

HYDRAULIC & WATER RESOURCES ENGINEERS, INC.

Consulting Engineers

Civil • Environmental • Hydrologic • Structural & Hazardous Waste Engineering

Mr. Chuck Schwer
Vermont Agency for Natural Resources
Department of Environmental Protection
103 South Main Street/West Office
Waterbury, VT 05671-0404

27 March 2000
20098-041-001-7190-70
DC No. S-324

Subject: Final Site Inspection Report
Space Research, Inc.
Jay, Vermont
CERCLIS No. VTD988366670
TDD No. 99-05-0133

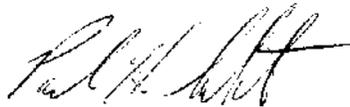
Dear Mr. Schwer:

Enclosed is one copy of the Final Site Inspection (SI) Report for the Space Research, Inc. property in Jay, Vermont. Comments received from the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration regarding the contents of the Draft SI Report have been incorporated. No comments were received from the Vermont Department of Environmental Conservation (VTDEC) or from the property owner.

Please contact the undersigned at (781) 899-9819 if you have any questions regarding this report.

Very truly yours,

Hydraulic & Water Resources Engineers, Inc.
Region I Superfund Technical Assessment and Response Team (START)



Paul H. Schrot
Site Leader



V. Rao Maddineni, Ph.D., P.E.
President

PHS:phs
Enclosure
cc: G. Millan-Ramos (Site Assessment Task Monitor)

HYDRAULIC & WATER RESOURCES ENGINEERS, INC.

Consulting Engineers

Civil • Environmental • Hydrologic • Structural & Hazardous Waste Engineering

Mr. Franklin E. Temple
RFD No. 1 Box 44
St. Johnsbury, VT 05819

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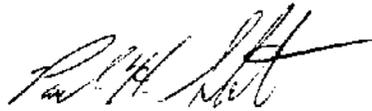
Dear Mr. Temple:

The Roy F. Weston, Inc. (WESTON®). Superfund Technical Assessment and Response Team (START) has completed the Final Site Inspection (SI) Report of the Space Research, Inc. property in Jay, Vermont under our work assignment with the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration. A copy of this report was also sent to the EPA Region I and the Vermont Department of Environmental Conservation. Enclosed is a copy of the Final SI Report for your files.

Please contact the undersigned at (781) 899-9819 or Mr. Donald Smith (EPA Region I Site Assessment Manager) at (617) 918-1433 if you have any questions regarding this report.

Very truly yours,

Hydraulic & Water Resources Engineers, Inc.
Region I Superfund Technical Assessment and Response (START)



Paul H. Schrot
Site Leader



V. Rao Maddineni, Ph.D., P.E.
President

PHS:phs
Enclosure

cc: G. Millan-Ramos (Site Assessment Task Monitor)
C. Schwer (VTDEC)

FINAL SITE INSPECTION REPORT
FOR
SPACE RESEARCH, INC.
JAY, VERMONT

Prepared For:
U.S. Environmental Protection Agency
Region 1
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100
Boston, MA 02114-2023

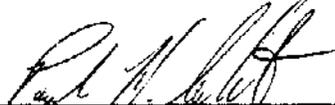
CONTRACT NO. 68-W5-0009

CERCLIS No. VTD988366670
TDD No. 99-05-0133
PCS NO. 7190
DC NO. S-324

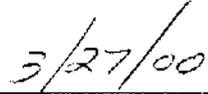
Submitted by:
Roy F. Weston, Inc. (WESTON_®)
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27 March 2000

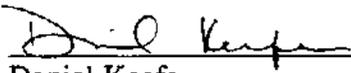
Region I START
Reviewed and Approved:



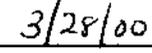
Paul H. Schrot
Site Leader



Date



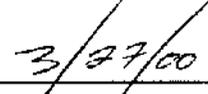
Daniel Keefe
Project Leader



Date



QA Review



Date

Work Order No. 20098-041-001-7190-70

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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INTRODUCTION

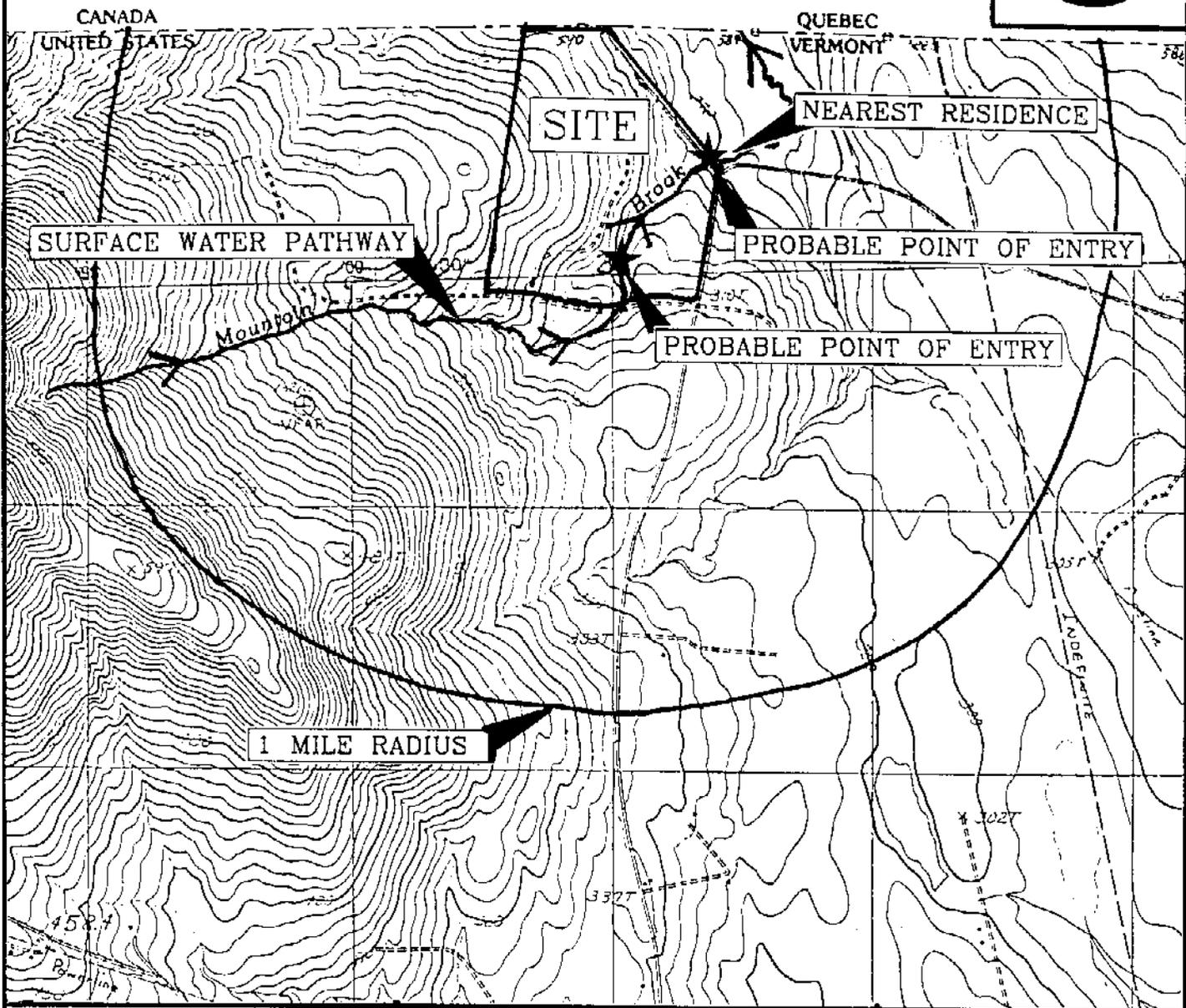
The Roy F. Weston, Inc. (WESTON_s) Superfund Technical Assessment and Response Team (START) was requested by the U.S. Environmental Protection Agency (EPA Region I), Office of Site Remediation and Restoration to perform a Site Inspection (SI) of the Space Research, Inc. (Space Research) property in Jay, Vermont. Tasks were conducted in accordance with the SI scope of work and technical specifications provided by EPA Region I. A Preliminary Assessment (PA) for the Space Research property was prepared by the Vermont Department of Environmental Conservation (VTDEC) in April 1991. VTDEC reported that photographic fixer/developer wastes were generated on site, and that these wastes may have been discharged to on-site septic systems. On the basis of the information provided in the PA, the Space Research SI was initiated.

Background information used in the generation of this report was obtained through file searches conducted at EPA Region I and VTDEC, telephone interviews with town officials, conversations with persons knowledgeable of the Space Research property, and conversations with other Federal, State, and local agencies.

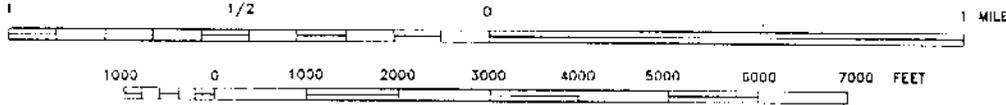
This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

The Space Research property is located at 45° 00' 19.0" North Latitude and 72° 26' 54.0" West Longitude in a rural/agricultural area along North Jay Road, in the Town of Jay, Orleans County, Vermont (Figure 1) [1, p. 1]. The original Space Research property encompassed approximately 3,000 acres, with approximately 1,500 acres in the Town of Jay and the remainder in the Province of Quebec, Canada [1, p. 1; 7-9]. However, according to the Jay Town Clerk's office, the approximately 1,500 acres within Jay has been subdivided (date unknown) into three parcels. Parcel No. 152276.01-03 (147 acres), currently owned by Mr. Franklin E. Temple, is the parcel which was actively used by Space Research, and is the parcel that VTDEC completed a PA for in April 1991 [1; 30, p. 286]. Subsequently, START personnel focused on this parcel of the property during the SI. This parcel of the property includes the areas in the vicinity of the former administration building, the former electronic component storage and assembly building, and the former guard house (Figure 2). The remaining two parcels of the original Space Research property are densely wooded and undeveloped [9].



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' USGS QUADRANGLE(S):
 NORTH TROY, VERMONT, 1986.



QUADRANGLE LOCATION

LOCATION MAP
 SPACE RESEARCH, INC.
 NORTH JAY ROAD
 JAY, VERMONT

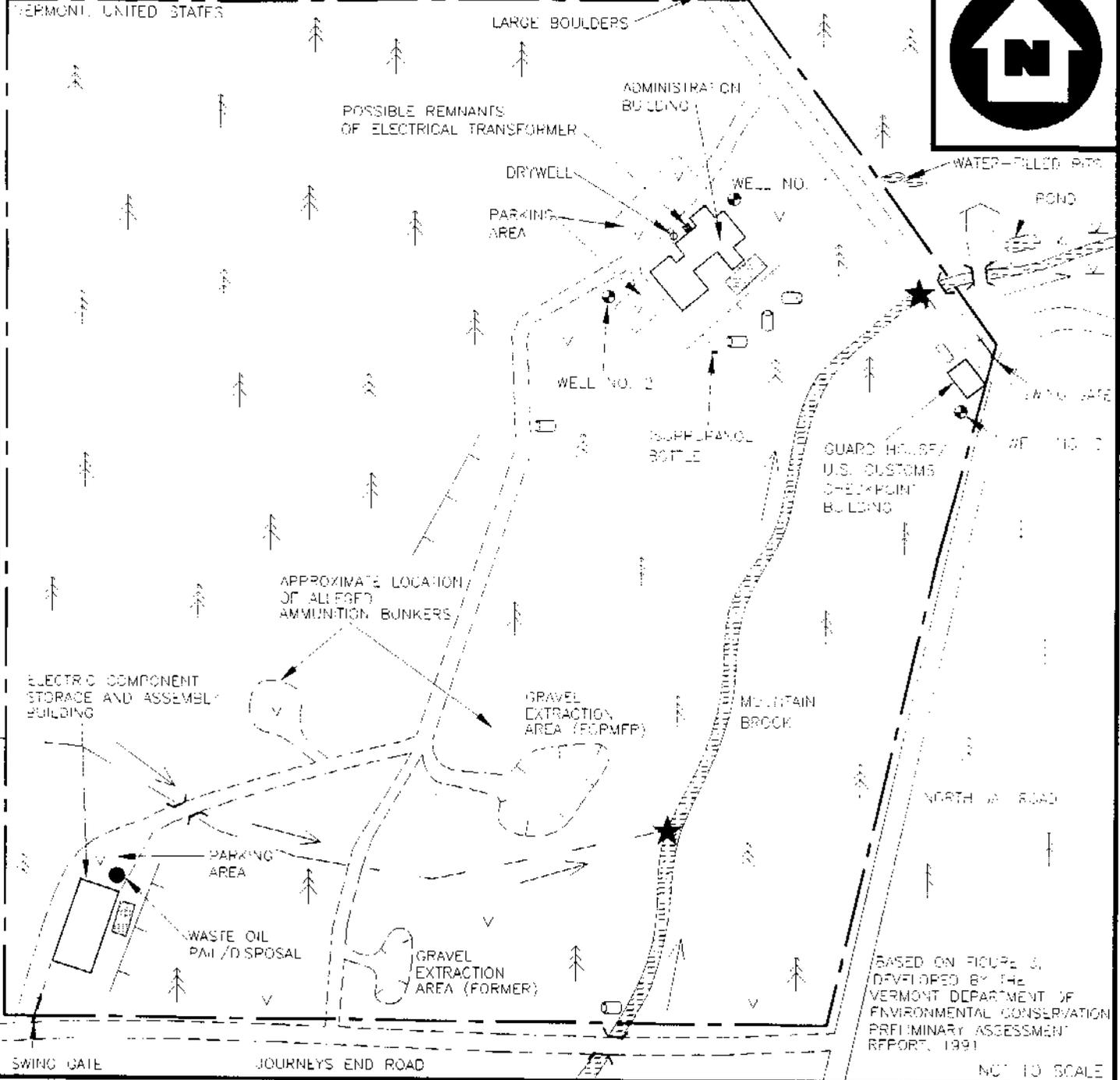
HWRE

Civil*Environmental*Hydrologic*Structural*Environmental*Hazardous Waste Engineering
 REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

ADD # 99-05-0133	DRAWN BY: PHS	DATE 05/01/99
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FILE NAME:
 C:\ACAD\START\SPACE\FIG_1.DWG

FIGURE 1



BASED ON FIGURE 3,
DEVELOPED BY THE
VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
PRELIMINARY ASSESSMENT
REPORT, 1991

NOT TO SCALE

<p>--- UNPAVED ROAD</p> <p>--- PAVED ROAD</p> <p>LEACHFIELD</p>	<p>TREES</p> <p>CULVERT</p> <p>55-GALLON DRUM</p> <p>GRASS</p>	<p>NEAREST RESIDENCE</p> <p>SLOPE (ticks downhill)</p> <p>SURFACE WATER</p>	<p>LEGEND</p> <p>● WATER SUPPLY WELL (SCREENED IN BEDROCK)</p> <p>▽ WETLAND</p> <p>★ PROBABLE POINT OF ENTRY (PPE)</p>	<p>← FLOW DIRECTION</p> <p>--- APPROXIMATE PROPERTY BOUNDARY LOCATION</p> <p>--- INTERMITTENT STREAM</p> <p>--- NATIONAL BOUNDARY</p>
---	--	---	---	---

SITE SKETCH

SPACE RESEARCH, INC.
NORTH JAY ROAD
JAY, VERMONT



Environmental • Hydrologic • Structural • Hazardous Waste • Engineering • Surveying
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 99-05-0133	DRAWN BY: P.H.S.	DATE 01/05/00
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FILE NAME: C:\ACAD\START\SPACE\FIG_2.DWG	FIGURE 2
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Access to the property is unrestricted. The main road through the property is a non-maintained dirt road. Two former gravel extraction areas are located in the southern portion of the property [1, Figure 2; 10, p. 4]. According to the Jay Town Clerk's office, an assessor's map for the property does not exist [9]. As a result, it is uncertain where the exact property boundaries are located.

