVC/Top of Casing) (feet)	Depth to Water 10/30/95 (feet)	Total Depth (PVC/TOC) 10/30/95 (feet)	Groundwater Elevation 10/30/95 (feet)	Well Diameter (Inches)	PID Reading (PPM) 10/30/95	Comments/Observations
Kame Sand Deposits - Shallow Water Table Wells									
W-01		PVC/TOC	-/1150.2	14.43/14.66	19.86/20.11	1135.54	2	0.0	Casing in tact and cover locked.
W-01-S1		PVC/TOC	1122.69/1122.93	9.35/9.65	13.99/14.29	1113.34	2	0.0	No tampering evident.
W-02		PVC/TOC	1083.79/1084.27	1.28/1.75	19.79/20.25	1082.51	2	16.0	No tampering evident.
W-03		PVC/TOC	1081.81/1082.01	2.15/2.35	19.81/20.00	1079.66	2	19.0	No tampering evident.
W-04S		PVC/TOC	1079.18/1079.38	.8/1.02	4.96/5.18	1078.38	2	0.0	No tampering evident.
W-04D		PVC/TOC	1081.81/1081.25	1.02/1.28	16.57/16.83	1080.79	2	5.0	No tampering evident.
W-05		PVC/TOC	1083.01/1083.18	2.42/2.58	16.22/16.38	1080.59	2	0.0	No tampering evident.
W-06S		PVC/TOC	1079.40/1079.51	1.09/1.16	5.82/5.88	1078.31	2	0.0	No tampering evident.
W-06D		PVC/TOC	1080.43/1080.92	1.46/1.96	18.41/18.91	1078.97	2	0.0	No tampering evident.
W-07-S1		PVC/TOC	1117.43/1117.74	11.45/11.72	16.79/17.09	1105.98	2	0.0	No tampering evident.
W-08-S1		PVC/TOC	1110.10/1110.38	24.24/24.55	27.94/28.24	1085.86	2	23.0	No tampering evident.
W-09-S1		PVC/TOC	1078.95/1079.35	4.71/5.15	11.88/12.31	1074.24	2	0.0	No tampering evident.
W-11-S1		PVC/TOC	1085.01/1085.19	3.30/3.50	10.03/10.23	1081.71	2	3.0	No tampering evident.
W-12-S1		PVC/TOC	1098.26/1098.3	2.28/2.35	9.98/10.05	1095.98	2	3.2	No tampering evident.
W-22-S1		PVC/TOC	1090.63/1090.97	2.99/3.34	10.99/11.34	1087.64	2	8.0	Tubing pulled from well after gauging
W-25-S1		PVC/TOC	1089.22/1089.32	6.89/7.04	12.05/12.20	1082.33	2	0.0	No tampering evident.
W-27-S1		PVC/TOC	1114.41/1114.71	20.15/20.30	21.68/21.85	1094.26	2	0.0	Replaced lock on well.
W-TP-12		Steel/TOC	1112.62/1112.95	26.35/26.68	29.57/29.92	1086.27	2	>2,500	Initial reading on PID was over 2,500 ppm.
SBW-10		PVC/TOC	1131.58/1131.91	-	-	-	-	-	Destroyed
SBW-15		Steel/TOC	1100.93/1101.30	8.86/9.24	9.11/9.49	-	2	0.0	No tampering evident.
SBW-20		Steel/TOC	1114.35/1114.65	20.12/20.42	20.28/20.58	-	2	4.6	Difficult to distinguish water level/ white bugs on probe.
SBW-21		Steel/TOC	1113.41/1113.67	17.07/17.37	19.83/20.13	1096.34	2	6.1	No tampering evident.
Ablation Glacial Till Wells									
W-03T		PVC/TOC	1081.58/1081.74	1.55/1.70	29.01/29.13	1080.03	2	1.0	No tampering evident.
W-04T		PVC/TOC	1080.35/1080.68	1.11/1.45	29.85/30.40	1079.24	2	28.5	No tampering evident.
W-22T		PVC/TOC	1089.91/1090.2	3.06/3.35	31.8/32.08	1086.85	2	25.0	Tubing pulled from well after gauging.
W-23T		PVC/TOC	1099.57/1099.74	5.12/5.27	9.65/9.80	1094.45	2	1.0	No tampering evident.
W-24T		PVC/TOC	1091.01/1091.15	2.82/2.96	17.84/17.97	1088.19	2	1.9	No tampering evident.
W-26T		PVC/TOC	1093.65/1093.77	21.42	22.10	1072.23	2	0.0	No tampering evident.
W-27T		PVC/TOC	1114.75/1115	19.90/20.20	35.63/35.93	1094.85	2	5.0	No tampering evident.

Table 2B
Summary of Groundwater Gauging and Field Screening Results, October 1995
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point (PVC/Top of Casing)	Measuring Point Elevation (PVC/Top of Casing) (feet)	Depth to Water 10/30/95 (feet)	Total Depth (PVC/TOC) 10/30/95 (feet)	Groundwater Elevation 10/30/95 (feet)	Well Diameter (Inches)	PID Reading (PPM) 10/30/95	Comments/Observations
Weathered Bedrock - Shallow Intermediate Wells									
W-04-SI		PVC/TOC	1085.52/1086.06	12.76/13.32	115.7/115.24	1072.76	2	0.0	No tampering evident.
W-07-SI		PVC/TOC	1118.48/1118.49	55.20/55.20	104.22/104.22	1063.28	2	0.0	No tampering evident.
W-08-SI		PVC/TOC	1111.07/1111.07	43.21/43.21	128.7/128.7	1067.86	2	0.0	No tampering evident.
W-09-SI		PVC/TOC	1078.83/1078.94	13.06/13.18	109.64/109.76	1065.77	2	0.0	No tampering evident.
W-25-SI		PVC/TOC	1090.54/1090.88	21.76/22.12	129.78/130.16	1068.78	2	0.0	No tampering evident.
Weathered Bedrock - Deep Intermediate Wells*									
W-01-DI		PVC/TOC	1150.25/1150.51	74.57/74.84	233.04/233.36	1075.68	2	0.0	No tampering evident.
W-04-DI		Steel/TOC	1085.62/1086.12	10.86/11.36	157.00	1074.76	2	0.0	No tampering evident.
W-07-DI		PVC/TOC	1117.87/1118.33	183.76/184.24	229.34/229.82	934.11	2	0.0	No tampering evident.
W-25-DI		PVC/TOC	1090.24/1090.71	25.60/27.10	203.00	1064.64	2	0.0	No tampering evident.
Competent Bedrock - Bedrock Wells*									
W-01B		PVC/TOC	1123.06/1123.56	55.0/55.5	362.8/363.3	1068.06	4	0.0	No tampering evident.
W-04B		PVC/TOC	1085.89/1086.19	27.36/27.68	475.00	1058.53	2-3	5.2	No tampering evident.
W-08B		PVC/TOC	1110.57/1110.72	53.14/53.30	448.00	1057.43	2	0.0	No tampering evident.
W-09B		PVC/TOC	1078.65/1079.09	20.35/20.80	466.00	1058.30	2	0.0	No tampering/ significant amount of sediment in well.
Stream Piezometers									
P-01		TOC	1077.90	1.67	5.70	1076.23	2	0.0	No tampering evident.
P-02		TOC	1081.58	1.94	9.13	1079.64	2	0.0	No tampering evident.
P-03		TOC	1084.68	2.38	6.18	1078.50	2	0.0	No tampering evident.

Notes:
- = Not Screened
* - Well depth for wells in these aquifers was not measured during Nov 1995 gauging round. Recorded depth taken from O'Brien & Gere Engineers Remedial Investigation Report dated February 1995.

Table 2C
Summary of Groundwater Gauging and Field Screening Results, Spring 1996
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point	Measuring Point Elevation (PVC/TOC) (feet)	Depth to Water 5/13/96 (feet)	Total Depth (PVC/TOC) 5/13/96 (feet)	Groundwater Elevation 5/13/96 (feet)	Well Diameter (Inches)	PID Reading 5/13/96 (PPM)	Comments/Observations
Kame Sand Deposits - Shallow Water Table Wells									
W-01		PVC/TOC	-/1150.20	2.52/2.74	19.87/20.10	1130.10	2	0.0	
W-01-S1		PVC/TOC	1122.69/1122.93	5.10/5.43	13.7/13.98	1117.59	2	0.1	
W-02		PVC/TOC	1083.79/1084.27	-/0.34	19.54/20.00	1083.93	2	*	Water in casing above PVC riser pipe
W-03		PVC/TOC	1081.81/1082.01	1.50/1.73	19.57/19.77	1080.31	2	1.4	
W-04S		PVC/TOC	1079.18/1079.38	0.47/0.68	4.91/5.14	1078.71	2	1.5	Found unlocked
W-04D		PVC/TOC	1081.81/1081.25	-/-	16.54/16.80	-	2	*	Casing full of water, over top of PVC riser
W-05		PVC/TOC	1083.01/1083.18	2.25/2.40	16.22/16.39	1080.76	2	0.0	
W-06S		PVC/TOC	1079.40/1079.51	1.00/1.07	5.51/5.59	1078.40	2	0.0	Casing is half-full with water
W-06D		PVC/TOC	1080.43/1080.92	0.65/1.16	18.44/18.92	1079.78	2	0.0	Casing is half-full with water
W-07-S1		PVC/TOC	1117.43/1117.74	3.63/3.91	16.52/16.79	1113.80	2	0.2	Well cap not on PVC
W-08-S1		PVC/TOC	1110.10/1110.38	18.23/18.52	27.73/28.03	1091.87	2	18.8	
W-09-S1		PVC/TOC	1078.95/1079.35	4.07/4.48	11.69/12.12	1074.88	2	0.9	
W-11-S1		PVC/TOC	1085.01/1085.19	3.00/3.20	9.73/9.91	1082.01	2	1.9	
W-12-S1		PVC/TOC	1098.26/1098.3	2.02/2.08	9.70/9.77	1096.24	2	0.0	
W-22-S1		PVC/TOC	1090.63/1090.97	2.37/2.69	11.01/11.33	1088.60	2	3.5	
W-25-S1		PVC/TOC	1089.22/1089.32	3.08/3.18	12.08/12.18	1086.14	2	0.5	
W-27-S1		PVC/TOC	1114.41/1114.71	13.97/14.13	21.40/21.56	1100.44	2	0.6	
W-TP-12		Steel/TOC	1112.62/1112.95	22.09/22.44	29.43/29.79	1090.53	2	2450.0	Red material on probe
SBW-10		PVC/TOC	1131.58/1131.91	DESTROYED	18.04/18.44	-	2	-	
SBW-15		Steel/TOC	1100.93/1101.30	7.47/7.85	19.98/20.3	1093.46	2	1860.0	Orange-brown material on probe
SBW-20		Steel/TOC	1114.35/1114.65	19.19/19.51	8.82/9.21	1095.16	2	0.0	Bugs on probe
SBW-21		Steel/TOC	1113.41/1113.67	16.01/16.35	19.96/20.28	1097.40	2	6.1	Found unlocked
Ablation Glacial Till Wells									
W-03T		PVC/TOC	1081.58/1081.74	0.56/0.67	28.97/29.13	1081.02	2	0.4	
W-04T		PVC/TOC	1080.35/1080.68	-/-	29.6/29.9	-	2	*	Casing full of water over top of PVC riser
W-22T		PVC/TOC	1089.91/1090.2	0.93/1.24	31.64/32.0	1088.98	2	1.6	
W-23T		PVC/TOC	1099.57/1099.74	1.85/2.00	9.64/9.79	1097.72	2	0.0	
W-24T		PVC/TOC	1091.01/1091.15	2.58/2.70	17.85/17.96	1088.43	2	0.0	
W-26T		PVC/TOC	1093.65/1093.77	7.81/7.95	22.02/22.13	1085.84	2	0.3	
W-27T		PVC/TOC	1114.75/1115	12.80/13.15	36.40/36.74	1101.95	2	0.2	

Table 2C
Summary of Groundwater Gauging and Field Screening Results, Spring 1996
Burgess Brothers Superfund Site, Woodford and Bennington, Vermont

Well Designation	Aquifer Designation	Measuring Point	Measuring Point Elevation (PVC/TOC) (feet)	Depth to Water 5/13/96 (feet)	Total Depth (PVC/TOC) 5/13/96 (feet)	Groundwater Elevation 5/13/96 (feet)	Well Diameter (Inches)	PID Reading 5/13/96 (PPM)	Comments/Observations
Weathered Bedrock - Shallow Intermediate Wells									
W-04-SI		PVC/TOC	1085.52/1086.06	6.12/6.67	115.7/115.24	1078.88	2	0.0	
W-07-SI		PVC/TOC	1118.48/1118.49	45.65/45.65	104.22/104.22	1072.83	2	0.0	
W-08-SI		PVC/TOC	1111.07/1111.07	33.38/33.38	128.7/128.7	1077.69	2	0.0	
W-09-SI		PVC/TOC	1078.83/1078.94	5.81/5.92	109.64/109.76	1073.02	2	0.5	
W-25-SI		PVC/TOC	1090.54/1090.88	12.89/13.24	129.78/130.16	1077.65	2	0.6	
Weathered Bedrock - Deep Intermediate Wells*									
W-01-DI		PVC/TOC	1150.25/1150.51	53.26/53.54	233.04/233.36	1096.99	2	0.1	
W-04-DI		Steel/TOC	1085.62/1086.12	1.95/2.44	157.00	1083.67	2	0.0	
W-07-DI		PVC/TOC	1117.87/1118.33	176.24/176.74	229.34/229.82	941.63	2	0.5	New lock
W-25-DI		PVC/TOC	1090.24/1090.71	15.17/15.67	203.00	1075.07	2	0.6	Locking cover is broken
Competent Bedrock - Bedrock Wells*									
W-01B		PVC/TOC	1123.06/1123.56	43.98/44.49	362.8/363.3	1079.08	4	0.0	Locking cover is broken
W-04B		PVC/TOC	1085.89/1086.19	4.90/5.21	475.00	1080.99	2-3		Lock is cut and replaced
W-08B		PVC/TOC	1110.57/1110.72	31.13/31.24	448.00	1079.44	2	0.0	
W-09B		PVC/TOC	1078.65/1079.09	-/-	466.00	-	2	*	Artesian conditions, no measurements
Stream Piezometers									
P-01		TOC	1077.90	0.53	5.70	1077.37	2		Downstream, near W-01
P-02		TOC	1081.58	1.60	9.13	1079.98	2		Mid-stream, near W-05
P-03		TOC	1084.68	2.39	6.18	1082.29	2		Upstream, near W-11

Notes:
- = Not Measured
* - Total depth for wells in this aquifer were not measured during Spring 1996 gauging round. Recorded depth taken from O'Brien & Gere Engineers Remedial Investigation Report dated February 1995.

Table 3A
Summary of Stabilization and Sampling Criteria for Individual Wells
Burgess Brothers Superfund Site
ERM-New England, May 1995 Sampling Round

Well Identification	Pump Type	Stabilization Parameters					Pumping Rate	Duration of Purging	Volume Purged	3 Drawdown Volumes	3 Screen Vol(SV)† or 3 Well Vol(WV)††	Stabilization Parameters Achieved
		pH	Temp. (°C)	Conductivity (µS)	Turbidity (NTU)	Drawdown (Feet)	(L/Min)	(Minutes)	(Gallons)	(Gallons)	(Gallons)	
Kame Sand - Shallow Water Table Wells												
W-01	Bladder	7.97	7.4	87.2	520	0.25	0.14	250	8.70	0.12	7.34 (SV)	TCP, 3DV, 3SV
W-01-S1	Bladder	7.41	10.8	210	1.19	NM	0.10	80	2.20	N/A	1.95 (WV)	TCP, TURB, 3WV
W-03	Bladder	7.54	9.9	418	560	1.52	0.07	215	3.90	0.75	4.89 (SV)	TCP, 3DV
W-04D	Bladder	7.67	10.2	417	220	2.17	0.12	250	7.60	1.05	2.45 (SV)	TCP, 3DV,3SV
W-06D	Bladder	8.11	6.7	91	492	4.30	0.11	260	7.20	2.10	2.45 (SV)	TCP, 3DV, 3SV
W-08-S1	Grundfos	7.57	19.2	220	198	2.53	0.16	98	3.60	1.23	3.18 (WV)	TCP, 3DV, 3WV
W-09-S1	Bladder	6.22	11.4	56	4.82	0.46	0.06	100	1.80	0.24	3.21 (WV)	TCP, TURB, 3DV
W-11-S1	Bladder	6.26	6.9	706	2.98	0.40	0.20	75	4.40	0.21	3.21 (WV)	TCP, TURB, 3DV, 3WV
W-22-S1	Grundfos	7.18	15.2	382	2.10	5.12	0.08	135	2.90	2.52	2.45 (SV)	TCP, TURB, 3DV, 3WV
W-25-S1	Bladder	5.54	9.7	283	3.60	NM	0.09	170	4.30	N/A	2.88 (WV)	TCP, TURB, 3WV
W-27-S1	Bladder	6.63	9.4	841	2.55	NM	0.08	150	3.60	N/A	2.10 (WV)	TCP, TURB, 3WV
W-TP-12	Grundfos	6.52	18.2	823	33.20	1.85	0.14	226	9.30	0.90	2.43 (WV)	TCP, 3DV, 3WV
SBW-10	Bladder	7.15	8.4	304	3.70	NM	0.11	105	3.00	N/A	2.10 (WV)	TCP, TURB, 3WV
SBW-21	Grundfos	6.41	24.4	545	>200	1.64	0.12	216	6.40	0.81	1.50 (WV)	TCP, 3DV, 3WV
Ablation Glacial Till Wells												
W-04T	Grundfos	8.38	9.8	201	3.48	4.72	0.22	235	9.80	2.31	4.89 (SV)	TCP, TURB, 3DV, 3SV
W-22T	Grundfos	8.09	8.2	192	5.50	2.34	0.08	240	5.10	1.14	4.89 (SV)	TCP, 3DV, 3SV
W-26T	Bladder	6.03	7.4	20	1.19	0.96	0.07	190	3.70	0.48	3.73 (WV)	TCP, TURB, 3DV
W-27T	Grundfos	7.09	11.6	1058	169	2.24	0.12	320	9.90	1.11	4.89 (SV)	TCP, 3DV, 3SV
Weathered Bedrock - Shallow Intermediate Wells												
W-04-SI	Grundfos	8.95	7.1	59	8.6	2.33	0.06	270	4.00	1.14	4.89 (SV)	TCP, 3DV, 3SV
W-07-SI	Grundfos	7.97	19.9	449	111.7	9.44	0.08	365	4.80	4.50	4.89 (SV)	TCP, 3DV
W-08-SI	Grundfos	12.39	9.9	4290	3.7	17.20	0.03	315	5.00	8.40	4.89 (SV)	TCP, TURB, 3SV
W-09-SI	Grundfos	7.87	6.5	99	13.70	1.83	0.07	270	4.60	0.90	4.89 (SV)	TCP, 3DV
W-25-SI	Grundfos	10.66	20.1	209	7.80	2.90	0.05	245	3.10	1.41	4.89 (SV)	TCP, 3DV
Weathered Bedrock - Deep Intermediate Wells												
W-01-DI	Grundfos	7.58	8.6	82	104.4	10.76	0.08	300	6.20	5.28	12.23 (SV)	TCP, 3DV
W-04-DI	Grundfos	8.81	14.1	174	16.6	5.08	0.03	372	3.10	2.49	4.89 (SV)	TCP, 3DV
W-25-DI	Grundfos	11.60	10.9	807	14.20	1.32	0.05	355	4.20	0.66	4.89 (SV)	TCP, 3DV
Competent Bedrock - Bedrock Wells												
W-01B	Bladder	7.28	8.6	79.7	5.00	1.10	0.14	210	8.40	0.54	25.00 (SV)	TCP, TURB, 3DV
W-04B	Bladder	6.91	8.0	72.7	3.97	1.62	0.12	115	4.00	1.04	24.45 (SV)	TCP, TURB, 3DV
W-09B	Bladder	6.92	8.2	72	4.48	1.23	0.14	140	5.00	0.60	24.45 (SV)	TCP, TURB, 3DV

Notes:
NM = Depth to water could not be measured in these wells because water level was below top of pump.
N/A = Not applicable
† - If water covered entire length of screen then screen volume(SV) is used as limiting stabilization parameter for volume purged.
†† - If groundwater did not cover entire length of screen then well volume(WV) is used as the limiting stabilization parameter for volume purged.

Stabilization parameters:
TCP = Temperature, Conductivity and pH stabilized to within 10%
TURB = Turbidity < 5 NTU
3DV = 3 Drawdown volumes purged
3WV = 3 Well volumes purged
3SV = 3 Screen volumes purged

Table 3B
Summary of Stabilization and Sampling Criteria for Individual Wells
Burgess Brothers Superfund Site
ERM-New England, October/November 1995 Sampling Round

Well Identification	Pump Type	Stabilization Parameters					Pumping Rate (L/Min)	Duration of Purging (Minutes)	Volume Purged (Gallons)	3 Drawdown Volumes (Gallons)	1 Drawdown Vol. / 1 Screen Vol. / Both (Gallons)	Stabilization Parameters Achieved
		pH	Temp. (°C)	Conductivity (µS)	Turbidity (NTU)	Drawdown (Feet)						
Kame Sand - Shallow Water Table Wells												
W-01	Bladder	8.27	6.5	203.0	4	0.09	≈.04	245	2.60	0.05	.015 / 2.43 / 2.445	All
W-01-S1	Bladder	7.61	11.4	195	0.38	0.19	≈Ω.1	75	2.20	0.09	.03 / 1.3 / 1.39	All
W-03	Bladder	8.01	6.2	328	26	0.95	≈.018	350	1.75	0.48	.16 / 1.63 / 1.79	All
W-04D	Bladder	7.65	1.2	438	183	0.46	≈.017	280	1.20	0.24	.08 / .816 / 8.96	All
W-06D	Bladder	9.18	5.4	134	30	5.71	≈.04	285	2.66	2.70	.9 / .82 / 1.72	All
W-08-S1	Bladder	7.41	8.2	221	78	-	≈.018	455	1.00	-	- / 1.63 / 1.63	All
W-09-S1	Bladder	5.93	9.4	99	3.12	0.13	≈.075	95	1.80	0.06	.02 / 1.63 / 1.65	All
W-11-S1	Bladder	6.53	9.6	863	2.36	0.24	≈.075	65	1.25	0.12	.04 / 1.3 / 1.34	All
W-22-S1	Bladder	7.40	3.2	470	2.63	-	≈.025	290	2.30	-	- / .82 / .82	All
W-25-S1	Bladder	5.73	12.6	198	1.90	-	≈.06	55	0.91	-	- / 1.3 / 1.3	All
Ablation Glacial Till Wells												
W-04T	Bladder	8.49	5.3	176	4.72	0.26	≈.02	210	1.20	0.13	.043 / 1.63 / 1.673	All
W-22T	Bladder	7.99	6.0	155	4.82	0.53	≈.018	340	1.50	0.26	.086 / 1.63 / 1.716	All
W-23T	Bladder	8.00	7.6	131	3.12	-	≈.06	100	1.50	-	- / .82 / .82	All
W-27T	Bladder	7.45	5.1	10	6	1.13	≈.065	395	7.60	0.55	.183 / 1.63 / 1.813	All
Weathered Bedrock - Shallow Intermediate Wells												
W-04-SI	Bladder	8.58	11.1	99	2.3	2.39	≈.09	260	6.30	1.17	.39 / 1.63 / 2.02	All
W-07-SI	Bladder	8.10	2.5	489	4.0	3.77	≈.018	470	1.91	1.85	.616 / 1.63 / 2.246	3 Drawdown Volumes
W-09-SI	Bladder	7.82	9.2	123	1.41	0.74	≈.03	380	2.66	0.36	.12 / 1.63 / 1.75	All
W-25-SI	Bladder	11.04	7.8	231	10.89	0.86	≈.014	470	1.80	0.42	.14 / 1.63 / 1.77	All
Weathered Bedrock - Deep Intermediate Wells												
W-01-DI	Bladder	7.85	7.0	105	3.0	2.67	≈.015	360	1.30	1.30	.43 / 8.15 / 8.58	3 Drawdown Volumes
W-04-DI	Bladder	6.67	12.0	115	9.6	7.62	≈.03	405	3.90	3.72	1.24 / 1.63 / 2.87	All
W-25-DI	Bladder	11.46	4.6	509	10.46	2.07	≈.024	395	2.60	1.02	.34 / 1.63 / 1.97	All
Competent Bedrock - Bedrock Wells												
W-01B	Bladder	7.28	46.6	109.0	24.00	0.38	≈.09	310	8.00	0.18	.06 / 8.15 / 8.21	All
W-04B	Bladder	7.44	8.8	93.8	31.50	0.10	≈.09	200	5.10	0.05	.016 / 8.15 / 8.166	All
W-09B	Bladder	7.55	8.6	54	12.70	0.13	≈.095	425	11.19	0.06	.02 / 8.15 / 8.17	All

Notes:
NM = Depth to water could not be measured in these wells because water level was below top of pump.
N/A = Not applicable
† - If water covered entire length of screen then screen volume(SV) is used as limiting stabilization parameter for volume purged.
†† - If groundwater did not cover entire length of screen then well volume(WV) is used as the limiting stabilization parameter for volume purged.

Table 3C
Summary of Stabilization and Sampling Criteria for Individual Wells
Burgess Brothers Superfund Site, Spring 1996 Sampling Round

Well Identification	Pump Type	Stabilization Parameters					Pumping Rate (L/Min)	Duration of Purging (Minutes)	Volume Purged (Gallons)	3 Drawdown Volumes (Gallons)	Number of Drawdown Volumes Purged	Stabilization Parameters Achieved (1)
		pH	Temp. (°C)	Conductivity (µS)	Turbidity (NTU)	Drawdown (Feet)						
Kame Sand - Shallow Water Table Wells												
W-01	Bladder	8.12	26.1	171.0	1.5	0.08	0.050	90	1.25	0.03	25	All
W-04D	Bladder	8.01	42.8	547.0	57.0	1.43	0.054	155	2.29	0.69	10	All except turbidity
W-06D	Bladder	8.29	63.4	167.0	42.3	1.73	0.023	170	1.05	0.84	3	All except turbidity
W-08-S1	Bladder	6.81	22.7	146.0	0.58	0.11	0.030	65	0.60	0.06	33	All
W-09-S1	Bladder	5.85	12.2	71.1	4.16	0.08	0.017	95	0.44	0.03	33	All
W-22-S1	Bladder	7.63	28.0	321.0	7.48	1.68	0.013	240	0.69	0.81	3	All except turbidity
W-25-S1	Bladder	6.20	19.0	574.0	23.4	0.23	0.015	180	0.71	0.12	17	All except turbidity
W-27-S1	Bladder	6.08	10.3	203.0	0.6	0.12	0.022	175	1.04	0.06	50	All
Ablation Glacial Till Wells												
W-04T	Bladder	8.52	10.1	189.0	14.4	0.08	0.030	120	0.99	0.03	75	All except turbidity
W-22T	Bladder	8.26	80.1	225.0	246.0	0.48	0.020	155	0.85	0.24	10	All except turbidity
W-26T	Bladder	6.80	31.6	55.6	3.8	0.13	0.058	70	1.14	0.06	57	All
W-27T	Bladder	7.00	12.4	1063.0	20.2	0.48	0.015	240	0.98	0.24	12	All except turbidity
Weathered Bedrock - Shallow Intermediate Wells												
W-04-SI	Bladder	9.27	40.7	149.6	8.3	0.75	0.017	240	1.12	0.36	9	All except turbidity
W-07-SI	Bladder	8.13	9.7	444.0	6.0	4.15	0.024	325	2.09	2.04	3	All except turbidity
W-09-SI	Bladder	7.59	9.6	134.0	3.4	1.26	0.060	80	1.40	0.63	6	All

Note:
(1) - Stabilization parameters include pH, temperature, conductivity, and turbidity.
- In addition to these stabilization parameters, purging a minimum of three drawdown volumes was used as a criteria before collecting samples.

Tal

Data Quality Evaluation Parameters
Burgess Brothers Superfund Site
Bennington, Vermont

	Spring 1995								
	Turbidity			Aluminum		Drawdown			Data Quality Indicator
Well ID	< 5 NTUs	5 - 100 NTUs	> 100 NTUs	< 200 µg/l	>200 µg/l	< 0.3 feet	> 0.3 feet w/ 3 DV	> 0.3 feet w/out 3 DV	Mn or Th exceeds MCLs
Shallow Kame Sand									
W-01			X		X	X			non-representative
W-01-S1	X			ND		NM	NM	NM	representative
W-03			X		X	X			non-representative
W-04D			X		X		X		non-representative
W-06D			X		X		X		non-representative
W-08-S1			X		X		X		non-representative
W-09-S1	X			ND			X		representative
W-11-S1	X				X		X		representative
W-22-S1	X			X			X		representative
W-25-S1	X			X		NM	NM	NM	representative
W-27-S1	X			X		NM	NM	NM	representative
W-TP-12		X			X		X		non-representative
SBW-21			X		X		X		non-representative
Glacial Till									
W-04T	X			X			X		representative
W-22T		X			X		X		representative
W-23T	-	-	-	-	-	-	-	-	-
W-26T	X			ND			X		representative
W-27T			X		X		X		non-representative
Shallow Bedrock									
W-04-SI		X			X		X		representative
W-07-SI			X		X		X		non-representative
W-09-SI		X		X			X		representative
W-25-SI		X			X		X		non-representative
Deep Bedrock									
W-01-DI			X		X		X		non-representative
W-04-DI		X		X			X		representative
W-25-DI		X			X		X		non-representative
Bedrock									
W-01B	X			ND			X		representative
W-04B	X			ND			X		representative
W09B	X			ND			X		representative

Notes:
NTU = Nephelometric Turbidity Units
µg/l = micrograms per liter (approximately equal to parts per billion (ppb))
3 DV = Three drawdown volumes
X = Requirements met for specific criteria
NM = Parameter not measured
ND = Results were non-detect for aluminum analysis
- = Well not sampled for specific parameter during sampling round indicated.

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Data Quality Evaluation Parameters
Burgess Brothers Superfund Site
Bennington, Vermont

	Fall 1995								
	Turbidity			Aluminum		Drawdown			Data Quality Indicator
Well ID	< 5 NTUs	5 - 100 NTUs	> 100 NTUs	< 200 µg/l	>200 µg/l	< 0.3 feet	> 0.3 feet & 3 DV	> 0.3 feet w/out 3 DV	
Shallow Kame Sand									
W-01	X			X		X			representative
W-01-S1	X			ND		X			representative
W-03		X			X		X		non-representative
W-04D			X		X		X		non-representative
W-06D		X		ND			X		representative
W-08-S1		X			X	NM	NM	NM	non-representative
W-09-S1	X			ND		X			representative
W-11-S1	X			ND		X			representative
W-22-S1	X				X	NM	NM	NM	representative
W-25-S1	X			ND		NM	NM	NM	representative
W-27-S1	-	-	-	-	-	-	-	-	-
W-TP-12	-	-	-	-	-	-	-	-	-
SBW-21	-	-	-	-	-	-	-	-	-
Glacial Till									
W-04T	X			ND		X			representative
W-22T	X				X		X		representative
W-23T	X			ND			NM		representative
W-26T	-	-	-	-	-	-	-	-	-
W-27T		X		ND			X		representative
Shallow Bedrock									
W-04-SI	X			ND			X		representative
W-07-SI	X			ND			X		representative
W-09-SI	X			ND			X		representative
W-25-SI		X			X		X		non-representative
Deep Bedrock									
W-01-DI	X			ND			X		representative
W-04-DI		X		ND			X		representative
W-25-DI		X			X		X		non-representataive
Bedrock									
W-01B		X		ND			X		representative
W-04B		X		ND		X			representative
W09B		X		ND		X			representative

Notes:
NTU = Nephelometric Turbidity Units
µg/l = micrograms per liter (approximately equal to parts per billion (ppb))
3 DV = Three drawdown volumes
X = Requirements met for specific criteria
NM = Parameter not measured
ND = Results were non-detect for aluminum analysis
- = Well not sampled for specific parameter during sampling round indicated.

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Data Quality Evaluation Parameters
Burgess Brothers Superfund Site
Bennington, Vermont

	Spring 1996								
	Turbidity			**Aluminum**		**Drawdown**			**Data Quality Indicator**
Well ID	< 5 NTUs	5 - 100 NTUs	> 100 NTUs	< 200 µg/l	>200 µg/l	< 0.3 feet	> 0.3 feet & 3 DV	> 0.3 feet w/out 3 DV	
Shallow Kame Sand									
W-01	X				X	X			representative
W-01-S1	-	-	-	-	-	-	-	-	-
W-03	-	-	-	-	-	-	-	-	-
W-04D		X			X		X		non-representative
W-06D	-	-	-	-	-	-	-	-	-
W-08-S1	X			ND		X			representative
W-09-S1	-	-	-	-	-	-	-	-	-
W-11-S1	-	-	-	-	-	-	-	-	-
W-22-S1		X		ND			X		representative
W-25-S1		X		ND		X			representative
W-27-S1	X			ND		X			representative
W-TP-12	-	-	-	-	-	-	-	-	-
SBW-21	-	-	-	-	-	-	-	-	-
Glacial Till									
W-04T	-	-	-	-	-	-	-	-	-
W-22T	-	-	-	-	-	-	-	-	-
W-23T	-	-	-	-	-	-	-	-	-
W-26T	-	-	-	-	-	-	-	-	-
W-27T	-	-	-	-	-	-	-	-	-
Shallow Bedrock									
W-04-SI		X		ND			X		representative
W-07-SI	-	-	-	-	-	-	-	-	-
W-09-SI	X			ND			X		representative
W-25-SI	-	-	-	-	-	-	-	-	-
Deep Bedrock									
W-01-DI	-	-	-	-	-	-	-	-	-
W-04-DI	-	-	-	-	-	-	-	-	-
W-25-DI	-	-	-	-	-	-	-	-	-
Bedrock									
W-01B	-	-	-	-	-	-	-	-	-
W-04B	-	-	-	-	-	-	-	-	-
W09B	-	-	-	-	-	-	-	-	-

Notes:
NTU = Nephelometric Turbidity Units
µg/l = micrograms per liter (approximately equal to parts per billion (ppb))
3 DV = Three drawdown volumes
X = Requirements met for specific criteria
NM = Parameter not measured
ND = Results were non-detect for aluminum analysis
- = Well not sampled for specific parameter during sampling round indicated.

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Summary of Groundwater Data Quality Evaluation
for Metals Exceeding Regulatory or Risk Based Standards*
Burgess Brothers Superfund Site
Woodford and Bennington, Vermont

Well Identification	Spring 1995									Fall 1995 (1)								Spring 1996							
	Pump Type	Turbidity (NTU)	Al	Cr	Fe	Pb	Mn	Ni	Tl	Turbidity (NTU)	Al	Cr	Fe	Pb	Mn	Ni	Tl	Turbidity (NTU)	Al	Cr	Fe	Pb	Mn	Ni	Tl
Federal MCL			50-200	100	300*	-	840†	100	2		50-200	100	300*	-	840†	100	2		50-200	100	300*	-	840†	100	2
Vermont MCL				50	300*	20	-	350	-			50	300*	20	-	350	-			50	300*	20	-	350	-
Kame Sand - Shallow Water Table Wells																									
W-01	Bladder	520	9300							4	105							1.5	544						
W-01-S1	Bladder	1.19								0.38								not sampled							
W-TP12	Grundfos	33.20	1230	228	117000	130	2420	441	5.5	not sampled								not sampled							
SBW-21	Grundfos	>200	29200	1120	74800	34.5	2660	788	6.5	not sampled								not sampled							
W-03	Bladder	560	8710		18400		981			26	440		1230					not sampled							
W-04D	Bladder	220	6570		6340			1290		183	8760		12800					57	958		1000		57.3		
W-06D	Bladder	492	8400		13300					30			349					not sampled							
W-08-S1	Grundfos	198	8590	1040	19600			767		78	893		1470					0.58							
W-09-S1	Bladder	4.82	16.5		9750		927			3.12			902				4.1	not sampled							
W-11-S1	Bladder	2.98	475		74900		3610		6.4	2.36			128000		4730			not sampled							
W-22-S1	Grundfos	2.1	45.8							2.63					1080			7.48							
W-25-S1	Bladder	3.6	610		17200		8860		6.3	1.90	626				2720			23.4			180000		3000		
W-27-S1	Bladder	2.55	102							dry								0.6							
Ablation Glacial Till Wells																									
W-04T	Grundfos	3.48	53.9							4.72								not sampled							
W-22T	Grundfos	5.5	1100		1450					4.82	1640		46900		5220			not sampled							
W-23T	not sampled									3.12								not sampled							
W-26T	Bladder	1.19								dry								not sampled							
W-27T	Grundfos	169	4040	150	1150			107		6.00								not sampled							
Weathered Bedrock - Shallow Intermediate Wells																									
W-04-SI	Grundfos	8.6	155		587					2.30								8.3							
W-07-SI	Grundfos	111.7	1240	109						4								not sampled							
W-09-SI	Grundfos	13.7								1.41								3.4							
W-25-SI	Grundfos	7.8								10.89			570	16.6				not sampled							
Weathered Bedrock - Deep Intermediate Wells																									
W-01-DI	Grundfos	104.4	887		6930					3								not sampled							
W-04-DI	Grundfos	16.6	50.8	65.2	809					9.60								not sampled							
W-25-DI	Grundfos	14.2	1620	50	694					10.46	1210							not sampled							
Competent Bedrock - Bedrock Wells																									
W-01B	Bladder	5			1980					24			5140					not sampled							
W-04B	Bladder	3.97			1110					31.50			4750					not sampled							
W-09B	Bladder	4.48			885					12.70								not sampled							

Notes:

* = Regulatory standards include Maximum Contaminant Limits (MCLs) and Vermont Enforcement Standards.

† = Value reported is an EPA derived risk based standard.

(1) All wells sampled with bladder pump.

Data without shading are representative of groundwater quality and used to evaluate the nature and extent of contamination.

Shaded pattern indicates data non-representative due to high sample turbidity and high concentrations of aluminum detected
These data are not used to evaluate the nature and extent of contamination or contaminant fate and transport.