The property is bordered to the east by North Jay Road; to the south by Journeys End Road; and to the west and north by heavily wooded areas with thick underbrush (Figure 2) [10, p. 2]. In addition, the U.S./Canada border traverses the northern property boundary [10, p. 3]. Mountain Brook flows north-northeast generally through the eastern portion of the property [1, Figure 2]. The property has been inactive since approximately 1984 [1, pp. 1-2].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

The Space Research facility was constructed sometime between 1968 through 1973. Prior to construction of the facility, the property consisted of open fields and woods. Space Research was owned and operated by Mr. Gerald Bull. Mr. Bull built the facility for the development and production of a "super cannon" capable of putting satellites and nuclear warheads into earth orbit. Space Research also developed and manufactured conventional munitions, howitzer systems, flight simulators, and computers. Operations associated with the production and testing of cannons (i.e., firing ranges, manufacturing, etc.) occurred on the Canadian portion of the property. Structures on the U.S. portion of the property included a guard house, an administration building, and an electronic component storage and assembly building (Figure 2). The guard house functioned as a security and U.S. Customs checkpoint. This eliminated the need for Space Research employees to travel to the U.S. Customs checkpoint in North Troy, Vermont since employees needed regular access to the Canadian portion of the facility. The administration building contained executive staff offices and support offices such as accounting, design, and drafting. The electronic component storage and assembly building, in addition to being used for shipping, also housed the computer center for Space Research and served as a warehouse [1, pp. 1-2].

In 1976, Space Research sold howitzer shells and the technology to produce an advanced howitzer system to South Africa. This sale was in violation of U.S. munitions laws and, as a result, Mr. Bull was sentenced to a one year prison term in 1980 [1, p. 2].

In 1981, Space Research went bankrupt and the property was sold to United Technologies of Massawippi, Inc. (UTM) who subsequently founded North Troy Engineering, Inc. (NTE) [1, p. 2]. Operations conducted by NTE on the property included electronics research and the manufacture of computers and computer chips [1, pp. 1-2]. NTE reportedly used a large camera, located in the administration building, for producing circuit board prints. It is likely that photographic fixer/developer wastes were generated from this operation. No information is available on specific hazardous materials that may have been generated or disposed of by NTE [1, p. 5]. In approximately 1984, NTE went bankrupt and subsequently ceased operations [1, pp. 1-2]. No RCRA inspections were conducted on the property while either the Space Research or the NTE facility were in operation [1, p. 1: 5].

In October 1989, VTDEC performed an inspection of the former Space Research/NTE property [3]. VTDEC reported that the gates of the facility were open and the buildings had been heavily vandalized. Furniture, computer components, smashed equipment, and documents were strewn about the premises in the vicinity of the former administration building. The former electronic component storage and assembly building was also found to be heavily vandalized. VTDEC reported that no hazardous wastes were found on the property; however, "containers" on site indicated that various photochemicals may have been used [2]. Several 5-gallon pails of various photochemical fixers/developers left from NTE operations were noted outside the former administration building [1, p. 4]. VTDEC reported that wastes generated from the use of the photochemical fixers/developers may have been discharged to on-site septic systems [3]. All three buildings on the property were served by a respective septic system. The septic system that served the former administration building is located southeast of the building and the septic system that served the former electronic component storage and assembly building is located east of the building. START personnel were unable to locate information in available files that indicated the location of the septic system that served the former guard house.

On 25 April 1990, based on the VTDEC inspection, Space Research was added to the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) [30, p. 286].

On 12 April 1991, Ms. Mary Hunt, a former employee of Space Research, stated to VTDEC that no hazardous substances were used or disposed of on the U.S. portion of the property. Ms. Hunt stated that chemicals which were used by Space Research on the Canadian portion of the facility included methyl ethyl ketone (MEK), solvents, and developers [5].

In April 1991, VTDEC completed a PA of the property. Due to the size of the former Space Research/NTE property, the PA focused on those portions of the property (approximately 147 acres) where operations were likely conducted [1, p. 1; 5]. The VTDEC PA reported that the buildings were in a state of disrepair and had been heavily vandalized. The VTDEC PA reported that access to the property was completely unrestricted and the property was a gathering place for local youths. VTDEC further reported that residents from the surrounding area had disposed of refuse and appliances on the property. In addition, the VTDEC PA reported that in 1989, approximately 200 acres of the property were sold for taxes owed [1, p. 5].

On 7 May 1998, START personnel conducted an on-site reconnaissance of the former Space Research/NTE property [10]. The START on-site reconnaissance focused on those areas of the property where the PA was conducted (approximately 147 acres). START personnel observed the former administration building to be severely vandalized and degraded. The roof had collapsed on the north side and there was evidence of a fire in the building at one time. START personnel did not enter the building due to its suspect structural integrity; however, much of the interior of the building could be visually inspected from the exterior. START personnel did not observe any evidence of hazardous materials in the former administration building [10, pp. 2-5]. Garbage and refuse, including large appliances, were located throughout the area in the immediate vicinity of the former administration building. START personnel conducted a search for the 5-gallon pails of photochemical fixers/developers left from NTE operations noted by VTDEC personnel in 1989;

however, they could not be located. In addition, the "large camera" used by NTE could not be located [10, pp. 2-5].

START personnel observed (what appeared to be) a square dry well located along the northern exterior wall of the former administration building. The dry well was measured by START personnel to be approximately 2 feet (ft) wide by 2 ft long by 2 ft deep [10, p. 2]. The dry well likely received stormwater runoff from the property and/or the roof of the building.

START members observed three empty and degraded 55-gallon drums located along the base of a slope, east of the former administration building [10, p. 2]. In addition, a small bottle (empty) of film remover labeled as containing isopropanol was located at the base of the slope. START personnel conducted air monitoring with a photoionization detector (PID) on the headspace of the bottle and the 55-gallon drums; however, no readings above background levels were noted [10, p. 2].

START personnel observed (what appeared to be) several groundwater seepage areas (possibly natural springs) at the base of the slope, downgradient, and east of the former administration building and its septic system [10, p. 3]. START personnel conducted air monitoring with a PID on the seepage areas; however, no readings above background levels were noted [10, pp. 2-4].

START personnel observed two water supply wells in the vicinity of the former administration building. Well No. 1 is located north of the former administration building. Groundwater was seeping from the joint at the base of the well casing [10, p. 3]. Furthermore, the well cap for Well No. 1 was removed. Well No. 2, located south of the former administration building, appeared to be secured [10, p. 2].

START personnel observed two water-filled pits located along the northeast side of the main access road into the property. The pits are approximately 10 ft wide by 30 ft long. It appeared as though the soils which had been excavated to create the pits were located adjacent to the respective pits. No information regarding the use of the pits could be located.

START personnel observed the former guard house. The building was completely dilapidated and destroyed and there was evidence that a fire had occurred at some time. Refuse was strewn throughout the area in the vicinity of the building [10, p. 3].

While conducting the on-site reconnaissance, START personnel were met by Officer Tupper of the Vermont State Police [10, p. 4]. Officer Tupper indicated that the property is heavily used by trespassers, off-road recreational vehicles, and disposal of large appliances and domestic garbage. Furthermore, Officer Tupper indicated that there were former ammunition bunkers on the U.S. portion of the property, located to the south of the former administration building. In addition, the ammunition bunkers were allegedly used for storage of dry chemicals [10, p. 4]. START personnel conducted a search for the former ammunition bunkers; however, they could not be located. Their approximate locations are given on Figure 2.

START personnel observed evidence of waste oil disposal north of the former electronic component storage and assembly building. A square hole, measured by START personnel to be approximately 1.5 ft wide by 1.5 ft long by 1.5 ft deep, contained an inverted 5-gallon pail containing (what appeared to be) waste oil [10, p. 4]. In addition, the base of the hole was covered with an oily substance, likely waste oil.

START personnel inspected the interior of the former electronic component storage and assembly building. The building had been heavily vandalized and was severely degraded [10, p. 4]. Garbage and refuse were observed throughout the interior of the building. START personnel observed evidence that the building was used as a gathering place for local youths (i.e., graffiti and empty bottles). START personnel did not observe any evidence of hazardous materials inside the former electronic component storage and assembly building [10, p. 4].

START personnel observed the two former gravel extraction areas on the property; however, there was no evidence of hazardous materials in either area [10, p. 4]. START personnel conducted periodic air monitoring during the on-site reconnaissance; no readings were detected above background levels [10, pp. 2-5].

On 13 October 1998, START personnel collected four soil/source samples (SO-01 through SO-04) and seven surface soil samples (SS-01 through SS-07) from the Space Research property, to determine if hazardous substances were discharged into the on-site septic systems and/or to the ground surface. In addition, START personnel collected eight sediment samples (SD-01 through SD-08) from Mountain Brook, to determine if there has been a release of hazardous substances historically used on the property to the surface water pathway (Figure 3). The soil/source and surface soil samples were analyzed through the Contract Laboratory Program (CLP) for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, and cyanide, with the exception of SS-05 which was analyzed for TAL metals only. The sediment samples were analyzed through a Delivery of Analytical Services (DAS) laboratory for VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide, with the exception of SD-08 which was analyzed for TAL metals only.

During the sampling event, START personnel observed one empty and degraded metal 55-gallon drum located in Mountain Brook, downstream (north) of Journeys End Road. One empty and degraded metal 55-gallon drum is located southwest of the former administration building, east of the main road through the property [10, p. 14].

Three metals were detected in soil/source samples; one pesticide and nine metals were detected in surface soil samples; and one VOC, one pesticide, and two metals were detected in sediment samples at concentrations greater than three times the reference concentrations or greater than or equal to the reference sample's sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) [33-36]. Analytical results of the soil/source samples, sediment samples, and surface soil samples collected by START personnel are discussed in greater detail in the Waste/Source Sampling, Surface Water Pathway, and Soil Exposure Pathway sections of this report.

Table 1 presents identified structures or areas on the Space Research property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

Table 1
Source Evaluation for Space Research, Inc.

Source Area	Containment Factors	Spatial Location
Septic Systems (3)	None.	Southeast of the former administration building; east of the former electronic component storage and assembly building; and in the vicinity of former guard house.
Dry Well	None.	Outside, along northwestern exterior wall of the former administration building.
Contaminated soil (associated with waste oil disposal)	None.	Outside, north of the former electronic component storage and assembly building.
Waste Oil Pail	Outside; evidence of migration from source.	Outside, north of the former electronic component storage and assembly building.
Drums (Approximately 5)	None.	East of the former administration building; in Mountain Brook, downstream (north) of Journeys End Road; and southwest of the former administration building, east of the main road through the property.
Isopropanol Bottle	None.	East of the former administration building.
Potentially-contaminated soil (associated with remnants of electrical transformer)	None.	Northwest of the former administration building.

[1: 10]

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the Space Research property.

Table 2

Hazardous Waste Quantity for Space Research, Inc.

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Soil contaminated with metals*	15,000 ft ³	Unknown	Unknown	Septic Systems
Unknown	8 ft ³	Unknown	Unknown	Dry Well
Soil contaminated with waste oil	2.25 ft ²	Unknown	Unknown	Contaminated Soil
Waste oil	5 gallons	Unknown	Unknown	Waste Oil Pail
Unknown	275 gallons	Unknown	Unknown	Drums
Isopropanol	0.264 gallons	Unknown	Unknown	Isopropanol Bottle
Soil contaminated with metals*	100 ft ²	Unknown	Unknown	Contaminated Soil

ft² = Square feet

ft³ = Cubic feet

* The specific substances are discussed in detail in the appropriate pathway sections of this report.

[1: 10]

There are no CERCLIS sites or RCRA generators located within 1-radial mile of the property [30; 32].

WASTE/SOURCE SAMPLING

On 13 October 1998, START personnel collected four subsurface soil/source samples (SO-01 through SO-04) from potential contaminated soil/source areas on the Space Research property, to determine if hazardous substances were discharged into the on-site septic systems. Surface soil samples SS-04 and SS-05 were collected north of the former administration building (upgradient of potential sources) to document reference conditions. The soil/source samples were analyzed through EPA CLP for VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide, except for surface soil sample SS-05, which was analyzed for metals only [10, pp. 6-9; 33; 34]. Surface soil samples, collected to determine if hazardous substances were disposed to the ground surface, are detailed in the Soil Exposure Pathway section of this report. Table 3 summarizes the soil/source samples collected by START personnel on 13 October 1998.

Table 3

**Soil/Source Sample Summary: Space Research, Inc.
Samples Collected by START on 13 October 1998**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (ft)	Sample Source
MATRIX: Soil					
SO-01	APC15 MALL68	1205	Grab	4-5	Sample collected approximately 25 ft southeast of the administration building in the vicinity of the septic system. Material was brown to dark brown, sandy silt.
SO-02	APC16 MALL69	1205	Grab	4-5	Duplicate sample of SO-01 collected for quality control.
SO-03	APC17 MALL70	1250	Grab	3.5-4	Sample collected approximately 30 ft east of the electronic component storage and assembly building in the vicinity of the septic system. Material was brown to dark brown, coarse sand with some fine gravel.
SO-04	APC18 MALL71	1350	Grab	3.5-4	Sample collected approximately 20 ft northwest of the guard house. Material was moist, dark brown, coarse sand with some gravel.

[10]

hrs = Hours

ft = Feet

Complete analytical results of START soil/source samples including quantitation and detection limits are presented in Attachment A. Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 4 is a summary of substances detected through CLP analyses of START soil/source samples. For each sample location, a compound or element is listed if it is detected at greater than or equal to three times the higher of the reference sample concentrations. Surface soil samples SS-04 and SS-05 were collected to document reference concentrations [33-34].

Table 4

**Summary of Analytical Results
Soil/Source Sample Analysis for Space Research, Inc.
Collected by START on 13 October 1998**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SO-01 (APC15, MALL68)	INORGANICS			
	Magnesium	4,090 ppm	1,220 ppm	3.35 × Ref
	Manganese	671 J ppm	176 J ppm	3.81 × Ref
SO-02 (APC16, MALL69)	INORGANICS			
	Manganese	619 J ppm	176 J ppm	3.52 × Ref
SO-03 (APC17, MALL70)	INORGANICS			
	Magnesium	4,780 ppm	1,220 ppm	3.92 × Ref
	Manganese	536 J ppm	176 J ppm	3.05 × Ref
	Potassium	505 ppm	157 J ppm	3.22 × Ref

ppm = Parts per million

Ref = Reference sample concentration

J = Quantitation is approximate due to limitations identified during the quality control review.

[33-34]

No VOCs, SVOCs, pesticides, or PCBs were detected at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [33].

A total of 18 metals were present in the soil/source samples; however, only three metals (magnesium, manganese, and potassium) were detected at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL. Maximum concentrations of these three metals detected in the soil/source samples included magnesium (4,780 ppm in SO-03); manganese (671 ppm in SO-01); and potassium (505 ppm in SO-03) [34].

No cyanide was detected in any of the soil/source samples at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL [34].

Limited file information exists which describes wastestream production and disposal practices for operations conducted on the Space Research property. To determine if wastes were disposed to

any of the septic systems, START personnel collected soil/source samples as part of the Space Research SI. As a result of START sampling, a contaminated soil source (with metals) has been documented.

GROUNDWATER PATHWAY

The Space Research property lies within the Green Mountain physiographic region of the New England Uplands Province [1, p. 2]. The majority of the property is heavily wooded with areas of thick underbrush. There are some grass-covered and unpaved open areas in the immediate vicinity of the buildings and the former gravel extraction areas. The property is underlain by deposits of unstratified glacial drift (till). Soils on the property include Lyman-Marlow rocky-to-very rocky soils and Peru stoney fine sandy loam [1, p. 3]. The Lyman-Marlow rocky-to-very rocky soils are excessively drained and composed mainly of glacial till. The Peru stoney fine sandy loam occur on till-covered uplands and are moderately well drained [1, p. 3]. The mean annual precipitation for Newport, Vermont, located approximately 12 miles east-southeast of the property, is 35.98 inches [1, p. 4].

Depth to bedrock is less than 20 ft below ground surface (bgs) on the property [1, p. 3]. The property is located along the contact of the Hazans Notch Formation and the Jay Peak member of the Underhill Formation [1, p. 2]. The Hazans Notch Formation is comprised of interbedded carbonaceous and non-carbonaceous schist and gneiss. The Jay Peak member of the Underhill Formation is comprised of interbedded carbonaceous and non-carbonaceous schists with local quartzites [1, p. 2].

Three "water supply wells" screened in bedrock are located on the Space Research property with reported yields of 3, 15, and 15 gallons per minute and total depths of 450, 180, and 273 ft, respectively [1, p. 3]. START personnel were unable to determine if the wells were historically used as drinking water sources. Groundwater flow direction beneath the property has not been determined; however, based on the location of Mountain Brook, groundwater flow beneath the property is likely to the east-northeast.

All or parts of the following Vermont cities and towns are located within 4-radial miles of the Space Research property: Jay (population 381) and Troy (population 1,609) [11]. In addition, a portion of Canada is located within 4-radial miles of the property; however, public and private well information for Canada is unknown.

All residents of the Town of Jay are served by private drinking water supply wells [12]. All the residents of the Town of Troy are served by private drinking water supply wells except those residents residing within the Village of North Troy and the Hamlet of Troy [13-14]. The Village of North Troy Water Department receives its public drinking water supply from one groundwater well located approximately 2 miles east of the village on Route 105; however, the well is not located within 4-radial miles of the Space Research property [13]. The Hamlet of Troy receives its public drinking water supply from one groundwater well located within the hamlet on Route

100; however, the well is not located within 4-radial miles of the Space Research property [13]. No groundwater public drinking water supply wells are located within 4-radial miles of the property.

The nearest private groundwater supply wells are located on the Space Research property (Well Nos. 1 through 3); however, since the property is vacant and inactive, the wells are not used. Private groundwater supplies located within 4-radial miles of the property were estimated using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the Space Research property. The nearest active private drinking water supply well is located approximately 300 ft east of the property at the nearest residence [31]. The total population which relies on groundwater within 4-radial miles of the property is estimated to be 310 persons and is summarized in Table 5.

Table 5

Estimated Drinking Water Populations Served By Groundwater Sources Within 4-Radial Miles of Space Research, Inc.

Radial Distance from Space Research, Inc. (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
≥0.00 to 0.25	5	0	5
>0.25 to 0.50	3	0	3
>0.50 to 1.00	12	0	12
>1.00 to 2.00	56	0	56
>2.00 to 3.00	97	0	97
>3.00 to 4.00	137	0	137
TOTAL	310	0	310

[12-16; 31]

START did not perform groundwater sampling as part of the Space Research SI. START personnel were unable to locate information in available files which documents the collection of groundwater samples from the property [1-4]. As a result, a release to groundwater from on-site sources is unknown. Based on the location and proximity (i.e., greater than 4-radial miles) of the surrounding public water supply wells, no nearby drinking water sources are known or suspected to have been impacted by on-site sources.

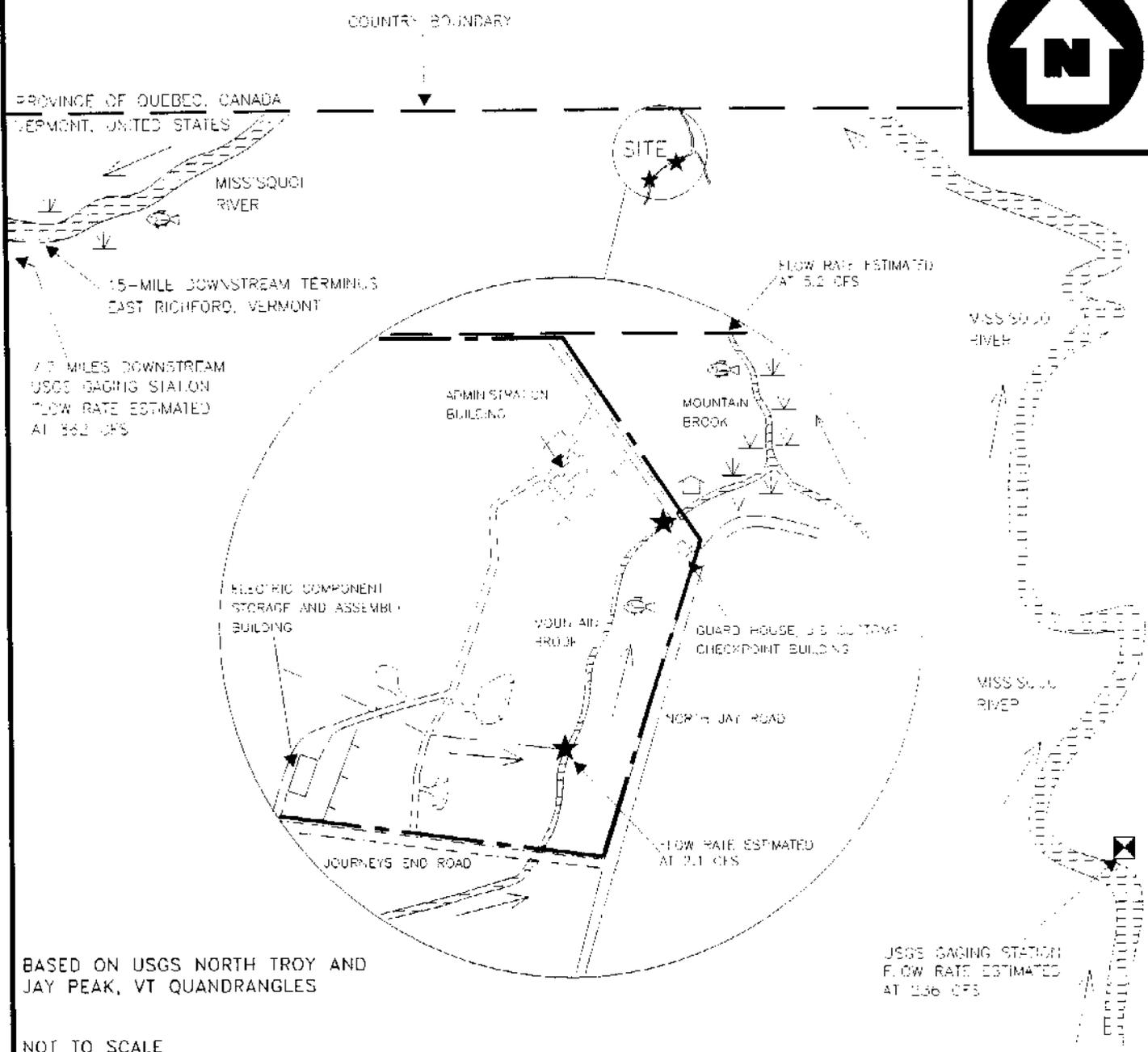
SURFACE WATER PATHWAY

The Space Research property is located within the Missisquoi River Drainage Basin [16; 21]. The property is situated on the side of a large hill which is at a higher elevation than the surrounding properties. There are no stormwater catchbasins on the property [10, pp. 2-5]. Stormwater runoff from the Space Research property flows east-southeast, via overland flow and an intermittent stream, into Mountain Brook, which is located in the eastern portion of the property [1, p. 3; 16]. The most downstream probable point of entry (PPE) to surface water is located at Mountain Brook, approximately 1,100 ft southeast of the former administration building (150 ft northwest of the former guard house) (Figure 3) [16]. A second PPE to surface water for Mountain Brook, is located at the confluence of the intermittent stream and Mountain Brook, approximately 1,000 ft east of the former electronic component storage and assembly building (Figure 4). This second PPE is approximately 0.4 miles upstream of the first PPE [16].

Mountain Brook flows north-northeast for 0.9 miles (from the second PPE) (0.4 miles of which is on the Space Research property) before entering Canada. Mountain Brook continues to flow within Canada for 1.3 miles before discharging into the Missisquoi River. The Missisquoi River flows westward within Canada for 11.5 miles before reentering the U.S. in East Richford, Vermont. As a result, a total of 12.8 miles of the surface water pathway lies within Canada and, therefore, will not be evaluated by START. The Missisquoi River continues to flow south-southwest for 1.7 miles to the 15-mile downstream terminus in East Richford, Vermont (Figure 4) [21-22].

There are no U.S. Geological Survey (USGS) gaging stations located on Mountain Brook [16; 21; 23]. The drainage basin area of Mountain Brook at the second PPE to surface water is approximately 1.14 square miles (mi^2). Using the USGS conversion factor of 1.8 cubic feet per second (cfs)/ mi^2 , Mountain Brook has an estimated flow rate of 2.1 cfs at the second PPE [23; 24]. The drainage basin area of Mountain Brook at the U.S./Canadian border is approximately 2.86 mi^2 . Using the USGS conversion factor of 1.8 cubic feet per second (cfs)/ mi^2 , Mountain Brook has an estimated flow rate of 5.2 cfs at the U.S./Canadian border [25].

The 1.7-mile length of reach of the Missisquoi River within the U.S. has an estimated flow rate between 236 cfs and 862 cfs [23; 26]. A USGS gaging station, located on the Missisquoi River approximately 6.3 miles upstream of its confluence with Mountain Brook, has a drainage basin area of 131 mi^2 (START personnel were unable to retrieve a recorded mean annual flow rate for the gaging station from USGS) [23]. Using the USGS conversion factor of 1.8 cfs/ mi^2 , the Missisquoi River has an estimated flow rate of approximately 236 cfs at this gaging station [23; 26]. A USGS gaging station, located on the Missisquoi River approximately 20.9 miles downstream of its confluence with Mountain Brook (approximately 7.7 miles downstream of the 15-mile downstream terminus), has a drainage basin area of 479 mi^2 (START personnel were unable to retrieve a recorded mean annual flow rate for the gaging station from USGS) [23]. Using the USGS conversion factor of 1.8 cfs/ mi^2 , the Missisquoi River has an estimated flow rate of 862 cfs at this gaging station [23; 26].



LEGEND

- | | | | | | |
|-------|-------------------------------|------------------|-------------------|-----------|--|
| ----- | UNPAVED ROAD | (ticks downhill) | SLOPE | CFS | CUBIC FEET PER SECOND |
| ===== | PAVED ROAD |) (| CULVERT | ⊠ | USGS GAGING STATION |
| ★ | PROBABLE POINT OF ENTRY (PPE) | ⦿ | FISHERY | - - - - - | INTERMITTENT STREAM |
| ∇ | WETLAND | ⌂ | NEAREST RESIDENCE | < | FLOW DIRECTION |
| | | | | --- | APPROXIMATE PROPERTY BOUNDARY LOCATION |
| | | | | ▨ | SURFACE WATER |

SURFACE WATER PATHWAY SKETCH

SPACE RESEARCH, INC.
NORTH JAY ROAD
JAY, VERMONT



Civil*Environmental*Hydrologic*Structural*Hazardous Waste Engineering*Surveying
REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 99-05-0133	DRAWN BY: P.H.S.	DATE 01/05/00
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FILE NAME: C:\ACAD\START\SPACE\FIG_4.DWG	FIGURE 4
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Table 6 summarizes the surface water bodies along the 15-mile downstream pathway from the Space Research property.

Table 6

Surface Water Bodies Along the 15-Mile Downstream Pathway from Space Research, Inc.

Surface Water Body	Descriptor ¹	Length of Reach (miles)	Flow Characteristics (cfs) ²	Length of Wetlands (miles)
Mountain Brook	Minimal stream	0.9	2.1 to 5.2	0.8
Missisquoi River	Moderate to large stream	1.7	236 to 862	0.4

- ¹ Minimal stream < 10 cfs. Moderate to large stream > 100-1,000 cfs.
- ² Cubic Feet Per Second.

Note: Approximately 12.8 miles of the site's surface water pathway flows through Canada. As a result, this 12.8 miles is not evaluated by START (see Figure 4). In addition, the initial 0.4-mile length of reach of Mountain Brook is located on the Space Research property.

[16-19; 21-26]

No known surface water drinking water intakes are located along the 15-mile downstream pathway from the Space Research property [12-14]. Mountain Brook is designated as a Class A water body by the Vermont Agency of Natural Resources/Water Quality Division (VTANR/WQD) [30; 37, p. 32]. Class A water bodies are defined as "high quality waters that have significant ecological value and water quality of uniformly excellent character" [37, p. 24]. Class A water bodies are further defined as "a source of public water supply with disinfection when necessary and, when compatible, for the enjoyment of water in its natural condition" [37 p. 24]. The Missisquoi River is designated as a Class B water body by VTANR/WQD. Class B water bodies are defined as "water of quality that consistently exhibits good aesthetic value and provides high quality habitat for aquatic biota, fish, and wildlife" [37, p. 24]. Class B water bodies are further defined as "public water supply with filtration and disinfection; irrigation and other agricultural uses; swimming, and recreation" [37, p. 24]. Approximately 1.2 miles of wetland frontage exist along the 15-downstream pathway from the property [17-19; 27].

The closest fishery to the property is Mountain Brook which flows through the property. According to the Vermont Digest of Fish and Wildlife Laws, all streams (including brooks, stream, and rivers) are trout waters [29]. Additional fish species commonly found in Vermont streams are bass, pike, pickerel, and salmon [29].

The Nongame and Natural Heritage Program of VTANR, Department of Fish and Wildlife maintains a database for occurrences of significant natural communities and threatened and endangered plants and animals; the database documented no such occurrences along the 15-mile

downstream pathway from the property [28]. Table 7 summarizes the sensitive environments along the 15-mile downstream pathway of the property.

Table 7

Sensitive Environments Along the 15-Mile Downstream Pathway from Space Research, Inc.

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE (miles)	Flow Rate at Environment (cfs)
Mountain Brook	Water body protected by CWA	Mountain Brook	0.0 to 0.9	2.1 to 5.2
Mountain Brook	Wetlands (0.8 miles)	Mountain Brook	0.0 to 0.9	2.1 to 5.2
Missisquoi River	Wetlands (0.4 miles)	Missisquoi River	13.7 to 15.4*	236 to 862

PPE = Probable Point of Entry
 CWA = Clean Water Act
 cfs = Cubic Feet Per Second

* The total length of reach for the downstream surface water pathway is > 15 miles due to the initial 0.4-mile length of reach of Mountain Brook being located on the Space Research property.

[16-19; 24-28]

On 13 October 1998, START personnel collected eight sediment samples (SD-01 through SD-08), including a duplicate, at points along Mountain Brook, to determine if there has been a release of hazardous substances (either used historically or documented in a soil source) to the surface water pathway (Figure 3). Sediment samples SD-07 and SD-08 were collected as the upstream reference samples for Mountain Brook. The sediment samples were analyzed through a DAS laboratory for VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide, except for sediment sample SD-08, which was analyzed for TAL metals only [10, pp. 9-12; 35; 36]. Table 8 summarizes the sediment samples collected by START personnel on 13 October 1998.