Shaded pattern indicates data non-representative due to high groundwater pH at this location, possible poor well construction.
These data are not used to evaluate the nature and extent of contamination or contaminant fate and transport.

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	*Upgradient Wells*																							
					W-01S1-01 5/25/93	Q	W-01S1-02 6/22/93	Q	W-01S1-03 11/22/93	Q	W-01S1-04 2/24/94	Q	W-01S1-06 11/28/94	Q	W-01S1-11 5/23/95	Q	W-01-04 2/24/94	Q	W-01-05 7/5/94	Q	W-01-06 11/28/94	Q	W-01-11 5/23/95	Q	W-01-12 11/10/95	Q	W-01-13 5/15/96	Q
Chloromethane	-	-	-	10																								
Vinyl Chloride	2	0.2	2	10																								
Methylene Chloride	5	2.5	5	5																								
Acetone	-	-	-	10					4.5	J	3.1	J																
Carbon Disulfide	-	-	-	5																								
1,1-Dichloroethene	7	0.7	7	5																								
1,1-Dichloroethane	-	-	-	5																								
1,2-Dichloroethene (total)	70	35	70	5																								
Chloroform	100/80*	-	-	5																								
1,2-Dichloroethane	5	0.5	5	5																								
2-Butanone	-	-	-	10																								
1,1,1-Trichloroethane	200	100	200	5																								
Carbon Tetrachloride	5	0.5	5	5																								
Trichloroethene	5	0.5	5	5																								
Benzene	5	0.5	5	5																								
2-Hexanone	-	-	-	10																								
Tetrachloroethene	5	0.07	0.7	5																								
Toluene	1,000	1210	2420	5																								
Chlorobenzene	-	50	100	5																								
Ethylbenzene	700	340	680	5																								
Xylene (total)	10,000	200	400	5																								
Total VOCs					0		0		4.5		3.1		0		0		0		0		0		0		0		0	
Total TICs					NA		NA		NA		NA		NA		0		NA		NA		NA		0		0		0	

Compound	BLDUP SBW-10-01 5/25/93	Q	SBW-10-01 5/25/93	Q	SBW-10-02 6/22/93	Q	SBW-10-03 11/30/93	Q
Chloromethane								
Vinyl Chloride								
Methylene Chloride								
Acetone								
Carbon Disulfide								
1,1-Dichloroethene								
1,1-Dichloroethane								
1,2-Dichloroethene (total)								
Chloroform								
1,2-Dichloroethane								
2-Butanone								
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Trichloroethene								
Benzene								
2-Hexanone								
Tetrachloroethene								
Toluene								
Chlorobenzene								
Ethylbenzene								
Xylene (total)								
Total VOCs	0		0		0		0	
Total TICs	NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	*Soil Staging Area* W-07S1-01 5/28/93	Q	W-07S1-02 6/24/93	Q	*Landfill Area Wells* SBW-21-01 5/25/93	Q	SBW-21-02 6/23/93	Q	SBW-21-03 11/22/93	Q	SBW-21-04 2/23/94	Q	SBW-21-06 11/28/94	Q	SBW-21-11 5/10/95	Q	W-TP-12-06 7/6/94	Q	W-TP-12-06 12/2/94	Q	W-TP-12-11 5/9/95	Q	BLDUP W-150 W-TP-12-11 5/9/95	Q	W-27S1-05 7/6/94	Q	W-27S1-06 11/28/94	Q
Chloromethane	-	-	-	10									140	J																		
Vinyl Chloride	2	0.2	2	10									300		280	J	380		80	J	45				1800		2000					
Methylene Chloride	5	2.5	5	5																	22											
Acetone	-	-	-	10																												
Carbon Disulfide	-	-	-	5																												
1,1-Dichloroethene	7	0.7	7	5									61								10				340	J	360	J				
1,1-Dichloroethane	-	-	-	5																												
1,2-Dichloroethene (total)	70	35	70	5					8700		7500		4000		3600		5300		4900		3000		960		2600		2800					
Chloroform	100/80*	-	-	5																												
1,2-Dichloroethane	5	0.5	5	5									25								10											
2-Butanone	-	-	-	10																												
1,1,1-Trichloroethane	200	100	200	5			12														17											
Carbon Tetrachloride	5	0.5	5	5																												
Trichloroethene	5	0.5	5	5			20		9000		14000		8400		5700		9300		10000		27000		14000		14000		15000				14	
Benzene	5	0.5	5	5			7																									
2-Hexanone	-	-	-	10																												
Tetrachloroethene	5	0.07	0.7	5																	21000		19000		8100		9100				0.43	J
Toluene	1,000	1210	2420	5	23		55														140				190	J	200	J				
Chlorobenzene	-	50	100	5																												
Ethylbenzene	700	340	680	5	11		16																									
Xylene (total)	10,000	200	400	5	120		230														18											
Total VOCs					154		340		17700		21500		12926		9580		14980		14980		51262		33960		27030		29460		0		14.43	
Total TICs					66	J	102	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

*Ground Water TCL Volatile Organics Analyses ***
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		West of the Landfill Wells																											
		Vermont	Vermont																													
	Federal	Prev. Act.	Enforcement		W-27S1-11		W-27S1-13		W-08S1-01		W-08S1-02		W-08S1-03		W-08S1-04		W-08S1-06		W-08S1-11		W-08S1-12		W-08S1-13		DUP W-150 W-08S1-13		W-09S1-02		W-09S1-03		W-09S1-04		W-09S1-06	
Compound	MCLs	Limit	Standards	CRQL	5/25/95	Q	5/14/96	Q	5/25/93	Q	6/22/93	Q	11/23/93	Q	2/28/94	Q	11/31/94	Q	5/9/95	Q	11/7/95	Q	5/15/96	Q	5/15/96	Q	6/22/93	Q	11/23/93	Q	2/24/94	Q	12/1/94	Q
Chloromethane	-	-	-	10																														
Vinyl Chloride	2	0.2	2	10	1	J																							1.3	J	2.9	J	2.5	
Methylene Chloride	5	2.5	5	5																														
Acetone	-	-	-	10																											9.1	J		
Carbon Disulfide	-	-	-	5																														
1,1-Dichloroethene	7	0.7	7	5																														
1,1-Dichloroethane	-	-	-	5																														
1,2-Dichloroethene (total)	70	35	70	5	1	J			6		14		14				12		12	J	21	J	31	J	30	J	9		22		30		3.7	
Chloroform	100/80*	-	-	5																														
1,2-Dichloroethane	5	0.5	5	5																														
2-Butanone	-	-	-	10															15	J														
1,1,1-Trichloroethane	200	100	200	5																														
Carbon Tetrachloride	5	0.5	5	5																														
Trichloroethene	5	0.5	5	5	22				150		260		360		390		240		320		470		660	J	650	J	5		7.1		2	J	18	
Benzene	5	0.5	5	5																														
2-Hexanone	-	-	-	10																														
Tetrachloroethene	5	0.07	0.7	5	3	J			49		73		160		200		120		170		270		380		360								2	
Toluene	1,000	1210	2420	5																														
Chlorobenzene	-	50	100	5																														
Ethylbenzene	700	340	680	5																														
Xylene (total)	10,000	200	400	5																														
Total VOCs					27		0		205		347		534		590		372		517		761		1071		1040		14		30.4		44		26.2	
Total TICs					0		0		NA		NA		NA		NA		NA		0		0		0		0		NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	West of the Landfill Wells																						Marshy Area Wells					
					W-09S1-11 5/31/95	Q	W-09S1-13 5/14/96	Q	W-25S1-01 5/25/93	Q	W-25S1-02 6/22/93	Q	W-25S1-03 11/23/93	Q	W-25S1-04 2/23/94	Q	W-25S1-06 11/29/94	Q	BLDUP W-25S1-06 11/29/94	Q	W-25S1-11 5/24/95	Q	W-25S1-12 11/3/95	Q	W-25S1-13 5/15/96	Q	W-02-02 6/24/93	Q	W-02-03 11/29/93	Q	BLDUP-4-3 W-02-03 11/29/93	Q
Chloromethane	-	-	-	10																												
Vinyl Chloride	2	0.2	2	10	3	J																							630	J	570	J
Methylene Chloride	5	2.5	5	5																												
Acetone	-	-	-	10					21		48	U	88		87						18				20							
Carbon Disulfide	-	-	-	5																												
1,1-Dichloroethene	7	0.7	7	5	1	J																							620	J		
1,1-Dichloroethane	-	-	-	5																												
1,2-Dichloroethene (total)	70	35	70	5	5	J											0.62	J	0.68	J			2	J			11000		14000		13000	
Chloroform	100/80*	-	-	5																												
1,2-Dichloroethane	5	0.5	5	5																												
2-Butanone	-	-	-	10									6.9	J	29																	
1,1,1-Trichloroethane	200	100	200	5																												
Carbon Tetrachloride	5	0.5	5	5																												
Trichloroethene	5	0.5	5	5	45				12		6		1.2	J	5	U	12		13		130		99				1800		1500	J	1900	J
Benzene	5	0.5	5	5																									550	J		
2-Hexanone	-	-	-	10																												
Tetrachloroethene	5	0.07	0.7	5	5	J											7.3		7.9		6	J	57				1400		400	J	860	J
Toluene	1,000	1210	2420	5																					4	J			610	J		
Chlorobenzene	-	50	100	5																									580	J		
Ethylbenzene	700	340	680	5																												
Xylene (total)	10,000	200	400	5																												
Total VOCs					59		0		33		54		96.1		121		19.92		21.58		154		158		24		14200		18890		16330	
Total TICs					0		0		NA		24	J	NA		NA		NA		NA		0		0		0		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
* " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Marshy Area Wells																									
					W-03-01 5/26/93	Q	W-03-02 6/24/93	Q	W-03-03 11/29/93	Q	W-03-06 12/1/94	Q	W-03-11 5/31/95	Q	W-03-12 11/15/95	Q	W-04S-02 6/23/93	Q	W-04S-03 11/29/93	Q	W-04D-01 5/26/93	Q	W-04D-02 6/23/93	Q	W-04D-03 11/23/93	Q	W-04D-06 11/29/94	Q	W-04D-11 5/24/95	Q	BLDUP-W151 W-04D-11 5/24/95	Q
Chloromethane	-	-	-	10																												
Vinyl Chloride	2	0.2	2	10													1000		1500		620		620									
Methylene Chloride	5	2.5	5	5																												
Acetone	-	-	-	10																												
Carbon Disulfide	-	-	-	5			510																									
1,1-Dichloroethene	7	0.7	7	5															120	J												
1,1-Dichloroethane	-	-	-	5																												
1,2-Dichloroethene (total)	70	35	70	5	22000		16000		11000		7500		9500		9200		3900		3800						150		380		510		540	J
Chloroform	100/80*	-	-	5																												
1,2-Dichloroethane	5	0.5	5	5																									18			
2-Butanone	-	-	-	10			1000																									
1,1,1-Trichloroethane	200	100	200	5																									3	J		
Carbon Tetrachloride	5	0.5	5	5																												
Trichloroethene	5	0.5	5	5	9800		8000		1300	J	5200		12000		7400		670		2000	J	3500		1900				6400		9500		9000	
Benzene	5	0.5	5	5															110	J												
2-Hexanone	-	-	-	10																												
Tetrachloroethene	5	0.07	0.7	5	10000		5800		350	J	2600		9200		8500				640	J	1000		560				2300		3300		3100	
Toluene	1,000	1210	2420	5															110	J												
Chlorobenzene	-	50	100	5															120	J												
Ethylbenzene	700	340	680	5																												
Xylene (total)	10,000	200	400	5																												
Total VOCs					41800		31310		12650		15300		30700		25100		5570		8400		5120		3080		150		9080		13331		12640	
Total TICs					NA		NA		NA		NA		0		0		NA		NA		NA		NA		NA		NA		0		0	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Marshy Area Wells*																							
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-04D-12	W-04D-13		W-05-02		W-05-03		W-06S-01		W-06S-02		W-06S-03		W-06D-01		W-06D-02		BLDUP W-06D-02		W-06D-03		W-06D-06		W-06D-11	
Compound	MCLs	Limit	Standards	CRQL	11/14/95	5/17/96	Q	6/24/93	Q	11/29/93	Q	5/27/93	Q	6/23/93	Q	11/29/93	Q	5/27/93	Q	6/23/93	Q	6/23/93	Q	11/29/93	Q	12/1/94	Q	5/26/95	Q
Chloromethane	-	-	-	10																									
Vinyl Chloride	2	0.2	2	10																									
Methylene Chloride	5	2.5	5	5																									
Acetone	-	-	-	10																									
Carbon Disulfide	-	-	-	5																									
1,1-Dichloroethene	7	0.7	7	5																									
1,1-Dichloroethane	-	-	-	5																									
1,2-Dichloroethene (total)	70	35	70	5	400	540	J	1100		310																			
Chloroform	100/80*	-	-	5																									
1,2-Dichloroethane	5	0.5	5	5																									
2-Butanone	-	-	-	10																									
1,1,1-Trichloroethane	200	100	200	5																									
Carbon Tetrachloride	5	0.5	5	5																									
Trichloroethene	5	0.5	5	5	7000	7300	J	1900		870	J			5		1.4	J												
Benzene	5	0.5	5	5																									
2-Hexanone	-	-	-	10																									
Tetrachloroethene	5	0.07	0.7	5	3100	3100		980		130	J																		
Toluene	1,000	1210	2420	5																									
Chlorobenzene	-	50	100	5																									
Ethylbenzene	700	340	680	5																									
Xylene (total)	10,000	200	400	5																									
Total VOCs					10500	10940		3980		1310		0		5		1.4		0		0		0		0		0		0	
Total TICs					0	0		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Marshy Area Wells																							
					W-06D-12 11/13/95	Q	W-06D-13 5/20/96	Q	W-11S1-02 6/24/93	Q	W-11S1-03 11/30/93	Q	W-11S1-04 2/24/94	Q	W-11S1-06 12/1/94	Q	W-11S1-11 5/26/95	Q	W-11S1-12 11/3/95	Q	W-12S1-02 6/24/93	Q	W-12S1-03 11/29/93	Q	W-12S1-04 2/25/94	Q	W-22S1-01 5/26/93	Q	W-22S1-02 6/24/93	Q
Chloromethane	-	-	-	10																										
Vinyl Chloride	2	0.2	2	10					2300				580	J	1700		1300		88											
Methylene Chloride	5	2.5	5	5																										
Acetone	-	-	-	10															12											
Carbon Disulfide	-	-	-	5																										
1,1-Dichloroethene	7	0.7	7	5							90	J							2	J										
1,1-Dichloroethane	-	-	-	5																										
1,2-Dichloroethene (total)	70	35	70	5					6900		7600		2000	J	2100		1100		160						3.3	J	3300		4400	J
Chloroform	100/80*	-	-	5																										
1,2-Dichloroethane	5	0.5	5	5																										
2-Butanone	-	-	-	10																										
1,1,1-Trichloroethane	200	100	200	5																										
Carbon Tetrachloride	5	0.5	5	5																										
Trichloroethene	5	0.5	5	5					810				320	J	200		170		23						11		34000		40000	J
Benzene	5	0.5	5	5															3	J										
2-Hexanone	-	-	-	10									48	J																
Tetrachloroethene	5	0.07	0.7	5																										
Toluene	1,000	1210	2420	5											28		37	J	46											
Chlorobenzene	-	50	100	5																										
Ethylbenzene	700	340	680	5													8	J	21											
Xylene (total)	10,000	200	400	5													41	J	96											
Total VOCs					0		0		10010		7690		2948		4028		2656		451		0		0		14.3		37300		44400	
Total TICs					0		0		NA		NA		NA		NA		0		10		NA		NA		NA		NA		NA	

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6A

Ground Water TCL Volatile Organics Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Marshy Area Wells*													
		Vermont	Vermont		BLDUP													
	Federal	Prev. Act.	Enforcement		W-22S1-02		W-22S1-03		W-22S1-04		W-22S1-06		W-22S1-11		W-22S1-12		W-22S1-13	
Compound	MCLs	Limit	Standards	CRQL	6/24/93	Q	11/29/93	Q	2/24/94	Q	12/1/94	Q	5/9/95	Q	11/13/95	Q	5/20/96	Q
Chloromethane	-	-	-	10														
Vinyl Chloride	2	0.2	2	10									99	J	250	J	350	J
Methylene Chloride	5	2.5	5	5														
Acetone	-	-	-	10														
Carbon Disulfide	-	-	-	5	1600	J												
1,1-Dichloroethene	7	0.7	7	5														
1,1-Dichloroethane	-	-	-	5														
1,2-Dichloroethene (total)	70	35	70	5	1900	J	1500		1600	J	1300		1600		1700		2400	
Chloroform	100/80*	-	-	5														
1,2-Dichloroethane	5	0.5	5	5														
2-Butanone	-	-	-	10														
1,1,1-Trichloroethane	200	100	200	5														
Carbon Tetrachloride	5	0.5	5	5														
Trichloroethene	5	0.5	5	5	14000	J	9000		13000	J	7400		9700		6800		8500	J
Benzene	5	0.5	5	5														
2-Hexanone	-	-	-	10														
Tetrachloroethene	5	0.07	0.7	5														
Toluene	1,000	1210	2420	5														
Chlorobenzene	-	50	100	5														
Ethylbenzene	700	340	680	5														
Xylene (total)	10,000	200	400	5														
Total VOCs					17500		10500		14600		8700		11399		8750		11250	
Total TICs					NA		NA		NA		NA		0		0		0	

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6B

Ground Water TCL Volatile Organics Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	West of the Landfill Wells																		Marshy Area Wells			
					W-26T-05 7/7/94	Q	W-26T-06 11/29/94	Q	W-26T-11 5/30/95	W-26T-13 5/16/96	Q	W-27T-05 7/6/94	Q	W-27T-06 11/29/94	Q	W-27T-11 5/15/95	Q	W-27T-12 11/2/95	Q	W-27T-13 5/14/96	Q	W-03T-02 6/24/93	Q	W-03T-03 11/29/93	Q
Chloromethane	-	-	-	10																						
Vinyl Chloride	2	0.2	2	10																						
Methylene Chloride	5	2.5	5	5																						
Acetone	-	-	-	10																						
Carbon Disulfide	-	-	-	5																						
1,1-Dichloroethene	7	0.7	7	5																						
1,1-Dichloroethane	-	-	-	5																						
1,2-Dichloroethene (total)	70	35	70	5																		56				
Chloroform	100/80*	-	-	5																						
1,2-Dichloroethane	5	0.5	5	5																						
2-Butanone	-	-	-	10																						
1,1,1-Trichloroethane	200	100	200	5																						
Carbon Tetrachloride	5	0.5	5	5																						
Trichloroethene	5	0.5	5	5										1.9		7	J	2				47		1.4	J
Benzene	5	0.5	5	5																						
2-Hexanone	-	-	-	10																						
Tetrachloroethene	5	0.07	0.7	5												10						81				
Toluene	1000	1210	2420	5																						
Chlorobenzene	-	50	100	5																						
Ethylbenzene	700	340	680	5																						
Xylene (total)	10000	200	400	5																						
Total VOCs					0		0		0	0		0		1.9		17		2		0		184		1.4		
Total TICs					NA		NA		0	0		NA		NA		0		0		0		NA		NA		

NOTES:
**- Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6B

Ground Water TCL Volatile Organics Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Marshy Area Wells																							
					W-04T-05 7/6/94	Q	W-04T-06 12/1/94	Q	BLDUP W-04T-06 12/1/94	Q	W-04T-11 5/17/95	Q	W-04T-12 11/14/95	Q	BLDUP W-154 W-04T-12 11/14/95		W-04T-13 5/17/96	Q	W-22T-05 7/7/94	Q	W-22T-06 11/30/94	Q	W-22T-11 5/10/95	Q	W-22T-12 11/8/95	Q	W-22T-13 5/20/96	Q
Chloromethane	-	-	-	10																								
Vinyl Chloride	2	0.2	2	10	20		28		35		54	J	34	J	35	J	77	J					6	J				
Methylene Chloride	5	2.5	5	5	35		50		43		49	J	44	J	42	J	39	J	150		140		130		110	J		
Acetone	-	-	-	10																								
Carbon Disulfide	-	-	-	5																								
1,1-Dichloroethene	7	0.7	7	5																								
1,1-Dichloroethane	-	-	-	5																								
1,2-Dichloroethene (total)	70	35	70	5	320		450		460		610		570		570		780		310	J	360		420		370	J	330	J
Chloroform	100/80*	-	-	5																								
1,2-Dichloroethane	5	0.5	5	5	9														21				21	J				
2-Butanone	-	-	-	10																								
1,1,1-Trichloroethane	200	100	200	5																								
Carbon Tetrachloride	5	0.5	5	5																			4	J				
Trichloroethene	5	0.5	5	5	1200		1400		1400		2500		1200		1300		2000	J	6400		6300		8800		7300		6000	J
Benzene	5	0.5	5	5																								
2-Hexanone	-	-	-	10																								
Tetrachloroethene	5	0.07	0.7	5	41																		4	J				
Toluene	1000	1210	2420	5																								
Chlorobenzene	-	50	100	5																								
Ethylbenzene	700	340	680	5																								
Xylene (total)	10000	200	400	5																								
Total VOCs					1625		1928		1938		3213		1848		1947		2896		6881		6800		8800		7780		6330	
Total TICs					NA		NA		NA		0		0		0		0		NA		NA		0		0		0	

NOTES:
**- Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6B

Ground Water TCL Volatile Organics Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Hillside Wells																	
					W-23T-01 5/24/93	Q	W-23T-02 6/22/93	Q	W-23T-03 11/23/93	Q	W-23T-12 11/9/95	Q	W-24T-01 5/24/93	Q	W-24T-02 6/22/93	Q	W-24T-03 11/23/93	Q	W-24T-03 BLDUP-3-3 11/23/93	Q
Chloromethane	-	-	-	10																		
Vinyl Chloride	2	0.2	2	10																		
Methylene Chloride	5	2.5	5	5																		
Acetone	-	-	-	10																		
Carbon Disulfide	-	-	-	5																		
1,1-Dichloroethene	7	0.7	7	5																		
1,1-Dichloroethane	-	-	-	5																		
1,2-Dichloroethene (total)	70	35	70	5																		
Chloroform	100/80*	-	-	5																		
1,2-Dichloroethane	5	0.5	5	5																		
2-Butanone	-	-	-	10																		
1,1,1-Trichloroethane	200	100	200	5																		
Carbon Tetrachloride	5	0.5	5	5																		
Trichloroethene	5	0.5	5	5																		
Benzene	5	0.5	5	5																		
2-Hexanone	-	-	-	10																		
Tetrachloroethene	5	0.07	0.7	5																		
Toluene	1000	1210	2420	5											12		5.2					
Chlorobenzene	-	50	100	5																		
Ethylbenzene	700	340	680	5																		
Xylene (total)	10000	200	400	5											5		5					
Total VOCs					0		0		0		0		0		17		10.2		0			
Total TICs					NA		NA		NA		0		NA		NA		NA		NA			

NOTES:
**- Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6C

Ground Water TCL Volatile Organics Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Upgradient Wells*								*Marshy Area Wells*																	
		Vermont	Vermont			BLDUP1-05								BLDUP												DUP W-150				
	Federal	Prev. Act.	Enforcement		W-01DI-05	W-01DI-05		W-01DI-11		W-01DI-12			W-04SI-01	W-04SI-01		W-04SI-02		W-04SI-03		W-04SI-04		W-04SI-06		W-04SI-11		W-04SI-12	W-04SI-12		W-04SI-13	
Compound	MCLs	Limit	Standards	CRQL	7/5/94	Q 7/5/94	Q	5/16/95	Q	11/10/95	Q		6/2/93	Q 6/2/93	Q	6/28/93	Q	11/30/93	Q	3/2/94	Q	12/1/94	Q	5/11/95	Q	11/2/95	Q 11/2/95		5/16/96	Q
Chloromethane	-	-	-	10																										
Vinyl Chloride	2	0.2	2	10																										
Methylene Chloride	5	2.5	5	5																										
Acetone	-	-	-	10																										
Carbon Disulfide	-	-	-	5																										
1,1-Dichloroethene	7	0.7	7	5																										
1,1-Dichloroethane	-	-	-	5																										
1,2-Dichloroethene (total)	70	35	70	5																				4	J					
Chloroform	100/80*	-	-	5																										
1,2-Dichloroethane	5	0.5	5	5																										
2-Butanone	-	-	-	10																										
1,1,1-Trichloroethane	200	100	200	5																										
Carbon Tetrachloride	5	0.5	5	5																										
Trichloroethene	5	0.5	5	5																				69						
Benzene	5	0.5	5	5																										
2-Hexanone	-	-	-	10																										
Tetrachloroethene	5	0.07	0.7	5																				100						
Toluene	1,000	1210	2420	5																										
Chlorobenzene	-	50	100	5																										
Ethylbenzene	700	340	680	5																										
Xylene (total)	10,000	200	400	5																										
Total VOCs					0	0		0		0			0	0		0		0		0		0		173		0	0		0	
Total TICs								0		0			NA	NA		NA		NA		NA		NA		NA		0	0		0	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6C

Ground Water TCL Volatile Organics Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Marshy Area Wells														Soil Staging Area Wells													
					W-04DI-01		W-04DI-02		W-04DI-03		W-04DI-04		W-04DI-06		W-04DI-11		W-04DI-12		W-07SI-01		W-07SI-02		W-07SI-03		W-07SI-04		W-07SI-11		W-07SI-12		W-07SI-13	
					6/4/93	Q	6/29/93	Q	12/01/93	Q	3/2/94	Q	12/1/94	Q	5/12/95	Q	11/3/95	Q	6/3/93	Q	6/30/93	Q	11/30/93	Q	3/3/94	Q	5/17/95	Q	11/15/95	Q	5/16/96	Q
Chloromethane	-	-	-	10																												
Vinyl Chloride	2	0.2	2	10																												
Methylene Chloride	5	2.5	5	5																												
Acetone	-	-	-	10					5.1	J																						
Carbon Disulfide	-	-	-	5																												
1,1-Dichloroethene	7	0.7	7	5																												
1,1-Dichloroethane	-	-	-	5																												
1,2-Dichloroethene (total)	70	35	70	5																												
Chloroform	100/80*	-	-	5																												
1,2-Dichloroethane	5	0.5	5	5																												
2-Butanone	-	-	-	10																												
1,1,1-Trichloroethane	200	100	200	5																												
Carbon Tetrachloride	5	0.5	5	5																												
Trichloroethene	5	0.5	5	5									1.7																22			
Benzene	5	0.5	5	5																												
2-Hexanone	-	-	-	10																												
Tetrachloroethene	5	0.07	0.7	5																												
Toluene	1,000	1210	2420	5																							3	J				
Chlorobenzene	-	50	100	5																												
Ethylbenzene	700	340	680	5																												
Xylene (total)	10,000	200	400	5																												
Total VOCs					0		0		5.1		0		1.7		0		0		0		0		0		0		3		22		0	
Total TICs					NA		NA		NA		NA		NA		0		0		NA		NA		NA		NA		0		0		0	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6C

Ground Water TCL Volatile Organics Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	*Soil Staging Area* W-07DI-03 11/30/93	Q	W-07DI-06 11/29/94	Q	*West of Landfill Area Wells* W-09SI-01 6/2/93	Q	W-09SI-02 6/29/93	Q	W-09SI-03 12/01/93	Q	W-09SI-04 2/28/94	Q	W-09SI-06 12/1/94	Q	BLDUP W-09SI-06 12/1/94	Q	W-09SI-11 5/18/95	Q	W-09SI-12 11/6/95	Q	W-09SI-13 5/14/96	Q	W-25SI-01 6/1/93	Q	BLDUP2-4 W-25SI-02 6/29/93	Q	W-25SI-03 12/01/93	Q	W-25SI-04 2/28/94	Q
Chloromethane	-	-	-	10																														
Vinyl Chloride	2	0.2	2	10																														
Methylene Chloride	5	2.5	5	5																														
Acetone	-	-	-	10									2.3	J																				
Carbon Disulfide	-	-	-	5			25								1.1	J																		
1,1-Dichloroethene	7	0.7	7	5																														
1,1-Dichloroethane	-	-	-	5																														
1,2-Dichloroethene (total)	70	35	70	5																														
Chloroform	100/80*	-	-	5	1	J																							5		2.7	J	2.9	J
1,2-Dichloroethane	5	0.5	5	5																														
2-Butanone	-	-	-	10																														
1,1,1-Trichloroethane	200	100	200	5																														
Carbon Tetrachloride	5	0.5	5	5																														
Trichloroethene	5	0.5	5	5	1.1	J															2	J												
Benzene	5	0.5	5	5																														
2-Hexanone	-	-	-	10																														
Tetrachloroethene	5	0.07	0.7	5	1	J																												
Toluene	1,000	1210	2420	5	3.8	J																												
Chlorobenzene	-	50	100	5																														
Ethylbenzene	700	340	680	5																														
Xylene (total)	10,000	200	400	5	4.8	J																												
Total VOCs					11.7		25		0		0		2.3		1.1		0		0		2		0		0		0		5		2.7		2.9	
Total TICs					NA		NA		NA		NA		NA		NA		NA		NA		0		0		0		NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
* * - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6C

Ground Water TCL Volatile Organics Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		West of Landfill Wells																											
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-25SI-04		W-25SI-06		W-25SI-11		W-25SI-12		W-25DI-01		W-25DI-02		W-25DI-03		W-25DI-04		W-25DI-06		W-25DI-11		W-25DI-12		W-08SI-01		W-08SI-02		W-08SI-03		W-08SI-04	
Compound	MCLs	Limit	Standards	CRQL	2/28/94	Q	11/30/94	Q	5/9/95	Q	11/7/95	Q	6/2/93	Q	6/30/93	Q	12/02/93	Q	3/2/94	Q	12/1/94	Q	5/13/95	Q	11/6/95	Q	6/1/93	Q	6/30/93	Q	12/01/93	Q	2/28/94	Q
Chloromethane	-	-	-	10																														
Vinyl Chloride	2	0.2	2	10																														
Methylene Chloride	5	2.5	5	5																														
Acetone	-	-	-	10																							21				17			
Carbon Disulfide	-	-	-	5																											5.4		2.5	J
1,1-Dichloroethene	7	0.7	7	5																														
1,1-Dichloroethane	-	-	-	5																														
1,2-Dichloroethene (total)	70	35	70	5																														
Chloroform	100/80*	-	-	5	2.8	J	0.94	J																										
1,2-Dichloroethane	5	0.5	5	5																														
2-Butanone	-	-	-	10																														
1,1,1-Trichloroethane	200	100	200	5																														
Carbon Tetrachloride	5	0.5	5	5																														
Trichloroethene	5	0.5	5	5																	3.2		2	J										
Benzene	5	0.5	5	5																														
2-Hexanone	-	-	-	10																														
Tetrachloroethene	5	0.07	0.7	5																														
Toluene	1,000	1210	2420	5																	2.8													
Chlorobenzene	-	50	100	5																														
Ethylbenzene	700	340	680	5																														
Xylene (total)	10,000	200	400	5																														
Total VOCs					2.8		0.94		0		0		0		0		0		0		6		2		0		21		0		22.4		2.5	
Total TICs					NA		NA		0		0		NA		NA		NA		NA		NA		0		0		NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6D

*Ground Water TCL Volatile Organics Analyses ***
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRQL	Upgradient Wells														Marshy Area Wells											
					W-01B-01 6/3/93	Q	W-01B-02 6/28/93	Q	W-01B-03 12/02/93	Q	W-01B-04 3/3/94	Q	W-01B-06 11/29/94	Q	W-01B-11 5/23/95	Q	W-01B-12 10/31/95	Q	W-04B-01 6/4/93	Q	W-04B-02 6/29/93	Q	W-04B-03 12/01/93	Q	W-04B-04 3/2/94	Q	BLDUP-1-4 W-04B-04 3/2/94	Q	W-04B-06 12/1/94	Q
Chloromethane	-	-	-	10																										
Vinyl Chloride	2	0.2	2	10																										
Methylene Chloride	5	2.5	5	5																										
Acetone	-	-	-	10																										
Carbon Disulfide	-	-	-	5																										
1,1-Dichloroethene	7	0.7	7	5																										
1,1-Dichloroethane	-	-	-	5																										
1,2-Dichloroethene (total)	70	35	70	5					3.3	J																			0.5	J
Chloroform	100/80*	-	-	5																										
1,2-Dichloroethane	5	0.5	5	5																										
2-Butanone	-	-	-	10																										
1,1,1-Trichloroethane	200	100	200	5																										
Carbon Tetrachloride	5	0.5	5	5																										
Trichloroethene	5	0.5	5	5																									1.8	
Benzene	5	0.5	5	5																										
2-Hexanone	-	-	-	10																										
Tetrachloroethene	5	0.07	0.7	5																										
Toluene	1,000	1210	2420	5																										
Chlorobenzene	-	50	100	5																										
Ethylbenzene	700	340	680	5																										
Xylene (total)	10,000	200	400	5																										
Total VOCs					0		0		3.3		0		0		0		0		0		0		0		0		0		2.3	
Total TICs					NA		NA		NA		NA		NA		0		0		NA		NA		NA		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 6D

Ground Water TCL Volatile Organics Analyses **
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Marshy Area Wells*				*West of Landfill Wells*																	
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-04B-11		W-04B-12		W-09B-01		W-09B-02		W-09B-03		W-09B-04		W-09B-06		W-09B-11		W-09B-12		W-08B-01		W-08B-02		W-08B-03	
Compound	MCLs	Limit	Standards	CRQL	5/30/95	Q	11/1/95	Q	6/2/93	Q	7/1/93	Q	12/01/93	Q	3/2/94	Q	11/30/94	Q	5/22/95	Q	11/1/95	Q	6/3/93	Q	7/1/93	Q	12/02/93	Q
Chloromethane	-	-	-	10																								
Vinyl Chloride	2	0.2	2	10																								
Methylene Chloride	5	2.5	5	5																								
Acetone	-	-	-	10																								
Carbon Disulfide	-	-	-	5									1.2	J														
1,1-Dichloroethene	7	0.7	7	5																								
1,1-Dichloroethane	-	-	-	5																								
1,2-Dichloroethene (total)	70	35	70	5																								
Chloroform	100/80*	-	-	5																								
1,2-Dichloroethane	5	0.5	5	5																								
2-Butanone	-	-	-	10																								
1,1,1-Trichloroethane	200	100	200	5																								
Carbon Tetrachloride	5	0.5	5	5																								
Trichloroethene	5	0.5	5	5													14											
Benzene	5	0.5	5	5																								
2-Hexanone	-	-	-	10																								
Tetrachloroethene	5	0.07	0.7	5													4.1											
Toluene	1,000	1210	2420	5																								
Chlorobenzene	-	50	100	5																								
Ethylbenzene	700	340	680	5																								
Xylene (total)	10,000	200	400	5																								
Total VOCs					0		0		0		0		1.2		0		18.1		0		0		0		0		0	
Total TICs					0		0		NA		NA		NA		NA		NA		0		0		NA		NA		NA	

NOTES:
** - Table only includes those compounds detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
TICs - Tentatively Identified Compounds.
" " - Blank space indicates that the element was not detected above method detection limits.
* - Current MCL/1994 Proposed rule

Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Upgradient Wells																							
					W-01S1-01		W-01S1-01-F		W-01S1-02		W-01S1-02-F		W-01S1-03		W-01S1-03-F		W-01S1-04		W-01S1-04-F		W-01S1-06		W-01S1-06-F		W-01S1-11	
					5/25/93	Q	5/25/93	Q	6/22/93	Q	6/22/93	Q	11/22/93	Q	11/22/93	Q	2/24/94	Q	2/24/94	Q	11/28/94	Q	11/28/94	Q	5/23/95	Q
Aluminum	50-200	-	-	200	55100	J			9710	J	33.8	J	42600				16800				38000					
Antimony	6.0	-	-	60					24.7	J													5.9	J		
Arsenic	50	25	50	10									3.5	J			1.5	J			9.9	J	3.4	J		
Barium	2,000	500	1,000	200	457	J	9.7	J	212		9.3	J	360		15		220		13		329		16.3	J	10.8	B
Beryllium	4	-	-	5	3.3	J			2.7	J			3.4				1.2	J			1.7	J				
Cadmium	5.0	2.5	5.0	3									7.7				0.52									
Chromium	100	25	50	10	97.0	J							50		6.2	J	17				39.5					
Iron	300(a)	150	300	100	92900	J			13700	J			73200		83	J	25800				52500				32	BJ
Lead	15(b)	10	20	3	48.2	J			18.2	J			37				20				38.8					
Manganese	50(a)	25	50	15	2640	J			1170	J	1.4	J	2600		7	J	1300				1530					
Mercury	2.0	1	2.0	0.2					0.21												0.057	J				
Nickel	100	175	350	40	82.8	J			9.9	J			60				19	J			40.6					
Thallium	2	-	-	10																			6.2	J		
Zinc	5,000(a)	2500	5,000	20	232	J			65.7				190		22		72				142					
BOD5 (mg/l)				1			NA				NA				NA				NA		NA		NA		NA	
Hardness (mg/l)				1	450	J	NA		330		NA		463		128		341		122		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
**Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Upgradient Wells																							
					W-01S1-12		W-01-4		W-01-4-F		W-01-5		W-01-5-F		W-01-6		W-01-6-F		W-01-11		W-01-11-F		W-01-12		W-01-13	
					10/31/95	Q	2/24/94	Q	2/24/94	Q	7/05/94	Q	7/05/94	Q	11/28/94	Q	11/28/94	Q	5/23/95	Q	5/23/95	Q	11/10/95	Q	5/15/96	Q
Aluminum	50-200	-	-	200			64000				20200				37800		35.8	J	9300	J	54.4	B	105	B	544	
Antimony	6.0	-	-	60													3.8	J								
Arsenic	50	25	50	10							1.8	J			8.2	J										
Barium	2,000	500	1,000	200	12.1	B	830		12		360	J	8.6	J	496		7.8	J	122	B	9.2	B	13.3	B	15.1	B
Beryllium	4	-	-	5			3.8				1.3	J			1.8	J			0.52	B						
Cadmium	5.0	2.5	5.0	3			1.5																			
Chromium	100	25	50	10			110				57.5	J	2.1	J	54				17.3	J						
Iron	300(a)	150	300	100			97500				43600		39.2	J	55500				13600				142			
Lead	15(b)	10	20	3			43				17.6	J			37.8				9	J						
Manganese	50(a)	25	50	15			4200				1480	J	1.5	J	1650				361				13.9	B		
Mercury	2.0	1	2.0	0.2			0.65	J							0.081	J										
Nickel	100	175	350	40			91				47.5	J	1.1	J	49				13.6	BJ			1.5	B		
Thallium	2	-	-	10													8.9	J								
Zinc	5,000(a)	2500	5,000	20			230				131	J	13.3	J	165				39.6				101			
BOD5 (mg/l)				1			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
**Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Soil Staging Area																							
					W-07S1-01		W-07S1-01-F		W-07S1-02		W-07S1-02-F		W-07S1-03		W-07S1-03-F		W-07S1-04		W-07S1-04-F		SBW-10-01		BLDUP#1-1 SBW-10-01		SBW-10-01-F	
					5/28/93	Q	5/28/93	Q	6/24/93	Q	6/24/93	Q	11/30/93	Q	11/30/93	Q	2/24/94	Q	2/24/94	Q	5/25/93	Q	5/25/93	Q	5/25/93	Q
Aluminum	50-200	-	-	200	37500	J			12500	J	35.6	J	22100				31500				295000	J	34900	J		
Antimony	6.0	-	-	60	29.1	J			39.6	J					15	J			16	J						
Arsenic	50	25	50	10									4.6	J			4.5	J								
Barium	2,000	500	1,000	200	816		42.9	J	313		45.2	J	1400		63		800		47		2350	J	293	J	12.1	J
Beryllium	4	-	-	5	3.4	J			2.8	J			3.7				3.2				16.6	J	3.4	J		
Cadmium	5.0	2.5	5.0	3													1									
Chromium	100	25	50	10	38.3	J			17.9				25	J			48				290	J	84.6	J		
Iron	300(a)	150	300	100	60000	J			18900	J	26.4	J	14500				55900				613000	J	66600	J		
Lead	15(b)	10	20	3	50.8	J			65.5				89				52				163	J	25.9	J	1.0	J
Manganese	50(a)	25	50	15	4500	J	2030		3350	J	1360		10500		260		6200		1000		14600	J	1730	J		
Mercury	2.0	1	2.0	0.2	0.20								1.3				0.89	J			0.22					
Nickel	100	175	350	40	56.7	J			22.2	J			41				42				371	J	62.8	J		
Thallium	2	-	-	10																			1.1	J		
Zinc	5,000(a)	2500	5,000	20	173	J											150				1380	J	155	J		
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA						NA	