Table 8

**Sediment Sample Summary: Space Research, Inc.
Samples Collected by START on 13 October 1998**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (inches)	Sample Source
MATRIX: Sediment					
SD-01	DAF01C	0805	Grab	0-6	Sample collected from Mountain Brook approximately 400 ft upstream (southwest) of unnamed stream. Material was light brown, sandy silt with small pebbles. T = 8.5 °C; Conductivity = 15 µmhos; pH = 6.5; FID = 0 units above background.
SD-02	DAF02C	0806	Grab	0-6	Duplicate sample of SD-01 collected for quality control.
SD-03	DAF03C	0815	Grab	0-6	Sample collected from Mountain Brook approximately 150 ft downstream (northeast) of the nearest residence's driveway. Material was light brown, coarse sand with small pebbles. T = 8.5 °C; Conductivity = 15 µmhos; pH = 6.5; FID = 0 units above background.
SD-04 (MS/MSD)	DAF04C	0910	Grab	0-6	Sample collected from Mountain Brook approximately 50 ft upstream (southwest) of the main access road on the Space Research property. Material was light brown, coarse sand with small pebbles. T = 9 °C; Conductivity = 23 µmhos; pH = 6.5.
SD-05	DAF05C	0925	Grab	0-6	Sample collected from Mountain Brook approximately 500 ft upstream (southwest) of sample SD-04. Material was brown to light gray, sandy silt. T = 9 °C; Conductivity = 15 µmhos; pH = 6.5.
SD-06	DAF06C	1015	Grab	0-6	Sample collected from Mountain Brook downstream of its confluence with an intermittent stream, approximately 200 ft east of the former gravel extraction area. Material was medium gray to dark gray, sandy silt. T = 10 °C; Conductivity = 15 µmhos; pH = 6.5.

Table 8

Sediment Sample Summary: Space Research, Inc.
 Samples Collected by START on 13 October 1998 (Concluded)

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (inches)	Sample Source
MATRIX: Sediment (Concluded)					
SD-07	DAF07C	1035	Grab	0-6	Sample collected from Mountain Brook approximately 75 ft downstream (north) of Journeys End Road, as a reference sample. Material was light brown to light gray, coarse sand with small pebbles. T = 10 °C; Conductivity = 15 µmhos; pH = 6.5.
SD-08	DAF08C	1035	Grab	0-6	Sample collected from Mountain Brook approximately 75 ft downstream (north) of Journeys End Road, as a reference sample (analyzed for total metals only). Material was light brown to light gray, sandy with small pebbles. T = 10 °C; Conductivity = 15 µmhos; pH = 6.5.

- MS/MSD = Matrix Spike/Matrix Spike Duplicate
- FID = Flame Ionization Detector
- µmhos = Micro Mhos
- °C = Degrees Celsius
- hrs = Hours
- ft = Feet
- T = Temperature

[10]

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment B. Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 9 is a summary of substances detected through DAS analyses of START sediment samples. For each sample location, a compound or element is listed if it is detected at greater than or equal to three times the higher of the reference sample concentrations or greater than or equal to the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses).

Table 9

**Summary of Analytical Results
Sediment Sample Analysis for Space Research, Inc.
Collected by START on 13 October 1998**

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments
SD-01 (DAF01C)	INORGANICS			
	Antimony	0.75 J ppm	0.71 U ppm	1.1 × SDL
SD-02 (DAF02C)	VOCs			
	Dichloroethene (total), 1,2-	12 J ppb	12 UJ ppb	1.0 × SQL
SD-04 (DAF04C)	PESTICIDES			
	Heptachlor	2.3 J ppb	1.9 UJ ppb	1.2 × SQL
	INORGANICS			
	Cadmium	0.25 J ppm	0.24 U ppm	1.0 × SDL
SD-05 (DAF05C)	PESTICIDES			
	Heptachlor	2.3 J ppb	1.9 UJ ppb	1.2 × SQL

ppm = parts per million

ppb = parts per billion

VOCs = Volatile Organic Compounds

SQL = Sample Quantitation Limit

SDL = Sample Detection Limit

U = Indicates the compound was analyzed for, but not detected. The associated numerical value is the SQL or SDL.

J = Quantitation is approximate due to limitations identified during the quality control review.

UJ = Indicates the compound was analyzed for, but not detected and reports the estimated detection value. The associated numerical value is the estimated SQL or SDL.

[35-36]

Three VOCs [1,2-dichloroethene (total) (1,2-DCE), trichloroethene (TCE), and toluene] were present in at least one of the sediment samples; however, only 1,2-DCE (12 ppb in SD-02) was detected at a concentration greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [35]. Based on available file information, the use and/or disposal of 1,2-DCE on the Space Research property is unknown. 1,2-DCE was not detected in any of the surface or subsurface soil samples collected from the property by START. As a result, START has not attributed this substance to the Space Research property.

A total of three SVOCs were present in the sediment samples; however, the SVOCs were not detected at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [35].

One pesticide (heptachlor) was detected in the sediment samples (2.3 ppb in both SD-04 and SD-05) at a concentration greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [35]. Based on available file information, the use and/or disposal of pesticides on the Space Research property is not suspected. In addition, this pesticide was not detected in surface or subsurface soil samples collected from the property by START. As a result, the pesticide detected in the sediment samples collected by START has not been attributed to the Space Research property.

No PCBs were detected in any of the sediment samples at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [35].

A total of 17 metals were present in the sediment samples; however, only two of these metals, antimony and cadmium, were detected at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL. Antimony was detected in sample SD-01 at 0.75 ppm, and cadmium was detected in sample SD-04 at 0.25 ppm [36]. Based on available file information, the use and/or disposal of metals on the Space Research property is unknown. Of these metals, only cadmium was present in surface soil samples collected from the property by START personnel. As a result, only cadmium detected in the sediment sample collected by START will be considered at least partially attributable to the Space Research property.

Cyanide was not detected in any of the sediment samples at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL [36].

START performed sediment sampling as part of the Space Research SI. Based on the analytical results of sediment samples collected by START personnel on 13 October 1998, a release of cadmium to Mountain Brook has been documented. As a result of the release, a Clean Water Act-protected water body and a fishery have been impacted. No other sensitive environments are known to have been impacted. To date, no actions have been taken to address the release to Mountain Brook.

SOIL EXPOSURE PATHWAY

There are no full-time employees on the Space Research property [10, pp. 2-5]. The property has been abandoned and inactive since approximately 1984 [1, p. 1]. Access to the property is unrestricted and is a gathering place for local youths, off-road vehicles, and the disposal of refuse (i.e., large appliances) by local residents [1, p. 4; 10, p. 4]. There are no residents on the property; the nearest residence is located approximately 300 ft east of the property on North Jay Road [1, p. 1; 10, p. 5]. The nearest school to the property is located approximately 2.1 miles east-southeast in the Village of North Troy [16]. There are no terrestrial sensitive environments

noted on the property [10, pp. 2-5]. An estimated 44 persons live within 1-radial mile of the property [15].

On 13 October 1998, START personnel collected seven surface soil samples (SS-01 through SS-02) from potential source areas on the Space Research property, to determine if hazardous substances were disposed of to the ground surface. Surface soil samples SS-04 and SS-05 were collected north of the former administration building (upgradient of potential sources) to document reference conditions. The soil samples were analyzed through EPA CLP for VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide, except for surface soil sample SS-05, which was analyzed for TAL metals only [10, pp. 6-9; 14; 33; 34]. Table 10 summarizes the surface soil samples collected by START personnel on 13 October 1998.

Table 10

**Surface Soil Sample Summary: Space Research, Inc.
Samples Collected by START on 13 October 1998**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (ft)	Sample Source
MATRIX: Soil					
SS-01	APC10 MALL62	1105	Grab	0-1	Sample collected approximately 25 ft southeast of the administration building in the vicinity of the septic system. Material was light brown to medium brown, fine sand.
SS-02	APC11 MALL63	1230	Grab	0-2	Sample collected approximately 30 ft east of the electronic component storage and assembly building in the vicinity of the septic system. Material was light brown to medium brown, coarse sand with some fine gravel.
SS-03 (MS/MSD)	APC12 MALL64	1335	Grab	0-2	Sample collected approximately 20 ft northwest of the guard house. Material was light gray to brown, coarse sand with some fine gravel.
SS-04	APC13 MALL65	0900	Grab	0.25-0.8	Sample collected approximately 150 ft north of the administration building, as a reference sample. Material was medium brown to dark brown, fine sand and silt with some organic material.

Table 10

**Surface Soil Sample Summary: Space Research, Inc.
Samples Collected by START on 13 October 1998 (Concluded)**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (ft)	Sample Source
MATRIX: Soil (Concluded)					
SS-05	MALL66	0910	Grab	0.25-0.8	Sample collected approximately 150 ft north of the administration building, as a reference sample (analyzed for total metals only). Material was medium brown to dark brown, fine sand and silt with some organic material.
SS-06	APC14 MALL67	1145	Grab	0-1	Sample collected at the base of the slope southeast of the administration building. Material was moist, medium brown to dark brown, fine sand and silt with trace wood debris.
SS-07	APC22 MALL74	1410	Grab	0-0.5	Sample collected adjacent to remnants of former electrical transformer northwest of the administration building. Material was medium brown to dark brown, fine sand and silt.

MS/MSD = Matrix Spike/Matrix Spike Duplicate
 hrs = Hours
 ft = Feet

[10]

Complete analytical results of START surface soil samples including quantitation and detection limits are presented in Attachment A. Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 11 is a summary of substances detected through CLP analyses of START surface soil samples. For each sample location, a compound or element is listed if it is detected at greater than or equal to three times the higher of the reference sample concentrations. Surface samples SS-04 and SS-05 were collected to document reference concentrations [33-34].

Table 11

**Summary of Analytical Results
Surface Soil Sample Analysis for Space Research, Inc.
Collected by START on 13 October 1998**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SS-02 (APC11, MALL63)	INORGANICS			
	Calcium	2,120 J ppm	574 J ppm	3.69 × Ref
	Magnesium	4,630 ppm	1,220 ppm	3.80 × Ref
	Manganese	695 J ppm	176 J ppm	3.95 × Ref
	Nickel	46.6 ppm	14.4 ppm	3.24 × Ref
SS-06 (APC14, MALL67)	INORGANICS			
	Cadmium	0.23 J ppm	0.11 U ppm	2.1 × SDL
	Calcium	3,360 J ppm	574 J ppm	5.85 × Ref
	Cobalt	17.1 ppm	5.3 ppm	3.2 × Ref
	Manganese	1,260 J ppm	176 J ppm	7.16 × Ref
	Selenium	0.91 J ppm	0.52 UJ ppm	1.8 × SDL
SS-07 (APC22, MALL74)	PESTICIDES			
	delta-BHC	0.32 J ppb	0.10 J ppb	3.2 × Ref
	INORGANICS			
	Barium	167 ppm	12.2 ppm	13.7 × Ref
	Cadmium	0.11 J ppm	0.11 U ppm	1.0 × SDL
	Calcium	2,250 J ppm	574 J ppm	3.92 × Ref
	Lead	33.7 ppm	8.9 ppm	3.8 × Ref

- ppm = parts per million
- ppb = parts per billion
- Ref = Reference sample concentration
- SDL = Sample Detection Limit
- U = Indicates the compound was analyzed for, but not detected. The associated numerical value is the adjusted SQL or SDL.
- J = Quantitation is approximate due to limitations identified during the quality control review.
- UJ = Indicates the compound was analyzed for, but not detected. The associated numerical value is the estimated SQL or SDL.

[33-34]

A total of three VOCs (methylene chloride, 4-methyl-2-pentanone, and tetrachloroethene) were detected in the surface soil samples; however, none of the VOCs were present at a concentration greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [33].

A total of nine SVOCs, including naphthalene, acenaphthylene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, and benzo(a)pyrene, were detected in the surface soil samples; however, none of the SVOCs were present at a concentration greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [33].

A total of eight pesticides were detected in the surface soil samples; however, only delta-BHC (0.32 ppb in SS-07) was detected at a concentration greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [33]. There is no documentation (in available files) suggesting the production and/or disposal of pesticides on the Space Research property; as a result, START has not used the relatively low concentration of the pesticide to document an area of soil contamination.

No PCBs were detected in any of the surface soil samples at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SQL [33].

A total of 20 metals were present in the surface soil samples; however, only nine of these metals (barium, cadmium, calcium, cobalt, lead, magnesium, manganese, nickel, and selenium) were detected at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL. Maximum concentrations of these nine metals detected in the surface soil samples include the following: barium (167 ppm in SS-07); cadmium (0.23 ppm in SS-06); calcium (3,360 ppm in SS-06); cobalt (17.1 ppm in SS-06); lead (33.7 ppm in SS-07); magnesium (4,630 ppm in SS-02); manganese (1,260 ppm in SS-06); nickel (46.6 ppm in SS-02); and selenium (0.91 ppm in SS-06) [34]. Based on available file information, the use and/or disposal of metals on the Space Research property is unknown.

No cyanide was detected in any of the soil/source or surface soil samples at concentrations greater than three times the reference sample concentration or greater than or equal to the reference sample's SDL [34].

START performed surface soil sampling as part of the Space Research SI. Based on the analytical results of surface soil samples collected by START personnel on 13 October 1998, a release of metals to surface soils from on-site sources has been documented. No impacts to nearby residential populations are known; however, based on site observations, the property is used by trespassers. As a result, impacts to nearby residents are possible. To date, no actions have been taken to address the release to on-site soils.

AIR PATHWAY

There are no full-time employees on the Space Research property [10, pp. 2-5]. The property has been abandoned and inactive since approximately 1984 [1, p. 1]. Access to the property is unrestricted and is a gathering place for local youths, off-road vehicles, and disposal of refuse (i.e., large appliances) by local residents [1, p. 4; 10, p. 4]. There are no residents on the property; the nearest residence is located approximately 300 ft east of the property on North Jay Road [1, p. 1; 10, p. 5]. The nearest school to the property is located approximately 2.1 miles east-southeast in the Village of North Troy [16]. Table 12 summarizes the estimated population within 4-radial miles of the property.

Table 12

Estimated Populations Within 4-Radial Miles of Space Research, Inc.

Radial distance from Space Research, Inc. (miles)	Estimated Population
On a Source	0
> 0.00 to 0.25	2
> 0.25 to 0.50	7
> 0.50 to 1.00	35
> 1.00 to 2.00	189
> 2.00 to 3.00	335
> 3.00 to 4.00	461
TOTAL	1,029

[15]

Approximately 516 acres of wetlands are located within 4-radial miles of the property [17-19; 27]. The Nongame and Natural Heritage Program of VTANR, Department of Fish and Wildlife maintains a database for occurrences of significant natural communities and threatened and endangered plants and animals; the database documented no such occurrences within 4-radial miles of the property [28]. Table 13 summarizes the sensitive environments located within 4-radial miles of the property.

Table 13

Sensitive Environments Located Within 4-Radial Miles of Space Research, Inc.

Radial distance from Space Research, Inc. (miles)	Sensitive Environments/Species (status)
> 0.00 to 0.25	32 acres wetlands
	Water body protected by Clean Water Act
> 0.25 to 0.50	17 acres wetlands
> 0.50 to 1.00	58 acres wetlands
> 1.00 to 2.00	118 acres wetlands
> 2.00 to 3.00	192 acres wetlands
> 3.00 to 4.00	99 acres wetlands

[17 19; 28]

During the START on-site reconnaissance, ambient air was monitored using a portable PID. No readings above background were noted [10, pp. 2-5].

No laboratory qualitative air samples are known to have been collected from the Space Research property. Based on the available data, a release of hazardous substances to the ambient air from on-site sources is not known or suspected to have occurred; no impacts to nearby residential populations or sensitive environments are known or suspected.