NOTES:
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Table 7A

*Ground Water Inorganic Analyses ***
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Soil Staging Area										Landfill Area Wells							
					BLDUP#1-1-F SBW-10-01-F		SBW-10-02		SBW-10-02-F		SBW-10-03		SBW-10-03-F		W-TP-12-05		W-TP-12-05-F		W-TP-12-06		W-TP-12-06-F	
					5/25/93	Q	6/22/93	Q	6/22/92	Q	11/30/93	Q	11/30/93	Q	7/06/94	Q	7/06/94	Q	12/2/94	Q	12/2/94	Q
Aluminum	50-200	-	-	200			20900	J	45.4	J	13000		350		40200		5720		22100			
Antimony	6.0	-	-	60			28.9	J													6	J
Arsenic	50	25	50	10							1.4	J			R		1.6	J	6.8		16.8	
Barium	2,000	500	1,000	200	11.3	J	222		8.1	J	380		200		370		162	J	326		161	J
Beryllium	4	-	-	5			2.7	J			2.3				2.2	J	0.72	J				
Cadmium	5.0	2.5	5.0	3							0.4	J					1.3	J				
Chromium	100	25	50	10			30.7				10	J			104	J	4.8	J	49.8			
Iron	300(a)	150	300	100			38400	J			15300		300		64700		939		123000		53000	
Lead	15(b)	10	20	3			35.9				42				3370	J	232		1790		8.7	
Manganese	50(a)	25	50	15			1260	J	1.2	J	2700		7.9	J	16400		13800		2810		1780	
Mercury	2.0	1	2.0	0.2							0.37				1.1				0.42			
Nickel	100	175	350	40			24.2	J			23	J			9370		8220		235		66.4	
Thallium	2	-	-	10																		
Zinc	5,000(a)	2500	5,000	20			95.0						8.6	J	1730	J	1150		245		32.1	
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA				NA				NA		NA		NA		NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Landfill Area Wells																					
					W-TP-12-11		BLDUP-W-150 W-TP-12-11		W-TP-12-11-F		BLDUP W-150F W-TP-12-11-F		SBW-21-01		SBW-21-01-F		SBW-21-02		SBW-21-02-F		SBW-21-03		SBW-21-03-F		SBW-21-04	
					5/9/95	Q	5/9/95	Q	5/9/95	Q	5/9/95	Q	5/26/93	Q	5/26/93	Q	6/23/93	Q	6/23/93	Q	11/22/93	Q	11/22/93	Q	2/23/94	Q
Aluminum	50-200	-	-	200	672	J	1230	J	10.6	B	10.2	B	93200	J			10500	J	42.4	J	20200				68700	
Antimony	6.0	-	-	60	3.4	B	3.1	B	2.7	B			38.3	J	22.7	J										
Arsenic	50	25	50	10	4.7	B	3.7	B			2.7	B									3.2	J	2.2	J	3.9	J
Barium	2,000	500	1,000	200	199		204		188	B	193	B	669	J	124	J	163	J	94.7	J	270		130		1100	
Beryllium	4	-	-	5									6.8	J			0.83	J			2.1				6	
Cadmium	5.0	2.5	5.0	3																	0.43	J			1.4	
Chromium	100	25	50	10	70.7	J	228	J					178	J			54.2				85		6.2	J	170	
Iron	300(a)	150	300	100	105000	J	114000		117000	J	113000		156000	J	529		20200	J	1810		40600		480		118000	
Lead	15(b)	10	20	3	94.7	J	130	J									21.5	J			22				120	
Manganese	50(a)	25	50	15	2420		2330		2200		2270		3360	J	1270		1430	J	1320		1600		1200		3000	
Mercury	2.0	1	2.0	0.2	0.09	B	0.09	B					0.21										0.2		0.23	
Nickel	100	175	350	40	311	J	441	J	199		216		166	J			30.9	J			55				130	
Thallium	2	-	-	10			5.5	B																	1.2	J
Zinc	5,000(a)	2500	5,000	20	32.8		38.9		23.3		24.1		546	J			66.0		5.8	J	150		11	J	440	
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA				NA				NA				NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Landfill Area Wells*										*West of Landfill Area Wells*											
	Federal	Vermont Prev. Act.	Vermont Enforcement		SBW-21-04-F		SBW-21-06		SBW-21-06-F		SBW-21-11		SBW-21-11-F		W-08S1-01		W-08S1-01-F		W-08S1-02		W-08S1-02-F		W-08S1-03		W-08S1-03-F	
Compound	MCLs	Limit	Standards	CRDL	2/23/94	Q	11/28/94	Q	11/28/94	Q	5/10/95	Q	5/10/95	Q	5/25/93	Q	5/25/93	Q	6/22/93	Q	6/22/93	Q	11/23/93	Q	11/23/93	Q
Aluminum	50-200	-	-	200			75800				29200	J			154000	J			17000	J	110	J	17600		100	
Antimony	6.0	-	-	60			2.1	J	4.4	J	4.2	B			132	J			34.5	J						
Arsenic	50	25	50	10	2.3	J	46		8.1	J	20.6												3.4	J		
Barium	2,000	500	1,000	200	140		890		203		336		120	B	1030	J			259		17.0	J	160		23	
Beryllium	4	-	-	5			4.1	J			1.6	B			9.4	J			2.7	J			2			
Cadmium	5.0	2.5	5.0	3																						
Chromium	100	25	50	10			153				1120	J			168	J			23.2				24			
Iron	300(a)	150	300	100	880		178000		585		74800		1540		281000	J	46.4	J	31600	J	61.0	J	33900			
Lead	15(b)	10	20	3			96.7				34.5	J			78.5	J			15.0							
Manganese	50(a)	25	50	15	1600		3690	J	1990		2680		2040		7480	J			1220	J	55.2		1100		25	
Mercury	2.0	1	2.0	0.2			0.14				0.05	B														
Nickel	100	175	350	40	9.9	J	106		3	J	788	J	65.5		228	J			28.0	J			33	J		
Thallium	2	-	-	10					11.8		6.5	B														
Zinc	5,000(a)	2500	5,000	20			466				178				721	J			93.6							
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells																					
					W-08S1-04		W-08S1-04-F		W-08S1-06		W-08S1-06-F		W-08S1-11		W-08S1-11-F		W-08S1-12		W-08S1-12-F		W-08S1-13		DUP W-150 W-08S1-13	
					2/23/94	Q	2/23/94	Q	11/30/94	Q	11/30/94	Q	5/9/95	Q	5/9/95	Q	11/7/95	Q	11/7/95	Q	5/15/96	Q	5/15/96	Q
Aluminum	50-200	-	-	200	54500				30900		31	J	8590	J	172	B	893							
Antimony	6.0	-	-	60																				
Arsenic	50	25	50	10	2.2	J			9	J	5.5	J	3.1	B										
Barium	2,000	500	1,000	200	560		16		257		14.4	J	85.9	B	22.3	B	33.3	B	22.9	B	29.9	B	30	B
Beryllium	4	-	-	5	3				1.3	J														
Cadmium	5.0	2.5	5.0	3																				
Chromium	100	25	50	10	48				37.4				1040	J	15		4	B						
Iron	300(a)	150	300	100	100000				57700				19600		394		1470	J						
Lead	15(b)	10	20	3	48				32.4				5.9	J										
Manganese	50(a)	25	50	15	4500		32		1400		6.2	J	405		35.6		33.7				28	JN*	27.1	JN*
Mercury	2.0	1	2.0	0.2	0.28				0.061	J														
Nickel	100	175	350	40	89				47.5		1.7	J	767	J	36.1	B	3.9	B	1.3	B				
Thallium	2	-	-	10							9.9	J												
Zinc	5,000(a)	2500	5,000	20	250				171				45.6											
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells																							
					W-09S1-01		W-09S1-01-F		W-09S1-02		W-09S1-02-F		W-09S1-03		W-09S1-03-F		W-09S1-04		W-09S1-04-F		W-09S1-06		W-09S1-06-F		W-09S1-11	
					5/25/93	Q	5/25/93	Q	6/22/93	Q	6/22/93	Q	11/23/93	Q	11/23/93	Q	2/24/94	Q	2/24/94	Q	12/1/94	Q	12/1/94	Q	5/31/95	Q
Aluminum	50-200	-	-	200	144000	J			12900	J	26.8	J	34200				21300		590		50500		27.2	J		
Antimony	6.0	-	-	60					36.1	J									14	J						
Arsenic	50	25	50	10	4.6	J							12		3.3	J	4.2	J	1.2	J	18.9		8.8	J	3.5	B
Barium	2,000	500	1,000	200	1080	J	27.8	J	134	J	32.0	J	330		35		240		44		348		22.8	J	25.8	B
Beryllium	4	-	-	5	12.5	J			2.7	J			2.4				1.8	J			2.4	J				
Cadmium	5.0	2.5	5.0	3													0.71									
Chromium	100	25	50	10	186	J			22.4				50				24				44					
Iron	300(a)	150	300	100	303000	J	4620		35700	J	7010		88100		4700		65800		21000		114000		4800		9750	J
Lead	15(b)	10	20	3	116	J			11.8				39				33				49.7					
Manganese	50(a)	25	50	15	13000	J	7860		9550	J	8680		5200		3700		4300		3900		2380		839		927	
Mercury	2.0	1	2.0	0.2	0.27								0.22				R				0.21		0.053	J		
Nickel	100	175	350	40	240	J	15.0	J	23.9	J	8.8	J	58		7.6	J	35	J			58.6				3.7	B
Thallium	2	-	-	10	1.4	J																	13			
Zinc	5,000(a)	2500	5,000	20	703	J			70.6		2.2	J	210				100				207		20			
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells																							
					W-09S1-12		W-25S1-01		W-25S1-01-F		W-25S1-02		W-25S1-02-F		W-25S1-03		W-25S1-03-F		W-25S1-04		W-25S1-04-F		W-25S1-06	
					11/1/95	Q	5/25/93	Q	5/25/93	Q	6/22/93	Q	6/22/93	Q	11/23/93	Q	11/23/93	Q	2/23/94	Q	2/23/94	Q	11/29/94	Q
Aluminum	50-200	-	-	200			46000	J			7460	J	122	J	17200				14700		40	J	24500	
Antimony	6.0	-	-	60							23.5	J											2.1	J
Arsenic	50	25	50	10			R								9.3		8.4		4.1	J	2.8	J	11.7	
Barium	2,000	500	1,000	200	41.6	B	376	J	35.9	J	103	J	47.8	J	230		86		210		71		243	
Beryllium	4	-	-	5			3.3	J											1.6	J			1.2	J
Cadmium	5.0	2.5	5.0	3															0.68					
Chromium	100	25	50	10			74.1	J					3.9	J	32				26				32.3	
Iron	300(a)	150	300	100	902	J	89600	J	1900		16300	J	5430		36100		5700		51200		30600		40600	
Lead	15(b)	10	20	3			37.3	J							29				19				46.2	
Manganese	50(a)	25	50	15	674		4030	J	2760		3640	J	3840		22500		22600		80000		85100		11400	
Mercury	2.0	1	2.0	0.2															0.2				0.24	
Nickel	100	175	350	40	2.9	B	90.0	J	20.1	J	17.2	J			39	J	18	J	46		8.3	J	41.5	
Thallium	2	-	-	10	4.1	B	1.4	J															3.9	J
Zinc	5,000(a)	2500	5,000	20			239	J			50.0		5.1	J					110				164	
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells																					
					BLDUP W-25S1-06 11/29/94	Q	W-25S1-06-F 11/29/94	Q	BLDUP W-25S1-06-F 11/29/94	Q	W-25S1-11 5/24/95	Q	W-25S1-12 11/3/95	Q	W-25S1-13 5/15/96	Q	W-25S1-13F 5/15/96	Q	BLDUP W-151 W-25S1-13F 5/15/96	Q	W-27S1-05 7/06/94	Q
Aluminum	50-200	-	-	200	34300						175	B									29900	
Antimony	6.0	-	-	60																		
Arsenic	50	25	50	10	15		8.1	J	8.2	J	4.2	B									2.4	J
Barium	2,000	500	1,000	200	308		33.8	J	27.2	J	49.5	B	44.9	B	44.4	B	50.6	B	48.4	B	314	J
Beryllium	4	-	-	5	1.5	J															1.5	J
Cadmium	5.0	2.5	5.0	3											4.1	B	3.5	B	3.6	B		
Chromium	100	25	50	10	46.2																48.5	J
Iron	300(a)	150	300	100	55400		2660		385		17200	J			180000		150000		157000		56800	
Lead	15(b)	10	20	3	64.2																21.3	J
Manganese	50(a)	25	50	15	11.7	J	10700		9.3	J	8860		2720		3000	JN*	2660		2780		1740	J
Mercury	2.0	1	2.0	0.2	0.23		0.072	J	0.065	J												
Nickel	100	175	350	40	62.1		1.2	J	2.2	J	4.3	BJ	2.3	B							52.2	J
Thallium	2	-	-	10	3.9	J	20.2		16.7		6.3	B										
Zinc	5,000(a)	2500	5,000	20	200												24.7	UJ	29.5	UJ	151	J
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	UJ
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	J
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA	U

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7A

Ground Water Inorganic Analyses **
Overburden Kame Sand Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells									
					W-27S1-05-F 7/06/94	Q	W-27S1-06 11/28/94	Q	W-27S1-06-F 11/28/94	Q	W-27S1-11 5/25/95	Q	W-27S1-13 5/14/96	Q
Aluminum	50-200	-	-	200			42200				102	B		
Antimony	6.0	-	-	60					7.9	J				
Arsenic	50	25	50	10			9.2	J	10.4					
Barium	2,000	500	1,000	200	40.1	J	476		115	J	121	B	141	B
Beryllium	4	-	-	5			1.8	J						
Cadmium	5.0	2.5	5.0	3										
Chromium	100	25	50	10			71.6							
Iron	300(a)	150	300	100			68500				180	J		
Lead	15(b)	10	20	3	1.8	J	39.7							
Manganese	50(a)	25	50	15	37.2		1750		28.7		22.7		82.9	J
Mercury	2.0	1	2.0	0.2			2		0.12	J	0.18	BJ		
Nickel	100	175	350	40	1.5	J	55.6							
Thallium	2	-	-	10					5.8	J				
Zinc	5,000(a)	2500	5,000	20	10.1	J	223							
BOD5 (mg/l)				1	NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA	J	NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA	

NOTES:
**Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																			
					W-02-01 5/27/93	Q	BLDUP#2-1 W-02-01 5/27/93	Q	W-02-01-F 5/27/93	Q	W-02-02 6/24/93	Q	W-02-02-F 6/24/93	Q	W-02-03 11/30/93	Q	BLDUP W-02-03 11/30/93	Q	W-02-03-F 11/30/93	Q	BLDUP W-02-03-F 11/30/93	Q
Aluminum	50-200	-	-	200	12000	J	455	J			451	J	17.6	J	790		820							
Antimony	6.0	-	-	60	31.0	J			25.9	J	40.9	J							16	J				
Arsenic	50	25	50	10													3.2	J	2.6	J	2.5	J		
Barium	2,000	500	1,000	200	173	J	81.4	J	78.3	J	71.6	J	81.2	J	110		100		980		95			
Beryllium	4	-	-	5	2.7	J																		
Cadmium	5.0	2.5	5.0	3											0.1	J	0.1	J						
Chromium	100	25	50	10	345	J	38.3	J			9.7	J					18	J						
Iron	300(a)	150	300	100	29200	J	4680	J	1390		2930	J	37.3	J	6100		5700		310		270			
Lead	15(b)	10	20	3	47.7	J					3.6	J			64		72							
Manganese	50(a)	25	50	15	1550	J	786	J	865		746	J	830		790		720		900		870			
Mercury	2.0	1	2.0	0.2																				
Nickel	100	175	350	40	469	J	66.1	J	35.6	J	45.3	J	38.9	J	67		68							
Thallium	2	-	-	10																				
Zinc	5,000(a)	2500	5,000	20	74.4	J	20.5	J					2.4	J							7.9	J		
BOD5 (mg/l)				1	NA				NA		3.1		3.3		NA		NA				NA			
Hardness (mg/l)				1	NA		270		NA		346		342		388		371		360	J	NA			
Hex Chromium [1]				10	NA		NA		NA						NA		NA				NA			

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																			
					W-03-01 5/26/93	Q	W-03-01-F 5/26/93	Q	W-03-02 6/24/93	Q	W-03-02-F 6/24/93	Q	W-03-03 11/29/93	Q	W-03-03-F 11/29/93	Q	W-03-06 12/1/94	Q	W-03-06-F 12/1/94	Q	W-03-11 5/31/95	Q	W-03-11-F 5/31/95	Q
Aluminum	50-200	-	-	200	11500	J			12900	J			54400		73	J	3000				8710			
Antimony	6.0	-	-	60	32.2	J	19.8	J	45.4	J					21	J								
Arsenic	50	25	50	10									7		2.2	J	4.5	J	8.3	J	8.3	B	3.2	B
Barium	2,000	500	1,000	200	114	J	23.8	J	132	J	30.2	J	470	J	43		53.1	J	30	J	106	B	32.4	B
Beryllium	4	-	-	5	2.7	J			0.84	J			2.9	J										
Cadmium	5.0	2.5	5.0	3									1.1	J										
Chromium	100	25	50	10	56.3	J			139				62				13.1				9.1	B		
Iron	300(a)	150	300	100	22400	J			28900	J	441		125000		110		7780				18400	J	413	
Lead	15(b)	10	20	3				13.2					30				3.8				10.3			
Manganese	50(a)	25	50	15	1040	J	564		1280	J	599		5100		440		6230		349		981		415	
Mercury	2.0	1	2.0	0.2				0.25					0.49								0.03	BJ		
Nickel	100	175	350	40	65.1	J	9.7	J	107	J	19.6	J	330		30	J	22.9	J	4.4	J	56.2	J	4.9	B
Thallium	2	-	-	10															5.7	J				
Zinc	5,000(a)	2500	5,000	20	56.7	J							340	J	5	J	27.5				56	J		
BOD5 (mg/l)				1			NA		4.8		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	460		NA		2530		177		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10			NA				NA				NA		NA		NA		NA		NA	

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																							
					W-03-12 11/15/95	Q	W-03-12-F 11/15/95	Q	W-04S-01 5/26/93	Q	W-04S-01-F 5/26/93	Q	W-04S-02 6/23/93	Q	W-04S-02-F 6/23/93	Q	W-04S-03 11/29/93	Q	W-04S-03-F 11/29/93	Q	W-04D-01 5/26/93	Q	W-04D-01-F 5/26/93	Q	W-04D-02 6/23/93	Q
Aluminum	50-200	-	-	200	440				62200	J	207		8210	J	193	J	53500		260		11200	J			7280	J
Antimony	6.0	-	-	60					37.3	J			27.1	J					15	J	19.0	J			30.3	J
Arsenic	50	25	50	10	2.5	B			4.2	J							9.5		3.7	J						
Barium	2,000	500	1,000	200	35.9	B	32.8	B	497		52.5	J	91.5	J	39.7	J	410		53		118	J	19.1	J	78.5	J
Beryllium	4	-	-	5					3.4	J							3				2.7	J				
Cadmium	5.0	2.5	5.0	3													4									
Chromium	100	25	50	10					280	J			33.7				85				16.4	J				
Iron	300(a)	150	300	100	1230		115		125000	J	1140	J	18900	J	487		93000		1200		18300	J			11500	J
Lead	15(b)	10	20	3					241	J			27.1				250									
Manganese	50(a)	25	50	15	315		292		2270	J	585		776	J	570		2000		690		1230	J	82.5		535	J
Mercury	2.0	1	2.0	0.2					0.37								0.52									
Nickel	100	175	350	40	7.6	B	5.4	B	1400	J	47.2		154		45.8		1400		82		32.2	J	24.7	J	29.7	J
Thallium	2	-	-	10													5	YJ								
Zinc	5,000(a)	2500	5,000	20					389	J			50.2				340		7.6	J	44.5	J			33.6	
BOD5 (mg/l)				1	NA		NA				NA		3		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		190		NA		513		202		NA		NA		NA		NA		NA	
Hex Chromium [1]				10	NA		NA				NA				NA				NA				NA			

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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
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B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
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* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																			
					W-04D-02-F 6/23/93	Q	W-04D-03 11/23/93	Q	W-04D-03-F 11/23/93	Q	W-04D-06 11/29/94	Q	W-04D-06-F 11/29/94	Q	W-04D-11 5/24/95	Q	BLDUP-W151 W-04D-11 5/24/95	Q	W-04D-11-F 5/24/95	Q	BLDUP-W151F W-04D-11-F 5/24/95	Q
Aluminum	50-200	-	-	200	39.7	J	24600				25300				5030		6570							
Antimony	6.0	-	-	60	21.6	J																		
Arsenic	50	25	50	10			4.8	J			6.3	J	4.8	J	3.6	B								
Barium	2,000	500	1,000	200	19.4	J	260		24		236		24.5	J	59.6	B	66.7	B	26.8	B	26.9	B		
Beryllium	4	-	-	5			1																	
Cadmium	5.0	2.5	5.0	3																				
Chromium	100	25	50	10			23	J			36.8						5.1	B						
Iron	300(a)	150	300	100	16.1	J	50600				43800				6340	J	8720	J			27.6	B		
Lead	15(b)	10	20	3			21				28.5				3.2		4.6							
Manganese	50(a)	25	50	15	96.6		2800	J	65		2090		50		323		320		47.3		55.3			
Mercury	2.0	1	2.0	0.2							0.14	J	0.076	J	0.03	BJ			0.03	J				
Nickel	100	175	350	40	18.7	J	57		26	J	59.5		16.7	J	27.3	BJ	1290	J	20.5	B	20.7	B		
Thallium	2	-	-	10									10.7											
Zinc	5,000(a)	2500	5,000	20	3.2	J					120				33.4	J	5480	J						
BOD5 (mg/l)				1	NA				NA		NA		NA		NA		NA		NA		NA			
Hardness (mg/l)				1	NA		570	J	NA		NA		NA		NA		NA		NA		NA			
Hex Chromium [1]				10	NA				NA		NA		NA		NA		NA		NA		NA			

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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
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* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

*Ground Water Inorganic Analyses ***
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																							
					BLDUP W-153																BLDUP#2-2				DUP#2-2-F	
					W-04D-12		W-04D-12-F		W-04D-12-F		W-04D-13		W-04D-13F		W-05-01		W-05-01-F		W-05-02		W-05-02		W-05-02-F		W-05-02-F	
					11/14/95	Q	11/14/95	Q	11/14/95	Q	5/17/96	Q	5/17/96	Q	5/27/93	Q	5/27/93	Q	6/24/93	Q	6/24/93	Q	6/24/93	Q	6/24/93	Q
Aluminum	50-200	-	-	200	8760						958				19300	J			2410	J	3740	J	40.1	J	36	J
Antimony	6.0	-	-	60											32.5	J	18.1	J								
Arsenic	50	25	50	10	3.1	B																				
Barium	2,000	500	1,000	200	87.8	B	29	B	28.8	B	35.9	B	29.5	B	194	J	6.8	J	30.2	J	45.2	J	10.9	J	10	J
Beryllium	4	-	-	5											2.6	J										
Cadmium	5.0	2.5	5.0	3																						
Chromium	100	25	50	10	7	B									23.5	J			15.0		13.6					
Iron	300(a)	150	300	100	12800						1000				34600	J			4860	J	7140	J	29.2	J	25.4	J
Lead	15(b)	10	20	3	7.2														4.1		7.6					
Manganese	50(a)	25	50	15	495		6.1	B	6	B	57.3	N*	22.5		1360	J			212	J	366	J	11.3	J	10.9	J
Mercury	2.0	1	2.0	0.2																						
Nickel	100	175	350	40	29.6	B	19.7	B	19.3	B	22	B	20.4	B	46.6	J			33.1	J	38.8	J			10.5	J
Thallium	2	-	-	10			3.2	B	3.1	B																
Zinc	5,000(a)	2500	5,000	20	34.6								2.5	UJ	84.5	J									2.3	J
BOD5 (mg/l)				1	NA		NA		NA		NA		NA				NA		NA				NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		160		NA		NA		1280		131		NA	
Hex Chromium [1]				10	NA		NA		NA		NA		NA						NA				NA		NA	

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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
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(a) Values are secondary MCLs
(b) Values are action levels
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N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																	
					W-05-03 11/29/93	Q	W-05-03-F 11/29/93	Q	W-06S-01 5/27/93	Q	W-06S-01-F 5/27/93	Q	W-06S-02 6/23/93	Q	W-06S-02-F 6/23/93	Q	W-06S-03 11/29/93	Q	W-06S-03-F 11/29/93	Q	W-06D-01 5/27/93	Q	W-06D-01-F 5/27/93	Q
Aluminum	50-200	-	-	200	34200		60	J	30600	J			8700	J	32.6	J	21400				59600	J		
Antimony	6.0	-	-	60					32.9	J			28.4	J					32	J	71.7	J		
Arsenic	50	25	50	10	3.9	J	1.3	J	4.6	J			5.1	J										
Barium	2,000	500	1,000	200	300	J	12		269		7.2	J	87.9	J	7.5	J	260		7.5	J	512	J	4.8	J
Beryllium	4	-	-	5	2.5				3.4	J							2.5				6.0	J		
Cadmium	5.0	2.5	5.0	3	0.83		0.22	J									1.1		0.16	J				
Chromium	100	25	50	10	43				91.6	J			28.6				48				83.2	J		
Iron	300(a)	150	300	100	66400		150		72800	J	9.7	J	19300	J	24.5	J	43100				113000	J		
Lead	15(b)	10	20	3	27		2.2	J	30.4	J			9.3				24		3	I	48.7	J		
Manganese	50(a)	25	50	15	3900		8.8	J	2810	J			865	J	2.3	J	3000		4.5	J	3400	J		
Mercury	2.0	1	2.0	0.2	0.31												0.31							
Nickel	100	175	350	40	95		14	J	51.1	J			11.3	J			36		9	J	82.2	J		
Thallium	2	-	-	10																				
Zinc	5,000(a)	2500	5,000	20	170	J	5.1	J	155	J							120				273	J		
BOD5 (mg/l)				1	NA						NA				NA		NA		NA		NA			
Hardness (mg/l)				1	NA		520	J	150		NA		560		97.1		NA		NA		NA		410	
Hex Chromium [1]				10	NA						NA				NA				NA		20		NA	

NOTES:
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J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																	
					W-06D-02		BLDUP#1-2 W-06D-02		W-06D-02-F		BLDUP#1-2F W-06D-02-F		W-06D-03		W-06D-03-F		W-06D-06		W-06D-06-F		W-06D-11	
					6/23/93	Q	6/23/93	Q	6/23/93	Q	6/23/93	Q	11/29/93	Q	11/29/93	Q	12/1/94	Q	12/1/94	Q	5/26/95	Q
Aluminum	50-200	-	-	200	22000	J	10300	J	105	J	117	J	21300				7930		32.6	J	8400	
Antimony	6.0	-	-	60	45.9	J	33.8	J														
Arsenic	50	25	50	10									3.2	J	1.4	J	4.2	J	5.2	J	3.8	B
Barium	2,000	500	1,000	200	195	J	142	J	5.0	J	5.0	J	230		7.4	J	68.7	J	5.9	J	80.2	B
Beryllium	4	-	-	5	2.7	J	2.8	J					2.1									
Cadmium	5.0	2.5	5.0	3									0.73									
Chromium	100	25	50	10	49.5		24.0				3.8	J	31				12.8				11.4	
Iron	300(a)	150	300	100	41900	J	18000	J	73.4	J	83.5	J	40000				14900				13300	J
Lead	15(b)	10	20	3	34.6		18.5						17				8.1				9.8	
Manganese	50(a)	25	50	15	1420	J	987	J	1.5	J	1.5	J	2300				415				460	
Mercury	2.0	1	2.0	0.2									0.31									
Nickel	100	175	350	40	48.0		15.3	J					42		13	J	13.3	J			12.2	BJ
Thallium	2	-	-	10															10.2			
Zinc	5,000(a)	2500	5,000	20	111				2.1	J	3.0	J	110				44.9				37.6	J
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA				NA		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10	NA		NA		NA		NA		NA				NA		NA		NA	

NOTES:
** - Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																
					W-06D-11-F 5/26/95	Q	W-06D-12 11/13/95	Q	W-06D-12-F 11/13/95	Q	BLDUP - W-152 W-06D-12-F 11/13/95	Q	W-11S1-01 5/26/93	Q	W-11S1-01-F 5/26/93	Q	W-11S1-02 6/24/93	Q	W-11S1-02-F 6/24/93	Q	W-11S1-03 11/30/93	Q
Aluminum	50-200	-	-	200									234000	J	253		13300	J	328		20300	
Antimony	6.0	-	-	60									86.2	J	23	J	37.7	J				
Arsenic	50	25	50	10											4.8	J	4.1	J			13	
Barium	2,000	500	1,000	200	6.8	B	9.9	B	7	B	6.9	B	1830	J	186	J	312		192	J	660	
Beryllium	4	-	-	5									13.4	J			2.8	J			3	
Cadmium	5.0	2.5	5.0	3																	1.6	
Chromium	100	25	50	10									221	J			19.3				49	J
Iron	300(a)	150	300	100	47.2	B	349	J	744	J			456000	J	47500		71500	J	50800		105000	
Lead	15(b)	10	20	3									194	J			31.7		10.0		88	
Manganese	50(a)	25	50	15			15.4						16600	J	3870		5450	J	4740		9400	
Mercury	2.0	1	2.0	0.2									0.51								0.38	
Nickel	100	175	350	40			1.1	B					311	J			33.7	J			64	
Thallium	2	-	-	10																		
Zinc	5,000(a)	2500	5,000	20									1050	J								
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10	NA		NA		NA		NA				NA				NA		NA	

NOTES:
** - Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																			
					W-11S1-03-F 11/30/93	Q	W-11S1-04 2/24/94	Q	W-11S1-04-F 2/24/94	Q	W-11S1-06 12/1/94	Q	W-11S1-06-F 12/1/94	Q	W-11S1-11 5/26/95	Q	W-11S1-12 11/3/95	Q	W-12S1-01 5/26/93	Q	W-12S1-01-F 5/26/93	Q
Aluminum	50-200	-	-	200			26900		160		18900		188	J	475				181000	J		
Antimony	6.0	-	-	60	16	J							2.3	J					102	J	25.9	J
Arsenic	50	25	50	10	3.7	J	3.9	J			12.3		18.4				2.6	B				
Barium	2,000	500	1,000	200	150		370		110		293		151	J	183	B	294		1140	J	7.2	J
Beryllium	4	-	-	5			1.9	J											10.0	J		
Cadmium	5.0	2.5	5.0	3			0.79															
Chromium	100	25	50	10			22				15.7								581	J		
Iron	300(a)	150	300	100	51800		102000		37400		11200		50700		74900	J	128000	J	325000	J		
Lead	15(b)	10	20	3			33				15.8								120	J		
Manganese	50(a)	25	50	15	3700		5600		3500		4160		3230		3610		4730		8670	J	227	
Mercury	2.0	1	2.0	0.2							0.061	J			0.47	J			0.56			
Nickel	100	175	350	40			51				24.3	J					7.3	B	310	J		
Thallium	2	-	-	10									10.5		6.4	B						
Zinc	5,000(a)	2500	5,000	20	11	J	130				83.7								1240	J		
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10	NA				NA		NA		NA		NA		NA				NA	

NOTES:
** - Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																	
					W-12S1-02 6/24/93	Q	W-12S1-02-F 6/24/93	Q	W-12S1-03 11/29/93	Q	W-12S1-03-F 11/29/93	Q	W-12S1-04 2/25/94	Q	W-12S1-04-F 2/25/94	Q	W-22S1-01 5/26/93	Q	W-22S1-01-F 5/26/93	Q	W-22S1-02 6/24/93	Q
Aluminum	50-200	-	-	200	17500	J	28.5	J	27100				47200		53	J	22900	J			45400	J
Antimony	6.0	-	-	60	54.6	J					30	J									85.3	
Arsenic	50	25	50	10					3.6	J	1.2	J	2.2	J							5.0	J
Barium	2,000	500	1,000	200	232		7.5	J	310		13		440		9.3	J	201		25.0	J	401	
Beryllium	4	-	-	5	2.7	J			2.6				3.2				2.6	J			3.5	J
Cadmium	5.0	2.5	5.0	3					0.9		0.35	J	0.94									
Chromium	100	25	50	10	64.9				100				130				109	J	6.2	J	81.2	
Iron	300(a)	150	300	100	32600	J	25.4	J	51000		51	J	79400		75	J	41200	J			81800	J
Lead	15(b)	10	20	3	36.3				30		3.4		56								66.3	
Manganese	50(a)	25	50	15	1830	J	141		3300		120		3700		84		1780	J	909		3000	J
Mercury	2.0	1	2.0	0.2	0.22				0.43				0.33	J							0.21	
Nickel	100	175	350	40	54.8	J	11.1	J	72		12	J	87				120	J			117	J
Thallium	2	-	-	10											1.4	J						
Zinc	5,000(a)	2500	5,000	20	261		2.3	J	360				620				174	J			266	
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10			NA		NA		NA				NA				NA			

NOTES:
** - Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7B

Ground Water Inorganic Analyses **
Overburden Kame Sand Marshy Area Wells
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																							
					W-22S1-02-F 6/24/93	Q	W-22S1-03 11/29/93	Q	W-22S1-03-F 11/29/93	Q	W-22S1-04 2/25/94	Q	W-22S1-04-F 2/25/94	Q	W-22S1-06 12/1/94	Q	W-22S1-06-F 12/1/94	Q	W-22S1-11 5/9/95	Q	W-22S1-12 11/13/95	Q	W-22S1-13 5/20/96	Q
Aluminum	50-200	-	-	200	41.4	J	26800				340				25400				45.8	BJ				
Antimony	6.0	-	-	60					13	J							2	J						
Arsenic	50	25	50	10			4	J							8.1	J	6.4	J						
Barium	2,000	500	1,000	200	22.6	J	220		28		32		36		189	J	15	J	21.7	B	35.5	B	18	B
Beryllium	4	-	-	5			2.6								1.1	J								
Cadmium	5.0	2.5	5.0	3			4.4																	
Chromium	100	25	50	10			35				9.3	J			29.8				12.3	J				
Iron	300(a)	150	300	100	39.6	J	50300				870				44100						208			
Lead	15(b)	10	20	3			16								23.8									
Manganese	50(a)	25	50	15	826		2700		69		500		540		1490		7.1	J	52.6		1080		175	JN*
Mercury	2.0	1	2.0	0.2			0.21				R													
Nickel	100	175	350	40			57		15	J	11	J			41.7				11	BJ	3	B		
Thallium	2	-	-	10													8.3	J						
Zinc	5,000(a)	2500	5,000	20			180								139						101			
BOD5 (mg/l)				1	NA		NA		NA				NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium [1]				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
** - Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.
* - Duplicate analysis not within control limits.

Table 7C

Ground Water Inorganic Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																													
					W-03T-01		W-03T-01-F		W-03T-02		W-03T-02-F		W-03T-03		W-03T-03-F		W-04T-05		W-04T-05-F		W-04T-06		BLDUP W-04T-06		W-04T-06-F		BLDUP W-04T-06-F		W-04T-11		W-04T-12		BLDUP W-154 W-04T-12	
					5/27/93	Q	5/27/93	Q	6/24/93	Q	6/24/93	Q	11/29/93	Q	11/29/93	Q	7/06/94	Q	7/06/94	Q	12/1/94	Q	12/1/94	Q	12/1/94	Q	12/1/94	Q	5/17/95	Q	11/14/95	Q	11/14/95	Q
Aluminum	50-200	-	-	200	375000	J	608		143000	J	6910		3100				75700		22.9	J	30400		39100						53.9	BJ				
Antimony	6.0	-	-	60	116	J			127	J					16	J																		
Arsenic	50	25	50	10													4.1	J	1.2	J	7.9	J	8.3	J	5.3	J	4.6	J						
Barium	2,000	500	1,000	200	2960	J	11.9	J	1430	J	50.2	J	49		12		722	J	11	J	259		327		9.1	J	9.4	J	9.9	B	10.5	B	10.7	B
Beryllium	4	-	-	5	20.0	J			9.7	J							3.9	J	0.15	J	1.3	J	1.7	J										
Cadmium	5.0	2.5	5.0	3									0.21	J																				
Chromium	100	25	50	10	401	J			180	J	5.3	J	14				157	J	3.1	J	52.2		80.5											
Iron	300(a)	150	300	100	566000	J	299		243000	J	3700		6700		30	J	140000				51200		66100								104		105	
Lead	15(b)	10	20	3	188	J			221		3.6		4.2				69.2	J	1.3	J	31.6		42.3											
Manganese	50(a)	25	50	15	18000	J	481		9290	J	507		1100		15		4460	J	174		1480		2030		124		124		96.8		111		109	
Mercury	2.0	1	2.0	0.2	1.6				0.62												0.11	J	0.14	J	0.09	J								
Nickel	100	175	350	40	1080	J			495	J	10.9	J	20	J	14	J	113	J	2.9	J	34.1	J	48.8								1.1	B		
Thallium	2	-	-	10					1.2	J							1.4	J							12.3		9.2	J						
Zinc	5,000(a)	2500	5,000	20	1540	J			702	J	16.0	J	46				327	J	21		113		153											
BOD5 (mg/l)				1	NA		NA		NA		NA				NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		560	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10			NA				NA				NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
**Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
* * - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7C

Ground Water Inorganic Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells												Hillside Wells													
					W-22T-05 7/07/94	Q	W-22T-05-F 7/07/94	Q	W-22T-06 11/30/94	Q	W-22T-06-F 11/30/94	Q	W-22T-11 5/10/95	Q	W-22T-11-F 5/10/95	Q	W-22T-12 11/8/95	Q	W-23T-01 5/24/93	Q	W-23T-01-F 5/24/93	Q	W-23T-02 6/22/93	Q	W-23T-02-F 6/22/93	Q	W-23T-03 11/23/93	Q	W-23T-03-F 11/23/93	Q	W-23T-12 11/9/95	Q
Aluminum	50-200	-	-	200	143000		359		19600		156	J	1100	J	11.1	B	1640		149000	J			20800	J	109	J	69400					
Antimony	6.0	-	-	60															108	J			28.9	J								
Arsenic	50	25	50	10	R		1.2	J	7.2	J	4.6	J					23.5										12					
Barium	2,000	500	1,000	200	1180	J	16.6	J	154	J	9.7	J	16.5	B	8.7	B	104	B	974	J			149	J	2.4	J	570		7.1	J	6.7	B
Beryllium	4	-	-	5	7.2				1	J									10	J			2.7	J			3.6					
Cadmium	5.0	2.5	5.0	3																												
Chromium	100	25	50	10	229	J			31				12.3	J	8.7	B	4.8	B	179	J			29.6		4.1	J	73	J				
Iron	300(a)	150	300	100	259000		580		30500		12	J	1450				46900	J	286000	J	9.2	J	38400	J	46.2	J	131000					
Lead	15(b)	10	20	3	186	J			20.2										106	J			18.5		11.2		65					
Manganese	50(a)	25	50	15	9000	J	218		1080		138		94.2		54.2		5220		8130	J	18.3		1080	J	4.2	J	5400	J				
Mercury	2.0	1	2.0	0.2					0.091	J																	0.36					
Nickel	100	175	350	40	199	J	2.7	J	26.5	J							32.3	B	212	J			30.9	J			98					
Thallium	2	-	-	10	3.1	J					7.7	J																				
Zinc	5,000(a)	2500	5,000	20	651	J	14.3	J	91.3										612	J			85.4		2.6	J	330	J				
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
** Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
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Table 7C

Ground Water Inorganic Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Hillside Wells*																		*West of Landfill Wells*									
		Vermont	Vermont																													
	Federal	Prev. Act.	Enforcement		W-24T-01		W-24T-01-F		W-24T-02		W-24T-02-F		W-24T-03		BLDUP#3-3 W-24T-03		W-24T-03-F		BLDUP#3-3-F W-24T-03-F		W-26T-05		W-26T-05-F		W-26T-06		W-26T-06-F		W-26T-11	
Compound	MCLs	Limit	Standards	CRDL	5/24/93	Q	5/24/93	Q	6/22/93	Q	6/22/93	Q	11/23/93	Q	11/23/93	Q	11/23/93	Q	11/23/93	Q	7/07/94	Q	7/07/94	Q	11/30/94	Q	11/30/94	Q	5/30/95	Q
Aluminum	50-200	-	-	200	88500	J			6780	J	42.9	J	8200		7300						59700				108	J				
Antimony	6.0	-	-	60					20.6	J							21	J												
Arsenic	50	25	50	10	R								2.1	J	2.1	J					3	J			22.7		4.4	J		
Barium	2,000	500	1,000	200	532	J	7.2	J	54.2	J	4.8	J	65		68		7.5	J	7.8	J	724	J	12.8	J	885		12.6	J	10.1	B
Beryllium	4	-	-	5	6.5	J															3.3	J			4.5	J				
Cadmium	5.0	2.5	5.0	3																										
Chromium	100	25	50	10	139	J			23.8				16		14						79.4	J			126					
Iron	300(a)	150	300	100	161000	J			11600	J	5.3	J	13000		14300						133000				192000				36.81	BJ
Lead	15(b)	10	20	3	52.3	J															53.2	J			114					
Manganese	50(a)	25	50	15	4530	J	288		600	J	252		520		650		140		140		4060	J	21.9		5930		15.6		4.61	B
Mercury	2.0	1	2.0	0.2																					0.28					
Nickel	100	175	350	40	137	J			10.4	J			13	J	15	J					111	J	1.3	J	164					
Thallium	2	-	-	10																							10.3			
Zinc	5,000(a)	2500	5,000	20	372	J			33.1												354	J	18.4	J	568					
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
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* - Duplicate analysis not within control limits.

Table 7C

Ground Water Inorganic Analyses **
Ablation Glacial Till Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		West of Landfill Wells																	
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-27T-05		W-27T-05-F		W-27T-06		W-27T-06-F		W-27T-11		W-27T-11-F		W-27T-12		W-27T-12-F	
Compound	MCLs	Limit	Standards	CRDL	7/6/94	Q	7/6/94	Q	11/29/94	Q	11/29/94	Q	5/15/95	Q	5/15/95	Q	11/2/95	Q	11/2/95	Q
Aluminum	50-200	-	-	200	33800				64800				4040	J	8.4					
Antimony	6.0	-	-	60					2.3	J	3.1	J								
Arsenic	50	25	50	10					18.8		8.1	J								
Barium	2,000	500	1,000	200	425	J	88.4	J	589		94.2	J	150	B	111	B	127	B	126	B
Beryllium	4	-	-	5	1.8	J			2.4	J			0.2	B						
Cadmium	5.0	2.5	5.0	3																
Chromium	100	25	50	10	53.9	J	5.2	J	66.4				150	J						
Iron	300(a)	150	300	100	67100		46.8	J	103000				8060		1150					
Lead	15(b)	10	20	3	23.5	J			62.8											
Manganese	50(a)	25	50	15	2140	J	322		2940		510		325		203		170	J	212	J
Mercury	2.0	1	2.0	0.2	1.4				4.7				1.5		0.67		1.2		1.2	
Nickel	100	175	350	40	57.4		3.8	J	81.4		1.6	J	107		19.8	B	2	B	32.3	B
Thallium	2	-	-	10							9.7									
Zinc	5,000(a)	2500	5,000	20	202	J	13	J	292				24							
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
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Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
" " - Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Upgradient Wells																		Marshy Area Wells							
					W-01DI-05		BLDUP-1-5 W-01DI-05		W-01DI-05-F		BLDUP-1-05-F W-01DI-05-F		W-01DI-06		W-01DI-06-F		W-01DI-11		W-01DI-11-F		W-01DI-12		W-04SI-01		BLDUP#3-1 W-04SI-01		W-04SI-01-F		BLDUP#3-1-F W-04SI-01-F	
					7/05/94	Q	7/05/94	Q	7/05/94	Q	7/05/94	Q	11/30/94	Q	11/30/94	Q	5/16/95	Q	5/16/95	Q	11/10/95	Q	6/2/93	Q	6/2/93	Q	6/2/93	Q	6/2/93	Q
Aluminum	50-200	-	-	200	15800		13100						1580				887	J					553	J					1290	J
Antimony	6.0	-	-	60																										
Arsenic	50	25	50	10																										
Barium	2,000	500	1,000	200	6210	J	4890	J	50.6	J	45.2	J	533		33.9	J	246		24.3	B	18	B	66.1	J	9.8	J	12.4	J	45.7	J
Beryllium	4	-	-	5	18.4		14.5						1.2	J															0.92	J
Cadmium	5.0	2.5	5.0	3																										
Chromium	100	25	50	10	165	J	139	J					34.1				44.4	J					26.5	J					5.3	J
Iron	300(a)	150	300	100	186000		142000		61.1	J			11700				6930				36	B	5160	J					1410	J
Lead	15(b)	10	20	3	114	J	103	J					17.9				6.8	J					38.1	J					36.2	J
Manganese	50(a)	25	50	15	12500	J	10600	J	369		286		850		114		407		29.9		14.3	B	238	J					203	J
Mercury	2.0	1	2.0	0.2																										
Nickel	100	175	350	40	743	J	671	J	5.7	J	4.5	J	59.4		3	J	48	J			1.6	B	14.5	J	8.7	J				
Thallium	2	-	-	10	6	J	6.5	J							9.6	J														
Zinc	5,000(a)	2500	5,000	20	1420	J	1160	J	21.8		105		115				53.8				33.2		131	J					102	J
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA				NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		65	J	NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA				NA					

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Values reported in µg/l (ppb) unless noted otherwise.
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(a) Values are secondary MCLs
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" " - Blank space indicates that the element was not detected above instrument detection limits
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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																													
					W-04SI-02		W-04SI-02-F		W-04SI-03		W-04SI-03-F		W-04SI-04		W-04SI-04-F		W-04SI-06		W-04SI-06-F		W-04SI-11		W-04SI-11-F		W-04SI-12		BLDUP W-150-12 W-04SI-12		W-04SI-13	
					6/28/93	Q	6/28/93	Q	11/30/93	Q	11/30/93	Q	3/2/94	Q	3/2/94	Q	12/2/94	Q	12/2/94	Q	5/12/95	Q	5/12/95	Q	11/2/95	Q	11/2/95	Q	5/16/96	Q
Aluminum	50-200	-	-	200	1450	J	12.9	J	1900				270				245				155	BJ										
Antimony	6.0	-	-	60							13	J																				
Arsenic	50	25	50	10															4.2	J												
Barium	2,000	500	1,000	200	165	J	10.0	J	130		12		36		11		38.3	J	11	J	17.1	B	13.9	B	15	B	14.9	B	18.9	B		
Beryllium	4	-	-	5																												
Cadmium	5.0	2.5	5.0	3					0.1	J																			0.42	B		
Chromium	100	25	50	10	20.5				26	J			9	J			4.5	J			19.7	J										
Iron	300(a)	150	300	100	15200	J	11.0	J	12600				2400	J	35	J	1200				587											
Lead	15(b)	10	20	3	123				48				14				24.9				3.8	J										
Manganese	50(a)	25	50	15	737	J	1.0	J	600				13000				121				22.2								5.2	UN*		
Mercury	2.0	1	2.0	0.2					0.2																							
Nickel	100	175	350	40	22.0	J			14	J							6	J			13.5	BJ										
Thallium	2	-	-	10	1.2	J							1.7	J					10.8													
Zinc	5,000(a)	2500	5,000	20	106		3.2	J	350		7.8	J					52.8															
BOD5 (mg/l)				1							NA				NA		NA		NA		NA		NA		NA		NA		NA			
Hardness (mg/l)				1	79		NA		68.9		60.9		61.4		53.3		NA		NA		NA		NA		NA		NA		NA			
Hex Chromium				10	NA		NA				NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			

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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Marshy Area Wells																													
					W-04DI-01		W-04DI-01-F		W-04DI-02		W-04DI-02-F		W-04DI-03		W-04DI-03-F		W-04DI-04		W-04DI-04-F		W-04DI-06		W-04DI-06-F		W-04DI-11		W-04DI-11-F		W-04DI-12		W-04DI-12-F	
					6/4/93	Q	6/4/93	Q	6/29/93	Q	6/29/93	Q	12/01/93	Q	12/01/93	Q	3/3/94	Q	3/3/94	Q	12/2/94	Q	12/2/94	Q	5/13/95	Q	5/13/95	Q	11/3/95	Q	11/3/95	Q
Aluminum	50-200	-	-	200							63.0	J					360				332				50.8	BJ						
Antimony	6.0	-	-	60					20.0	J	26.7	J																				
Arsenic	50	25	50	10																			3.7	J								
Barium	2,000	500	1,000	200	18.9	J	24.1	J	21.7	J	19.1	J	37		28		36		24		26	J	20.8	J	21.9	B	19.6	B	24.9	B	24.1	B
Beryllium	4	-	-	5																												
Cadmium	5.0	2.5	5.0	3									0.3	J	0.28	J																
Chromium	100	25	50	10									41		4.9	J	22				8.3	J			65.2	J						
Iron	300(a)	150	300	100	485	J							1100				4500	J			2180				809							
Lead	15(b)	10	20	3					1.8	J			14				26				13.9				3.7	J						
Manganese	50(a)	25	50	15	16.9	J					5.6	J	77		24		120				63.7		3.8	J	22.2				7.8	B	5.1	B
Mercury	2.0	1	2.0	0.2																	0.053	J	0.093	J								
Nickel	100	175	350	40									150		15	J	28				13.1				48.7	J	18.4	B	1.6	B	1.5	B
Thallium	2	-	-	10													1.9	J					10.9									
Zinc	5,000(a)	2500	5,000	20							9.3	J			49		63	J	26		35.6		21.1						214		195	
BOD5 (mg/l)				1			NA				NA				NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	47	J	NA		56		NA		60.8		62.4		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10			NA				NA				NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Soil Staging Area Wells													
					W-07SI-01 6/3/93 Q	W-07SI-01-F 6/3/93 Q	W-07SI-02 6/30/93 Q	W-07SI-02-F 6/30/93 Q	W-07SI-03 11/30/93 Q	W-07SI-03-F 11/30/93 Q	W-07SI-04 3/3/94 Q	W-07SI-04-F 3/3/94 Q	W-07SI-11 5/17/95 Q	W-07SI-11-F 5/17/95 Q	W-07SI-12 11/15/95 Q	W-07DI-03-F 11/30/93 Q	W-07DI-06 11/30/94 Q	W-07DI-06-F 11/30/94 Q
Aluminum	50-200	-	-	200	12700 J		17100 J	39.0 J	180		150		1240 J	14.5 B		92 J	514	
Antimony	6.0	-	-	60	29.9 J		20.1 J									16 J		
Arsenic	50	25	50	10					1.2 J	1.1 J								4.3 J
Barium	2,000	500	1,000	200	138 J	13.3 J	200 J	13.4 J	21	20		18	57.9 B	43.8 B	40.8 B	3800	32.9 J	26.3 J
Beryllium	4	-	-	5	2.7 J		3.0 J											
Cadmium	5.0	2.5	5.0	3					0.1 J			0.16 J						
Chromium	100	25	50	10	136 J		146				16		109 J				21.8	
Iron	300(a)	150	300	100	31000 J		42000 J	9.4 J	280		540		3470		67.6 B		1000	
Lead	15(b)	10	20	3	21.9 J		25.0		21 J		11		3.7 J				7.3	
Manganese	50(a)	25	50	15	724 J		1190 J	5.6 J	27	11	16		234	173	6.9 B	6.6 J	23.9	10.3 J
Mercury	2.0	1	2.0	0.2														
Nickel	100	175	350	40	126		114				12 J		78.7 J		1.1 B		17.3 J	
Thallium	2	-	-	10								1.6 J						9.2 J
Zinc	5,000(a)	2500	5,000	20	101 J		136			8 J			57.6			6 J	43.8	
BOD5 (mg/l)				1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness (mg/l)				1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hex Chromium				10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of the Landfill Area Wells W-09SI-01 6/2/93	Q	W-09SI-01-F 6/2/93	Q	W-09SI-02 6/29/93	Q	W-09SI-02-F 6/29/93	Q	W-09SI-03 12/01/93	Q	W-09SI-03-F 12/01/93	Q	W-09SI-04 2/28/94	Q	W-09SI-04-F 2/28/94	Q	W-09SI-06 12/2/94	Q	BLDUP W-09SI-06 12/2/94	Q	W-09SI-06-F 12/2/94	Q	BLDUP W-09SI-06-F 12/2/94	Q	W-09SI-11 5/19/95	Q
Aluminum	50-200	-	-	200	1910	J			995	J	66.2	J					97	J			1040		837						16.5	BJ
Antimony	6.0	-	-	60							37.3	J																		
Arsenic	50	25	50	10																					3.8	J				
Barium	2,000	500	1,000	200	155	J	62.3	J	107	J	64.4	J	99		84		85		81		111	J	107	J	79.1	J	78.3	J	109	B
Beryllium	4	-	-	5	2.8	J																								
Cadmium	5.0	2.5	5.0	3									0.1	J																
Chromium	100	25	50	10	148	J			19.2				40		3.4	J					9.9	J	11.7							
Iron	300(a)	150	300	100	22500	J			10300	J			4100				600	J			8020		6100							
Lead	15(b)	10	20	3					2.9	J			1.8	J							7.2		6.7							
Manganese	50(a)	25	50	15	326	J			153	J	9.4	J	78		28		28		21		110		100		13.6	J	13.2	J	162	
Mercury	2.0	1	2.0	0.2																	0.07	J	0.5				0.057	J		
Nickel	100	175	350	40	84.0				15.8	J			18	J							9.9	J	9.8	J						
Thallium	2	-	-	10																	3	J			12.9		9.9	J		
Zinc	5,000(a)	2500	5,000	20	468	J			93.3				380		16	J	23				285		244							
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NOTES:
** Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in μg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of the Landfill Area Wells																													
					W-09SI-11-F 5/19/95	Q	W-09SI-12 11/6/95	Q	W-09SI-13 5/14/96	Q	W-25SI-01 6/1/93	Q	W-25SI-01-F 6/1/93	Q	W-25SI-02 6/29/93	Q	W-25SI-02-F 6/29/93	Q	W-25SI-03 12/01/93	Q	W-25SI-03-F 12/01/93	Q	W-25SI-04 2/28/94	Q	BLDUP-2-4 W-25SI-04 2/28/94	Q	W-25SI-04-F 2/28/94	Q	BLDUP-2-4-F W-25SI-04-F 2/28/94	Q
Aluminum	50-200	-	-	200							2900	J	299	J	8420	J	308		3000		390		1000		1200		350		240	
Antimony	6.0	-	-	60																												
Arsenic	50	25	50	10																	1	J										
Barium	2,000	500	1,000	200	103	B	88.1	B	86.5	B	185	J	39.9	J	489	J	26.9	J	120		19		39		40		17		16			
Beryllium	4	-	-	5							2.8	J			3.9	J																
Cadmium	5.0	2.5	5.0	3															0.2	J												
Chromium	100	25	50	10							75.9	J	9.3	J	45.0		12.2		12		13		8.9	J								
Iron	300(a)	150	300	100							9220	J			32600	J			2200				1000	J	1600	J						
Lead	15(b)	10	20	3							428	J			1180				560				68		62				1.8	J		
Manganese	50(a)	25	50	15	156		23.1				380	J			1520	J			660				98		99							
Mercury	2.0	1	2.0	0.2															0.22													
Nickel	100	175	350	40							33.6	J			33.9	J																
Thallium	2	-	-	10											1.4	J																
Zinc	5,000(a)	2500	5,000	20							109	J			247				320		8	J	29		21							
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
Hex Chromium				10	NA		NA		NA		20	U	NA		NA		NA		NA		NA		NA		NA		NA		NA			

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Table 7D

*Ground Water Inorganic Analyses ***
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of the Landfill Area Wells																	
					W-25SI-06 12/1/94	Q	W-25SI-06-F 12/1/94	Q	W-25SI-11 5/10/95	Q	W-25SI-11-F 5/10/95	Q	W-25SI-12 11/7/95	Q	W-25SI-12-F 11/7/95	Q	W-25DI-01 6/2/93	Q	W-25DI-01-F 6/2/93	Q	W-25DI-02 6/30/93	Q	W-25DI-02-F 6/30/93	Q	W-25DI-03 12/02/93	Q	W-25DI-03-F 12/02/93	Q
Aluminum	50-200	-	-	200	3820		157	J	610	J	497		626		444		1180	J	407	J	1000	J	1040		410		50	J
Antimony	6.0	-	-	60																								
Arsenic	50	25	50	10			4.5	J																				
Barium	2,000	500	1,000	200	162	J	11.2	J	15.1	B	12.7	B	18.1	B	13.8	B	204		186	J	258	J	251		140		45	
Beryllium	4	-	-	5																								
Cadmium	5.0	2.5	5.0	3																								
Chromium	100	25	50	10	30.5		8.3	J	19.1	J			9.1	B	9.5	B	30.2	J	7.2	J	12.4		8.6	J	23		11	
Iron	300(a)	150	300	100	7530				246				370	J			3140	J			122	J	15.9	J	20100			
Lead	15(b)	10	20	3	717				10.8	J			26.6								10.6		8.7		7.1	J		
Manganese	50(a)	25	50	15	525								15.4				92.5	J			7.6	J	6.4	J	170			
Mercury	2.0	1	2.0	0.2																								
Nickel	100	175	350	40	14.6	J											15.5	J							29	J		
Thallium	2	-	-	10			10.7																					
Zinc	5,000(a)	2500	5,000	20	310																		6.5	J	630		15	J
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells																			
					W-25DI-04 3/2/94	Q	W-25DI-04-F 3/2/94	Q	W-25DI-06 12/2/94	Q	W-25DI-06-F 12/2/94	Q	W-25DI-11 5/13/95	Q	W-25DI-11-F 5/13/95	Q	W-25DI-12 11/6/95	Q	W-25DI-12-F 11/6/95	Q	W-08SI-01 6/1/93	Q	W-08SI-01-F 6/1/93	Q
Aluminum	50-200	-	-	200	1600		1300		1440		80.1	J	1620	J	1480		1210		1090		1680	J	357	J
Antimony	6.0	-	-	60			15	J																
Arsenic	50	25	50	10							3.6	J												
Barium	2,000	500	1,000	200	200		180		101	J	53.9	J	71.1	B	62.6	B	55.6	B	49.4	B	3160	J	3320	J
Beryllium	4	-	-	5																	1.7	J	1.7	J
Cadmium	5.0	2.5	5.0	3																				
Chromium	100	25	50	10	140		17		179		5.8	J	59	J	14.4		16		13.9		19.0	J	5.3	J
Iron	300(a)	150	300	100	2400	J			3930				684								534	J		
Lead	15(b)	10	20	3	26		2.1	J	40.8															
Manganese	50(a)	25	50	15	33		10		75.4				17				8.3	B			20.8	J		
Mercury	2.0	1	2.0	0.2																				
Nickel	100	175	350	40	180				170				30.6	BJ			2.4	B						
Thallium	2	-	-	10							12.8										1.3	J		
Zinc	5,000(a)	2500	5,000	20	53	J			103															
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7D

Ground Water Inorganic Analyses **
Weathered Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	West of Landfill Area Wells											
					W-08SI-02 6/30/93	Q	W-08SI-02-F 6/30/93	Q	W-08SI-03 12/01/93	Q	W-08SI-03-F 12/01/93	Q	W-08SI-04 2/23/94	Q	W-08SI-04-F 2/23/94	Q
Aluminum	50-200	-	-	200	1070	J	472		1800		520		1600		110	
Antimony	6.0	-	-	60					63							
Arsenic	50	25	50	10												
Barium	2,000	500	1,000	200	2230	J	2490	J	2100		2000		1400		1200	
Beryllium	4	-	-	5					1.3	J						
Cadmium	5.0	2.5	5.0	3					1.0	J						
Chromium	100	25	50	10	9.4	J	7.1	J	56				31			
Iron	300(a)	150	300	100	327	J	4.9	J	1400		69	J	780	J		
Lead	15(b)	10	20	3					2.6	J						
Manganese	50(a)	25	50	15	14.7	J	8.1	J	24				19			
Mercury	2.0	1	2.0	0.2												
Nickel	100	175	350	40					24	J			13	J		
Thallium	2	-	-	10												
Zinc	5,000(a)	2500	5,000	20					200		19	J	180			
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA	

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Table 7E

Ground Water Inorganic Analyses*
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Federal MCLs	(VPALs) Vermont Prev. Act. Limit	(VMCLs) Vermont Enforcement Standards	CRDL	Upgradient Wells																									
					W-01B-01		W-01B-01-F		W-01B-02		W-01B-02-F		W-01B-03		W-01B-03-F		W-01B-04		W-01B-04-F		W-01B-06		W-01B-06-F		W-01B-11	
					6/3/93	Q	6/3/93	Q	6/28/93	Q	6/28/93	Q	12/02/93	Q	12/02/93	Q	3/3/94	Q	3/3/94	Q	11/29/94	Q	11/29/94	Q	5/22/95	Q
Aluminum	50-200	-	-	200									440				89	J								
Antimony	6.0	-	-	60																						
Arsenic	50	25	50	10									4.2	J	1.1	J							3.1	J		
Barium	2,000	500	1,000	200	114	J	128	J	112	J	121	J	160		86		150		120		135	J	115	J	128	B
Beryllium	4	-	-	5																						
Cadmium	5.0	2.5	5.0	3																						
Chromium	100	25	50	10									17								2.4	J				
Iron	300(a)	150	300	100	516	J			172	J	10.3	J	15700				10100		260		449		13.1	J	1980	
Lead	15(b)	10	20	3					1.5	J			11	J			1.8	J			4.6					
Manganese	50(a)	25	50	15							4.2	J	200		46		97		46		30.6		21.2		189	
Mercury	2.0	1	2.0	0.2																			0.076	J		
Nickel	100	175	350	40													8.2	J			2.6	J				
Thallium	2	-	-	10															1.6	J			7.5	J		
Zinc	5,000(a)	2500	5,000	20							4.4	J	750		15	J	530				27.7				36.5	
BOD5 (mg/l)				1			NA				NA				NA				NA		NA		NA		NA	
Hardness (mg/l)				1	59	J	NA		60		NA		67.3		69.1		67.6		67.1		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 7E

Ground Water Inorganic Analyses*
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Upgradient Wells*				*Marshy Area Wells*																							
		Vermont	Vermont																						BLDUP-1-4				BLDUP-1-4F			
	Federal	Prev. Act.	Enforcement		W-01B-12		W-01B-12-F		W-04B-01		W-04B-01-F		W-04B-02		W-04B-02-F		W-04B-03		W-04B-03-F		W-04B-04		W-04B-04		W-04B-04-F		W-04B-04-F		W-04B-06	
Compound	MCLs	Limit	Standards	CRDL	10/31/95	Q	10/31/95	Q	6/4/93	Q	6/4/93	Q	6/29/93	Q	6/29/93	Q	12/01/93	Q	12/01/93	Q	3/2/94	Q	3/2/94	Q	3/2/94	Q	3/2/94	Q	3/2/94	Q	12/1/94	Q
Aluminum	50-200	-	-	200											68.3	J															40.1	J
Antimony	6.0	-	-	60											36.6	J																
Arsenic	50	25	50	10																												
Barium	2,000	500	1,000	200	121	B	115	B	38.6	J	39.8	J	42.5	J	38.2	J	53		47		50		44		45		44		43.9			
Beryllium	4	-	-	5																												
Cadmium	5.0	2.5	5.0	3																												
Chromium	100	25	50	10															3.8	J												
Iron	300(a)	150	300	100	5140	J	721	J	620	J			235	J	72.1	J	560		37	J	1300	J	830	J	44	J	43	J	324			
Lead	15(b)	10	20	3													1.9	J			1	J										
Manganese	50(a)	25	50	15	335		304		33.8	J	34.6	J	34.8	J	33.7		49		44	J	42		45		42		38		33.2			
Mercury	2.0	1	2.0	0.2																												
Nickel	100	175	350	40	2.5	B	1.1	B	14.6	J																					3.2	J
Thallium	2	-	-	10																	1.7	J										
Zinc	5,000(a)	2500	5,000	20	288										4.9	J			27		46	J			21				31.4			
BOD5 (mg/l)				1	NA		NA				NA				NA				NA						NA		NA		NA			
Hardness (mg/l)				1	NA		NA		61	J	NA		67		NA		72.4		65.2		73.1		64.9		66.2		67.9		NA			
Hex Chromium				10	NA		NA								NA				NA		NA		NA		NA		NA		NA			

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Table 7E

Ground Water Inorganic Analyses**
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		*Marshy Area Wells*				*West of Landfill Area Wells*						
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-04B-06-F	W-04B-11	W-04B-12	W-04B-12-F	W-09B-01	W-09B-01-F	W-09B-02	W-09B-02-F	W-09B-03	W-09B-03-F	W-09B-04
Compound	MCLs	Limit	Standards	CRDL	12/1/94 Q	5/30/95 Q	11/1/95 Q	11/1/95 Q	6/2/93 Q	6/2/93 Q	7/1/93 Q	7/1/93 Q	12/01/93 Q	12/01/93 Q	3/2/94 Q
Aluminum	50-200	-	-	200							55.0 J				
Antimony	6.0	-	-	60											
Arsenic	50	25	50	10	5.2 J										
Barium	2,000	500	1,000	200	40.9 J	33.9 B	28.3 B	26.2 B		43.4 J	59.5 J	42.0 J	55	50	52
Beryllium	4	-	-	5											
Cadmium	5.0	2.5	5.0	3										0.17 J	
Chromium	100	25	50	10									7.9 J	5.6 J	
Iron	300(a)	150	300	100	18.5 J	1110 J	4750			181 J	424 J	98.8 J	440	63 J	500 J
Lead	15(b)	10	20	3						1.1 J			1.2 J		1.5 J
Manganese	50(a)	25	50	15	33.1	133	101	66.5	41.6 J		18.4 J	12.4 J	12	16	9
Mercury	2.0	1	2.0	0.2								0.31			
Nickel	100	175	350	40		6.1 BJ	6.6 B	2.8 B							
Thallium	2	-	-	10	11.8										1.5 J
Zinc	5,000(a)	2500	5,000	20		49.6 J								19 J	
BOD5 (mg/l)				1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness (mg/l)				1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hex Chromium				10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 7E

*Ground Water Inorganic Analyses***
Competent Bedrock Wells
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

		(VPALs)	(VMCLs)		West of Landfill Area Wells																							
	Federal	Vermont Prev. Act.	Vermont Enforcement		W-09B-04-F		W-09B-06		W-09B-06-F		W-09B-11		W-09B-12		W-09B-12-F		W-08B-01		W-08B-01-F		W-08B-02		W-08B-02-F		W-08B-03		W-08B-03-F	
Compound	MCLs	Limit	Standards	CRDL	3/2/94	Q	11/30/94	Q	11/30/94	Q	5/22/95	Q	11/1/95	Q	11/1/95	Q	6/3/93	Q	6/3/93	Q	7/1/93	Q	7/1/93	Q	12/02/93	Q	12/02/93	Q
Aluminum	50-200	-	-	200			1620														15.0	J			48	J		
Antimony	6.0	-	-	60																								
Arsenic	50	25	50	10					3.2	J																		
Barium	2,000	500	1,000	200	52		70.9	J	30.6	J	44.1	B			40.1	B	90.1	J	84.5	J	88.8	J	83.9	J	87		78	
Beryllium	4	-	-	5																								
Cadmium	5.0	2.5	5.0	3																								
Chromium	100	25	50	10			6.8	J																			3.4	J
Iron	300(a)	150	300	100	50	J	6300				885	J					910	J			254	J	13.8	J	2300			
Lead	15(b)	10	20	3			110														1.5	J			4.7	J		
Manganese	50(a)	25	50	15	7.2	J	185		3	J	76.5		1.5	B	24.2		19.2	J			21.7	J	20.5		40		30	
Mercury	2.0	1	2.0	0.2																	0.22		0.23					
Nickel	100	175	350	40			5.9								1.2	B												
Thallium	2	-	-	10					9	J																		
Zinc	5,000(a)	2500	5,000	20			125						0.59	B							40.0		10.1	J	140		33	
BOD5 (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)				1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium				10	NA		NA		NA		NA		NA		NA						NA		NA		NA		NA	

NOTES:
** Table only includes those metals for which Federal Maximum Contaminant Level(MCL), Secondary MCL (SMCL), Vermont Preventative Action Limit(VPAL's) or Vermont Enforcement Standards (VMCL's) were exceeded.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
(a) Values are secondary MCLs
(b) Values are action levels
- Blank space indicates that the element was not detected above instrument detection limits
N - Matrix spiked sample recovery not within control limits
* - Duplicate analysis not within control limits.

Table 8A

*Surface Water Organic Volatile Analyses-EPA Method 524.2***
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards				Ambient Water Quality Criteria				Most Stringent Standard	Detection Limit	*Landfill Area*				*Downstream Swale 2*											
	Organisms		Consumption		Organisms		Human Health				SW-11-03		SW-12-03		SW-03-03		SW-03-06		SW-03-11		BLDUP SW-03-11		SW-03-12		BLDUP SW-150-12		SW-14-03	
	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only			11/17/93	Q	11/17/93	Q	11/17/93	Q	11/22/94	Q	6/1/95	Q	6/1/95	Q	11/13/95	Q	11/13/95	Q	11/17/93	Q
Dichlorodifluoromethane	-	-	-	-	-	-	-	-	-	1	7																	
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	1	2		2		1		2.5											
trans-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1	2		2		1		4.7										1	
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	1	7		110		90		130.0		110		97		2		2		70	
cis-1,3-Dichloropropene	-	-	10	1700	-	-	10	1700	10	1																		
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	1			30		22		34.0		21		21		0.7		0.8		17	
Toluene	-	-	6800	200000	-	-	680	200000	680	1	2		1															
Vinyl chloride	-	-	2	525	-	-	2	525	2	1	140		38		21				16		16		3		3		13	
Acetone	-	-	-	-	-	-	-	-	-	5													2	J				
Methylene chloride	-	-	4.7	1600	-	-	4.7	1600	4.7	1																		
Carbon disulfide	-	-	-	-	-	-	-	-	-	1																		
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	1																		
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1	190		260		210		750.0		240		220		19		19		170	
Chloroform	-	-	5.7	470	-	-	5.7	470	5.7	1																		
Xylenes (total)	-	-	-	-	-	-	-	-	-	1	1		3															
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1	0.5	J																
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1	0.7	J																

NOTES:
** Table only includes those compounds detected above method detection limits
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the compound was not detected above method detection limits

Table 8A

Surface Water Organic Volatile Analyses-EPA Method 524.2*
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards				Ambient Water Quality Criteria				Most Stringent Standard	Detection Limit	*Downstream Unnamed Stream*												*Barney Brook*											
	Organisms		Consumption		Organisms		Human Health				SW-15-03		SW-15-06		SW-15-11		SW-15-12		SW-15-13		SW-04-03		SW-07-03		SW-06-03		SW-06-06		SW-06-11		SW-06-12		SW-06-13	
	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only			11/16/93	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	11/16/93	Q	11/16/93	Q	11/16/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q
Dichlorodifluoromethane	-	-	-	-	-	-	-	-	-	1																								
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	1			0.7																					
trans-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1			1.4																					
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	1	40		40		35		2		2		8													
cis-1,3-Dichloropropene	-	-	10	1700	-	-	10	1700	10	1			0.54																					
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	1	10		9.5		8		0.8		0.3	J	2													
Toluene	-	-	6800	200000	-	-	680	200000	680	1																								
Vinyl chloride	-	-	2	525	-	-	2	525	2	1	4		7.3		3		2		2															
Acetone	-	-	-	-	-	-	-	-	-	5									3	J														6
Methylene chloride	-	-	4.7	1600	-	-	4.7	1600	4.7	1																								
Carbon disulfide	-	-	-	-	-	-	-	-	-	1																								
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	1																								
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1	100		240		86		18		19		19		2								0.5			
Chloroform	-	-	5.7	470	-	-	5.7	470	5.7	1																								
Xylenes (total)	-	-	-	-	-	-	-	-	-	1																								
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1																								
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1																								

NOTES:
** Table only includes those compounds detected above method detection limits
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
* * - Blank space indicates that the compound was not detected above method detection limits

Table 8A

Surface Water Organic Volatile Analyses-EPA Method 524.2*
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria				Most																							
	Organisms		Consumption		Organisms		Human Health		Stringent	Detection	SW-05-03		SW-16-03		SW-16-06		SW-16-11		SW-16-12		*Barney Brook*											
																					BLDUP-1-3										DUP SW-151	
																					SW-17-03		SW-17-03		SW-17-04		SW-17-06		SW-17-11		SW-17-12		SW-17-13		SW-17-13	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only	Standard	Limit	11/16/93	Q	11/16/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	11/16/93	Q	11/16/93	Q	2/22/94	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	5/15/96	Q
Dichlorodifluoromethane	-	-	-	-	-	-	-	-	-	1																										
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	1																										
trans-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1																										
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	1															1.1											
cis-1,3-Dichloropropene	-	-	10	1700	-	-	10	1700	10	1																										
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	1																										
Toluene	-	-	6800	200000	-	-	680	200000	680	1																										
Vinyl chloride	-	-	2	525	-	-	2	525	2	1																										
Acetone	-	-	-	-	-	-	-	-	-	5																										
Methylene chloride	-	-	4.7	1600	-	-	4.7	1600	4.7	1																										
Carbon disulfide	-	-	-	-	-	-	-	-	-	1																										
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	1																										
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	1										2			100								1		0.6		0.6	
Chloroform	-	-	5.7	470	-	-	5.7	470	5.7	1																										
Xylenes (total)	-	-	-	-	-	-	-	-	-	1																										
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1																										
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	1																										

NOTES:
** Table only includes those compounds detected
above method detection limits
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the compound was not detected
above method detection limits

Table 8B

*Surface Water TCL Volatile Organic Analyses***
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria						Upstream				Landfill Area															
	Organisms		Consumption		Organisms		Human Health		Minimum		SW-01B-01		SW-08-02		SW-10-01		SW-10-02		SW-09-01		SW-09-02		SW-11-01		SW-11-02		SW-11-06		SW-11-11		SW-11-12	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only	Standard	CRQL	9/23/92	Q	4/15/93	Q	9/23/92	Q	4/15/93	Q	9/23/92	Q	4/14/93	Q	9/23/92	Q	4/14/93	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q
Vinyl chloride	-	-	2	525	-	-	2	525	2	10													290		170		190		67		6	J
Acetone	-	-	-	-	-	-	-	-	-	10									11				12									
Carbon disulfide	-	-	-	-	-	-	-	-	-	10	10																					
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	10																						
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	10					10		6				8		770		240		190		39		15	
Chloroform	-	-	5.7	4700	-	-	5.7	4700	5.7	10																						
Bromodichloromethane	-	-	0.27	22	-	-	0.27	22	0.27	10															10							
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	10					12		19				6		390		67		4.1		3	J	2	J
Bromoform	-	-	4.3	360	-	-	4.3	360	4.3	10																						
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	10									11				14	J								
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	10													50		11							
Toluene	-	-	6800	200000	-	-	6800	200000	6800	10													17				1.3					
cis-1,2-Dichloroethylene	-	-	-	-	-	-	-	-	-	10																						

NOTES:
** - Table only includes compounds detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the element was not detected above method detection limits.