SUMMARY

The Space Research, Inc. (Space Research) property is located in a rural/agricultural area along North Jay Road, in the Town of Jay, Orleans County, Vermont. The original Space Research property encompassed approximately 3,000 acres, with approximately 1,500 acres in the Town of Jay and the remainder in the Province of Quebec, Canada. However, the approximately 1,500 acres within Jay has been subdivided into three parcels. A 147-acre parcel was actively used by Space Research, and is the parcel that the Vermont Department of Environmental Conservation (VTDEC) completed a Preliminary Assessment (PA) for in 1991. Subsequently, Roy F. Weston, Inc. (WESTON_®) Superfund Technical Assessment and Response Team (START) personnel focused on this parcel of the property during the Site Inspection (SI). This parcel of the property includes the areas in the vicinity of the former administration building, the former electronic component storage and assembly building, and the former guard house. The remaining portions of the original Space Research property are densely wooded, undeveloped parcels.

The main road through the property is a non-maintained dirt road. Two former gravel extraction areas are located in the southern portion of the property. The property is bordered to the east by North Jay Road; to the south by Journeys End Road; and to the west and north by heavily wooded areas with thick underbrush. In addition, the U.S./Canada border traverses the northern property boundary. Mountain Brook flows northeast generally through the eastern portion of the property.

The Space Research facility was constructed sometime between 1968 through 1973. Space Research developed and manufactured conventional munitions, howitzer systems, flight simulators, and computers. Operations associated with the production and testing of cannons (i.e., firing ranges, manufacturing, etc.) occurred on the Canadian portion of the property. Structures on the U.S. portion of the property included a guard house, an administration building, and an electronic component storage and assembly building.

In 1981, Space Research went bankrupt and the property was sold to United Technologies of Massawippi, Inc. (UTM) who subsequently founded North Troy Engineering, Inc. (NTE). Operations conducted by NTE on the property included electronics research and the manufacture of computers and computer chips. NTE reportedly used a large camera, located in the administration building, for producing circuit board prints. It is likely that photographic fixer/developer wastes were generated from this operation; however, no information is available on specific hazardous materials that may have been generated or disposed of by NTE. In approximately 1984, NTE went bankrupt and subsequently ceased operations. No Resource Conservation and Recovery Act (RCRA) inspections were conducted on the property while either the Space Research or the NTE facility were in operation.

In 1991, the VTDEC PA reported that no hazardous wastes were found on the property; however, containers on site indicated that various photochemicals may have been used. VTDEC reported that wastes generated from the use of the photochemical fixers/developers may have been discharged to on-site septic systems. All three buildings on the property were served by a respective septic system.

On 7 May 1998, START personnel conducted an on-site reconnaissance of the former Space Research property. On 13 October 1998, START personnel collected four subsurface soil/source samples and seven surface soil samples from potential source areas on the Space Research property to determine if hazardous substances were discharged into the on-site septic systems and/or disposed of on the ground surface. In addition, START personnel collected eight sediment samples from Mountain Brook to determine if there has been a release of hazardous substances. Hazardous substances detected in soil/source samples included three metals, and hazardous substances detected in surface soil samples included one pesticide and nine metals. One metal (cadmium) was detected above reference concentrations in the sediment samples (which has also been detected above reference concentrations in soil samples and is, therefore, partially attributable to the Space Research property).

Depth to groundwater on the property has not been determined. In addition, groundwater flow direction beneath the property has not been determined; however, based on the location of Mountain Brook, groundwater flow beneath the property is likely to the east-northeast. No groundwater public drinking water supply wells are located within 4-radial miles of the property. The nearest active private drinking water supply well is located approximately 300 ft east of the property at the nearest residence. The total population which relies on groundwater within 4-radial miles of the property is 310 people.

Stormwater runoff from the property flows east-southeast into Mountain Brook, which is located in the eastern portion of the property. Mountain Brook flows north-northeast for 0.9 miles (0.4 miles of which is on the Space Research property) before entering Canada. Mountain Brook continues to flow within Canada for 1.3 miles before discharging into the Missisquoi River. The Missisquoi River flows westward within Canada for 11.5 miles before reentering the U.S. in East Richford, Vermont. As a result, a total of 12.8 miles of the surface water pathway lies within Canada. The Missisquoi River continues to flow south-southwest for 1.7 miles to the 15-mile downstream pathway terminus.

There are no full-time employees on the Space Research property. The property has been abandoned and inactive since approximately 1984. Access to the property is unrestricted and is a gathering place for local youths, off-road vehicles, and the disposal of refuse (i.e., large appliances) by local residents. There are no residents on the property; the nearest residence is located approximately 300 ft east of the property on North Jay Road. The nearest school to the property is located approximately 2.1 miles east-southeast in the Village of North Troy. An estimated 44 persons live within 1-radial mile of the property, and an estimated 1,029 persons live within 4-radial miles of the property. In addition, approximately 516 acres of wetlands are located within 4-radial miles of the property.

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ATTACHMENT A

SPACE RESEARCH, INC.

**SOIL/SOURCE AND SURFACE SOIL SAMPLE
ANALYTICAL RESULTS
START**

Samples Collected 13 October 1998

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
µg/kg

	APC10 SS-01 982203A-01	APC11 SS-02 982203A-02	APC12 SS-03 982203A-03	APC13 SS-04 982203A-04	APC14 SS-06 982203A-05	APC15 SO-01 982203A-06
SAMPLE NUMBER:						
SAMPLE LOCATION:						
LABORATORY NUMBER:						
COMPOUND	CRQL					
Chloromethane	10	12 U	11 U	11 U	15 U	16 U
Bromomethane	10	12 U	11 U	11 U	15 U	16 U
Vinyl Chloride	10	12 U	11 U	11 U	15 U	16 U
Chloroethane	10	12 UJ	11 UJ	11 UJ	15 UJ	16 UJ
Methylene Chloride	10	12 U	11 U	11 U	15	16
Acetone	10	12 UJ	11 UJ	11 UJ	15 UJ	16 UJ
Carbon Disulfide	10	12 U	11 U	11 U	15 U	16 U
1,1-Dichloroethene	10	12 U	11 U	11 U	15 U	16 U
1,1-Dichloroethane	10	12 U	11 U	11 U	15 U	16 U
1,2-Dichloroethene (Total)	10	12 U	11 U	11 U	15 U	16 U
Chloroform	10	12 U	11 U	11 U	15 U	16 U
1,2-Dichloroethane	10	12 U	11 U	11 U	15 U	16 U
2-Butanone	10	12 UJ	11 UJ	11 UJ	15 UJ	16 UJ
1,1,1-Trichloroethane	10	12 U	11 U	11 U	15 U	16 U
Carbon Tetrachloride	10	12 U	11 U	11 U	15 U	16 U
Bromodichloromethane	10	12 U	11 U	11 U	15 U	16 U
1,2-Dichloropropane	10	12 U	11 U	11 U	15 U	16 U
cis-1,3-Dichloropropene	10	12 U	11 U	11 U	15 U	16 U
Trichloroethene	10	12 U	11 U	11 U	15 U	16 U
Dibromochloromethane	10	12 U	11 U	11 U	15 U	16 U
1,1,2-Trichloroethane	10	12 U	11 U	11 U	15 U	16 U
Benzene	10	12 U	11 U	11 U	15 U	16 U
trans-1,3-Dichloropropene	10	12 U	11 U	11 U	15 U	16 U
Bromoform	10	12 U	11 U	11 U	15 U	16 U
4-Methyl-2-pentanone	10	12 U	11 U	11 U	15 U	16 U
2-Hexanone	10	12 U	11 U	11 U	15 U	16 U
Tetrachloroethene	10	12 U	11 U	11 U	15 U	16 U
1,1,2,2-Tetrachloroethane	10	12 U	11 U	11 U	15 U	16 U
Toluene	10	12 U	11 U	11 U	15 U	16 U
Chlorobenzene	10	12 U	11 U	11 U	15 U	16 U
Ethylbenzene	10	12 U	11 U	11 U	15 U	16 U
Styrene	10	12 U	11 U	11 U	15 U	16 U
Xylene (total)	10	12 U	11 U	11 U	15 U	16 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE ANALYZED:		10/21/98	10/21/98	10/22/98	10/22/98	10/22/98
% MOISTURE:		14	10	11	33	11

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
µg/kg

SAMPLE NUMBER:	APC16	APC17	APC18	APC22
SAMPLE LOCATION:	SO-02	SO-03	SO-04	SS-07
LABORATORY NUMBER:	982203A-07	982203A-08	982203A-09	982203A-12

COMPOUND	CRQL	APC16	APC17	APC18	APC22
Chloromethane	10	11 U	11 U	14 U	13 U
Bromomethane	10	11 U	11 U	14 U	13 U
Vinyl Chloride	10	11 U	11 U	14 U	13 U
Chloroethane	10	11 UJ	11 U	14 U	13 U
Methylene Chloride	10	11 U	11 U	14 U	13 U
Acetone	10	14 UJ	14 UJ	71 UJ	27 UJ
Carbon Disulfide	10	11 U	11 U	14 U	13 U
1,1-Dichloroethene	10	11 U	11 U	14 U	13 U
1,1-Dichloroethane	10	11 U	11 U	14 U	13 U
1,2-Dichloroethene (Total)	10	11 U	11 U	14 U	13 U
Chloroform	10	0.8 JTB	11 U	14 U	13 U
1,2-Dichloroethane	10	11 U	11 U	14 U	13 U
2-Butanone	10	11 UJ	11 UJ	14 UJ	13 UJ
1,1,1-Trichloroethane	10	11 U	11 U	14 U	13 U
Carbon Tetrachloride	10	11 U	11 U	14 U	13 U
Bromodichloromethane	10	11 U	11 U	14 U	13 U
1,2-Dichloropropane	10	11 U	11 U	14 U	13 U
cis-1,3-Dichloropropene	10	11 U	11 U	14 U	13 U
Trichloroethene	10	11 U	11 U	14 U	13 U
Dibromochloromethane	10	11 U	11 U	14 U	13 U
1,1,2-Trichloroethane	10	11 U	11 U	14 U	13 U
Benzene	10	11 U	11 U	14 U	13 U
trans-1,3-Dichloropropene	10	11 U	11 U	14 U	13 U
Bromoform	10	11 U	11 U	14 U	13 U
4-Methyl-2-pentanone	10	11 U	11 UJ	14 UJ	13 UJ
2-Hexanone	10	11 U	11 U	14 U	3 J
Tetrachloroethene	10	0.6 J	11 U	14 U	13 U
1,1,2,2-Tetrachloroethane	10	11 U	11 U	14 U	13 U
Toluene	10	11 U	11 U	14 U	13 U
Chlorobenzene	10	11 U	11 U	14 U	13 U
Ethylbenzene	10	11 U	11 U	14 U	13 U
Styrene	10	11 U	11 U	14 U	13 U
Xylene (total)	10	11 U	11 U	14 U	13 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0
DATE SAMPLED:		10/13/98	10/13/98	10/13/98	10/13/98
DATE ANALYZED:		10/22/98	10/22/98	10/22/98	10/22/98
% MOISTURE:		9	12	30	21

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 2
VOLATILE AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER:	APC19	APC20
SAMPLE LOCATION:	TB-01	RB-01
LABORATORY NUMBER:	982203A-10	982203A-11

COMPOUND	CRQL		
Chloromethane	10	10 U	10 U
Bromomethane	10	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Chloroethane	10	10 U	10 U
Methylene Chloride	10	10 U	10 U
Acetone	10	10 UJ	10 UJ
Carbon Disulfide	10	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
1,2-Dichloroethene (Total)	10	10 U	10 U
Chloroform	10	13	10
1,2-Dichloroethane	10	10 U	10 U
2-Butanone	10	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U
Bromodichloromethane	10	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
Trichloroethene	10	10 U	10 U
Dibromochloromethane	10	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Benzene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
Bromoform	10	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U
Toluene	10	10 U	10 U
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Styrene	10	10 U	10 U
Xylene (total)	10	10 U	10 U
		1.0	1.0
DILUTION FACTOR:		10/13/98	10/13/98
DATE SAMPLED:		10/22/98	10/22/98
DATE ANALYZED:			

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CT

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
µg/kg

SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY NUMBER:	APC10 SS-01 982203A-01	APC11 SS-02 982203A-02	APC12 SS-03 982203A-03	APC13 SS-04 982203A-04	APC14 SS-06 982203A-05	APC15 SQ-01 982203A-08
COMPOUND	CRQL					
Phenol	330	380 U	370 U	370 UJ	490 U	100 J EB 360 U
bis(2-Chloroethyl)ether	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2-Chlorophenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
1,3-Dichlorobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
1,4-Dichlorobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
1,2-Dichlorobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2-Methylphenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,2'-Oxybis(1-chloropropane)	330	380 U	370 U	370 UJ	490 U	530 U 360 U
4-Methylphenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
N-Nitroso-di-n-propylamine	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Hexachloroethane	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Nitrobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Isophorone	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2-Nitrophenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,4-Dimethylphenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
bis(2-Chloroethoxy)methane	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,4-Dichlorophenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
1,2,4-Trichlorobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Naphthalene	330	380 U	6 J	370 UJ	490 U	530 U 360 U
4-Chloroaniline	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Hexachlorobutadiene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
4-Chloro-3-methylphenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2-Methylnaphthalene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Hexachlorocyclopentadiene	330	380 UJ	370 UJ	370 UJ	490 UJ	530 UJ 360 UJ
2,4,6-Trichlorophenol	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,4,5-Trichlorophenol	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
2-Chloronaphthalene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2-Nitroaniline	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
Dimethylphthalate	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Acenaphthylene	330	380 U	370 U	370 UJ	490 U	12 J 360 U
2,6-Dinitrotoluene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
3-Nitroaniline	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
Acenaphthene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,4-Dinitrophenol	830	960 UJ	920 UJ	920 UJ	1200 UJ	1300 UJ 900 UJ
4-Nitrophenol	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
Dibenzofuran	330	380 U	370 U	370 UJ	490 U	530 U 360 U
2,4-Dinitrotoluene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Diethylphthalate	330	380 U	370 U	370 UJ	490 U	530 U 360 U
4-Chlorophenyl-phenylether	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Fluorene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
4-Nitroaniline	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
4,5-Dinitro-2-methylphenol	830	960 UJ	920 UJ	920 UJ	1200 UJ	1300 UJ 900 UJ
N-Nitrosodiphenylamine(1)	330	380 U	370 U	370 UJ	490 U	530 U 360 U
4-Bromophenyl-phenylether	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Hexachlorobenzene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Pentachlorophenol	830	960 U	920 U	920 UJ	1200 U	1300 U 900 U
Phenanthrene	330	380 U	370 U	370 UJ	490 U	58 J 360 U
Anthracene	330	380 U	370 U	370 UJ	490 U	14 J 360 U
Carbazole	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Di-n-butylphthalate	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Fluoranthene	330	380 U	370 U	370 UJ	490 U	42 J 360 U
Pyrene	330	6 J	370 U	370 UJ	490 U	82 J 360 U
Butylbenzylphthalate	330	380 U	370 U	370 UJ	490 U	530 U 360 U
3,3'-Dichlorobenzidine	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Benzo(a)anthracene	330	380 U	370 U	370 UJ	490 U	19 J 360 U
Chrysene	330	380 U	370 U	370 UJ	490 U	16 J 360 U
Bis(2-ethylhexyl)phthalate	330	150 J EB	120 J EB	120 J EB	85 J EB	94 J EB 38 J EB
Di-n-octylphthalate	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Benzo(b)fluoranthene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Benzo(k)fluoranthene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Benzo(a)pyrene	330	380 U	370 U	370 UJ	490 U	16 J 360 U
Indeno(1,2,3-cd)pyrene	330	380 U	370 U	370 UJ	490 U	530 U 360 U
Dibenz(a,h)anthracene	330	330 U	370 U	370 UJ	490 U	530 U 360 U
Benzo(g,h,i)perylene	330	330 U	370 U	370 UJ	490 U	530 U 360 U
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:	10/21/98	10/21/98	11/02/98	10/21/98	10/21/98	10/21/98
DATE ANALYZED:	11/14/98	11/14/98	11/14/98	11/14/98	11/14/98	11/14/98
% MOISTURE:	14	10	10	33	38	8