Table 8B

*Surface Water TCL Volatile Organic Analyses***
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria						Landfill Area																							
	Organisms		Consumption		Organisms		Human Health		Minimum		SW-02-01		SW-02-06		SW-02-11		SW-02-12		SW-02-13		BLDUP SW-12-01		SW-12-02		SW-12-06		SW-12-11		SW-12-12	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only	Standard	CRQL	9/23/92	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	9/23/92	Q	9/23/92	Q	4/14/93	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q
Vinyl chloride	-	-	2	525	-	-	2	525	2	10	190		800		90		3	J	4	J	130						99		58		3	J
Acetone	-	-	-	-	-	-	-	-	-	10	12																							
Carbon disulfide	-	-	-	-	-	-	-	-	-	10																								
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	10																								
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	10	1300		2500		540		23		37		710		710		13		910		400		27			
Chloroform	-	-	5.7	4700	-	-	5.7	4700	5.7	10																								
Bromodichloromethane	-	-	0.27	22	-	-	0.27	22	0.27	10																								
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	10	420		270		270		2	J	3	J	220		230		9		170		190		2	J		
Bromoform	-	-	4.3	360	-	-	4.3	360	4.3	10																								
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	10																								
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	10	57		71		58						28						42		42					
Toluene	-	-	6800	200000	-	-	6800	200000	6800	10	18				4	J					7													
cis-1,2-Dichloroethylene	-	-	-	-	-	-	-	-	-	10																								

NOTES:
** - Table only includes compounds detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the element was not detected above method detection limits.

Table 8B

Surface Water TCL Volatile Organic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria						Downstream Swale 2														Swale 1	
	Organisms		Consumption		Organisms		Human Health		Minimum		SW-03-01		SW-03-06		SW-14-01		SW-14-02		SW-14-06		SW-14-11		SW-14-12		BLDUP SW-151-12		SW-13-02	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only	Standard	CRQL	9/22/92	Q	11/22/94	Q	9/22/92	Q	4/14/93	Q	11/22/94	Q	6/1/95	Q	11/14/95	Q	11/14/95	Q	4/15/93	Q
Vinyl chloride	-	-	2	525	-	-	2	525	2	10	49								32		20		3	J	4	J		
Acetone	-	-	-	-	-	-	-	-	-	10	5	J			5	J												
Carbon disulfide	-	-	-	-	-	-	-	-	-	10	230				17													
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	10	2	J	2.5															
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	10	560				220		11		390		210		23		28			
Chloroform	-	-	5.7	4700	-	-	5.7	4700	5.7	10																		
Bromodichloromethane	-	-	0.27	22	-	-	0.27	22	0.27	10																		
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	10	140		130		50		8		74		92		3	J	3	J		
Bromoform	-	-	4.3	360	-	-	4.3	360	4.3	10																		
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	10																		
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	10	17		34		7				19		21		1	J	1	J		
Toluene	-	-	6800	200000	-	-	6800	200000	6800	10	2	J																
cis-1,2-Dichloroethylene	-	-	-	-	-	-	-	-	-	10			750															

NOTES:
** - Table only includes compounds detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the element was not detected above method detection limits.

Table 8B

*Surface Water TCL Volatile Organic Analyses***
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards				Ambient Water Quality Criteria				Minimum Standard	CRQL	*Downstream Unnamed Stream*																													
	Organisms		Consumption		Organisms		Human Health				SW-04-01		SW-04-02		SW-04-02 BLDUP		SW-04-06		SW-04-11		SW-04-12		SW-04-13		DUP-SW-150 SW-04-13		SW-07-01		SW-07-02		SW-07-06		SW-07-11		SW-07-12	
	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only			9/22/92	Q	4/13/93	Q	4/13/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	5/15/96	Q	9/22/92	Q	4/13/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q
Vinyl chloride	-	-	2	525	-	-	2	525	2	10																												
Acetone	-	-	-	-	-	-	-	-	-	10									8	J	1	J																
Carbon disulfide	-	-	-	-	-	-	-	-	-	10	6																											
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	10																												
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	10			5		5		20.0		19		14		13		14								2	J			7	J
Chloroform	-	-	5.7	4700	-	-	5.7	4700	5.7	10																												
Bromodichloromethane	-	-	0.27	22	-	-	0.27	22	0.27	10																												
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	10							3.2		6	J	2	J			0.9	J												
Bromoform	-	-	4.3	360	-	-	4.3	360	4.3	10																												
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	10																												
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	10							0.79	J	1	J																		
Toluene	-	-	6800	200000	-	-	6800	200000	6800	10																												
cis-1,2-Dichloroethylene	-	-	-	-	-	-	-	-	-	10																												

NOTES:
** - Table only includes compounds detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the element was not detected above method detection limits.

Table 8B

Surface Water TCL Volatile Organic Analyses*
Burgess Brothers Superfund Site
Remedial Investigation
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria						Barney Brook											
	Organisms		Consumption		Organisms		Human Health		Minimum		SW-05-01		SW-05-02		SW-05-06		SW-05-11		SW-05-12		SW-05-13	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only	Standard	CRQL	9/21/92	Q	4/13/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q
Vinyl chloride	-	-	2	525	-	-	2	525	2	10												
Acetone	-	-	-	-	-	-	-	-	-	10												
Carbon disulfide	-	-	-	-	-	-	-	-	-	10	33											
1,1-Dichloroethene	-	-	0.057	3.2	-	-	0.057	3.2	0.057	10												
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	10									2	J		
Chloroform	-	-	5.7	4700	-	-	5.7	4700	5.7	10												
Bromodichloromethane	-	-	0.27	22	-	-	0.27	22	0.27	10												
Trichloroethene	-	-	2.7	81	-	-	2.7	81	2.7	10												
Bromoform	-	-	4.3	360	-	-	4.3	360	4.3	10												
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	10												
Tetrachloroethene	-	-	0.8	8.85	-	-	0.8	8.85	0.8	10												
Toluene	-	-	6800	200000	-	-	6800	200000	6800	10												
cis-1,2-Dichloroethylene	-	-	-	-	-	-	-	-	-	10												

NOTES:
** - Table only includes compounds detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
" " - Blank space indicates that the element was not detected above method detection limits.

Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				*Ambient Water Quality Criteria*				*Lowest Standard*		*Upstream*								*Landfill Area*											
	Organisms		Consumption		Organisms		Human Health				SW-01A-02		SW-01B-01		SW-01B-02		SW-08-02		SW-10-01		SW-10-02		SW-09-01		SW-09-02		SW-11-01		SW-11-02		SW-11-03	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only		CRDL	4/15/93	Q	9/23/92	Q	4/15/93	Q	4/15/93	Q	9/23/92	Q	4/15/93	Q	9/23/92	Q	4/14/93	Q	9/23/92	Q	4/14/93	Q	11/17/93	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	NA		377	J	333		2140		1280	J			196	J			311	J			810	
Antimony	-	-	14	4,300	-	-	14	4,300	14	17	NA																					
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10	NA						6	J									2	J			10	
Barium	-	-	-	-	-	-	-	-	-	200	NA		33.2	J	27.8	J	278	J	101	J	37.1	J	85	J	37.7	J	94.8	J	49.1	J	980	
Beryllium	-	-	-	-	-	-	-	-	-	5	NA																					
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3	NA																				0.47	J
Calcium	-	-	-	-	-	-	-	-	-	5000	NA		10800		2870	J	21000		29900		25700		39800		26000		36600		26200		53300	
Chromium	1,190	142	-	-	376	122	-	-	122	10	NA						5.6	J													34	J
Cobalt	-	-	-	-	-	-	-	-	-	50	NA						25.6	J	4.2	J												
Copper	11	8	-	-	11	8	-	-	8	5	NA				3.3	J	12.2	J			3	J			4.9	J			4.7	J		
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	NA		509		331		309000		14200		498		10100		1180		13300		3510		593000	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3	NA		1.2	J	2.6	J	7.5		6.6		3	J	1.3	J			1.6	J				
Magnesium	-	-	-	-	-	-	-	-	-	5000	NA		4390	J	706	J	4130	J	8300				11100		6640		11100		7040		11800	
Manganese	-	-	-	-	-	-	-	-	-	15	NA		176		12.4	J	2680	J	2540		342		1420		372		1700		547		22800	J
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2	NA																					
Nickel	960	107	610	4,600	958	106	610	4,600	106	40	NA																					
Potassium	-	-	-	-	-	-	-	-	-	5000	NA				1050	J	628	J	1760	J	2070	J	6050	J	3330	J	6260	J	3560	J	5600	
Selenium	20	5	-	-	20	5	-	-	5	5	NA																					
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10	NA						5.9	J							2.5	J						
Sodium	-	-	-	-	-	-	-	-	-	5000	NA		2490	J	2150	J	1830	J	3200	J	3510	J	6390		4310	J	7070		5020		2800	J
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10	NA																					
Vanadium	-	-	-	-	-	-	-	-	-	50	NA						11.2	J	8.5	J			7.6	J			7.3	J				
Zinc	79.2	72	-	-	77.4	71	-	-	71	20	NA						170		62.7				31.8									
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5	NA														6							
BOD5 (mg/l)										1	NA																				NA	
Hardness (mg/l)										1	NA		45		10		69		110		90		150		92		140		94		NA	
Hex Chromium										10																						

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Table 9

*Surface Water Inorganic Analyses***
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				Ambient Water Quality Criteria				Lowest Standard		Landfill Area																				
	Organisms		Consumption		Organisms		Human Health				SW-11-03-F		SW-11-06		SW-11-11		SW-11-12		SW-02-01		SW-02-02		SW-02-06		SW-02-11		SW-02-12		SW-02-13		SW-12-01	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only		CRDL	11/17/93	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q	9/23/92	Q	4/14/93	Q	11/22/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	9/23/92	Q
Aluminum	-	-	-	-	-	-	-	-	-	200			914				19.6	B	176	J			41100		21.8	B	111	B	92	B	136	J
Antimony	-	-	14	4,300	-	-	14	4,300	14	17	19	J																				
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10			11.4										49									
Barium	-	-	-	-	-	-	-	-	-	200	63		882		52.7	B	53.2	B	62	J	26.2	J	3120		43.6	B	31.4	B	35	B	53.6	J
Beryllium	-	-	-	-	-	-	-	-	-	5													4.8	J								
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3																						
Calcium	-	-	-	-	-	-	-	-	-	5000	39500		69600		31300		33400		23800		3040	J	81800		14600		3270	B	3970	B	22300	
Chromium	1,190	142	-	-	376	122	-	-	122	10			2.5	J									37									
Cobalt	-	-	-	-	-	-	-	-	-	50			11	J									97.7									
Copper	11	8	-	-	11	8	-	-	8	5			6.4								4.1	J	37.6									
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	70	J	570000		1710		2940		5230		154		765000		808		171		189		2610	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3																						
Magnesium	-	-	-	-	-	-	-	-	-	5000	12000		15700		8710		9560		8130		778	J	20900		5220		1000	B	1100	B	7720	
Manganese	-	-	-	-	-	-	-	-	-	15	640		9990		253		630		1190		19.1		130000		154		49.1		29.1		849	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2													0.49									
Nickel	960	107	610	4,600	958	106	610	4,600	106	40			24.5	J									383									
Potassium	-	-	-	-	-	-	-	-	-	5000	8200		9560		3830	B	3890	B	4310	J	670	J	10900		1360	B	594	B	1040	B	3910	J
Selenium	20	5	-	-	20	5	-	-	5	5			31.6										85.8									
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10													3.5	J								
Sodium	-	-	-	-	-	-	-	-	-	5000	6100		6640		3000	B	2630	B	5260		1850	J	9480						670	B	5920	
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10			7.2	J									97.6									
Vanadium	-	-	-	-	-	-	-	-	-	50									5.8	J			36.2	J								
Zinc	79.2	72	-	-	77.4	71	-	-	71	20			59		1.6	B	2.6	B					644				5.1	B				
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																						
BOD5 (mg/l)										1	NA		NA		NA		NA						NA		NA		NA		NA			
Hardness (mg/l)										1	NA		NA		NA		NA		93		11		NA		NA		NA		NA		87	
Hex Chromium										10	NA		NA		NA		NA						NA		NA		NA		NA			

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Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards: Organisms Acute	Vermont: Organisms Chronic	Vermont: Consumption W&O	Vermont: Consumption O-only	Ambient Water Quality Criteria: Organisms Acute	Ambient: Organisms Chronic	Ambient: Human Health W&O	Ambient: Human Health O-only	Lowest Standard	CRDL	Landfill Area: BLDUP#1 9/23/92	Q	SW-12-02 4/14/93	Q	SW-12-03 11/17/93	Q	SW-12-03-F 11/17/93	Q	SW-12-06 11/22/94	Q	SW-12-11 6/1/95	Q	SW-12-12 11/13/95	Q	Downstream Swale 2: SW-03-01 9/22/92	Q	SW-03-02 4/14/93	Q	SW-03-03 11/17/93	Q	SW-03-03-F 11/17/93	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	138	J							2620		28.8	B	136	B	884	J						
Antimony	-	-	14	4,300	-	-	14	4,300	14	17																					0.15	J
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																						
Barium	-	-	-	-	-	-	-	-	-	200	54	J	27.8	J	26		20		147	J	43.8	B	31.1	B	66.4	J	26.2	J	29			
Beryllium	-	-	-	-	-	-	-	-	-	5																					20	
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3					0.13	J	0.12	J											0.15	J		
Calcium	-	-	-	-	-	-	-	-	-	5000	22400		3370	J	10100		10900		33700		14800		3290	B	24000		3390	J	11000		11500	
Chromium	1,190	142	-	-	376	122	-	-	122	10					8.6	J			3.6	J							2.3	J				
Cobalt	-	-	-	-	-	-	-	-	-	50									3	J							5.8	J				
Copper	11	8	-	-	11	8	-	-	8	5			3.3	J													4.6	J				
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	2670		175		470		130		23300		508		222		3150		176		180		62	J
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3					1.7	J			50.5						3.5				2	J		
Magnesium	-	-	-	-	-	-	-	-	-	5000	7760		815	J	3700		4100		11200		5370		1030		8820		806	J	4100		4400	
Manganese	-	-	-	-	-	-	-	-	-	15	849		21.5		130		110		1240		148		50.7		681		22		120		120	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2																						
Nickel	960	107	610	4,600	958	106	610	4,600	106	40									158						7.5	J						
Potassium	-	-	-	-	-	-	-	-	-	5000	4270	J			490	J	2300	J	6360		1290	B	610	B	4240	J			1000	J	3500	J
Selenium	20	5	-	-	20	5	-	-	5	5																						
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10					5	J													7.9	J		
Sodium	-	-	-	-	-	-	-	-	-	5000	6730		2180	J	1600	J	1500	J	5620						6070		2190	J	1900	J		
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10																						
Vanadium	-	-	-	-	-	-	-	-	-	50	5.8	J							4.4	J												
Zinc	79.2	72	-	-	77.4	71	-	-	71	20									64.7				6.7	B								
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																	5					
BOD5 (mg/l)										1					NA		NA		NA		NA		NA						NA		NA	
Hardness (mg/l)										1	88		12		NA		NA		NA		NA		NA		96		12		NA		NA	
Hex Chromium										10							NA		NA		NA		NA								NA	

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Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards: Organisms Acute	Organisms Chronic	Consumption W&O	Consumption O-only	Ambient Water Quality Criteria: Organisms Acute	Organisms Chronic	Human Health W&O	Human Health O-only	Lowest Standard	CRDL	Downstream Swale 2: SW-03-06 11/22/94	Q	SW-03-11 6/1/95	Q	BLDUP SW-03-11 6/1/95	Q	SW-03-12 11/13/95	Q	BLDUP SW-150 SW-03-12 11/13/95	Q	SW-14-01 9/22/92	Q	SW-14-02 4/14/93	Q	SW-14-03 11/17/93	Q	SW-14-03-F 11/17/93	Q	SW-14-06 11/22/94	Q	SW-14-11 6/1/95	Q	SW-14-12 11/14/95	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	89.8	J	21.2	B	23.8	B	151	B	109	B	197	J			85	J			25.5	J	14.4	B	104	B
Antimony	-	-	14	4,300	-	-	14	4,300	14	17											20.2	J												
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																								
Barium	-	-	-	-	-	-	-	-	-	200	55.2	J	44.9	B	43.9	B	32	B	31	B	53.6	J	27.3	J	32		23		50.3	J	42.7	B	30.4	B
Beryllium	-	-	-	-	-	-	-	-	-	5																								
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3																	0.11	J						
Calcium	-	-	-	-	-	-	-	-	-	5000	29900		15000		14700		3470	B	3410	B	21800		3390	J	11700		11700		29600		14200		3360	B
Chromium	1,190	142	-	-	376	122	-	-	122	10																								
Cobalt	-	-	-	-	-	-	-	-	-	50																								
Copper	11	8	-	-	11	8	-	-	8	5													3	J									1.2	B
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	1520		311		307		253		173		1120		162		970		140		226		284		180	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3											1.6	J			1.2	J			3.7					
Magnesium	-	-	-	-	-	-	-	-	-	5000	10300		5440		5330		1080	B	1060	B	7970		841	J	4400		4400		10100		5140		1050	B
Manganese	-	-	-	-	-	-	-	-	-	15	619		154		152		58.1		55.5		583		23.6		230		120		369		159		49.3	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2					0.05	B															0.03	B		B
Nickel	960	107	610	4,600	958	106	610	4,600	106	40	22.4	J									6.6	J							19.5	J			587	B
Potassium	-	-	-	-	-	-	-	-	-	5000	6180		1420	B	1410	B	621	B	626	B	3700	J			2100	J	3400	J	6340		1350	B	4.5	BJ
Selenium	20	5	-	-	20	5	-	-	5	5					4.1	BJ																		
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10															3.2	J								
Sodium	-	-	-	-	-	-	-	-	-	5000	5440										6090		2220	J	3100	J			5470					
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10																								
Vanadium	-	-	-	-	-	-	-	-	-	50																			1.4	J			4.6	B
Zinc	79.2	72	-	-	77.4	71	-	-	71	20					2.5	B	4.9	B	4.7	B														
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																								
BOD5 (mg/l)										1	NA		NA		NA		NA		NA						NA		NA		NA		NA		NA	
Hardness (mg/l)										1	NA		NA		NA		NA		NA		87		12		NA		NA		NA		NA		NA	
Hex Chromium										10	NA		NA		NA		NA		NA								NA		NA		NA		NA	

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Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
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Compound	*Vermont Water Quality Standards* Organisms Acute	Organisms Chronic	Consumption W&O	Consumption O-only	*Ambient Water Quality Criteria* Organisms Acute	Organisms Chronic	Human Health W&O	Human Health O-only	*Lowest Standard*	CRDL	*Swale 1* SW-13-02 4/15/93	Q	*Downstream Unnamed Stream* SW-15-01 9/22/92	Q	SW-15-02 4/14/93	Q	SW-15-03 11/16/93	Q	SW-15-03-F 11/16/93	Q	SW-15-06 11/22/94	Q	SW-15-11 6/1/95	Q	SW-15-12 11/13/95	Q	SW-15-13 5/15/96	Q	SW-04-01 9/22/92	Q	SW-04-02 4/13/93	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	194	J	113	J							40.7	J	42.9	B	107	B	65.7	B	170	J	222	
Antimony	-	-	14	4,300	-	-	14	4,300	14	17			29	J															23.4	J		
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																						
Barium	-	-	-	-	-	-	-	-	-	200	12.6	J	50.5	J	26.2	J	26		21		45.8	J	32.8	B	29.9	B	31.4	B	45.6	J	27.8	J
Beryllium	-	-	-	-	-	-	-	-	-	5																						
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3									0.16	J												
Calcium	-	-	-	-	-	-	-	-	-	5000	5950		22700		3600	J	11100		11400		27900		12500		3590	B	4360	B	21800		3620	J
Chromium	1,190	142	-	-	376	122	-	-	122	10					2.8	J																
Cobalt	-	-	-	-	-	-	-	-	-	50																						
Copper	11	8	-	-	11	8	-	-	8	5	7.7				3	J															3.6	J
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	271		559		218		160		40	J	185		185		177		150		367		268	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3							1.5	J														
Magnesium	-	-	-	-	-	-	-	-	-	5000	2270	J	8400		992	J	4100		4300		9730		4730	B	1140	B	1350	B	8200		930	J
Manganese	-	-	-	-	-	-	-	-	-	15	33.6		301		25.2		75		69		167		82.3		54.4		35.3		61.8		50.8	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2					0.22																	
Nickel	960	107	610	4,600	958	106	610	4,600	106	40											13.7	J										
Potassium	-	-	-	-	-	-	-	-	-	5000			4310	J			750	J	1700	J	5430		894	B	630	B	965	B	3950	J		
Selenium	20	5	-	-	20	5	-	-	5	5																						
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10							3.2	J											2.2	J		
Sodium	-	-	-	-	-	-	-	-	-	5000	2230	J	5670		2180	J	1500	J			4850	J					743	B	5420		2140	J
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10																						
Vanadium	-	-	-	-	-	-	-	-	-	50																						
Zinc	79.2	72	-	-	77.4	71	-	-	71	20													1.8	B	4.3	B						
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																						
BOD5 (mg/l)										1							NA		NA		NA		NA		NA		NA					
Hardness (mg/l)										1	24		91		13		NA		NA		NA		NA		NA		NA		88		13	
Hex Chromium										10									NA		NA		NA		NA		NA					

NOTES:
** Table only includes those metals detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B - Compound was detected above the IDL but below the CRDL.
F - Dissolved Metals

Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	*Vermont Water Quality Standards* Organisms Acute	Organisms Chronic	Consumption W&O	Consumption O-only	*Ambient Water Quality Criteria* Organisms Acute	Organisms Chronic	Human Health W&O	Human Health O-only	*Lowest Standard*	CRDL
Aluminum	-	-	-	-	-	-	-	-	-	200
Antimony	-	-	14	4,300	-	-	14	4,300	14	17
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10
Barium	-	-	-	-	-	-	-	-	-	200
Beryllium	-	-	-	-	-	-	-	-	-	5
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3
Calcium	-	-	-	-	-	-	-	-	-	5000
Chromium	1,190	142	-	-	376	122	-	-	122	10
Cobalt	-	-	-	-	-	-	-	-	-	50
Copper	11	8	-	-	11	8	-	-	8	5
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3
Magnesium	-	-	-	-	-	-	-	-	-	5000
Manganese	-	-	-	-	-	-	-	-	-	15
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2
Nickel	960	107	610	4,600	958	106	610	4,600	106	40
Potassium	-	-	-	-	-	-	-	-	-	5000
Selenium	20	5	-	-	20	5	-	-	5	5
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10
Sodium	-	-	-	-	-	-	-	-	-	5000
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10
Vanadium	-	-	-	-	-	-	-	-	-	50
Zinc	79.2	72	-	-	77.4	71	-	-	71	20
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5
BOD5 (mg/l)										1
Hardness (mg/l)										1
Hex Chromium										10

Compound	*Downstream Unnamed Stream* BLDUP SW-04-02 4/13/93	Q	SW-04-03 11/16/93	Q	SW-04-03-F 11/16/93	Q	SW-04-06 11/21/94	Q	BLDUP SW-04-06 11/21/94	Q	SW-04-11 6/1/95	Q	SW-04-12 11/13/95	Q	SW-04-13 5/15/96	Q	DUP W-150 SW-04-13 5/15/96	Q	SW-07-01 9/22/92	Q	SW-07-02 4/13/93	Q	SW-07-03 11/16/93
Aluminum	218		50	J			283		134	J	42.8	B	124	B	101	B	93.2	B	419	J			140
Antimony					14	J																UJ	
Arsenic																							
Barium	26.2	J	25		19		50.3	J	40.9	J	30.3	B	28.2	B	31.5	B	30.8		54.5	J	22.9	J	31
Beryllium																							
Cadmium																							0.41
Calcium	3370	J	11500		12700		26700		26400		12200		3760	B	4630	B	4540	B	21300		3690	J	14000
Chromium					8.1	J																	
Cobalt																							
Copper	5.2																				3.3	J	
Iron	269		94	J	30	J	598		209				178		190		164		943		229		300
Lead																			2.1	J			1.9
Magnesium	915	J	4300		4800		9590		9540		4680	B	1230	B	1470	B	1430	B	8190		1030	J	5400
Manganese	44.1		20				156		48		25		50.5		35		34.8		191		34		60
Mercury																							
Nickel							8.2	J	6.4	J													
Potassium			1400	J	1000	J	4180	J	4370	J	836	B	639	B	991	B	956	B	2390	J			2000
Selenium																							
Silver			5.1	J	5.8	J																	3.8
Sodium	2230	J	1600	J	1900	J	4200	J	4100	J					709	B	625	B	5010		2010	J	3700
Thallium																							
Vanadium							1.1	J															
Zinc													3.9	B									
Cyanide																							
BOD5 (mg/l)			NA		NA		NA		NA		NA		NA		NA		NA						NA
Hardness (mg/l)	12		NA		NA		NA		NA		NA		NA		NA		NA		87		13		NA
Hex Chromium					NA		NA		NA		NA		NA		NA		NA						

NOTES:
** Table only includes those metals detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B - Compound was detected above the IDL but below the CRDL.
F - Dissolved Metals

Table 9

*Surface Water Inorganic Analyses***
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	Vermont Water Quality Standards				Ambient Water Quality Criteria				Lowest Standard	CRDL	Downstream Unnamed Stream								Barney Brook				Barney Brook							
	Organisms		Consumption		Organisms		Human Health				SW-07-03-F		SW-07-06		SW-07-11		SW-07-12		SW-06-01		SW-06-02		SW-06-03		SW-06-03-F		SW-06-06		SW-06-11		SW-06-12		SW-06-13	
	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only			11/16/93		11/21/94		6/1/95		11/13/95		9/21/92		4/13/93		11/16/93		11/16/93		11/21/94		6/1/95		11/13/95		5/15/96	
											Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Aluminum	-	-	-	-	-	-	-	-	-	200			62.9	J	58	B	99	B	129	J	464		59	J					42.4	B	78.8	B	148	B
Antimony	-	-	14	4,300	-	-	14	4,300	14	17													25	J										
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																								
Barium	-	-	-	-	-	-	-	-	-	200		22	44.3	J	32.2	B	25.4	B	45.2	J	19.6	J	25		16		40.2	J	26.1	B	23.8	B	23.5	B
Beryllium	-	-	-	-	-	-	-	-	-	5																								
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3	J	0.43	J										0.34	J	0.37	J								
Calcium	-	-	-	-	-	-	-	-	-	5000		14100	26600		13200		4120	B	26900		3890	J	7700		8100		25100		9290		7690		5000	
Chromium	1,190	142	-	-	376	122	-	-	122	10											2.6	J			8.2	J								
Cobalt	-	-	-	-	-	-	-	-	-	50																								
Copper	11	8	-	-	11	8	-	-	8	5											6													
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100			107				143		329		699		81	J	20						388		276	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3	J								2.2	J	1.3	J	1.4	J										
Magnesium	-	-	-	-	-	-	-	-	-	5000		5400	9860		5050		1380	B	9970		1100	J	2300		2500		7500		2790	B	2180	B	1440	B
Manganese	-	-	-	-	-	-	-	-	-	15			13.9	J	21.6		39.7		102		31.3		6.5	J	4.6	J	6.5	J	17.7		89.5		84.8	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2																								
Nickel	960	107	610	4,600	958	106	610	4,600	106	40			5.7	J													1.1	J						
Potassium	-	-	-	-	-	-	-	-	-	5000	J	1200	J	3530	J	829	B	622	B		901	J			330	J	1720	J	962	B	1080	B	1190	B
Selenium	20	5	-	-	20	5	-	-	5	5						3.2	B																	
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10	J	3.7	J										12											
Sodium	-	-	-	-	-	-	-	-	-	5000	J	1600	J	3660	J	1050	B		5140		2420	J	2800	J	1800	J	13100		3780	B	2030	B	1990	B
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10																								
Vanadium	-	-	-	-	-	-	-	-	-	50																								
Zinc	79.2	72	-	-	77.4	71	-	-	71	20						1.7	B	3.8	B												4.5	B		
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																								
BOD5 (mg/l)										1		NA	NA		NA		NA						NA		NA		NA		NA		NA		NA	
Hardness (mg/l)										1		NA	NA		NA		NA		110		14		NA		NA		NA		NA		NA		NA	
Hex Chromium										10		NA	NA		NA		NA								NA		NA		NA		NA		NA	

NOTES:
** Table only includes those metals detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B - Compound was detected above the IDL but below the CRDL.
F - Dissolved Metals

Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				*Ambient Water Quality Criteria*				*Lowest Standard*		*Barney Brook*																		*Barney Brook*					
	Organisms		Consumption		Organisms		Human Health				SW-05-01		SW-05-02		SW-05-03		SW-05-03-F		SW-05-06		SW-05-11		SW-05-12		SW-05-13		SW-16-03		SW-16-03-F		SW-16-06	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only		CRDL	9/21/92	Q	4/13/93	Q	11/16/93	Q	11/16/93	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q	11/16/93	Q	11/16/93	Q	11/21/94	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	232	J	444		69	J					38.4	B	88.2	B	157	B	85	J			41.9	J
Antimony	-	-	14	4,300	-	-	14	4,300	14	17	23.1	J							5.4	J									60			
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																						
Barium	-	-	-	-	-	-	-	-	-	200	47.8	J	22.9	J	26		16		46.4	J	27.5	B	24	B	24.3	B	25		16		46.6	J
Beryllium	-	-	-	-	-	-	-	-	-	5																						
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3					0.2	J	0.22	J									0.14	J	0.14	J		
Calcium	-	-	-	-	-	-	-	-	-	5000	21800		4200	J	9300		9100		25600		10200		6700		4980	B	8500		9100		25500	
Chromium	1,190	142	-	-	376	122	-	-	122	10							9.9	J														
Cobalt	-	-	-	-	-	-	-	-	-	50																						
Copper	11	8	-	-	11	8	-	-	8	5			4.4	J																		
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100	786		696		92	J	55	J	94.8	J			328		265		94	J	97	J	117	
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3	3.1		1.7	J	1.6	J																
Magnesium	-	-	-	-	-	-	-	-	-	5000	7930		1170	J	3000		2900		8170		3280	B	1970	B	1460	B	2700		2900		8050	
Manganese	-	-	-	-	-	-	-	-	-	15	102		39.8		8.9	J	6.3	J	11.9	J	17.9		74.3		77.7		17		6.9	J	20.2	
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2											0.04	B										
Nickel	960	107	610	4,600	958	106	610	4,600	106	40									1.5	J												
Potassium	-	-	-	-	-	-	-	-	-	5000	1010	J			1500	J			1970	J	944	B	918	B	1150	B					2130	J
Selenium	20	5	-	-	20	5	-	-	5	5											3.8	BJ					2.2	J				
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10					3	J	3.5	J									5.7	J	4.7	J		
Sodium	-	-	-	-	-	-	-	-	-	5000	4960	J	2510	J	4100	J			11200		3280	B	1750	B	1810	B	3600	J	3200	J	10700	
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10									3.8	J												
Vanadium	-	-	-	-	-	-	-	-	-	50																						
Zinc	79.2	72	-	-	77.4	71	-	-	71	20											1.8	B	4.9	B								
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																						
BOD5 (mg/l)										1					NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hardness (mg/l)										1	87		15		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Hex Chromium										10							NA		NA		NA		NA		NA				NA		NA	

NOTES:
**Table only includes those metals detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B - Compound was detected above the IDL but below the CRDL.
F - Dissolved Metals

Table 9

Surface Water Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

	Vermont Water Quality Standards				*Ambient Water Quality Criteria*				*Lowest Standard*		*Barney Brook*																									
																	BLDUP 1-3				BLDUP 1-3F															
	Organisms		Consumption		Organisms		Human Health				SW-16-11		SW-16-12		SW-17-03		SW-17-03		SW-17-03-F		SW-17-03-F		SW-17-04		SW-17-04F		SW-17-06		SW-17-11		SW-17-12		SW-17-13	
Compound	Acute	Chronic	W&O	O-only	Acute	Chronic	W&O	O-only		CRDL	6/1/95	Q	11/13/95	Q	11/16/93	Q	11/16/93	Q	11/16/93	Q	11/16/93	Q	2/22/94	Q	2/22/94	Q	11/21/94	Q	6/1/95	Q	11/13/95	Q	5/15/96	Q
Aluminum	-	-	-	-	-	-	-	-	-	200	40.8	B	65.9	B	97	J	65	J					69	J			26.7	J	39.2	B	84.9	B	182	B
Antimony	-	-	14	4,300	-	-	14	4,300	14	17																										
Arsenic	360	190	0.02	1.50	360	190	0.018	0.14	0.02	10																										
Barium	-	-	-	-	-	-	-	-	-	200	27.4	B	23.5	B	26		24		15		26		24		24		49.8	J	28.4	B	24.6	B	25.5	B
Beryllium	-	-	-	-	-	-	-	-	-	5																										
Cadmium	2.3	0.8	-	-	2.2	0.7	-	-	0.7	3					0.12	J	0.21	J	0.14	J	0.26	J	0.15	J												
Calcium	-	-	-	-	-	-	-	-	-	5000	10200		6730		9000		8500		8800		9200		8800		10100		25700		10200		6960		5200			
Chromium	1,190	142	-	-	376	122	-	-	122	10					8.1	J																	0.87	B		
Cobalt	-	-	-	-	-	-	-	-	-	50																										
Copper	11	8	-	-	11	8	-	-	8	5															3.7	J							1.7	B		
Iron	-	1,000	-	-	-	1,000	-	-	1,000	100			283		320		130		43	J	44	J	190				111				345		318			
Lead	45	1.8	-	-	39	1.5	-	-	1.5	3					1.8	J	2.5	J					1.2	J												
Magnesium	-	-	-	-	-	-	-	-	-	5000	3260	B	1980	B	2900		2700		2800		2900		2800		3300		8110		3310	B	2050	B	1520	B		
Manganese	-	-	-	-	-	-	-	-	-	15	18.8		74.1		32		20		11		12		46		50		38.6		20.1		77.4		78.6			
Mercury	2.4	0.012	0.14	0.15	2.4	0.012	0.14	0.15	0.012	0.2																										
Nickel	960	107	610	4,600	958	106	610	4,600	106	40																	1.1	J								
Potassium	-	-	-	-	-	-	-	-	-	5000	918	B	942	B	460	J							890	J	1100	J	1960	J	926	B	953	B	1200	B		
Selenium	20	5	-	-	20	5	-	-	5	5							2.4	J																		
Silver	1.8	-	-	-	1.6	-	-	-	1.6	10					4.3	J	6.6	J	6.9	J	4.1	J							1.8	B						
Sodium	-	-	-	-	-	-	-	-	-	5000	2890	B	1810	B	5000		3900	J	4200	J	2100	J			4900	J	10800		3260	B	1740	B	1860	B		
Thallium	-	-	1.7	6.3	-	-	1.7	6.3	1.7	10																										
Vanadium	-	-	-	-	-	-	-	-	-	50																			1.3	B						
Zinc	79.2	72	-	-	77.4	71	-	-	71	20			4.2		B																4.4	B			
Cyanide	22	5.2	700	220,000	22	5.2	700	220,000	5.2	5																										
BOD5 (mg/l)										1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
Hardness (mg/l)										1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
Hex Chromium										10	NA		NA						NA		NA		NA		NA		NA		NA		NA		NA			

NOTES:
** Table only includes those metals detected above method detection limits.
Values reported in ug/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B - Compound was detected above the IDL but below the CRDL.
F - Dissolved Metals

Table 10

Leachate Seeps TCL Volatile Organics **
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	LS-1 1/28/93	Q	LS-01-11 5/11/95	Q	LS-01-12 10/31/95	Q	LS-2 5/3/93	Q	LS-02-11 5/11/95	Q	LS-02-12 10/31/95	Q	BLDUP-LS-150 LS-02-12 10/31/95	Q	LS-3 5/3/93	Q	BLDUP LS-3 5/3/93	Q	LS-03-11 5/11/95	Q	LS-03-11 5/11/95	Q	LS-03-12 10/31/95	Q
Vinyl chloride			30		7	J			70										460	J	460	J		
Acetone	32						21																	
Carbon disulfide					1	J																		
1,1-Dichloroethene									5	J														
1,2-Dichloroethene (total)	32		230		13		10		53						1800		1800		7400		7700		5700	
2-Butanone																								
Bromodichloromethane			3	J																				
Trichloroethene	570				18				51						26000		26000		28000		27000		44000	
Tetrachloroethene															9200		9400		8900		8800		18000	

NOTES:
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
** - Table only includes those compounds detected above method detection limits.
" " - Blank space indicates that the element was not detected above instrument detection limits

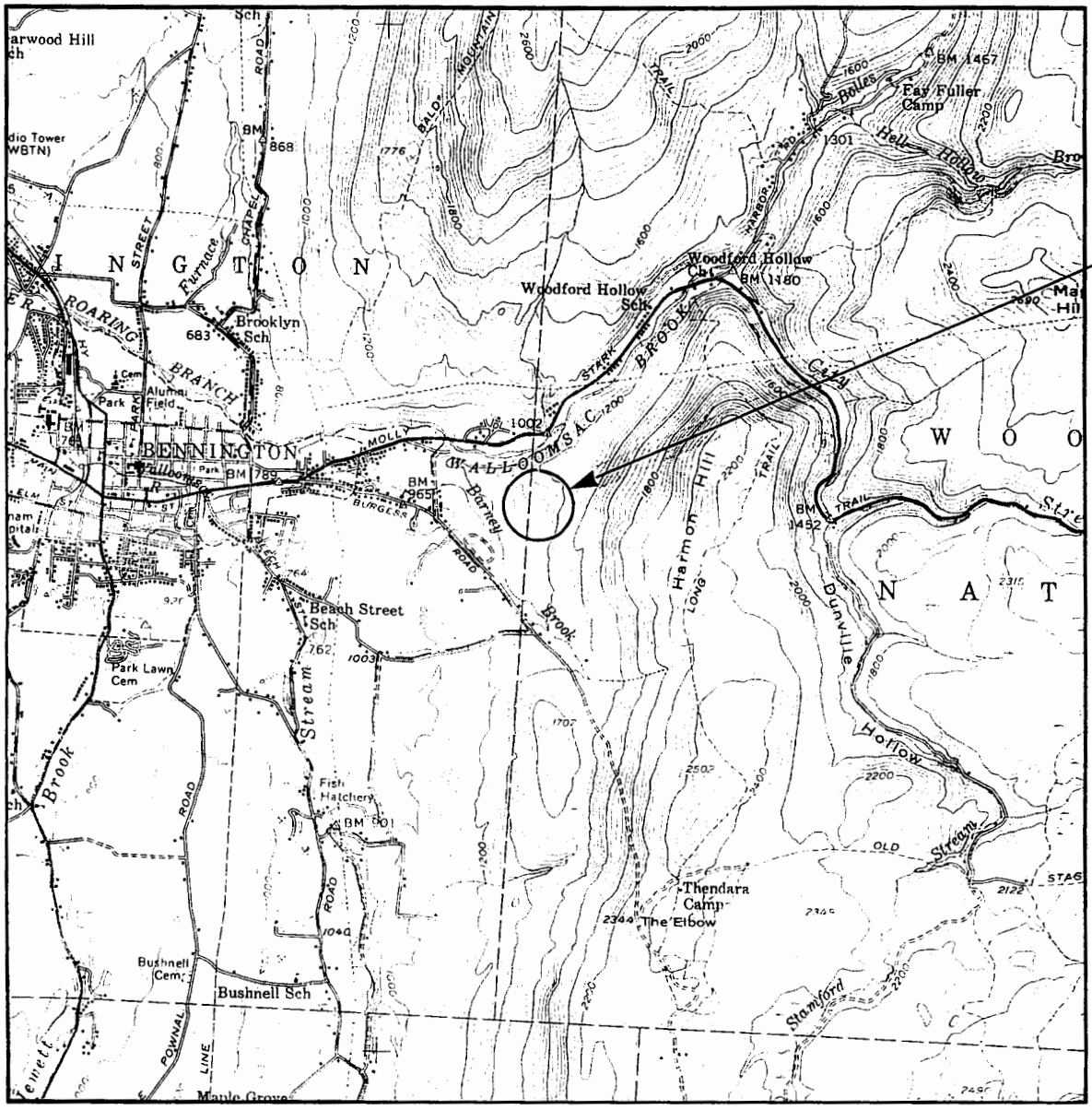
Table 11

Leachate Seeps Inorganic Analyses**
Burgess Brothers Superfund Site
Remedial Investigation/LTMP
Woodford and Bennington, Vermont

Compound	CRDL	LS-1 1/29/93	Q	LS-01-11 5/11/95	Q	LS-01-12 10/31/95	Q	LS-2 5/3/93	Q	LS-02-11 5/11/95	Q	LS-02-12 10/31/95	Q	BLDUP-LS-150 LS-02-12 10/31/95	Q	LS-3 5/3/93	Q	BLDUP LS-3 5/5/93	Q	LS-03-11 5/11/95	Q	LS-03-11 5/11/95	Q	LS-03-12 10/31/95	Q
Aluminum	200	157	J	3960		16700	J	32100		5760		2030	J	4260	J	75000		31200		25700		34100		17000	J
Antimony	60							39.7	J					2.5	B										
Arsenic	10					16.9																			
Barium	200	32.3	J	119	B	196	B	880	J	360		309		410		430		183	J	116	B	161	B	54.7	B
Beryllium	5					1.1	B											2.6	J	0.78	B	1	B	0.48	B
Chromium	10					18.7		43.1	J	6.2	B	4.4	BJ	8.1	BJ	56.3		14.0		5.8	B	8.9	B		
Iron	100	687		42100		40200	J	260000		70900		38500	J	67000	J	31900		8890		23700		29800		3420	J
Lead	3	1.7	J	29.1		82.1	J	998	J	156		30.2	J	66	J	225	J	55.8		250		314		35.1	J
Manganese	15	25.2		2570		4290		10200	J	6130		5740		5950		937		602		431		532		451	
Mercury	0.2							2.7	J							0.86	J	0.33	J						
Nickel	40			5.7	B	19.5	B	235	J	34.3	B	13.2	B	18.2	B	390	J	248	J	104		119		181	
Thallium	10			5.3	B	3.7	B	1.1	J					4.7	B	2.4	J								
Zinc	20	1270	J	1760	J	8180	J	1810	J	310	J	200	J	290	J	236	J	75.1	J	86.4	J	126	J	158	J
BOD5 (mg/L)	1			NA		NA				NA		NA		NA						NA		NA		NA	
Hardness (mg/L)	1	130		NA		NA		320	J	NA		NA		NA		47	J	21		NA		NA		NA	

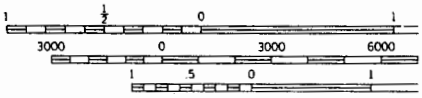
NOTES:
** Table only includes those metals detected above method detection limits.
Values reported in µg/l (ppb) unless noted otherwise.
J - Indicates an estimated value.
NA - Not Applicable.
B -Compound was detected above the IDL, but below the CRDL.
" " - Blank space indicates that the element was not detected above instrument detection limits

Figures



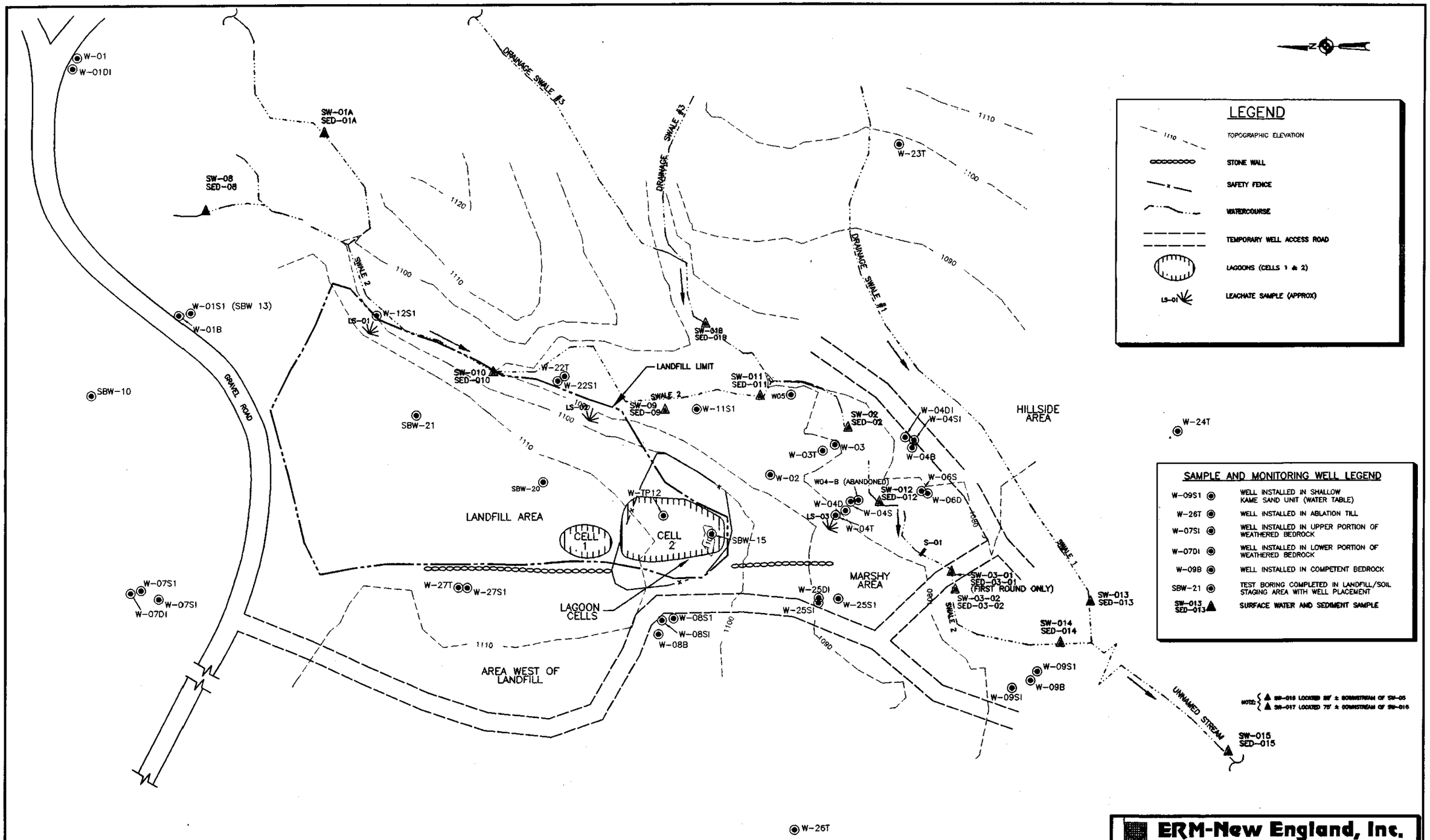
SCALE 1:62,500

CONTOUR INTERVAL 40 FEET



SOURCE: BENNINGTON, VERMONT USGS Quad

ERM-New England, Inc.		
205 PORTLAND STREET – BOSTON, MA 02114 (617) 742-8228		
CLIENT NAME: GPB Real Estate	DRAWN BY: KCW	DATE: 09/26/96
FILE NAME: LTMP_01.dwg	SCALE: 1:62,500	PROJ: 397.03
Burgess Brothers Superfund Site Woodford & Bennington, Vermont		
Site Location Map		FIGURE NO. 1
PROJECT MGR: AMP	TOM REV: MW	



When photographic reproduction is used; the drawings are not to scale. All scales are reduced from indicated to approximately half size.

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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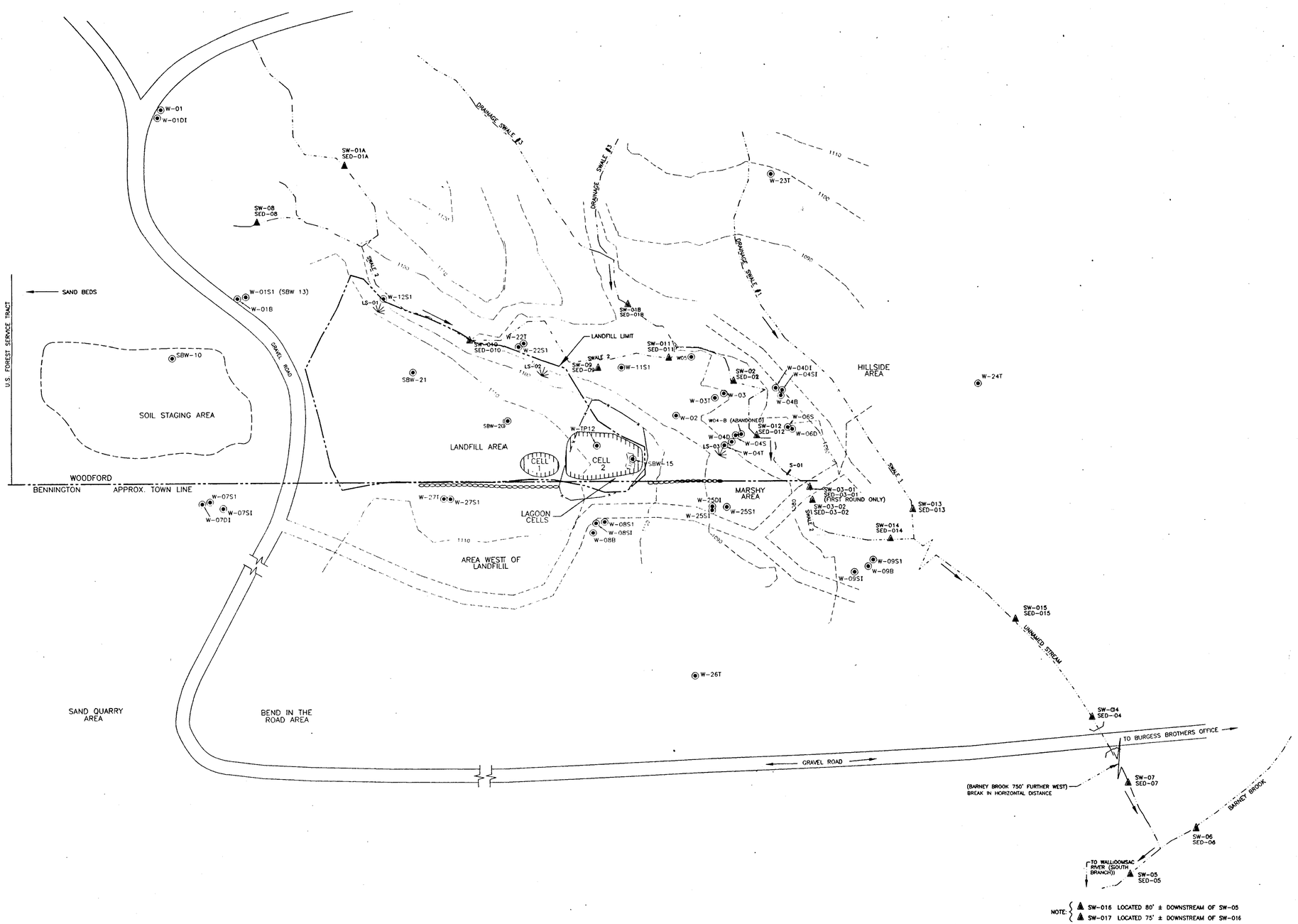
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: LTMP_01E.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

Site Base Map

FIGURE NO. ES-1

PROJECT MGR: AMP | TQM REV: MW



NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

LEGEND

1110	TOPOGRAPHIC ELEVATION
	STONE WALL
x	SAFETY FENCE
	WATERCOURSE
	TEMPORARY WELL ACCESS ROAD
	LAGOONS (CELLS 1 & 2)
LS-01	LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

SCALE
30 0 15 30 60 120

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locatiions of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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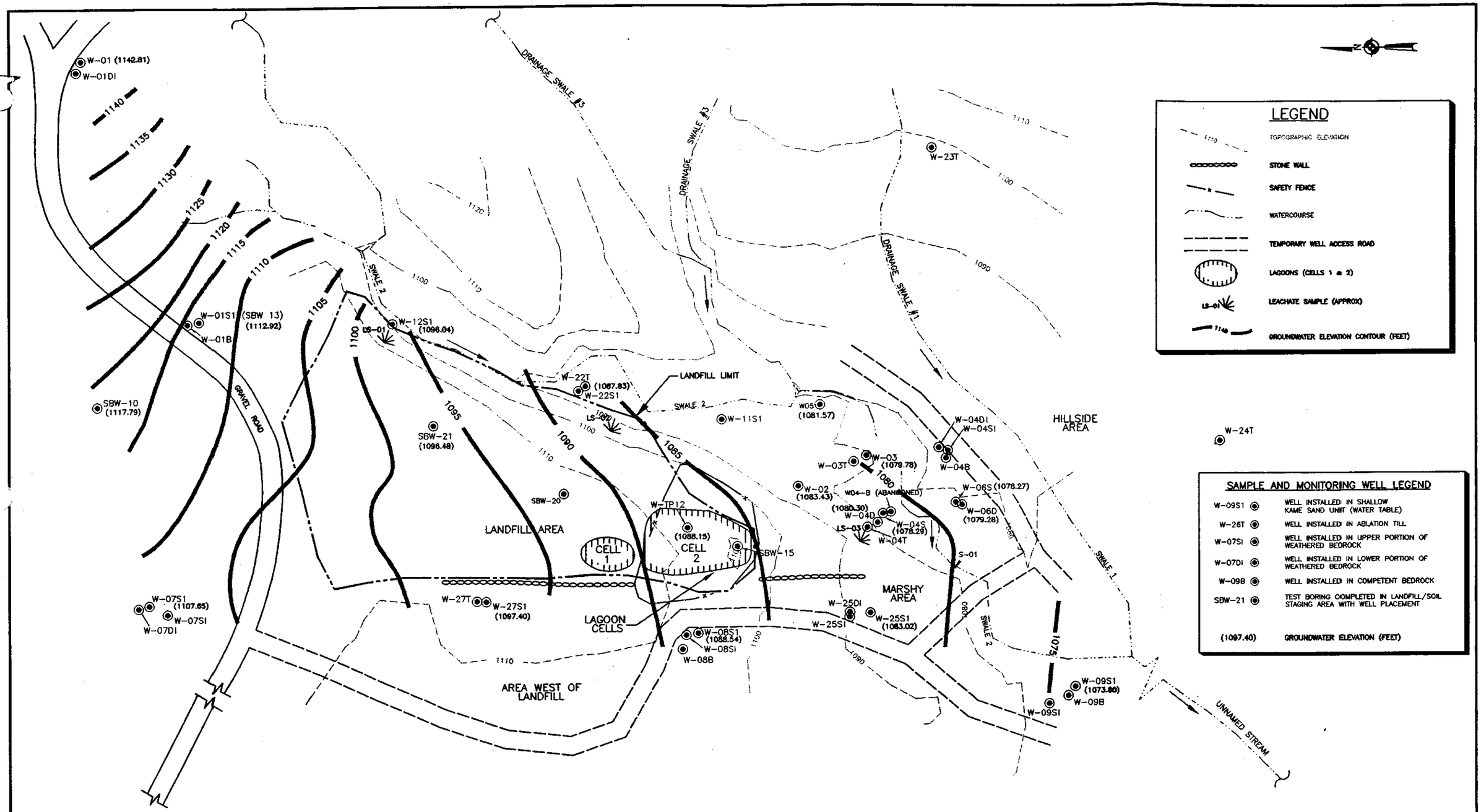
(617) 742-3228

BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by: AMP	SUPPLEMENTAL RI WOODFORD & BENNINGTON, VERMONT
Drawn by: KCW	
Checked by: AMP	SITE BASE MAP
Reviewed by: MW	Scale: 1"=60' / Date: 09/24/96
Submitted by: AMP/MW	File Name: LTMP_02.dwg / Project No. 397.03 / Figure No. 2



NOTE: WATER LEVEL FROM W-07SI WAS NOT USED TO CONSTRUCT MAP, BECAUSE THE WATER LEVEL IS LOW AND THE WELL IS NOT SCREENED OVER THE SAME DEPTH INTERVAL AS THE OTHER WELLS

When photographic reproduction is used; the drawings are not to scale. All scales are reduced from indicated to approximately half size.

GENERAL NOTES

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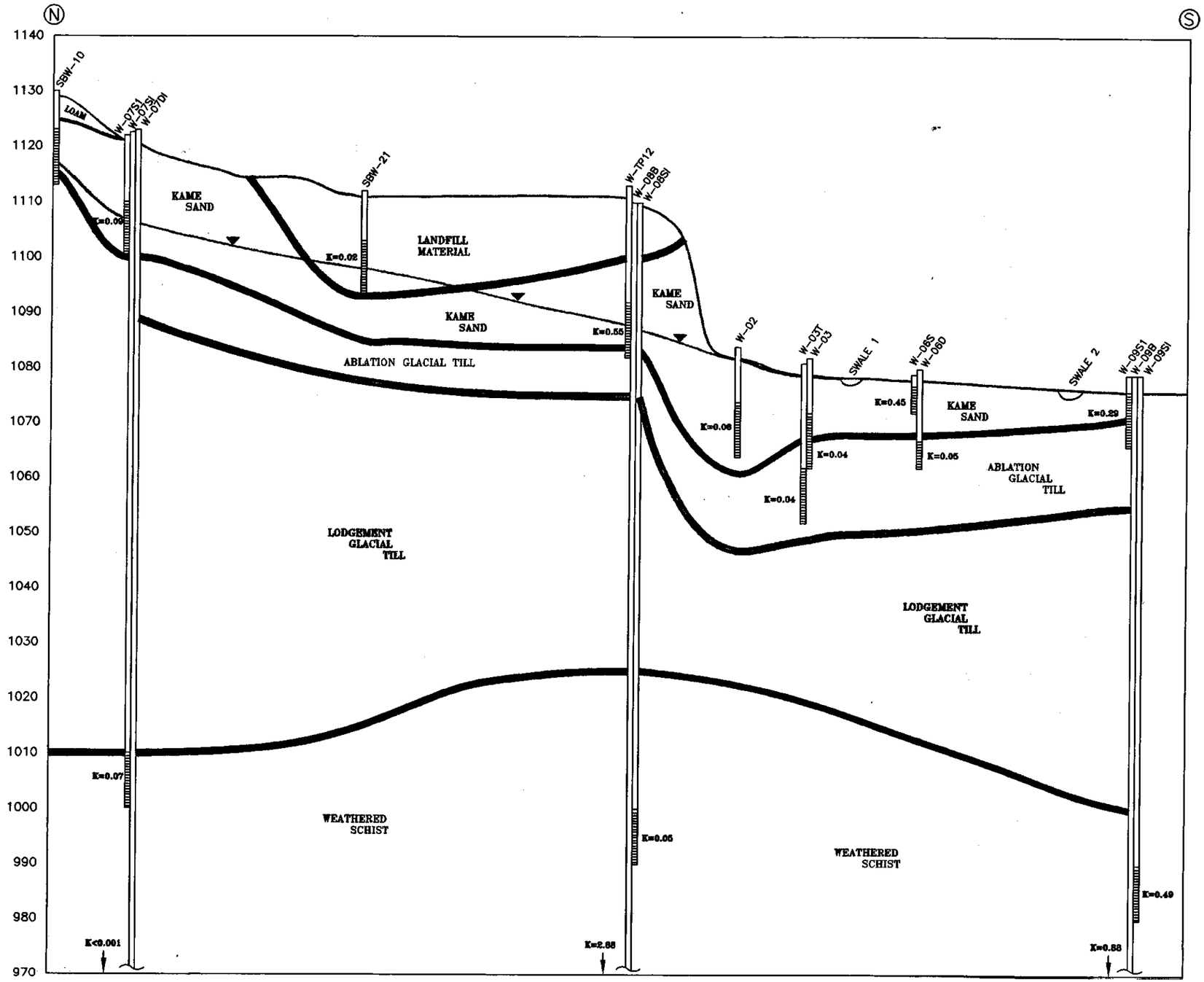
205 PORTLAND STREET - BOSTON, MA 02114 (617) 742-8228

CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: FIG_4A.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

Kame Sand Groundwater Flow Map — FIGURE NO. 4A

PROJECT MGR: AMP — TQM REV: MW



LEGEND

HORIZONTAL VELOCITIES

KAME SANDS	10–30	FT/YR
TILL	7	FT/YR
WEATHERED BEDROCK	5–8	FT/YR

AVERAGE HYDRAULIC CONDUCTIVITIES

	FT/D	CM/SEC
MARSHY AREA KAME	0.15	5.3×10^{-5}
LANDFILL AREA KAME	0.12	4.2×10^{-5}
LANDFILL MATERIALS	0.1	3.5×10^{-5}
ABLATION TILL	0.05	1.8×10^{-5}

K = HYDRUALIC CONDUCTIVITY (FT/D)

SCALE

VERTICAL SCALE	1"=20'
HORIZONTAL SCALE	1"=100'

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205 PORTLAND STREET – BOSTON, MA 02114 (617) 742–8228

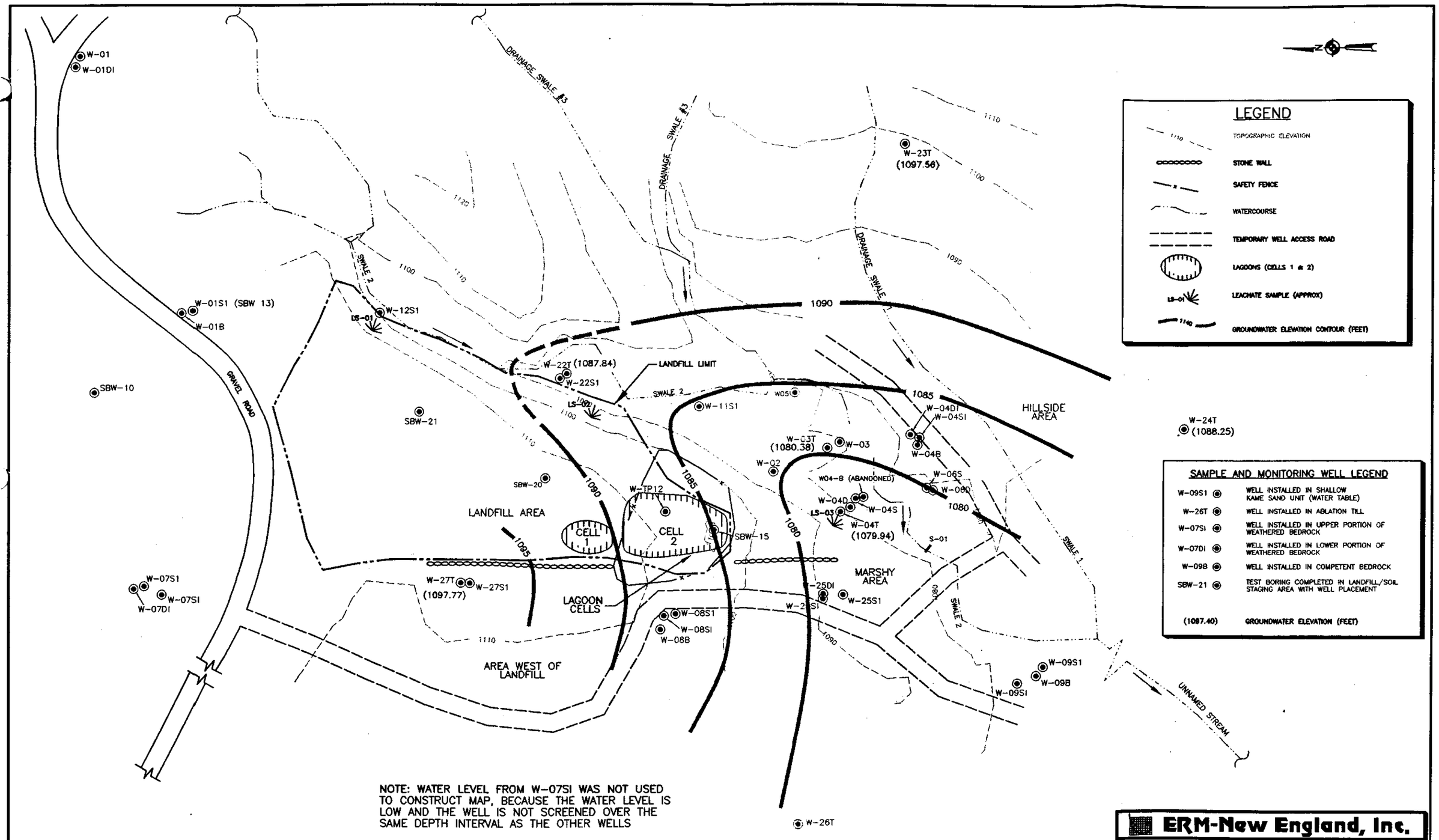
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: CROS_SEC.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

North–South Geologic Cross Section

FIGURE NO. 3

PROJECT MGR: AMP | TQM REV: MW



NOTE: WATER LEVEL FROM W-07SI WAS NOT USED TO CONSTRUCT MAP, BECAUSE THE WATER LEVEL IS LOW AND THE WELL IS NOT SCREENED OVER THE SAME DEPTH INTERVAL AS THE OTHER WELLS

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GENERAL NOTES

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SCALE

40 0 20 40 80 160

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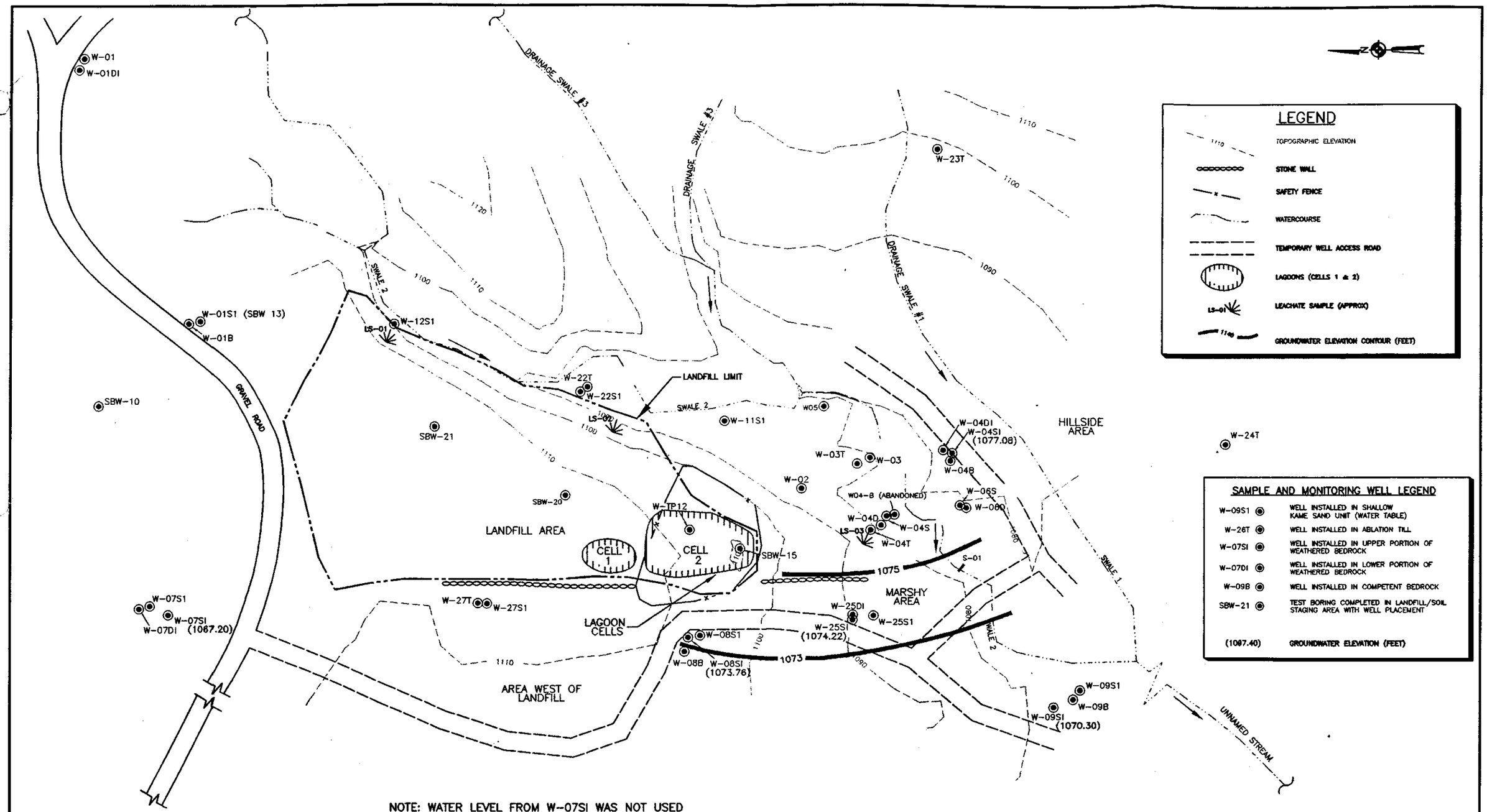
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: FIG_4B.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

Ablation Glacial Till Groundwater Flow Map

FIGURE NO. 4B

PROJECT MGR: AMP | TOM REV: MW



NOTE: WATER LEVEL FROM W-07SI WAS NOT USED TO CONSTRUCT MAP, BECAUSE THE WATER LEVEL IS LOW AND THE WELL IS NOT SCREENED OVER THE SAME DEPTH INTERVAL AS THE OTHER WELLS

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SCALE

40 0 20 40 80 160

ERM-New England, Inc.

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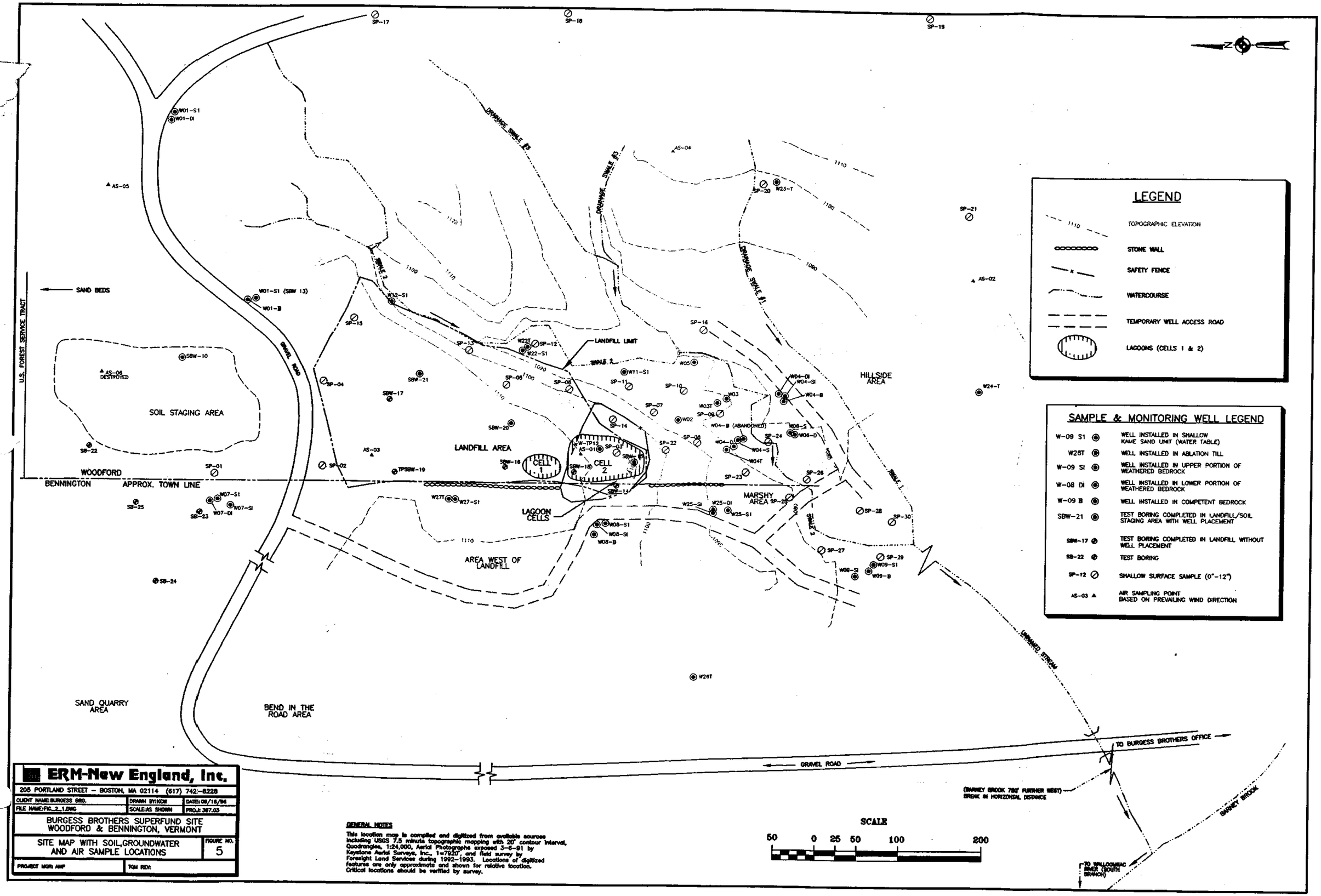
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: FIG_4C.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

Shallow Weathered Bedrock Groundwater Flow Map

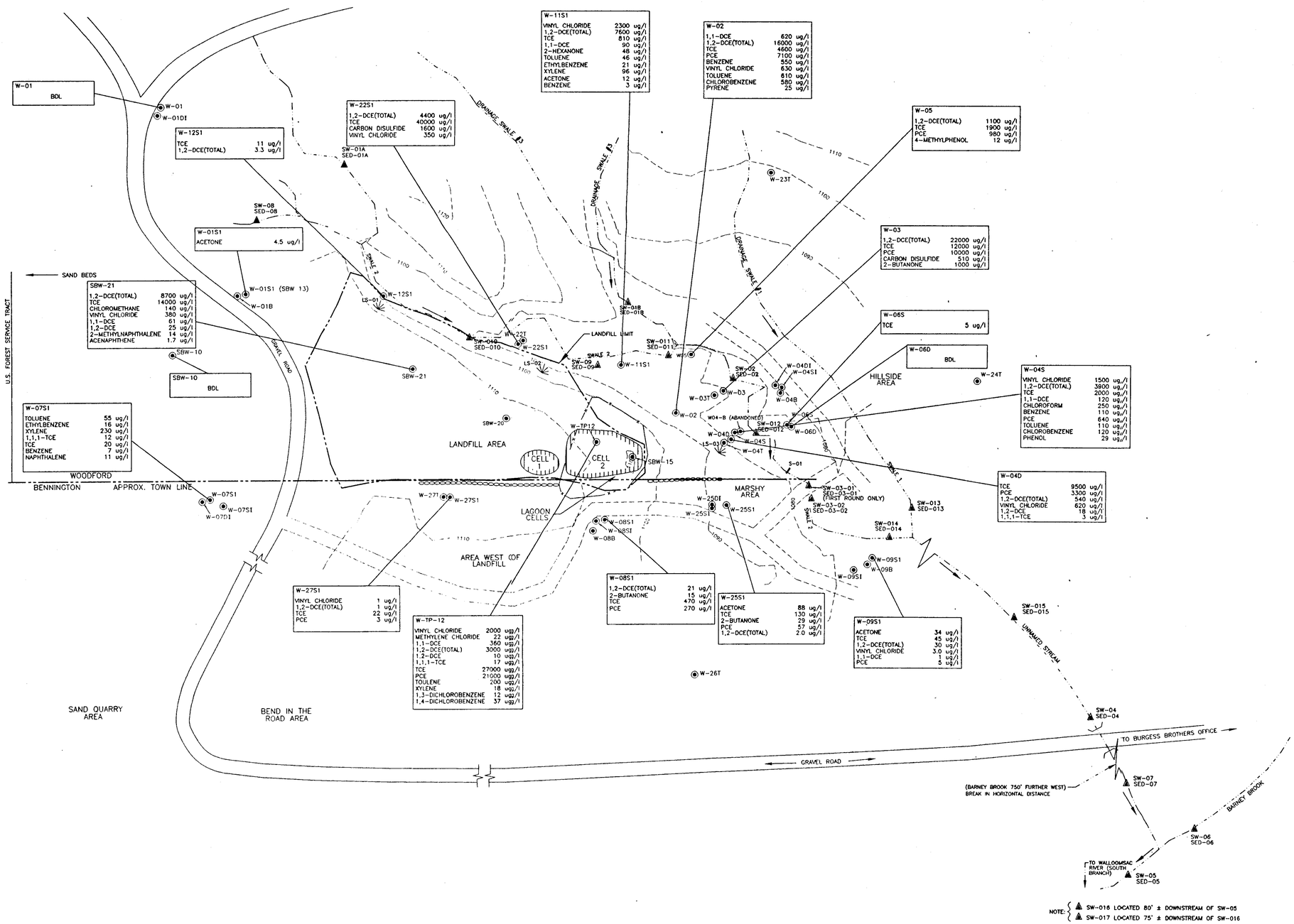
FIGURE NO. 4C

PROJECT MGR: AMP | TQM REV: MW



GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.