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 25560 SDG: APC10
LABORATORY: IEA - CT

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
µg/kg

	APC:6 SO-02 982203A-07	APC:17 SO-03 982203A-08	APC:18 SO-04 982203A-09	APC:22 SS-07 982203A-12
SAMPLE NUMBER:				
SAMPLE LOCATION:				
LABORATORY NUMBER:				
COMPOUND	CRQL			
Phenol	330	8 J EB	370 U	400 U 440 U
bis(2-Chloroethyl)ether	330	360 U	370 U	400 U 440 U
2-Chlorophenol	330	360 U	370 U	400 U 440 U
1,3-Dichlorobenzene	330	360 U	370 U	400 U 440 U
1,4-Dichlorobenzene	330	360 U	370 U	400 U 440 U
1,2-Dichlorobenzene	330	360 U	370 U	400 U 440 U
2-Methylphenol	330	360 U	370 U	400 U 440 U
2,2'-Oxybis(1-chloropropane)	330	360 U	370 U	400 U 440 U
4-Methylphenol	330	360 U	370 U	400 U 440 U
N-Nitroso-di-n-propylamine	330	360 U	370 U	400 U 440 U
Hexachloroethane	330	360 U	370 U	400 U 440 U
Nitrobenzene	330	360 U	370 U	400 U 440 U
Isophorone	330	360 U	370 U	400 U 440 U
2-Nitrophenol	330	360 U	370 U	400 U 440 U
2,4-Dimethylphenol	330	360 U	370 U	400 U 440 U
bis(2-Chloroethoxy)methane	330	360 U	370 U	400 U 440 U
2,4-Dichlorophenol	330	360 U	370 U	400 U 440 U
1,2,4-Trichlorobenzene	330	360 U	370 U	400 U 440 U
Napthalene	330	360 U	370 U	400 U 440 U
4-Chloroaniline	330	360 U	370 U	400 U 440 U
Hexachlorobutadiene	330	360 U	370 U	400 U 440 U
4-Chloro-3-methylphenol	330	360 U	370 U	400 U 440 U
2-Methylnapthalene	330	360 U	370 U	400 U 440 U
Hexachlorocyclopentadiene	330	360 U	370 U	400 U 440 U
2,4,6-Trichlorophenol	330	360 U	370 U	400 U 440 U
2,4,5-Trichlorophenol	830	910 U	930 U	1000 U 1100 U
2-Chloronapthalene	330	360 U	370 U	400 U 440 U
2-Nitroaniline	830	910 U	930 U	1000 U 1100 U
Dimethylphthalate	330	360 U	370 U	400 U 440 U
Acenaphthylene	330	360 U	370 U	400 U 440 U
2,6-Dinitrotoluene	330	360 U	370 U	400 U 440 U
3-Nitroaniline	830	910 U	930 U	1000 U 1100 U
Acenaphthene	330	360 U	370 U	400 U 440 U
2,4-Dinitrophenol	830	910 U	930 U	1000 U 1100 U
4-Nitrophenol	830	910 U	930 U	1000 U 1100 U
Dibenzofuran	330	360 U	370 U	400 U 440 U
2,4-Dinitrotoluene	330	360 U	370 U	400 U 440 U
Diethylphthalate	330	360 U	370 U	400 U 440 U
4-Chlorophenyl-phenylether	330	360 U	370 U	400 U 440 U
Fluorene	330	360 U	370 U	400 U 440 U
4-Nitroaniline	830	910 U	930 U	1000 U 1100 U
4,6-Dinitro-2-methylphenol	830	910 U	930 U	1000 U 1100 U
N-Nitrosodiphenylamine(1)	330	360 U	370 U	400 U 440 U
4-Bromophenyl-phenylether	330	360 U	370 U	400 U 440 U
Hexachlorobenzene	330	360 U	370 U	400 U 440 U
Pentachlorophenol	830	910 U	930 U	1000 U 1100 U
Phenanthrene	330	360 U	370 U	400 U 440 U
Anthracene	330	360 U	370 U	400 U 440 U
Carbazole	330	360 U	370 U	400 U 440 U
Di-n-butylphthalate	330	360 U	370 U	400 U 440 U
Fluoranthene	330	360 U	370 U	400 U 440 U
Pyrene	330	360 U	6 J	400 U 440 U
Butylbenzylphthalate	330	360 U	370 U	400 U 440 U
3,3'-Dichlorobenzidine	330	360 U	370 U	400 U 440 U
Benzo(a)anthracene	330	360 U	370 U	400 U 440 U
Chrysene	330	360 U	370 U	400 U 440 U
Bis(2-ethylhexyl)phthalate	330	71 J EB	160 J EB	78 J EB 440 U
Di-n-octylphthalate	330	360 U	370 U	400 U 440 U
Benzo(b)fluoranthene	330	360 U	370 U	400 U 440 U
Benzo(k)fluoranthene	330	360 U	370 U	400 U 440 U
Benzo(a)pyrene	330	360 U	370 U	400 U 440 U
Indeno(1,2,3-cd)pyrene	330	360 U	370 U	400 U 440 U
Dibenz(a,h)anthracene	330	360 U	370 U	400 U 440 U
Benzo(g,h,i)perylene	330	360 U	48 J	400 U 440 U
DILUTION FACTOR:	1.0	1.0	1.0	1.0
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:	10/21/98	10/21/98	10/21/98	10/21/98
DATE ANALYZED:	11/14/98	11/14/98	11/14/98	11/15/98
% MOISTURE:	9	11	18	25

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 26550 SOG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 4
SEMIVOLATILE AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER: APC20
SAMPLE LOCATION: RB-01
LABORATORY NUMBER: 982203A-11

COMPOUND	QRQL	
Phenol	10	0.2 J
bis(2-Chloroethyl)ether	10	10 U
2-Chlorophenol	10	10 U
1,3-Dichlorobenzene	10	10 U
1,4-Dichlorobenzene	10	10 U
1,2-Dichlorobenzene	10	10 U
2-Methylphenol	10	10 U
2,2'-Oxybis(1-chloropropane)	10	10 U
4-Methylphenol	10	10 U
N-Nitroso-di-n-propylamine	10	10 U
Hexachloroethane	10	10 U
Nitrobenzene	10	10 U
Isopropene	10	10 U
2-Nitrophenol	10	10 U
2,4-Dimethylphenol	10	10 U
bis(2-Chloroethoxy)methane	10	10 U
2,4-Dichlorophenol	10	10 U
1,2,4-Trichlorobenzene	10	10 U
Naphthalene	10	10 U
4-Chloroaniline	10	10 U
Hexachlorobutadiene	10	10 U
4-Chloro-3-methylphenol	10	10 U
2-Methylnaphthalene	10	10 U
Hexachlorocyclopentadiene	10	10 U
2,4,5-Trichlorophenol	10	10 U
2,4,5-Trichlorophenol	25	26 U
2-Chloronaphthalene	10	10 U
2-Nitroaniline	25	26 U
Dimethylphthalate	10	10 U
Acenaphthylene	10	10 U
2,5-Dinitrotoluene	10	10 U
3-Nitroaniline	25	26 U
Acenaphthene	10	10 U
2,4-Dinitrophenol	25	26 UJ
4-Nitrophenol	25	26 U
Dibenzofuran	10	10 U
2,4-Dinitrotoluene	10	10 U
Diethylphthalate	10	10 U
4-Chlorophenyl-phenylether	10	10 U
Fluorene	10	10 U
4-Nitroaniline	25	26 U
4,5-Dinitro-2-methylphenol	25	26 UJ
N-Nitrosodiphenylamine(1)	10	10 U
4-Bromophenyl-phenylether	10	10 U
Hexachlorobenzene	10	10 U
Pentachlorophenol	25	26 U
Phenanthrene	10	10 U
Anthracene	10	10 U
Carbazole	10	10 U
Di-n-butylphthalate	10	10 U
Fluoranthene	10	10 U
Pyrene	10	10 U
Butylbenzylphthalate	10	10 U
3,3'-Dichlorobenzidine	10	10 U
Benzo(a)anthracene	10	10 U
Chrysene	10	10 U
Bis(2-ethylhexyl)phthalate	10	2 J
Di-n-octylphthalate	10	10 U
Benzo(b)fluoranthene	10	10 U
Benzo(k)fluoranthene	10	10 U
Benzo(a)pyrene	10	10 U
Indeno(1,2,3-cd)pyrene	10	10 U
Dibenz(a,h)anthracene	10	10 U
Benzo(g,h,i)perylene	10	10 U

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/19/98
DATE ANALYZED: 11/14/98

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 5
PESTICIDE/POLYCHLORINATED BIPIHENYL SOIL ANALYSIS
µg/kg

		APC10	APC11	APC12	APC13	APC14	APC15
		SS-01	SS-02	SS-03	SS-04	SS-06	SO-01
		982203A-01	982203A-02	982203A-03	982203A-04	982203A-05	982203A-06
SAMPLE NUMBER:							
SAMPLE LOCATION:							
LABORATORY NUMBER:							
COMPOUND	CRQL						
alpha-BHC	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
beta-BHC	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
delta-BHC	1.7	2.0 U	1.9 U	1.9 U	0.10 J	2.7 U	1.9 U
gamma-BHC (Lindane)	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Heptachlor	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Aldrin	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Heptachlor Epoxide	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Endosulfan I	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Dieldrin	3.3	3.9 U	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
4,4'-DDE	3.3	2.2 J	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
Endrin	3.3	3.9 U	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
Endosulfan II	3.3	3.9 U	0.30 J	3.6 U	4.9 U	5.2 U	3.7 U
4,4'-DDD	3.3	3.9 U	0.40 J	3.6 U	4.9 U	5.2 U	3.7 U
Endosulfan Sulfate	3.3	3.9 U	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
4,4'-DDT	3.3	2.8 J	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
Methoxychlor	17	2.1 J	19 U	0.44 J	1.1 J	0.94 J	19 U
Endrin Ketone	3.3	3.9 U	3.7 U	0.24 J	0.41 J	5.2 U	3.7 U
Endrin Aldehyde	3.3	3.9 U	3.7 U	3.6 U	4.9 U	5.2 U	3.7 U
alpha-Chlordane	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
gamma-Chlordane	1.7	2.0 U	1.9 U	1.9 U	2.5 U	2.7 U	1.9 U
Toxaphene	170	200 U	190 U	190 U	250 U	270 U	190 U
Aroclor-1016	33	39 U	37 U	36 U	49 U	52 U	37 U
Aroclor-1221	67	80 U	74 U	74 U	100 U	110 U	74 U
Aroclor-1232	33	39 U	37 U	36 U	49 U	52 U	37 U
Aroclor-1242	33	39 U	37 U	36 U	49 U	52 U	37 U
Aroclor-1248	33	39 U	37 U	36 U	49 U	52 U	37 U
Aroclor-1254	33	39 U	37 U	36 U	49 U	52 U	37 U
Aroclor-1260	33	39 U	37 U	36 U	49 U	52 U	37 U
DILUTION FACTOR:		1.00	1.00	1.00	1.00	1.00	1.00
DATE SAMPLED:		10/13/98	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:		10/16/98	10/16/98	10/16/98	10/16/98	10/16/98	10/16/98
DATE ANALYZED:		10/29/98	10/29/98	10/29/98	10/29/98	10/29/98	10/29/98
% MOISTURE:		16	10	9	33	37	10

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 5
PESTICIDE/POLYCHLORINATED BIPIHENYL SOIL ANALYSIS
µg/kg

SAMPLE NUMBER:	APC16	APC17	APC18	APC22
SAMPLE LOCATION:	SO-02	SO-03	SO-04	SS-07
LABORATORY NUMBER:	982203A-07	982203A-08	982203A-09	982203A-12

COMPOUND	CRQL	APC16	APC17	APC18	APC22
alpha-BHC	1.7	1.9 U	1.9 U	2.3 U	2.1 U
beta-BHC	1.7	1.9 U	1.9 U	2.3 U	2.1 U
delta-BHC	1.7	1.9 U	1.9 U	2.3 U	0.32 J
gamma-BHC (Lindane)	1.7	1.9 U	1.9 U	2.3 U	2.1 U
Heptachlor	1.7	1.9 U	1.9 U	2.3 U	2.1 U
Aldrin	1.7	1.9 U	1.9 U	0.11 J	2.1 U
Heptachlor Epoxide	1.7	1.9 U	1.9 U	2.3 U	2.1 U
Endosulfan I	1.7	1.9 U	1.9 U	R	2.1 U
Dieldrin	3.3	3.6 U	3.7 U	4.4 U	4.1 U
4,4'-DDE	3.3	3.6 U	3.7 U	4.4 U	4.1 U
Endrin	3.3	3.6 U	3.7 U	4.4 U	R
Endosulfan II	3.3	3.6 U	3.7 U	4.4 U	0.86 J
4,4'-DDD	3.3	3.6 U	3.7 U	4.4 U	4.1 U
Endosulfan Sulfate	3.3	3.6 U	3.7 U	4.4 U	0.79 J
4,4'-DDT	3.3	3.6 U	3.7 U	0.65 J	4.1 U
Methoxychlor	17	19 U	19 U	0.49 J	21 U
Endrin Ketone	3.3	3.6 U	3.7 U	4.4 U	4.1 U
Endrin Aldehyde	3.3	3.6 U	3.7 U	4.4 U	R
alpha-Chlordane	1.7	1.9 U	1.9 U	2.3 U	R
gamma-Chlordane	1.7	1.9 U	1.9 U	2.3 U	2.1 U
Toxaphene	170	190 U	190 U	230 U	210 U
Aroclor-1016	33	36 U	37 U	44 U	41 U
Aroclor-1221	67	74 U	75 U	89 U	84 U
Aroclor-1232	33	36 U	37 U	44 U	41 U
Aroclor-1242	33	36 U	37 U	44 U	41 U
Aroclor-1248	33	36 U	37 U	44 U	41 U
Aroclor-1254	33	36 U	37 U	44 U	41 U
Aroclor-1260	33	36 U	37 U	44 U	41 U

DILUTION FACTOR:	1.00	1.00	1.00	1.00
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:	10/16/98	10/16/98	10/16/98	10/16/98
DATE ANALYZED:	10/30/98	10/30/98	10/30/98	10/30/98
% MOISTURE:	9	11	25	20

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH, INC.
CASE: 26560 SDG: APC10
LABORATORY: IEA - CONNECTICUT

TABLE 6
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER: APC20
SAMPLE LOCATION: RB-01
LABORATORY NUMBER: 82203A-11

COMPOUND	CRQL	
alpha-BHC	0.050	0.050 UJ
beta-BHC	0.050	0.050 UJ
delta-BHC	0.050	0.050 UJ
gamma-BHC (Lindane)	0.050	0.050 UJ
Heptachlor	0.050	0.050 UJ
Aldrin	0.050	0.050 UJ
Heptachlor Epoxide	0.050	0.050 UJ
Endosulfan I	0.050	0.050 UJ
Dieldrin	0.10	0.10 UJ
4,4'-DDE	0.10	0.10 UJ
Endrin	0.10	0.10 UJ
Endosulfan II	0.10	0.10 UJ
4,4'-DDD	0.10	0.10 UJ
Endosulfan Sulfate	0.10	0.10 UJ
4,4'-DDT	0.10	0.10 UJ
Methoxychlor	0.50	0.50 UJ
Endrin Ketone	0.10	0.10 UJ
Endrin Aldehyde	0.10	0.10 UJ
alpha-Chlordane	0.050	0.050 UJ
gamma-Chlordane	0.050	0.050 UJ
Toxaphene	5.0	5.0 UJ
Aroclor-1016	1.0	1.0 UJ
Aroclor-1221	2.0	2.0 UJ
Aroclor-1232	1.0	1.0 UJ
Aroclor-1242	1.0	1.0 UJ
Aroclor-1248	1.0	1.0 UJ
Aroclor-1254	1.0	1.0 UJ
Aroclor-1260	1.0	1.0 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/16/98
DATE ANALYZED: 10/22/98

SITE: SPACE RESEARCH INC.
CASE: 26560 SDG: MALL62
LABORATORY: SENTINEL, INC.