LEGEND

1110	TOPOGRAPHIC ELEVATION
	STONE WALL
x	SAFETY FENCE
	WATERCOURSE
	TEMPORARY WELL ACCESS ROAD
	LAGOONS (CELLS 1 & 2)
LS-01	LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

DETECTED ANALYTE — WELL ID — MAXIMUM CONCENTRATION (ug/l)

W-03

1,2-DCE(TOTAL)	22000 ug/l
TCE	12000 ug/l
PCE	10000 ug/l
CARBON DISULFIDE	510 ug/l
2-BUTANONE	1000 ug/l

BDL – ALL COMPOUNDS WERE BELOW METHOD DETECTION LIMITS
DCE – DICHLOROETHENE
PCE – TETRACHLOROETHENE
TCE – TRICHLOROETHENE

NOTE: ANALYTE CONCENTRATIONS REPORTED WERE HIGHEST VALUES REPORTED THROUGHOUT EIGHT SAMPLING ROUNDS. ANALYTES NOT PRESENTED WERE REPORTED BELOW METHOD DETECTION LIMITS.

SCALE
30 0 15 30 60 120

NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

GENERAL NOTES

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When photographic reproduction is used; the drawings are not to scale.

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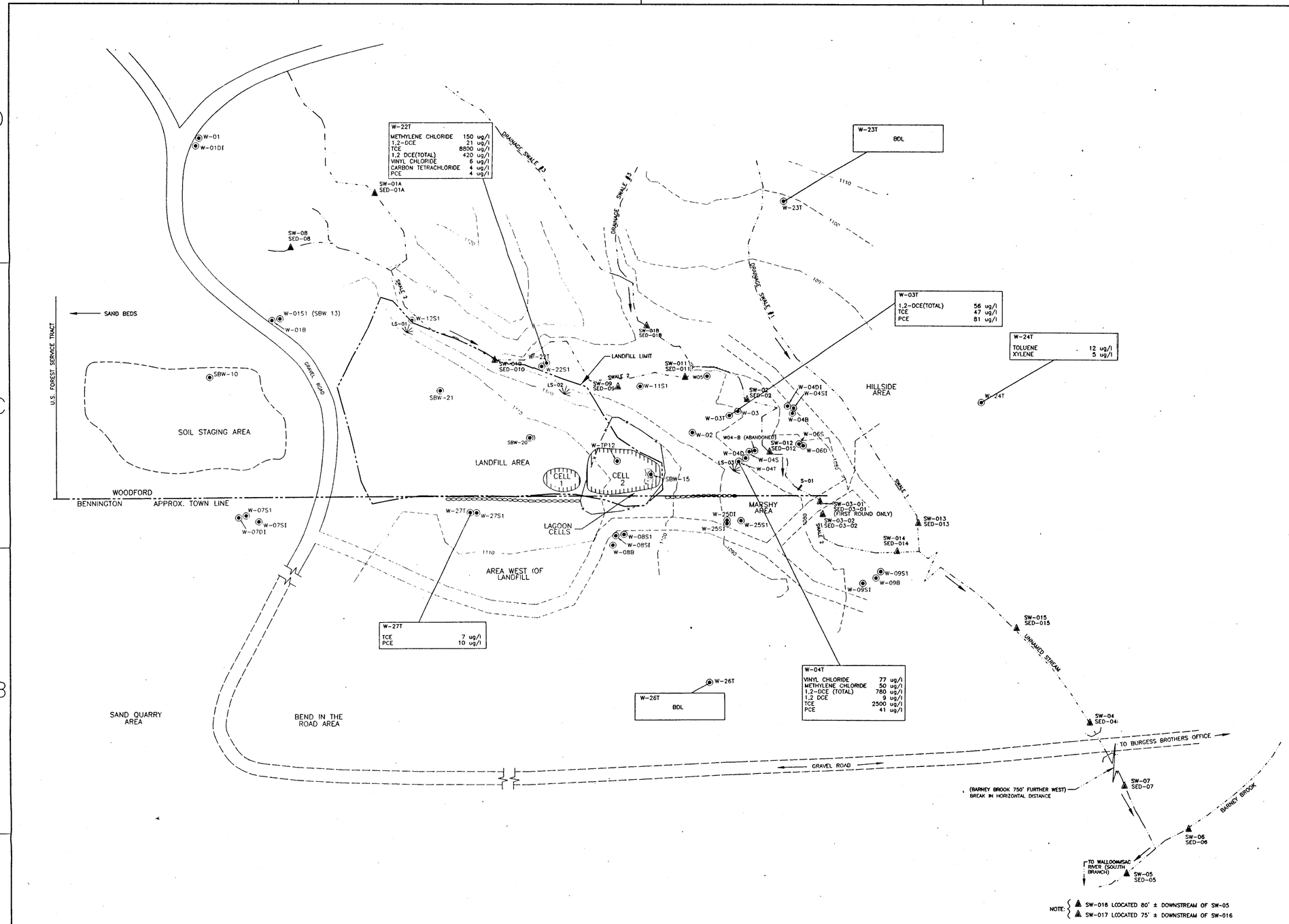
(617) 742-8228

BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by: AMP	SUMMARY OF ORGANICS DETECTED IN KAME SAND (VOCs, SVOCs, PCBs)
Drawn by: KCW	
Checked by: AMP	
Reviewed by: MW	Scale: 1"=60' — Date: 09/24/96
Submitted by: AMP/MW	File Name: LTMP_06.dwg — Project No. 397.03 — Figure No. 6



LEGEND

1110	TOPOGRAPHIC ELEVATION
	STONE WALL
x	SAFETY FENCE
	WATERCOURSE
	TEMPORARY WELL ACCESS ROAD
	LAGOONS (CELLS 1 & 2)
LS-01	LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

DETECTED ANALYTE — WELL ID — MAXIMUM CONCENTRATION (ug/l)

W-22T	
1,2-DCE(TOTAL)	22000 ug/l
TCE	12000 ug/l
PCE	10000 ug/l
CARBON DISULFIDE	510 ug/l
2-BUTANONE	1000 ug/l

BDL – ALL COMPOUNDS WERE BELOW METHOD DETECTION LIMITS
DCE – DICHLOROETHENE
PCE – TETRACHLOROETHENE
TCE – TRICHLOROETHENE

NOTE: ANALYTE CONCENTRATIONS REPORTED WERE HIGHEST VALUES REPORTED THROUGHOUT EIGHT SAMPLING ROUNDS. ANALYTES NOT PRESENTED WERE REPORTED BELOW METHOD DETECTION LIMITS.

SCALE
30 0 15 30 60 120

NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with :20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3—6—91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992–1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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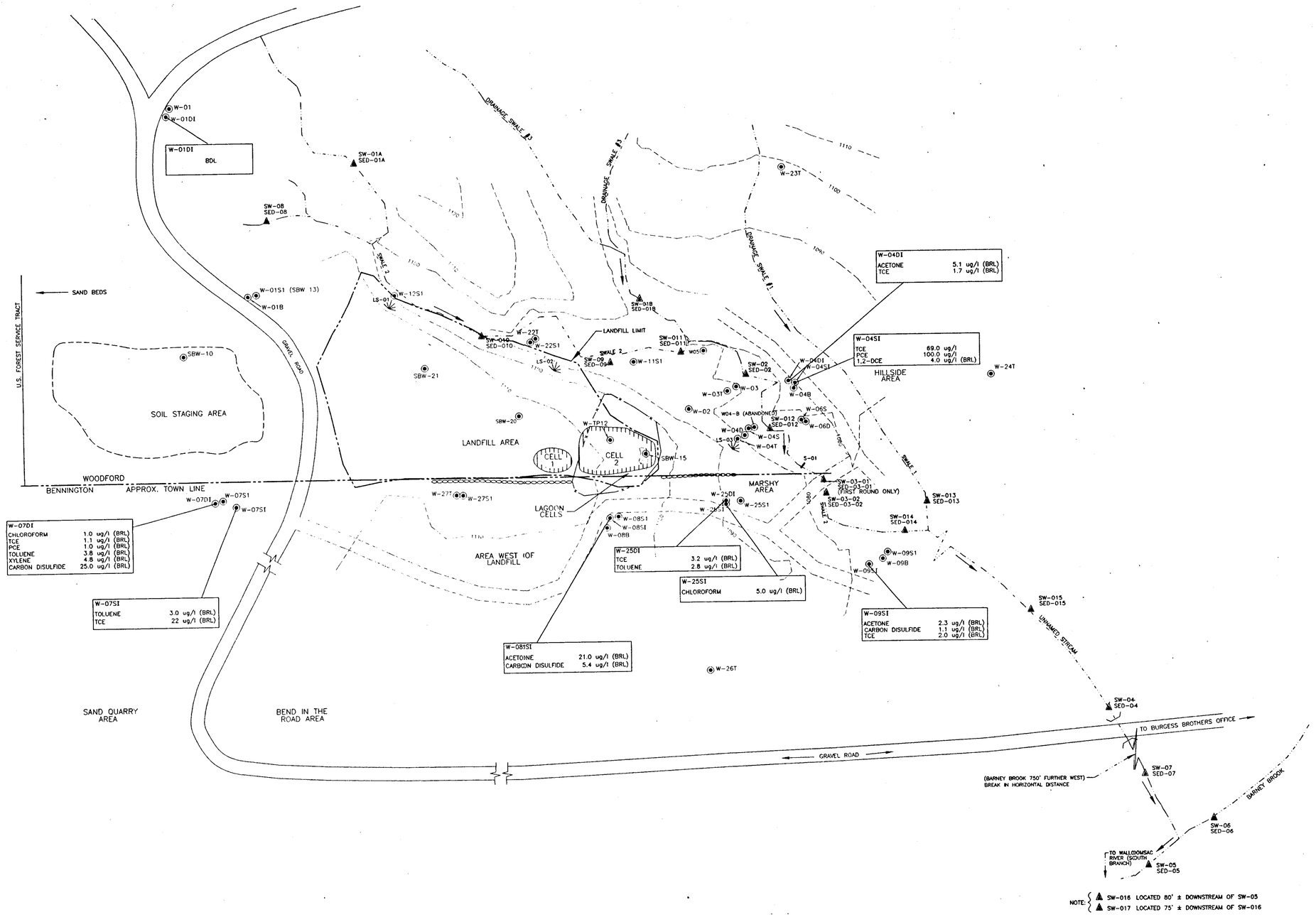
BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by: AMP	SUMMARY OF ORGANICS DETECTED IN ABLATION GLACIAL TILL (VOCs, SVOCs, PCBs)
Drawn by: KCW	
Checked by: AMP	
Reviewed by: MW	Scale: 1"=60' Date: 09/24/96
Submitted by: AMP/MW	File Name: LTMP_07.dwg Figure No. 7
	Project No. 397.03



W-07DI	
CHLOROFORM	1.0 ug/l (BRL)
TCE	1.1 ug/l (BRL)
PCE	1.0 ug/l (BRL)
TOLUENE	3.8 ug/l (BRL)
XYLENE	4.8 ug/l (BRL)
CARBON DISULFIDE	25.0 ug/l (BRL)

W-07SI	
TOLUENE	3.0 ug/l (BRL)
TCE	22 ug/l (BRL)

W-08SI	
ACETONE	21.0 ug/l (BRL)
CARBON DISULFIDE	5.4 ug/l (BRL)

W-25DI	
TCE	3.2 ug/l (BRL)
TOLUENE	2.8 ug/l (BRL)

W-25SI	
CHLOROFORM	5.0 ug/l (BRL)

W-09SI	
ACETONE	2.3 ug/l (BRL)
CARBON DISULFIDE	1.1 ug/l (BRL)
TCE	2.0 ug/l (BRL)

W-04DI	
ACETONE	5.1 ug/l (BRL)
TCE	1.7 ug/l (BRL)

W-04SI	
TCE	69.0 ug/l
PCE	100.0 ug/l
1,2-DCE	4.0 ug/l (BRL)

NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

LEGEND

- TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LS-01 LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

DETECTED ANALYTE — WELL ID — MAXIMUM CONCENTRATION (ug/l)

W-22T	
1,2-DCE(TOTAL)	22000 ug/l
TCE	12000 ug/l
PCE	10000 ug/l
CARBON DISULFIDE	510 ug/l
2-BUTANONE	1000 ug/l

BDL - ALL COMPOUNDS WERE BELOW METHOD DETECTION LIMITS
DCE - DICHLOROETHENE
PCE - TETRACHLOROETHENE
TCE - TRICHLOROETHENE

NOTE: ANALYTE CONCENTRATIONS REPORTED WERE HIGHEST VALUES REPORTED THROUGHOUT EIGHT SAMPLING ROUNDS. ANALYTES NOT PRESENTED WERE REPORTED BELOW METHOD DETECTION LIMITS.

SCALE
30 0 15 30 60 120

When photographic reproduction is used; the drawings are not to scale.

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locatiions of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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205 PORTLAND STREET-BOSTON, MA 02114
(617) 742-3228

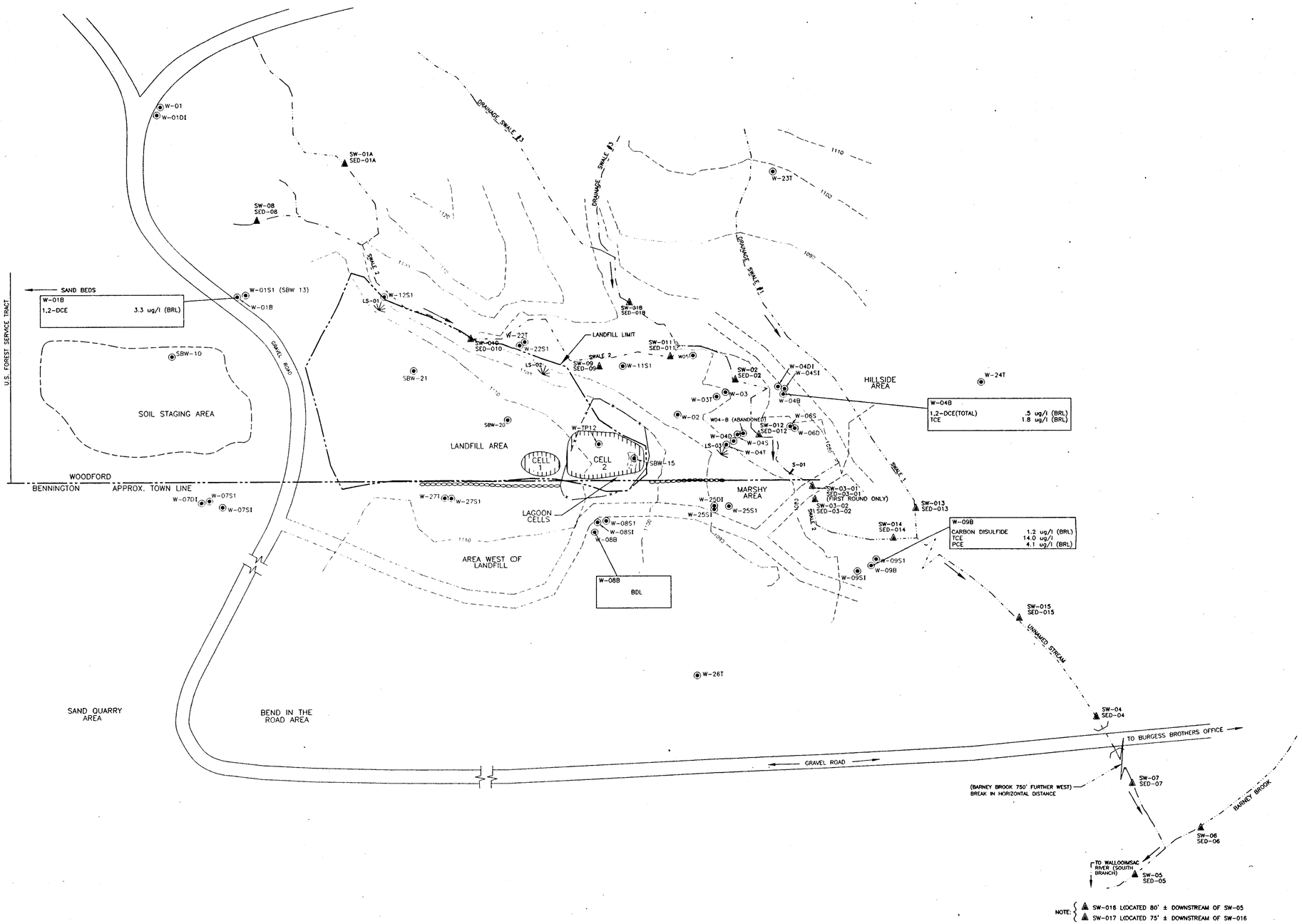
BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by:	AMP
Drawn by:	KCW
Checked by:	AMP
Reviewed by:	MW
Submitted by:	AMP/MW

SUMMARY OF ORGANICS DETECTED IN SHALLOW & DEEP WEATHERED BEDROCK

(VOCs, SVOCs, PCBs)

Scale: 1"=60'
Date: 09/24/96
File Name: LTMP_08.dwg
Figure No. 8
Project No. 397.03



LEGEND

- TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

DETECTED ANALYTE — WELL ID — MAXIMUM CONCENTRATION (ug/l)

W-22T

1,2-DCE(TOTAL)	22000 ug/l
TCE	12000 ug/l
PCE	10000 ug/l
CARBON DISULFIDE	510 ug/l
2-BUTANONE	1000 ug/l

BDL – ALL COMPOUNDS WERE BELOW METHOD DETECTION LIMITS
DCE – DICHLOROETHENE
PCE – TETRACHLOROETHENE
TCE – TRICHLOROETHENE

NOTE: ANALYTE CONCENTRATIONS REPORTED WERE HIGHEST VALUES REPORTED THROUGHOUT EIGHT SAMPLING ROUNDS. ANALYTES NOT PRESENTED WERE REPORTED BELOW METHOD DETECTION LIMITS.

SCALE
30 0 15 30 60 120

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000. Aerial Photographs exposed 3–6–91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992–1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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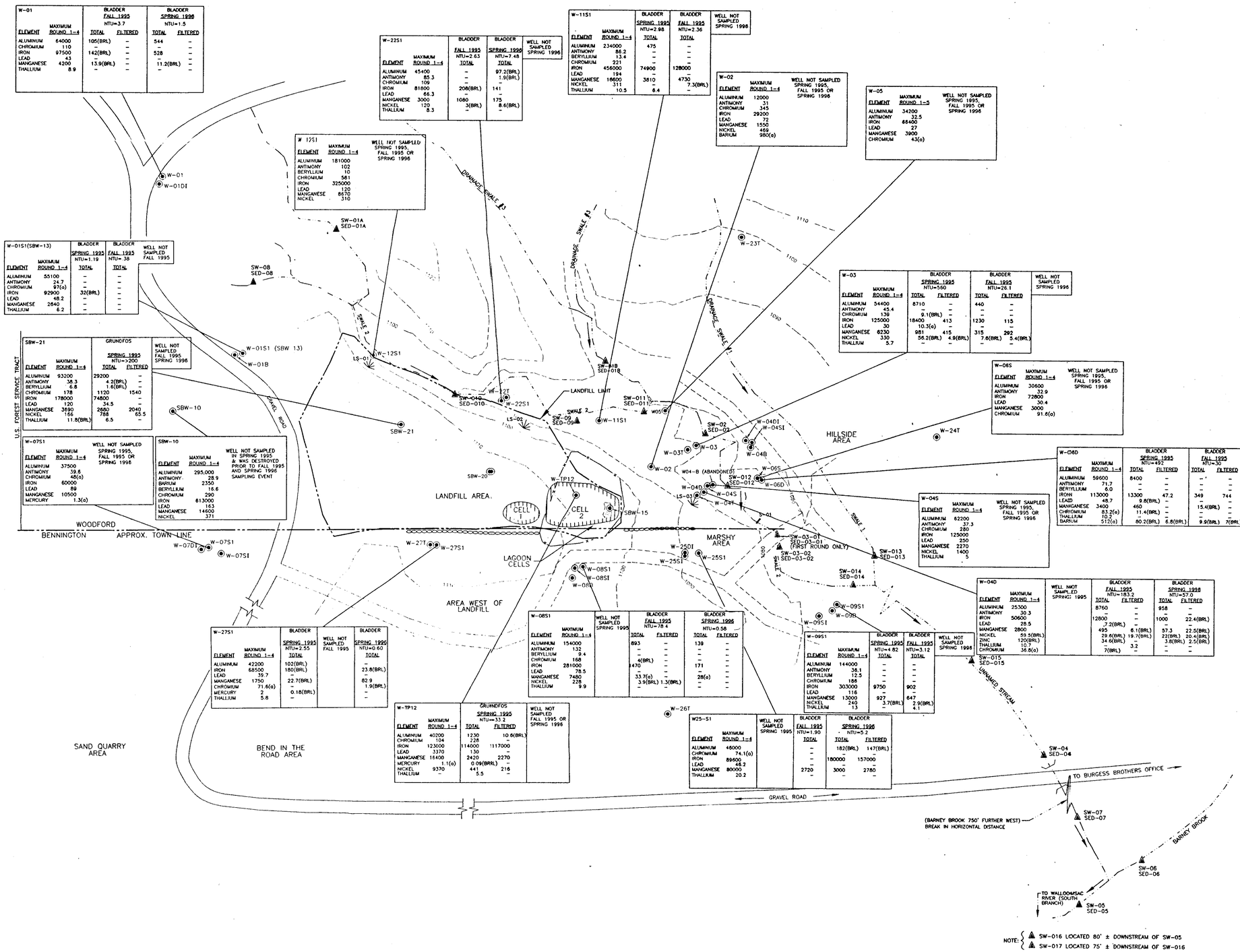
Designed by: AMP	SUMMARY OF ORGANICS DETECTED IN COMPETENT BEDROCK (VOCs, SVOCs, PCBs)
Drawn by: KCW	
Checked by: AMP	
Reviewed by: MW	Scale: 1"=60' Date: 09/24/96
Submitted by: AMP/MW	File Name: LTMP_09.dwg Figure No. 9 Project No. 397.03



W-01		BLADDER FALL 1995 NTU=3.7		BLADDER SPRING 1996 NTU=1.5	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64000	105(BRL)	–	544	–
CHROMIUM	110	–	–	–	–
IRON	97500	142(BRL)	–	528	–
LEAD	43	–	–	–	–
MANGANESE	4200	13.9(BRL)	–	11.2(BRL)	–
THALLIUM	8.9	–	–	–	–

W-22S1		BLADDER FALL 1995 NTU=2.63		BLADDER SPRING 1996 NTU=7.48	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL		TOTAL	
ALUMINUM	45400	–		97.2(BRL)	
ANTIMONY	85.3	–		1.9(BRL)	
CHROMIUM	109	–		–	
IRON	81800	208(BRL)		141	
LEAD	66.3	–		–	
MANGANESE	3000	1080		175	
NICKEL	120	3(BRL)		8.6(BRL)	
THALLIUM	8.3	–		–	

WELL NOT SAMPLED SPRING 1996

W-11S1		BLADDER SPRING 1995 NTU=2.98		BLADDER FALL 1995 NTU=2.36	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL		TOTAL	
ALUMINUM	234000	475		–	
ANTIMONY	86.2	–		–	
BERYLLIUM	13.4	–		–	
CHROMIUM	221	–		–	
IRON	456000	74900		128000	
LEAD	194	–		–	
MANGANESE	16600	3610		4730	
NICKEL	311	–		7.3(BRL)	
THALLIUM	10.5	6.4		–	

WELL NOT SAMPLED SPRING 1996

W-02		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	12000	
ANTIMONY	31	
CHROMIUM	345	
IRON	29200	
LEAD	72	
MANGANESE	1550	
NICKEL	469	
BARIUM	980(a)	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

W-05		
ELEMENT	MAXIMUM ROUND 1-5	
ALUMINUM	34200	
ANTIMONY	32.5	
IRON	86400	
LEAD	27	
MANGANESE	3900	
CHROMIUM	43(a)	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

W 12S1		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	181000	
ANTIMONY	102	
BERYLLIUM	10	
CHROMIUM	561	
IRON	325000	
LEAD	120	
MANGANESE	8670	
NICKEL	310	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

W-01S1(SBW-13)		BLADDER SPRING 1995 NTU=1.19	BLADDER FALL 1995 NTU=38
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	TOTAL
ALUMINUM	55100	–	–
ANTIMONY	24.7	–	–
CHROMIUM	97(a)	–	–
IRON	92900	32(BRL)	–
LEAD	48.2	–	–
MANGANESE	2640	–	–
THALLIUM	6.2	–	–

WELL NOT SAMPLED FALL 1995

SBW-21		GRUNDFOS SPRING 1995 NTU=>200	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED
ALUMINUM	93200	29200	–
ANTIMONY	38.3	4.2(BRL)	–
BERYLLIUM	6.8	1.6(BRL)	–
CHROMIUM	178	1120	1540
IRON	178000	74800	–
LEAD	120	34.5	–
MANGANESE	3690	2680	2040
NICKEL	156	788	65.5
THALLIUM	11.8(BRL)	6.5	–

WELL NOT SAMPLED FALL 1995 SPRING 1996

W-03		BLADDER SPRING 1995 NTU=560		BLADDER FALL 1995 NTU=26.1	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	54400	8710	–	440	–
ANTIMONY	45.4	–	–	–	–
CHROMIUM	139	–	9.1(BRL)	–	–
IRON	125000	18400	413	1230	115
LEAD	30	–	10.3(a)	–	–
MANGANESE	6230	981	415	315	292
NICKEL	330	56.2(BRL)	4.9(BRL)	7.6(BRL)	5.4(BRL)
THALLIUM	5.7	–	–	–	–

WELL NOT SAMPLED SPRING 1996

W-06S		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	30600	
ANTIMONY	32.9	
IRON	72800	
LEAD	30.4	
MANGANESE	3000	
CHROMIUM	91.6(a)	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

W-07S1		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	37500	
ANTIMONY	39.6	
CHROMIUM	48(a)	
IRON	60000	
LEAD	89	
MANGANESE	10500	
MERCURY	1.3(a)	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

SBW-10		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	295,000	
ANTIMONY	28.9	
BARIUM	2350	
BERYLLIUM	16.6	
CHROMIUM	290	
IRON	613000	
LEAD	163	
MANGANESE	14600	
NICKEL	371	

WELL NOT SAMPLED IN SPRING 1995 & WAS DESTROYED PRIOR TO FALL 1995 AND SPRING 1996 SAMPLING EVENT

W-04S		
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	62200	
ANTIMONY	37.3	
CHROMIUM	280	
IRON	125000	
LEAD	250	
MANGANESE	2270	
NICKEL	1400	
THALLIUM	5	

WELL NOT SAMPLED SPRING 1995, FALL 1995 OR SPRING 1996

W-06D		BLADDER SPRING 1995 NTU=492		BLADDER FALL 1995 NTU=30	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	59600	8400	–	–	–
ANTIMONY	71.7	–	–	–	–
BERYLLIUM	6.0	–	–	–	–
IRON	113000	13300	47.2	349	744
LEAD	45.7	9.8(BRL)	–	–	–
MANGANESE	3400	460	–	15.4(BRL)	–
CHROMIUM	83.2(a)	11.4(BRL)	–	–	–
THALLIUM	10.2	–	–	–	–
BARIUM	512(a)	80.2(BRL)	6.8(BRL)	9.9(BRL)	7(BRL)

WELL NOT SAMPLED SPRING 1996

W-04D		WELL NOT SAMPLED SPRING 1995	BLADDER FALL 1995 NTU=183.2		BLADDER SPRING 1996 NTU=57.0	
ELEMENT	MAXIMUM ROUND 1-4		TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	25300		8760	–	958	–
ANTIMONY	30.3		–	–	–	–
IRON	50600		12800	–	1000	22.4(BRL)
LEAD	28.5		7.2(BRL)	–	–	–
MANGANESE	2800		495	6.1(BRL)	57.3	22.5(BRL)
NICKEL	59.5(BRL)		29.6(BRL)	19.7(BRL)	22(BRL)	20.4(BRL)
ZINC	120(BRL)		34.6(BRL)	–	3.8(BRL)	2.5(BRL)
THALLIUM	10.7		–	3.2	–	–
CHROMIUM	36.8(a)		7(BRL)	–	–	–

W-27S1		BLADDER SPRING 1995 NTU=2.55		BLADDER SPRING 1996 NTU=0.60
ELEMENT	MAXIMUM ROUND 1-4	TOTAL		TOTAL
ALUMINUM	42200	102(BRL)		–
IRON	68500	180(BRL)		23.8(BRL)
LEAD	39.7	–		82.9
MANGANESE	1750	22.7(BRL)		1.9(BRL)
CHROMIUM	71.6(a)	–		–
MERCURY	2	0.18(BRL)		–
THALLIUM	5.8	–		

WELL NOT SAMPLED FALL 1995

W-08S1		WELL NOT SAMPLED SPRING 1995	BLADDER FALL 1995 NTU=78.4		BLADDER SPRING 1996 NTU=0.58	
ELEMENT	MAXIMUM ROUND 1-4		TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	154000		893	–	139	–
ANTIMONY	132		–	–	–	–
BERYLLIUM	9.4		–	–	–	–
CHROMIUM	168		8(BRL)	–	–	–
IRON	281000		1470	–	171	–
LEAD	78.5		–	–	–	–
MANGANESE	7480		33.7(a)	–	28(a)	–
NICKEL	228		3.9(BRL)	1.3(BRL)	–	–
THALLIUM	9.9		–	–	–	–

W-09S1		BLADDER SPRING 1995 NTU=4.82		BLADDER FALL 1995 NTU=3.12	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL		TOTAL	
ALUMINUM	144000	–		–	
ANTIMONY	38.1	–		–	
BERYLLIUM	12.5	–		–	
CHROMIUM	188	–		–	
IRON	303000	9750		902	
LEAD	116	–		–	
MANGANESE	13000	923		647	
NICKEL	240	3.7(BRL)		2.9(BRL)	
THALLIUM	13	–		4.1	

WELL NOT SAMPLED SPRING 1996

W-TP12		GRUNDFOS SPRING 1995 NTU=33.2	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED
ALUMINUM	40200	1230	10.6(BRL)
CHROMIUM	104	226	–
IRON	123000	114000	117000
LEAD	3370	130	–
MANGANESE	16400	2420	2270
MERCURY	1.1(a)	0.09(BRL)	–
NICKEL	9370	441	216
THALLIUM	–	5.5	–

WELL NOT SAMPLED FALL 1995 OR SPRING 1996

W25-S1		WELL NOT SAMPLED SPRING 1995	BLADDER FALL 1995 NTU=1.90	BLADDER SPRING 1996 NTU=5.2	
ELEMENT	MAXIMUM ROUND 1-4		TOTAL	TOTAL	FILTERED
ALUMINUM	46000		–	182(BRL)	147(BRL)
CHROMIUM	74.1(a)		–	–	–
IRON	89600		–	180000	157000
LEAD	46.2		–	–	–
MANGANESE	80000		2720	3000	2780
THALLIUM	20.2		–	–	–

LEGEND

- 1110 — TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LS-01 — LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

- W-09S1 — WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
- W-26T — WELL INSTALLED IN ABLATION TILL
- W-07SI — WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
- W-07DI — WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
- W-09B — WELL INSTALLED IN COMPETENT BEDROCK
- SBW-21 — TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
- SW-013 / SED-013 — SURFACE WATER AND SEDIMENT SAMPLE

NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

NOTE: METALS REPORTED ONLY INCLUDE THOSE DETECTED ABOVE MCLs, SECONDARY MCLs, VERMONT ENFORCEMENT STANDARDS (VES), VERMONT PREVENTATIVE ACTION LIMITS (VT. PALs) OR EPA DERIVED RISK LEVEL (MANGANESE ONLY). CONCENTRATIONS REPORTED IN THE FIRST COLUMN WERE THE HIGHEST VALUES DETECTED THROUGHOUT FIVE SAMPLING EVENTS AND WERE COLLECTED USING CONVENTIONAL PURGE AND SAMPLING TECHNIQUES. THE SPRING 1995, FALL 1995 & SPRING 1996 SAMPLES WERE COLLECTED USING LOW FLOW PURGE AND SAMPLING TECHNIQUES. VALUES REPORTED UNDER TOTAL METALS ARE UNFILTERED SAMPLE ANALYTICAL RESULTS. FILTERED METALS SAMPLES WERE ONLY COLLECTED DURING THE LOW FLOW SAMPLING EVENTS IF A TURBIDITY LESS THAN 5 NTU COULD NOT BE ACHIEVED.