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:
SAMPLE LOCATION:
LABORATORY NUMBER:
PERCENT SOLIDS:

MALL62	MALL63	MALL64	MALL65	MALL66	MALL67	MALL68
SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SO 01
15626S	15627S	15628S	15629S	15630S	15631S	15632S
85.2	89.6	85.8	72.4	77.4	64.4	91.2

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)							CONTRACT DETECTION LIMITS (mg/kg)	
		MALL62	MALL63	MALL64	MALL65	MALL66	MALL67	MALL68		
ALUMINUM	P	4.1	6720	8140	4750	7030	4740	7620	7420	40
ANTIMONY	P	0.8	0.94 UJ	0.89 UJ	0.93 UJ	1.1 UJ	1.0 UJ	1.2 UJ	0.88 UJ	12
ARSENIC	P	0.4	6.0	10.5	5.6	6.5	4.7	7.0	7.6	2
BARIUM	P	0.78	13.0	24.5	9.4	12.2	9.6	29.4	17.1	40
BERYLLIUM	P	0.12	0.19	0.26 J	0.14 U	0.32 J	0.24 J	0.37 J	0.23 J	1
CADMIUM	P	0.08	0.09 U	0.09 U	0.09 U	0.11 U	0.10 U	0.23 J	0.09 U	1
CALCIUM	P	2.7	950 J	2120 J	1460 J	515 J	574 J	3360 J	1130 J	1000
CHROMIUM	P	0.18	10.8	18.2	11.4	11.5	8.9	11.7	20.4	2
COBALT	P	0.64	6.9	12.5	7.4	5.2	5.3	17.1	11.4	10
COPPER	P	0.46	15.9	27.6	18.8	14.2	10.2	23.2	16.4	5
IRON	P	2.7	12800	20400	12100	15400	9820	14800	17000	20
LEAD	P	0.34	11.8	13.5	5.9	8.9	7.3	17.7	9.4	0.6
MAGNESIUM	P	2.3	1750	4630	2640	1180	1220	2050	4090	1000
MANGANESE	P	0.24	260 J	695 J	323 J	176 J	153 J	1260 J	671 J	3
MERCURY	CV	0.05	0.10 UJ	0.06 UJ	0.06 U	0.10 UJ	0.07 UJ	0.12 UJ	0.07 UJ	0.1
NICKEL	P	0.68	17.1	46.6	23.5	12.5	14.4	31.3	35.3	8
POTASSIUM	P	3.84	152 J	424 J	224 J	157 J	82.0 J	347 J	248 J	1000
SELENIUM	P	0.36	0.45 UJ	0.42 UJ	0.44 UJ	0.52 UJ	0.49 UJ	0.91 J	0.42 UJ	1
SILVER	P	0.22	0.56 J	0.80 J	0.58 J	0.52 J	0.51 J	0.89 J	0.70 J	2
SODIUM	P	25.9	84.7	81.5	98.4	91.7	71.9	122	75.0	1000
THALLIUM	P	0.72	0.85 U	0.80 U	0.84 U	0.99 U	0.93 U	1.1 UJ	0.79 U	2
VANADIUM	P	0.58	9.6	11.3	6.5	11.9	8.3	11.1	11.4	10
ZINC	P	0.48	41.6	44.1	26.4	27.2	26.6	51.1	39.2	4
CYANIDE	CA	0.07	0.08 U	0.08 U	0.06 U	0.10 U	NA	0.19 UJ	0.13 UJ	0.5

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR
CA - MIDI-DISTILLATION
SPECTROPHOTOMETRIC

NOTE: J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED
NA = NOT ANALYZED

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH INC.
CASE: 26560 SDG: MALL62
LABORATORY: SENTINEL, INC.

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:	MALL69	MALL70	MALL71	MALL74
SAMPLE LOCATION:	SO-02	SO-03	SO 04	SS-07
LABORATORY NUMBER:	15633S	15634S	15635S	15637S
PERCENT SOLIDS:	91.0	86.6	76.5	74.6

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)					CONTRACT DETECTION LIMITS (mg/kg)
		MALL69	MALL70	MALL71	MALL74		
ALUMINUM	P	4.1	6770	9590	8400	6430	40
ANTIMONY	P	0.8	0.88 UJ	0.92 UJ	1.0 UJ	1.1 UJ	12
ARSENIC	P	0.4	11.7	5.9	5.5	9.3	2
BARIUM	P	0.78	16.3	29.9	17.2	167	40
BERYLLIUM	P	0.12	0.27 J	0.33 J	0.27 J	0.24 J	1
CADMIUM	P	0.08	0.09 U	0.09 U	0.10 U	0.11 J	1
CALCIUM	P	2.7	1290 J	1290 J	1220 J	2250 J	1000
CHROMIUM	P	0.18	17.9	19.3	19.2	19.1	2
COBALT	P	0.64	11.3	11.1	9.1	9.5	10
COPPER	P	0.46	17.7	30.4	17.1	22.0	5
IRON	P	2.7	15800	20700	17700	20700	20
LEAD	P	0.34	10.4	8.1	10.0	33.7	0.6
MAGNESIUM	P	2.3	3270	4780	3280	3250	1000
MANGANESE	P	0.24	619 J	536 J	376 J	413 J	3
MERCURY	CV	0.05	0.08 UJ	0.06 U	0.08 UJ	0.11 UJ	0.1
NICKEL	P	0.68	34.1	38.1	25.0	32.9	8
POTASSIUM	P	3.84	215 J	505 J	263 J	289 J	1000
SELENIUM	P	0.38	0.42 UJ	0.44 UJ	0.48 UJ	0.51 UJ	1
SILVER	P	0.22	0.80 J	0.87 J	0.86 J	1.0 J	2
SODIUM	P	25.9	102	97.6	120	110	1000
THALLIUM	P	0.72	0.79 U	0.83 U	0.92 U	0.97 U	2
VANADIUM	P	0.58	10.0	12.9	12.3	12.4	10
ZINC	P	0.48	38.5	45.5	33.2	76.6	4
CYANIDE	CA	0.07	0.08 U	0.08 U	0.09 U	0.20 UJ	2.5

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR
CA - MDI-DISTILLATION
SPECTROPHOTOMETRIC

NOTE: J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED
NA = NOT ANALYZED

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH INC.
CASE: 26560 SDG: MALL62
LABORATORY: SENTINEL, INC.

TABLE 2
INORGANIC AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER: MALL72
SAMPLE LOCATION: RB-01
LABORATORY NUMBER: 15636S

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (µg/L)		CONTRACT DETECTION LIMITS (µg/L)
ALUMINUM	P	20.4	20.4 U	200
ANTIMONY	P	4.0	4.0 U	60
ARSENIC	P	2.0	2.2 J	10
BARIUM	P	3.9	3.9 U	200
BERYLLIUM	P	0.6	0.60 U	5
CADMIUM	P	0.4	0.40 U	5
CALCIUM	P	13.7	78.8 U	5000
CHROMIUM	P	0.8	0.90 U	10
COBALT	P	3.2	3.2 U	50
COPPER	P	2.3	2.3 U	25
IRON	P	13.7	13.7 U	100
LEAD	P	1.7	2.5 J	3
MAGNESIUM	P	11.5	11.5 U	5000
MANGANESE	P	1.2	1.2 U	15
MERCURY	CV	0.1	0.10 U	0.2
NICKEL	P	3.4	3.4 U	40
POTASSIUM	P	19.2	21.6 J	5000
SELENIUM	P	1.9	1.9 UJ	5
SILVER	P	1.1	1.1 UJ	10
SODIUM	P	129.7	130 U	5000
THALLIUM	P	3.6	3.6 U	10
VANADIUM	P	2.9	2.9 U	50
ZINC	P	2.4	9.6	20
CYANIDE	CA	1.4	5.5 UJ	10

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR
CA - MIDI-DISTILLATION
SPECTROPHOTOMETRIC

NOTE: J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

ATTACHMENT B

SPACE RESEARCH, INC.

**SEDIMENT SAMPLE
ANALYTICAL RESULTS
START**

Samples Collected 13 October 1998

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_O
LABORATORY: SWOK

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
µg/kg

	DAF01C SD-01 35987.01	DAF02C SD-02 35987.02	DAF03C SD-03 35987.03	DAF04C SD-04 35987.04	DAF05C SD-05 35987.07	DAF06C SD-06 35987.09
SAMPLE NUMBER:						
SAMPLE LOCATION:						
LABORATORY NUMBER:						
COMPOUND	CRQL					
Chloromethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Bromomethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Vinyl Chloride	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Chloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Methylene Chloride	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Acetone	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Carbon Disulfide	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,1-Dichloroethene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,1-Dichloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,2-Dichloroethene (Total)	10	12 UJ	12 J	5 J	12 UJ	11 UJ
Chloroform	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,2-Dichloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
2-Butanone	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,1,1-Trichloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Carbon Tetrachloride	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Bromodichloromethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,2-Dichloropropane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
cis-1,3-Dichloropropene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Trichloroethene	10	12 UJ	2 J	1 J	12 UJ	11 UJ
Dibromochloromethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,1,2-Trichloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Benzene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
trans-1,3-Dichloropropene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Bromoform	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
4-Methyl-2-pentanone	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
2-Hexanone	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Tetrachloroethene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,1,2,2-Tetrachloroethane	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Toluene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Chlorobenzene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Ethylbenzene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Styrene	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
Xylene (total)	10	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE ANALYZED:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98
% MOISTURE:	15	9	10	14	11	14

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH, INC.
CASE: D184F SDG: DAF01C_O
LABORATORY: SWOK

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
µg/kg

SAMPLE NUMBER: DAF07C
SAMPLE LOCATION: SD-07
LABORATORY NUMBER: 35987.10

COMPOUND	CRQL	
Chloromethane	10	12 UJ
Bromomethane	10	12 UJ
Vinyl Chloride	10	12 UJ
Chloroethane	10	12 UJ
Methylene Chloride	10	12 UJ
Acetone	10	12 UJ
Carbon Disulfide	10	12 UJ
1,1-Dichloroethane	10	12 UJ
1,1-Dichloroethane	10	12 UJ
1,2-Dichloroethane (Total)	10	12 UJ
Chloroform	10	12 UJ
1,2-Dichloroethane	10	12 UJ
2-Butanone	10	12 UJ
1,1,1-Trichloroethane	10	12 UJ
Carbon Tetrachloride	10	12 UJ
Bromodichloromethane	10	12 UJ
1,2-Dichloropropane	10	12 UJ
cis-1,3-Dichloropropene	10	12 UJ
Trichloroethene	10	12 UJ
Dibromochloromethane	10	12 UJ
1,1,2-Trichloroethane	10	12 UJ
Benzene	10	12 UJ
trans-1,3-Dichloropropene	10	12 UJ
Bromoform	10	12 UJ
4-Methyl-2-pentanone	10	12 UJ
2-Hexanone	10	12 UJ
Tetrachloroethene	10	12 UJ
1,1,2,2-Tetrachloroethane	10	12 UJ
Toluene	10	12 UJ
Chlorobenzene	10	12 UJ
Ethylbenzene	10	12 UJ
Styrene	10	12 UJ
Xylene (total)	10	12 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE ANALYZED: 10/20/98
% MOISTURE: 15

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_0
LABORATORY: SWOK

TABLE 2
VOLATILE AQUEOUS ANALYSIS
µg/L

	SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY NUMBER:	DAF09C TB-02 35987.12	DAF10C RB-03 35987.13
COMPOUND		CRQL	
Chloromethane		10	10 UJ
Bromomethane		10	10 UJ
Vinyl Chloride		10	10 UJ
Chloroethane		10	10 UJ
Methylene Chloride		10	10 UJ
Acetone		10	10 UJ
Carbon Disulfide		10	10 UJ
1,1-Dichloroethene		10	10 UJ
1,1-Dichloroethane		10	10 UJ
1,2-Dichloroethene (Total)		10	10 UJ
Chloroform		10	11 J
1,2-Dichloroethane		10	8 J
2-Butanone		10	10 UJ
1,1,1-Trichloroethane		10	10 UJ
Carbon Tetrachloride		10	10 UJ
Bromodichloromethane		10	10 UJ
1,2-Dichloropropane		10	10 UJ
cis-1,3-Dichloropropene		10	10 UJ
Trichloroethene		10	10 UJ
Dibromochloromethane		10	10 UJ
1,1,2-Trichloroethane		10	10 UJ
Benzene		10	10 UJ
trans-1,3-Dichloropropene		10	10 UJ
Bromoform		10	10 UJ
4-Methyl-2-pentanone		10	10 UJ
2-Hexanone		10	10 UJ
Tetrachloroethene		10	10 UJ
1,1,2,2-Tetrachloroethane		10	10 UJ
Toluene		10	10 UJ
Chlorobenzene		10	10 UJ
Ethylbenzene		10	10 UJ
Styrene		10	10 UJ
Xylene (total)		10	10 UJ
	DILUTION FACTOR:	1.0	1.0
	DATE SAMPLED:	10/13/98	10/13/98
	DATE ANALYZED:	10/22/98	10/22/98

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
µg/kg

SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY NUMBER:	DAF01C SD-01 35987.01	DAF02C SD-02 35987.02	DAF03C SD-03 35987.03	DAF04C SD-04 35987.04	DAF05C SD-05 35987.07	DAF06C SD-08 35987.09
COMPOUND	CRQL					
Phenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
bis(2-Chloroethyl)ether	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2-Chlorophenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
1,3-Dichlorobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
1,4-Dichlorobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	21 J
1,2-Dichlorobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2-Methylphenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,2'-Oxybis(1-chloropropane)	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Methylphenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
N-Nitroso-di-n-propylamine	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Hexachloroethane	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Nitrobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Isophorone	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2-Nitrophenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4-Dimethylphenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
bis(2-Chloroethoxy)methane	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4-Dichlorophenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
1,2,4-Trichlorobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	250 UJ
Naphthalene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Chloroaniline	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Hexachlorobutadiene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Chloro-3-methylphenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2-Methylnaphthalene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Hexachlorocyclopentadiene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4,5-Trichlorophenol	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4,5-Trichlorophenol	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
2-Chloronaphthalene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2-Nitroaniline	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
Dimethylphthalate	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Acenaphthylene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,6-Dinitrotoluene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
3-Nitroaniline	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
Acenaphthene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4-Dinitrophenol	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
4-Nitrophenol	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
Dibenzofuran	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
2,4-Dinitrotoluene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Diethylphthalate	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Chlorophenyl-phenylether	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Fluorene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Nitroaniline	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
4,6-Dinitro-2-methylphenol	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
N-Nitrosodiphenylamine(1)	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
4-Bromophenyl-phenylether	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Hexachlorobenzene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Pentachlorophenol	330	930 UJ	870 UJ	900 UJ	920 UJ	890 UJ
Phenanthrene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Anthracene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Carbazole	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Di-n-butylphthalate	330	370 UJ	340 UJ	24 J	370 UJ	350 UJ
Fluoranthene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Pyrene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Butylbenzylphthalate	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
3,3'-Dichlorobenzidine	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Benzo(a)anthracene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Chrysene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
bis(2-Ethylhexyl)phthalate	330	370 UJ	30 J	25 J	370 UJ	27 J
Di-n-octylphthalate	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Benzo(b)fluoranthene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Benzo(k)fluoranthene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Benzo(a)pyrene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Indeno(1,2,3-cd)pyrene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Dibenz(a,h)anthracene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
Benzo(g,h,i)perylene	330	370 UJ	340 UJ	360 UJ	370 UJ	350 UJ
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:	10/19/98	10/19/98	10/19/98	10/19/98	10/19/98	10/19/98
DATE ANALYZED:	10/22/98	10/22/98	10/22/98	10/22/98	10/22/98	10/22/98
% MOISTURE:	15	9	10	14	11	14