WELL ID — W-01

CONCENTRATIONS (ug/l)

DETECTED METALS		BLADDER SPRING 1995 NTU=520		BLADDER FALL 1995 NTU=3.7	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64000	9300	54.4(BRL)	105(BRL)	–
CHROMIUM	110	17.3(BRL)	–	–	–
IRON	97500	136000	–	142(BRL)	–
LEAD	43	9(BRL)	–	–	–
MANGANESE	4200	381	–	13.9(BRL)	–
THALLIUM	8.9	–	–	–	–
ZINC	230	39.6	–	101(BRL)	–

BRL – DETECTED CONCENTRATIONS ARE BELOW MCLs, SECONDARY MCLs, VES AND VT. PALs
– NOT DETECTED ABOVE METHOD DETECTION LIMITS
(a) – ONLY EXCEEDS VT. PALs

SCALE: 30 0 15 30 60 120

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

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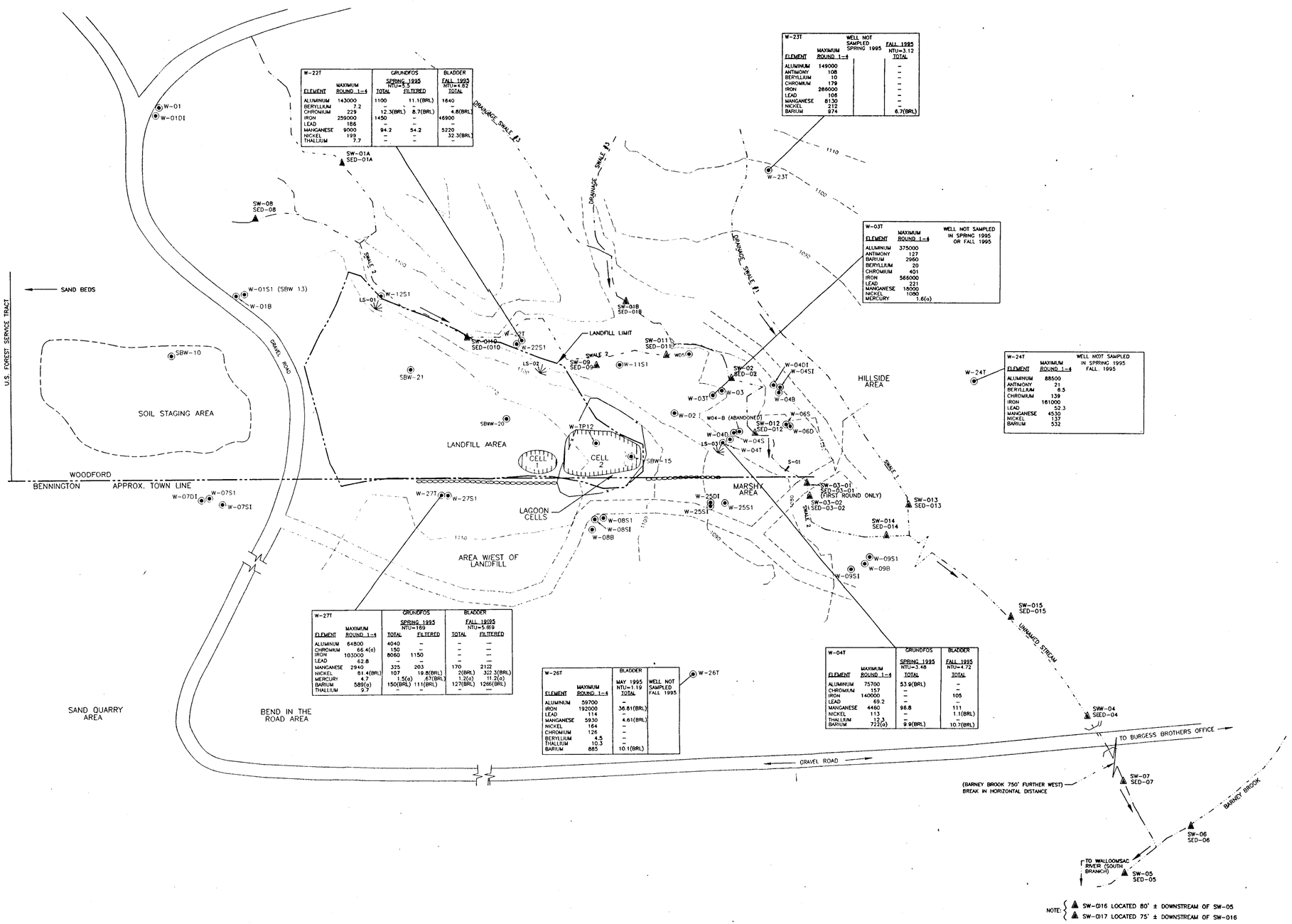
WOODFORD & BENNINGTON, VERMONT

Designed by:	AMP
Drawn by:	KCW
Checked by:	AMP
Reviewed by:	MW
Submitted by:	AMP/MW

SUMMARY OF INORGANICS DETECTED IN KAME SAND

Scale: 1"=60' | Date: 09/24/96
File Name: LTMP_10.dwg | Figure No. 10
Project No. 397.03



W-22T		GRUNDFOS SPRING 1995 NTU=5.5		BLADDER FALL 1995 NTU=4.62
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL
ALUMINUM	143000	1100	11.1(BRL)	1640
BERYLLIUM	7.2	–	–	–
CHROMIUM	229	12.3(BRL)	8.7(BRL)	4.8(BRL)
IRON	259000	1450	–	46900
LEAD	186	–	–	–
MANGANESE	9000	94.2	54.2	5220
NICKEL	199	–	–	32.3(BRL)
THALLIUM	7.7	–	–	–

W-23T		WELL NOT SAMPLED SPRING 1995	FALL 1995 NTU=3.12
ELEMENT	MAXIMUM ROUND 1-4		TOTAL
ALUMINUM	149000		–
ANTIMONY	108		–
BERYLLIUM	10		–
CHROMIUM	179		–
IRON	266000		–
LEAD	108		–
MANGANESE	8130		–
NICKEL	212		–
BARIUM	974		6.7(BRL)

W-03T		WELL NOT SAMPLED IN SPRING 1995 OR FALL 1995
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	375000	
ANTIMONY	127	
BARIUM	2960	
BERYLLIUM	20	
CHROMIUM	401	
IRON	565000	
LEAD	221	
MANGANESE	18000	
NICKEL	1090	
MERCURY	1.6(a)	

W-24T		WELL NOT SAMPLED IN SPRING 1995 FALL 1995
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	88500	
ANTIMONY	21	
BERYLLIUM	6.5	
CHROMIUM	139	
IRON	161000	
LEAD	52.3	
MANGANESE	4530	
NICKEL	137	
BARIUM	532	

W-27T		GRUNDFOS SPRING 1995 NTU=169		BLADDER FALL 1995 NTU=5.659	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64800	4040	–	–	–
CHROMIUM	66.4(a)	150	–	–	–
IRON	103000	8060	1150	–	–
LEAD	62.8	–	–	–	–
MANGANESE	2940	325	203	170	2122
NICKEL	81.4(BRL)	107	19.8(BRL)	2(BRL)	322.3(BRL)
MERCURY	4.7	1.5(a)	67(BRL)	1.2(a)	11.2(a)
BARIUM	589(a)	150(BRL)	111(BRL)	127(BRL)	1266(BRL)
THALLIUM	9.7	–	–	–	–

W-26T		BLADDER MAY 1995 NTU=1.19	WELL NOT SAMPLED FALL 1995
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	
ALUMINUM	59700	–	
IRON	192000	36.81(BRL)	
LEAD	114	–	
MANGANESE	5930	4.61(BRL)	
NICKEL	164	–	
CHROMIUM	126	–	
BERYLLIUM	4.5	–	
THALLIUM	10.3	–	
BARIUM	885	10.1(BRL)	

W-04T		GRUNDFOS SPRING 1995	BLADDER FALL 1995 NTU=4.72
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	TOTAL
ALUMINUM	75700	53.9(BRL)	–
CHROMIUM	157	–	–
IRON	140000	–	105
LEAD	69.2	–	–
MANGANESE	4460	96.8	111
NICKEL	113	–	1.1(BRL)
THALLIUM	12.3	–	–
BARIUM	722(a)	9.9(BRL)	10.7(BRL)

NOTE: { SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

LEGEND

- TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LS-01 LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
W-26T	WELL INSTALLED IN ABLATION TILL
W-07SI	WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
W-07DI	WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE

NOTE: METALS REPORTED ONLY INCLUDE THOSE DETECTED ABOVE MCLs, SECONDARY MCLs,VERMONT ENFORCEMENT STANDARDS (VES), VERMONT PREVENTATIVE ACTION LIMITS (VT. PALs) OR EPA DERIVED RISK LEVEL (MANGANESE ONLY).
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WELL ID — CONCENTRATIONS (ug/l) — DETECTED METALS

W-01		SPRING 1995 NTU=520		BLADDER FALL 1995 NTU=3.7	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64000	9300	54.4(BRL)	105(BRL)	–
CHROMIUM	110	17.3(BRL)	–	–	–
IRON	97500	136000	–	142(BRL)	–
LEAD	43	9(BRL)	–	–	–
MANGANESE	4200	361	–	13.9(BRL)	–
THALLIUM	8.9	–	–	–	–
ZINC	230	39.6	–	101(BRL)	–

BRL – DETECTED CONCENTRATIONS ARE BELOW MCLs, SECONDARY MCLs,VES AND VT. PALs
– NOT DETECTED ABOVE METHOD DETECTION LIMITS
(a) – ONLY EXCEEDS VT. PALs

SCALE
30 0 15 30 60 120

GENERAL NOTES

This location map is compiled and digitized froom available sources including USGS 7.5 minute topographic mappincg with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystore Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locations of digitized features are only approximate and shown for rrelative location. Critical locations should be verified by survey.

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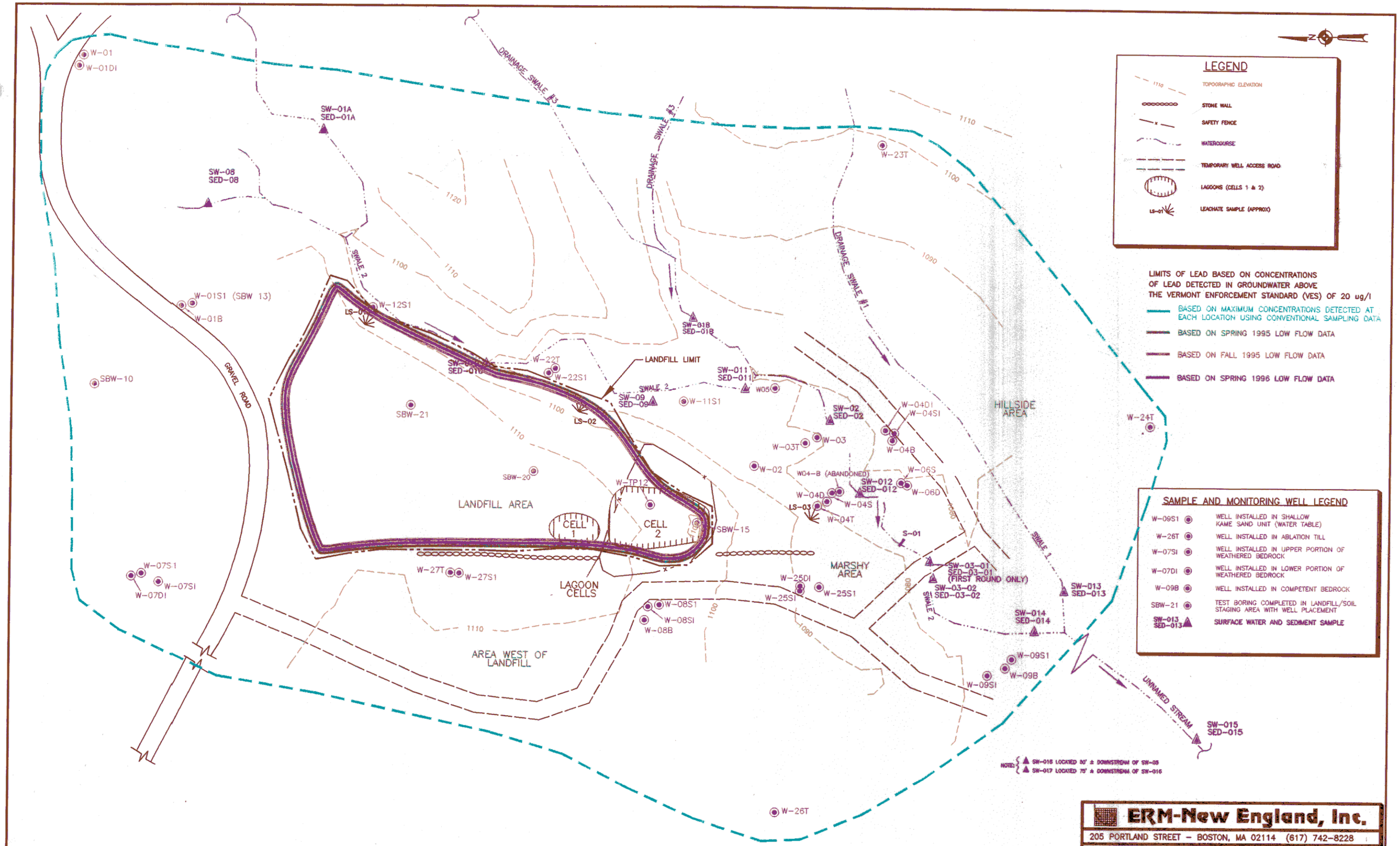
BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by:	AMP
Drawn by:	KCW
Checked by:	AMP
Reviewed by:	MW
Submitted by:	AMP/MW

SUMMARY OF INORGANICS DETECTED IN ABLATION GLACIAL TILL

Scale: 1"=60' | Date: 09/24/96
File Name: LTMP_11.dwg | Figure No. 11
Project No. 397.03



When photographic reproduction is used; the drawings are not to scale. All scales are reduced from indicated to approximately half size.

GENERAL NOTES

This location map is compiled and digitized from available sources including USGS 7.5 minute topographic mapping with 20' contour interval, Quadrangles, 1:24,000, Aerial Photographs exposed 3-6-91 by Keystone Aerial Surveys, Inc., 1=7920', and field survey by Foresight Land Services during 1992-1993. Locations of digitized features are only approximate and shown for relative location. Critical locations should be verified by survey.

SCALE

40 0 20 40 80 160

ERM-New England, Inc.

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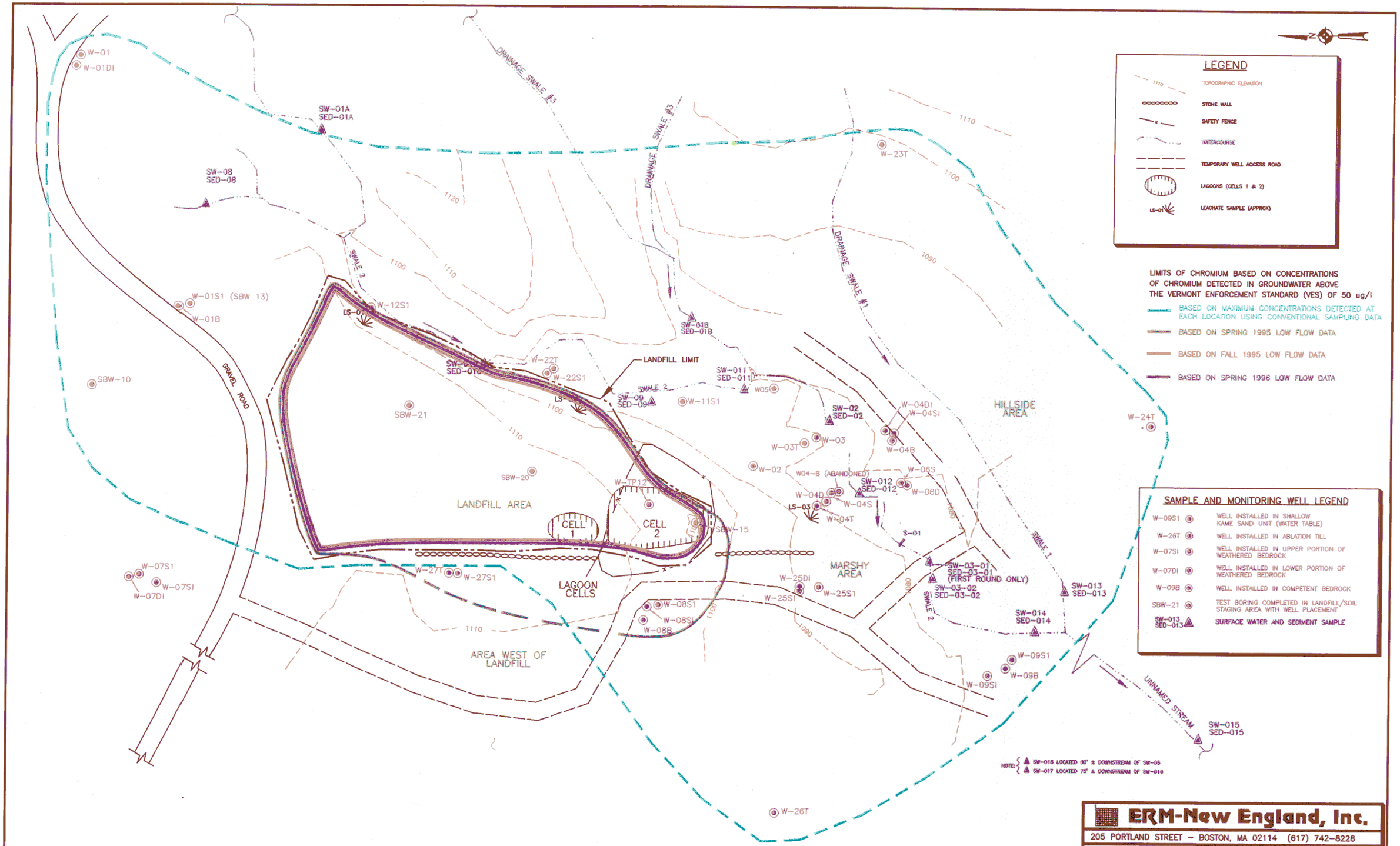
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: LTMP_12.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

EXTENT OF LEAD IN UNCONSOLIDATED OVERBURDEN

FIGURE NO. 12

PROJECT MGR: AMP | TQM REV: MW



When photographic reproduction is used; the drawings are not to scale. All scales are reduced from indicated to approximately half size.

GENERAL NOTES

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SCALE

40 0 20 40 80 160

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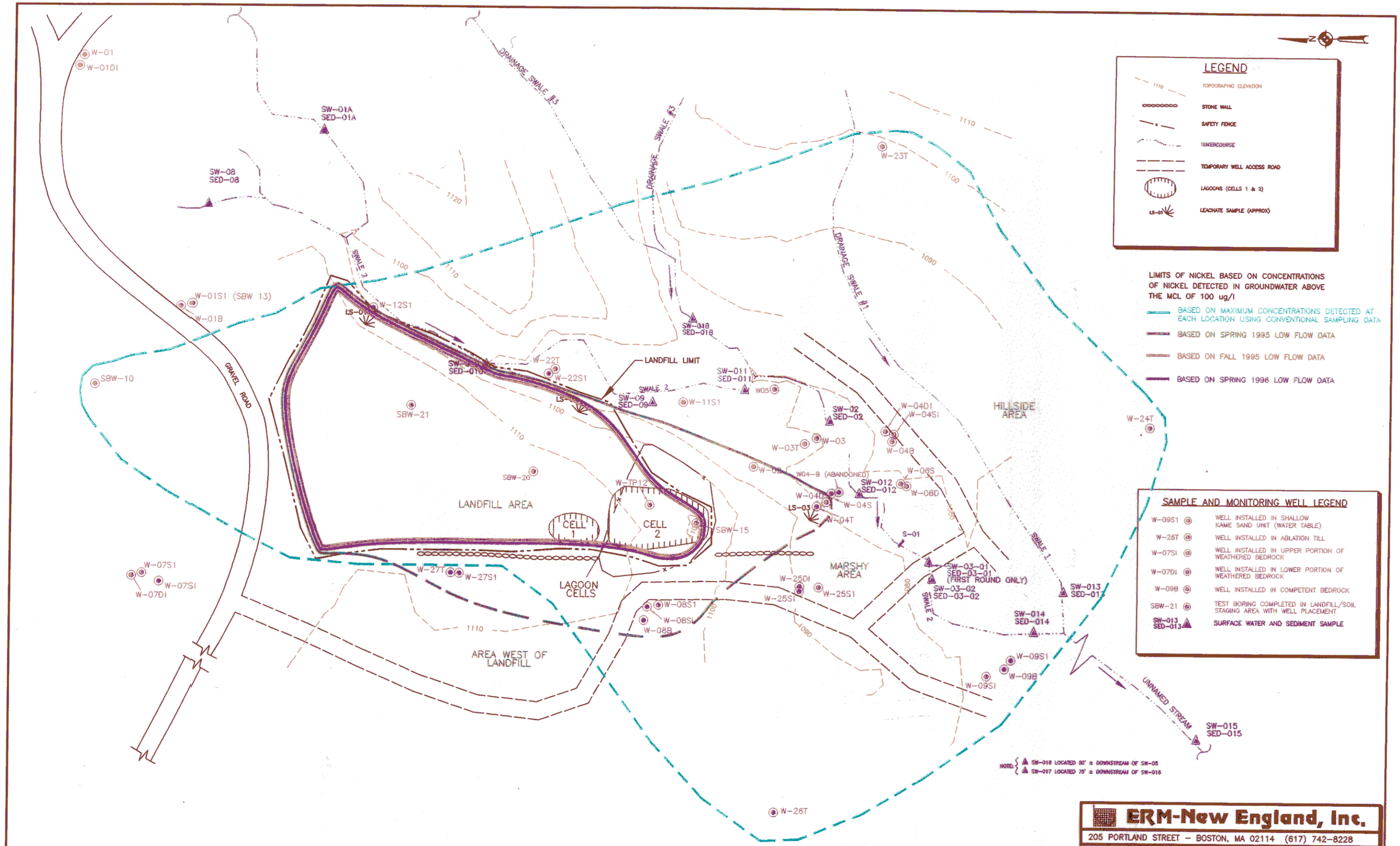
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: LTMP_13.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

EXTENT OF CHROMIUM IN UNCONSOLIDATED OVERBURDEN

FIGURE NO. 13

PROJECT MGR: AMP | TQM REV: MW



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SCALE

40 0 20 40 80 160

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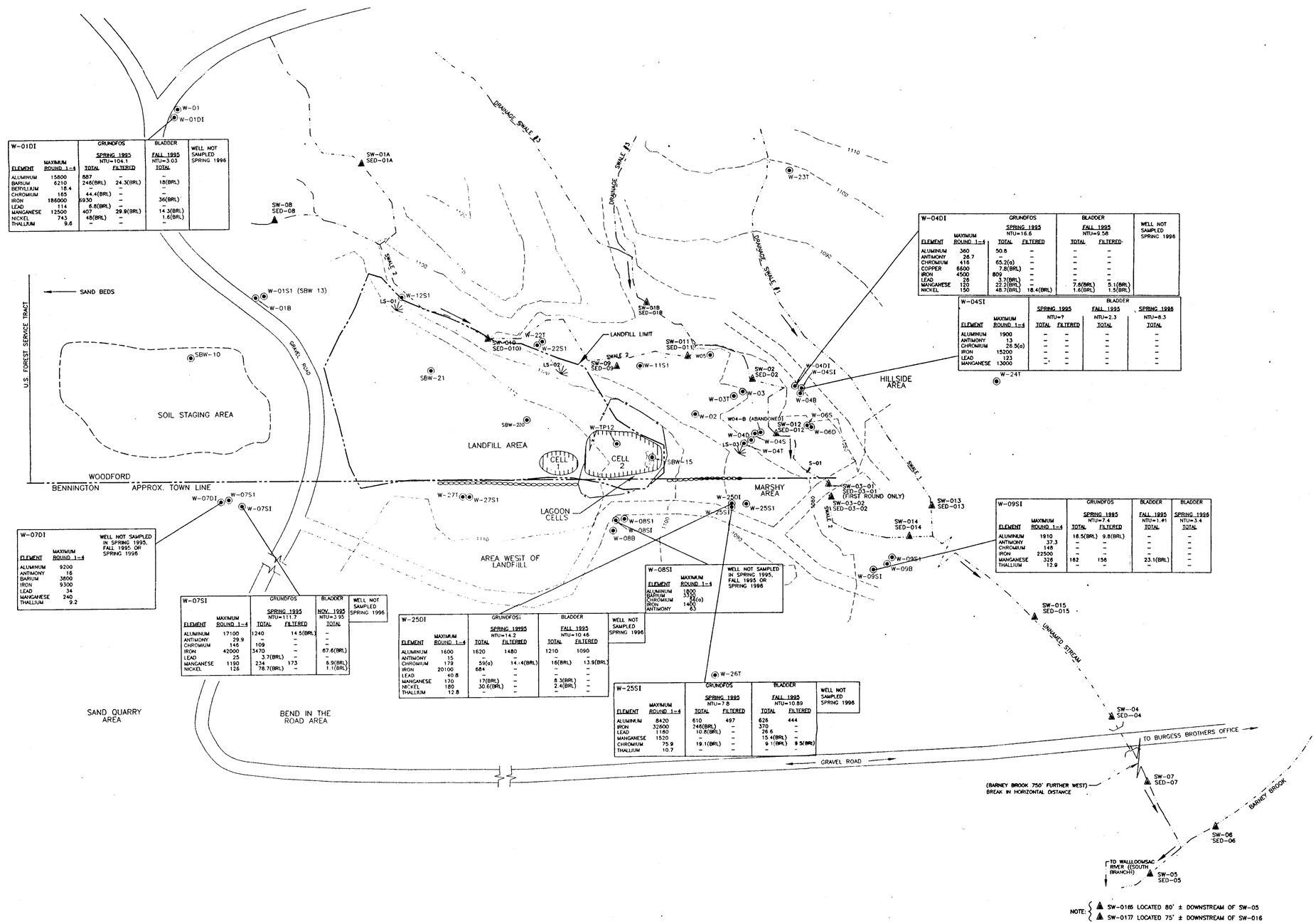
CLIENT NAME: Burgess Brothers	DRAWN BY: KCW	DATE: 09/24/96
FILE NAME: LTMP_14.dwg	SCALE: AS SHOWN	PROJ: 397.03

Burgess Brothers Superfund Site
Woodford & Bennington, Vermont

EXTENT OF NICKEL IN UNCONSOLIDATED OVERBURDEN

FIGURE NO. 14

PROJECT MGR: AMP | TQM REV: MW



W-01DI		GRUNDFOS SPRING 1995 NTU=104.1		BLADDER FALL 1995 NTU=3.03	WELL NOT SAMPLED SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	
ALUMINUM	15600	887	–	–	
BARIUM	6210	246(BRL)	24.3(BRL)	18(BRL)	
BERYLLIUM	18.4	–	–	–	
CHROMIUM	165	44.4(BRL)	–	–	
IRON	186000	5930	–	36(BRL)	
LEAD	114	6.8(BRL)	–	–	
MANGANESE	12500	407	29.9(BRL)	14.3(BRL)	
NICKEL	743	48(BRL)	–	1.6(BRL)	
THALLIUM	9.6	–	–	–	

W-04DI		GRUNDFOS SPRING 1995 NTU=16.6		BLADDER FALL 1995 NTU=9.58		WELL NOT SAMPLED SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED	
ALUMINUM	360	50.6	–	–	–	
ANTIMONY	26.7	–	–	–	–	
CHROMIUM	416	65.2(a)	–	–	–	
COPPER	6600	7.8(BRL)	–	–	–	
IRON	4500	809	–	–	–	
LEAD	26	3.7(BRL)	–	–	–	
MANGANESE	120	22.2(BRL)	–	7.8(BRL)	5.1(BRL)	
NICKEL	150	48.7(BRL)	18.4(BRL)	1.6(BRL)	1.5(BRL)	

W-04SI		BLADDER SPRING 1995 NTU=7		FALL 1995 NTU=2.3	SPRING 1996 NTU=8.3
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	TOTAL
ALUMINUM	1900	–	–	–	–
ANTIMONY	13	–	–	–	–
CHROMIUM	26.5(a)	–	–	–	–
IRON	15200	–	–	–	–
LEAD	123	–	–	–	–
MANGANESE	13000	–	–	–	–

W-09SI		GRUNDFOS SPRING 1995 NTU=7.4		BLADDER FALL 1995 NTU=1.41	BLADDER SPRING 1996 NTU=3.4
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	TOTAL
ALUMINUM	1910	16.5(BRL)	9.8(BRL)	–	–
ANTIMONY	37.3	–	–	–	–
CHROMIUM	146	–	–	–	–
IRON	22500	–	–	–	–
MANGANESE	328	162	156	23.1(BRL)	–
THALLIUM	12.9	–	–	–	–

W-07D1		WELL NOT SAMPLED IN SPRING 1995, FALL 1995 OR SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	9200	
ANTIMONY	16	
BARIUM	3800	
IRON	9300	
LEAD	34	
MANGANESE	240	
THALLIUM	9.2	

W-07SI		GRUNDFOS SPRING 1995 NTU=111.7		BLADDER NOV. 1995 NTU=3.95	WELL NOT SAMPLED SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	
ALUMINUM	17100	1240	14.5(BRL)	–	
ANTIMONY	29.9	–	–	–	
CHROMIUM	146	109	–	–	
IRON	42000	3470	–	67.6(BRL)	
LEAD	25	3.7(BRL)	–	–	
MANGANESE	1190	234	173	6.9(BRL)	
NICKEL	126	78.7(BRL)	–	1.1(BRL)	

W-25D1		GRUNDFOS SPRING 1995 NTU=14.2		BLADDER FALL 1995 NTU=10.46		WELL NOT SAMPLED SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED	
ALUMINUM	1600	1620	1480	1210	1090	
ANTIMONY	15	–	–	–	–	
CHROMIUM	179	59(a)	14.4(BRL)	16(BRL)	13.9(BRL)	
IRON	20100	684	–	–	–	
LEAD	40.8	–	–	–	–	
MANGANESE	170	17(BRL)	–	8.3(BRL)	–	
NICKEL	180	30.6(BRL)	–	2.4(BRL)	–	
THALLIUM	12.8	–	–	–	–	

W-08SI		WELL NOT SAMPLED IN SPRING 1995, FALL 1995 OR SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	
ALUMINUM	1800	
BARIUM	33.2	
CHROMIUM	20(a)	
IRON	1400	
ANTIMONY	63	

W-25S1		GRUNDFOS SPRING 1995 NTU=7.8		BLADDER FALL 1995 NTU=10.89		WELL NOT SAMPLED SPRING 1996
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED	
ALUMINUM	8420	610	497	626	444	
IRON	32600	246(BRL)	–	370	–	
LEAD	1180	10.8(BRL)	–	26.6	–	
MANGANESE	1520	–	–	15.4(BRL)	–	
CHROMIUM	75.9	19.1(BRL)	–	9.1(BRL)	9.5(BRL)	
THALLIUM	10.7	–	–	–	–	

NOTE: ▲ SW-0165 LOCATED 80' ± DOWNSTREAM OF SW-05
▲ SW-0177 LOCATED 75' ± DOWNSTREAM OF SW-016

LEGEND

- 1110 — TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LS-01 — LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

- W-09S1 — WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
- W-26T — WELL INSTALLED IN ABLATION TILL
- W-07SI — WELL INSTALLED IN UPPER PORTION OF WEATHERED BEDROCK
- W-07DI — WELL INSTALLED IN LOWER PORTION OF WEATHERED BEDROCK
- W-09B — WELL INSTALLED IN COMPETENT BEDROCK
- SBW-21 — TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
- SW-013 / SED-013 — SURFACE WATER AND SEDIMENT SAMPLE

NOTE: METALS REPORTED ONLY INCLUDE THOSE DETECTED ABOVE MCLs, SECONDARY MCLs, VERMONT ENFORCEMENT STANDARDS (VES), VERMONT PREVENTATIVE ACTION LIMITS (VT. PALs) OR EPA DERIVED RISK LEVEL (MANGANESE ONLY).
CONCENTRATIONS REPORTED IN THE FIRST COLUMN WERE THE HIGHEST VALUES DETECTED THROUGHOUT FIVE SAMPLING EVENTS AND WERE COLLECTED USING CONVENTIONAL PURGE AND SAMPLING TECHNIQUES. THE SPRING 1995, FALL 1995 & SPRING 1996 SAMPLES WERE COLLECTED USING LOW FLOW PURGE AND SAMPLING TECHNIQUES. VALUES REPORTED UNDER TOTAL METALS ARE UNFILTERED SAMPLE ANALYTICAL RESULTS. FILTERED METALS SAMPLES WERE ONLY COLLECTED DURING THE LOW FLOW SAMPLING EVENTS IF A TURBIDITY LESS THAN 5 NTU COULD NOT BE ACHIEVED.

WELL ID — CONCENTRATIONS (ug/l) — DETECTED METALS

W-01		SPRING 1995 NTU=520		BLADDER FALL 1995 NTU=3.7	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64000	9300	54.4(BRL)	105(BRL)	–
CHROMIUM	110	17.3(BRL)	–	–	–
IRON	97500	136000	–	142(BRL)	–
LEAD	43	9(BRL)	–	–	–
MANGANESE	4200	361	–	13.9(BRL)	–
THALLIUM	8.9	–	–	–	–
ZINC	230	39.6	–	101(BRL)	–

BRL – DETECTED CONCENTRATIONS ARE BELOW MCLs, SECONDARY MCLs, VES AND VT. PALs
– NOT DETECTED ABOVE METHOD DETECTION LIMITS
(a) – ONLY EXCEEDS VT. PALs

SCALE
80 0 15 30 60 120

GENERAL NOTES
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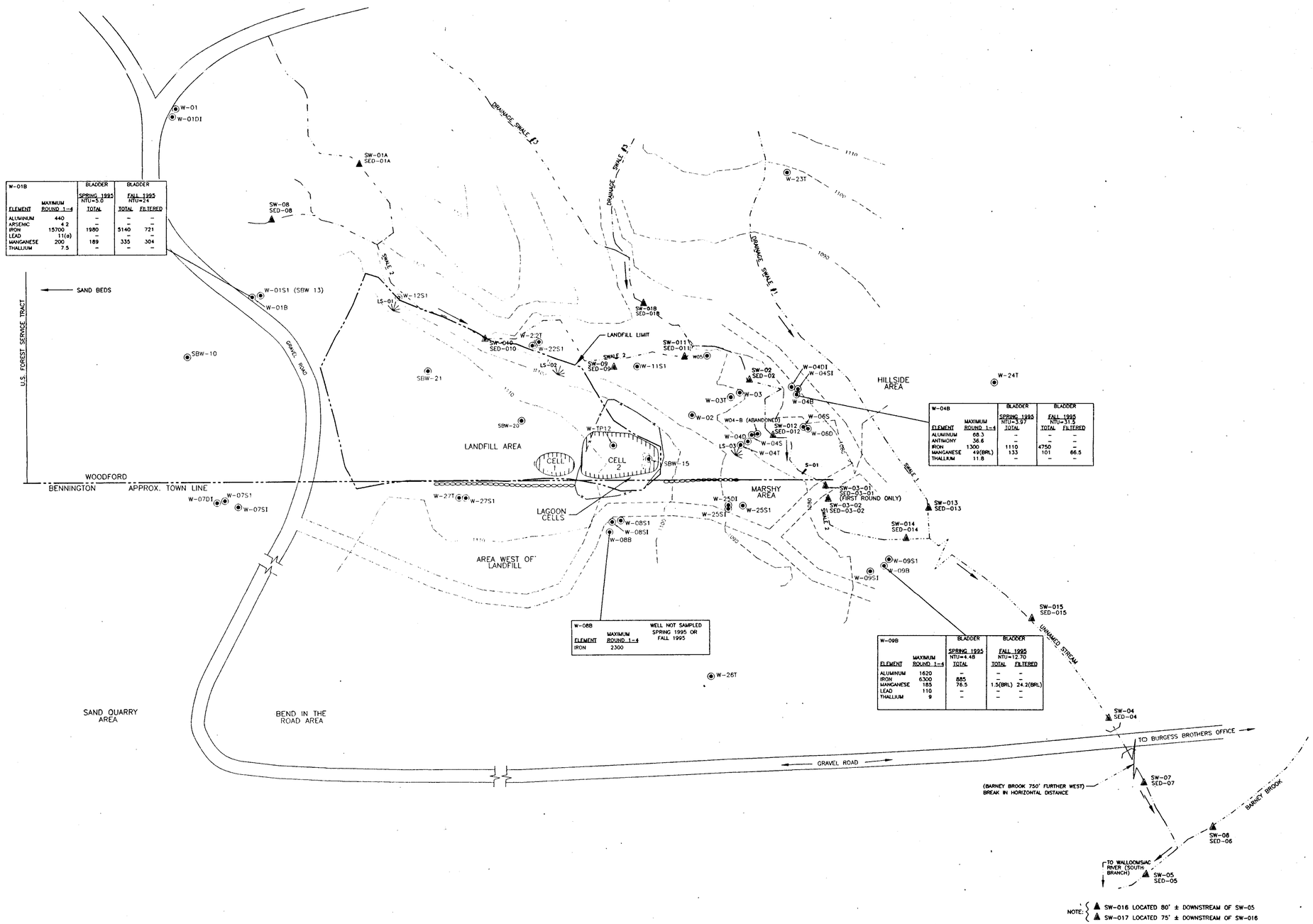
BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by: AMP	SUMMARY OF INORGANICS DETECTED IN SHALLOW & DEEP WEATHERED BEDROCK
Drawn by: KCW	
Checked by: AMP	
Reviewed by: MW	Scale: 1"=60' Date: 09/24/96
Submitted by: AMP/MW	File Name: LTMP_15.dwg Figure No. 15
	Project No. 397.03



W-01B		BLADDER SPRING 1995 NTU=5.0	BLADDER FALL 1995 NTU=24	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	TOTAL	FILTERED
ALUMINUM	440	–	–	–
ARSENIC	2	–	–	–
IRON	15700	1980	5140	721
LEAD	11(a)	–	–	–
MANGANESE	200	189	335	304
THALLIUM	7.5	–	–	–

W-04B		BLADDER SPRING 1995 NTU=3.97	BLADDER FALL 1995 NTU=31.5	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	TOTAL	FILTERED
ALUMINUM	68.3	–	–	–
ANTIMONY	36.6	–	–	–
IRON	1300	1110	4750	–
MANGANESE	49(BRL)	133	101	66.5
THALLIUM	11.8	–	–	–

W-08B		WELL NOT SAMPLED SPRING 1995 OR FALL 1995
ELEMENT	MAXIMUM ROUND 1-4	
IRON	2300	

W-09B		BLADDER SPRING 1995 NTU=4.48	BLADDER FALL 1995 NTU=12.70	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	TOTAL	FILTERED
ALUMINUM	1620	–	–	–
IRON	6300	885	–	–
MANGANESE	185	76.5	1.5(BRL)	24.2(BRL)
LEAD	110	–	–	–
THALLIUM	9	–	–	–

NOTE: SW-016 LOCATED 80' ± DOWNSTREAM OF SW-05
SW-017 LOCATED 75' ± DOWNSTREAM OF SW-016

LEGEND

- TOPOGRAPHIC ELEVATION
- STONE WALL
- SAFETY FENCE
- WATERCOURSE
- TEMPORARY WELL ACCESS ROAD
- LAGOONS (CELLS 1 & 2)
- LS-01 LEACHATE SAMPLE (APPROXIMATE)

SAMPLE AND MONITORING WELL LEGEND

W-09S1	WELL INSTALLED IN SHALLOW KAME SAND UNIT (WATER TABLE)
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W-09B	WELL INSTALLED IN COMPETENT BEDROCK
SBW-21	TEST BORING COMPLETED IN LANDFILL/SOIL STAGING AREA WITH WELL PLACEMENT
SW-013 SED-013	SURFACE WATER AND SEDIMENT SAMPLE
W-TP-12	TEST BORING COMPLETED IN LANDFILL WITHOUT WELL PLACEMENT

NOTE: METALS REPORTED ONLY INCLUDE THOSE DETECTED ABOVE MCLs, SECONDARY MCLs,VERMONT ENFORCEMENT STANDARDS (VES), VERMONT PREVENTATIVE ACTION LIMITS (VT. PALs) OR EPA DERIVED RISK LEVEL (MANGANESE ONLY).
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WELL ID — DETECTED METALS — CONCENTRATIONS (ug/l)

W-01		BLADDER SPRING 1995 NTU=520		BLADDER FALL 1995 NTU=3.7	
ELEMENT	MAXIMUM ROUND 1-4	TOTAL	FILTERED	TOTAL	FILTERED
ALUMINUM	64000	9300	54.4(BRL)	105(BRL)	–
CHROMIUM	110	17.3(BRL)	–	–	–
IRON	97500	136000	–	142(BRL)	–
LEAD	43	9(BRL)	–	–	–
MANGANESE	4200	361	–	13.9(BRL)	–
THALLIUM	8.9	–	–	–	–
ZINC	230	39.6	–	101(BRL)	–

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– NOT DETECTED ABOVE METHOD DETECTION LIMITS
(a) – ONLY EXCEEDS VT. PALs

SCALE: 30 0 15 30 60 120

GENERAL NOTES

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BURGESS BROTHERS SUPERFUND SITE
WOODFORD & BENNINGTON, VERMONT

Designed by:	AMP
Drawn by:	KCW
Checked by:	AMP
Reviewed by:	MW
Submitted by:	AMP/MW

SUMMARY OF INORGANICS DETECTED IN COMPETENT BEDROCK

Scale: 1"=60'
Date: 09/24/96
File Name: LTMP_16.dwg
Figure No. 16
Project No. 397.03