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 3184F SDG: DAF01C_0
LABORATORY: SWOK

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
µg/kg

SAMPLE NUMBER: DAF07C
SAMPLE LOCATION: SD-07
LABORATORY NUMBER: 35987.10

COMPOUND	CRQL	
Phenol	330	370 UJ
bis(2-Chloroethyl)ether	330	370 UJ
2-Chlorophenol	330	370 UJ
1,3-Dichlorobenzene	330	370 UJ
1,4-Dichlorobenzene	330	370 UJ
1,2-Dichlorobenzene	330	370 UJ
2-Methylphenol	330	370 UJ
2,2'-Oxybis(1-chloropropane)	330	370 UJ
4-Methylphenol	330	370 UJ
N-Nitroso-di-n-propylamine	330	370 UJ
Hexachloroethane	330	370 UJ
Nitrobenzene	330	370 UJ
Isophorone	330	370 UJ
2-Nitrophenol	330	370 UJ
2,4-Dimethylphenol	330	370 UJ
bis(2-Chloroethoxy)methane	330	370 UJ
2,4-Dichlorophenol	330	370 UJ
1,2,4-Trichlorobenzene	330	370 UJ
Naphthalene	330	370 UJ
4-Chloroaniline	330	370 UJ
Hexachlorocyclopentadiene	330	370 UJ
4-Chloro-3-methylphenol	330	370 UJ
2-Methylnaphthalene	330	370 UJ
Hexachlorocyclopentadiene	330	370 UJ
2,4,6-Trichlorophenol	330	370 UJ
2,4,5-Trichlorophenol	830	930 UJ
2-Chloronaphthalene	330	370 UJ
2-Nitroaniline	830	930 UJ
Dimethylphthalate	330	370 UJ
Acenaphthylene	330	370 UJ
2,6-Dinitrotoluene	330	370 UJ
3-Nitroaniline	830	930 UJ
Acenaphthene	330	370 UJ
2,4-Dinitrophenol	830	930 UJ
4-Nitrophenol	830	930 UJ
Dibenzofuran	330	370 UJ
2,4-Dinitrotoluene	330	370 UJ
Diethylphthalate	330	370 UJ
4-Chlorophenyl-phenylether	330	370 UJ
Fluorene	330	370 UJ
4-Nitroaniline	830	930 UJ
4,6-Dinitro-2-methylphenol	830	930 UJ
N-Nitrosodiphenylamine(1)	330	370 UJ
4-Bromophenyl-phenylether	330	370 UJ
Hexachlorobenzene	330	370 UJ
Pentachlorophenol	830	930 UJ
Phenanthrene	330	370 UJ
Anthracene	330	370 UJ
Carbazole	330	370 UJ
Di-n-butylphthalate	330	370 UJ
Fluoranthene	330	370 UJ
Pyrene	330	370 UJ
Butylbenzylphthalate	330	370 UJ
3,3'-Dichlorobenzidine	330	370 UJ
Benzo(a)anthracene	330	370 UJ
Chrysene	330	370 UJ
bis(2-Ethylhexyl)phthalate	330	370 UJ
Di-n-octylphthalate	330	370 UJ
Benzo(b)fluoranthene	330	370 UJ
Benzo(k)fluoranthene	330	370 UJ
Benzo(a)pyrene	330	370 UJ
Indeno(1,2,3-cd)pyrene	330	370 UJ
Dibenz(a,h)anthracene	330	370 UJ
Benzo(g,h,i)perylene	330	370 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/19/98
DATE ANALYZED: 10/22/98
% MOISTURE: 15

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_0
LABORATORY: SWOK

TABLE 4
SEMIVOLATILE AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER: DAF10C
SAMPLE LOCATION: RB-03
LABORATORY NUMBER: 35987.13

COMPOUND	CRQL	
Phenol	10	10 UJ
bis(2-Chloroethyl)ether	10	10 UJ
2-Chlorophenol	10	10 UJ
1,3-Dichlorobenzene	10	10 UJ
1,4-Dichlorobenzene	10	10 UJ
1,2-Dichlorobenzene	10	10 UJ
2-Methylphenol	10	10 UJ
2,2'-Oxybis(1-chloropropane)	10	10 UJ
4-Methylphenol	10	10 UJ
N-Nitroso-di-n-propylamine	10	10 UJ
Hexachloroethane	10	10 UJ
Nitrobenzene	10	10 UJ
Isocourene	10	10 UJ
2-Nitrophenol	10	10 UJ
2,4-Dimethylphenol	10	10 UJ
bis(2-Chloroethoxy)methane	10	10 UJ
2,4-Dichlorophenol	10	10 UJ
1,2,4-Trichlorobenzene	10	10 UJ
Naphthalene	10	10 UJ
4-Chloroaniline	10	10 UJ
Hexachlorobutadiene	10	10 UJ
4-Chloro-3-methylphenol	10	10 UJ
2-Methylnaphthalene	10	10 UJ
Hexachlorocyclopentadiene	10	10 UJ
2,4,6-Trichlorophenol	10	10 UJ
2,4,5-Trichlorophenol	25	25 UJ
2-Chloronaphthalene	10	10 UJ
2-Nitroamine	25	25 UJ
Dimethylphthalate	10	10 UJ
Acenaphthylene	10	10 UJ
2,8-Dinitrotoluene	10	10 UJ
3-Nitroamine	25	25 UJ
Acenaphthene	10	10 UJ
2,4-Dinitrophenol	25	25 UJ
4-Nitrophenol	25	25 UJ
Dibenzofuran	10	10 UJ
2,4-Dinitrotoluene	10	10 UJ
Diethylphthalate	10	14 UJ
4-Chlorophenyl-phenylether	10	10 UJ
Fluorene	10	10 UJ
4-Nitroaniline	25	25 UJ
4,6-Dinitro-2-methylphenol	25	25 UJ
N-Nitrosodiphenylamine(1)	10	10 UJ
4-Bromophenyl-phenylether	10	10 UJ
Hexachlorobenzene	10	10 UJ
Pentachlorophenol	25	25 UJ
Phenanthrene	10	10 UJ
Anthracene	10	10 UJ
Carbazole	10	10 UJ
Di-n-butylphthalate	10	10 UJ
Fluoranthene	10	10 UJ
Pyrene	10	10 UJ
Butylbenzylphthalate	10	10 UJ
3,3'-Dichlorobenzidine	10	10 UJ
Benzo(a)anthracene	10	10 UJ
Chrysene	10	10 UJ
bis(2-Ethylhexyl)phthalate	10	10 UJ
Di-n-octylphthalate	10	10 UJ
Benzo(b)fluoranthene	10	10 UJ
Benzo(k)fluoranthene	10	10 UJ
Benzo(a)pyrene	10	10 UJ
Indeno(1,2,3-cd)pyrene	10	10 UJ
Dibenz(a,h)anthracene	10	10 UJ
Benzo(g,h,i)perylene	10	10 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/19/98
DATE ANALYZED: 10/22/98

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_O
LABORATORY: SWOK

TABLE 5
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSIS
µg/kg

	DAF01C SD-01 35987.01	DAF02C SD-02 35987.02	DAF03C SD-03 35987.03	DAF04C SD-04 35987.04	DAF05C SD-05 35987.07	DAF06C SD-06 35987.09
SAMPLE NUMBER:						
SAMPLE LOCATION:						
LABORATORY NUMBER:						
COMPOUND	CRQL					
alpha-BHC	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
beta-BHC	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
delta-BHC	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
gamma-BHC (Lindane)	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
Heptachlor	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.3 J	2.3 J
Aldrin	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
Heptachlor Epoxide	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
Endosulfan I	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
Dieldrin	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
4,4'-DDE	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
Endrin	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
Endosulfan II	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
4,4'-DDD	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
Endosulfan Sulfate	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
4,4'-DDT	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
Methoxychlor	17	19 UJ	18 UJ	18 UJ	20 UJ	19 UJ
Endrin Ketone	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
Endrin Aldehyde	3.3	3.7 UJ	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ
alpha-Chlordane	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
gamma-Chlordane	1.7	1.9 UJ	1.8 UJ	1.8 UJ	2.0 UJ	1.9 UJ
Toxaphene	170	190 UJ	180 UJ	180 UJ	200 UJ	190 UJ
Aroclor-1016	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
Aroclor-1221	67	76 UJ	73 UJ	72 UJ	78 UJ	75 UJ
Aroclor-1232	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
Aroclor-1242	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
Aroclor-1248	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
Aroclor-1254	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
Aroclor-1260	33	37 UJ	36 UJ	35 UJ	38 UJ	37 UJ
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98	10/13/98
DATE EXTRACTED:	10/19/98	10/19/98	10/19/98	10/19/98	10/19/98	10/19/98
DATE ANALYZED:	10/27/98	10/27/98	10/27/98	10/27/98	10/28/98	10/28/98
% MOISTURE:	15	9	10	14	11	14

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 01B4F SDG: DAF01C_O
LABORATORY: SWOK

TABLE 5
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSIS
µg/kg

SAMPLE NUMBER: DAF07C
SAMPLE LOCATION: SD-07
LABORATORY NUMBER: 35987.10

COMPOUND	CRQL	
alpha-BHC	1.7	1.9 UJ
beta-BHC	1.7	1.9 UJ
delta-BHC	1.7	1.9 UJ
gamma-BHC (Lindane)	1.7	1.9 UJ
Heptachlor	1.7	1.9 UJ
Aldrin	1.7	1.9 UJ
Heptachlor Epoxida	1.7	1.9 UJ
Endosulfan I	1.7	1.9 UJ
Dieldrin	3.3	3.8 UJ
4,4'-DDE	3.3	3.8 UJ
Endrin	3.3	3.8 UJ
Endosulfan II	3.3	3.8 UJ
4,4'-DDD	3.3	3.8 UJ
Endosulfan Sulfate	3.3	3.8 UJ
4,4'-DDT	3.3	3.8 UJ
Methoxychlor	17	19 UJ
Endrin Ketone	3.3	3.8 UJ
Endrin Aldehyde	3.3	3.8 UJ
alpha-Chlordane	1.7	1.9 UJ
gamma-Chlordane	1.7	1.9 UJ
Toxaphene	170	190 UJ
Aroclor-1016	33	38 UJ
Aroclor-1221	67	76 UJ
Aroclor-1232	33	38 UJ
Aroclor-1242	33	38 UJ
Aroclor-1248	33	38 UJ
Aroclor-1254	33	38 UJ
Aroclor-1260	33	38 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/19/98
DATE ANALYZED: 10/28/98
% MOISTURE: 15

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_O
LABORATORY: SWOK

TABLE 6
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER: DAF10C
SAMPLE LOCATION: RB-03
LABORATORY NUMBER: 35987.13

COMPOUND	CRQL	
alpha-BHC	0.050	0.050 UJ
beta-BHC	0.050	0.050 UJ
delta-BHC	0.050	0.050 UJ
gamma-BHC (Lindane)	0.050	0.050 UJ
Heptachlor	0.050	0.050 UJ
Aldrin	0.050	0.050 UJ
Heptachlor Epoxide	0.050	0.050 UJ
Endosulfan I	0.050	0.050 UJ
Dieldrin	0.10	0.10 UJ
4,4'-DDE	0.10	0.10 UJ
Endrin	0.10	0.10 UJ
Endosulfan II	0.10	0.10 UJ
4,4'-DDD	0.10	0.10 UJ
Endosulfan Sulfate	0.10	0.10 UJ
4,4'-DDT	0.10	0.10 UJ
Methoxychlor	0.50	0.50 UJ
Endrin Ketone	0.10	0.10 UJ
Endrin Aldehyde	0.10	0.10 UJ
alpha-Chlordane	0.050	0.050 UJ
gamma-Chlordane	0.050	0.050 UJ
Toxaphene	5.0	5.0 UJ
Aroclor-1016	1.0	1.0 UJ
Aroclor-1221	2.0	2.0 UJ
Aroclor-1232	1.0	1.0 UJ
Aroclor-1242	1.0	1.0 UJ
Aroclor-1248	1.0	1.0 UJ
Aroclor-1254	1.0	1.0 UJ
Aroclor-1260	1.0	1.0 UJ

DILUTION FACTOR: 1.0
DATE SAMPLED: 10/13/98
DATE EXTRACTED: 10/20/98
DATE ANALYZED: 11/03/98

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_1
LABORATORY: SOUTHWEST LABORATORY
OF OKLAHOMA

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:	DAF01C	DAF02C	DAF03C	DAF04C	DAF05C	DAF06C	DAF07C
SAMPLE LOCATION:	SD-01	SD-02	SD-03	SD 04	SD-05	SD-06	SD-07
LABORATORY NUMBER:	35987.01	35987.02	35987.03	35987.04	35987.07	35987.09	35987.10
PERCENT SOLIDS:	85.3	90.7	90.1	86.5	88.6	85.7	85.0

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)	DAF01C	DAF02C	DAF03C	DAF04C	DAF05C	DAF06C	DAF07C	CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	2.4	6410	7500	4820	8370	6810	7240	7490	40
ANTIMONY	P	0.60	0.75 J	0.65 U	0.63 U	0.69 U	0.66 U	0.69 U	0.68 U	12
ARSENIC	P	0.40	4.2 J	4.8 J	2.7 J	3.4 J	7.7 J	3.6 J	4.5 J	2
BARIUM	P	0.20	9.5	9.1	9.5	16.1	12.8	10.4	10	40
BERYLLIUM	P	0.20	0.23 U	0.22 U	0.21 U	0.23 U	0.22 U	0.23 U	0.23 U	1
CADMIUM	P	0.20	0.23 U	0.22 U	0.21 U	0.25 J	0.22 U	0.23 U	0.23 U	1
CALCIUM	P	2.2	964	1630	875	1060	974	1000	1090	1000
CHROMIUM	P	0.20	13.8	11.8	9.2	18.0	12.2	12.2	22.0	2
COBALT	P	0.40	4.7	5.0	4.8	7.9	8.4	6.7	7.0	10
COPPER	P	0.40	8.4	9.1	7.0	12.7	11.0	12.4	7.7	5
IRON	P	2.4	14500	18100	10900	18500	20600	17900	18500	20
LEAD	P	0.20	4.1 J	4.2 J	3.6 J	4.9 J	6.0 J	6.4 J	4.3 J	0.6
MAGNESIUM	P	4.4	3610	3890	2840	4770	4620	4300	4360	1000
MANGANESE	P	0.20	140 J	186 J	333 J	440 J	352 J	352 J	340 J	3
MERCURY	AV	0.05	0.05 U	0.06 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.06 U	0.1
NICKEL	P	0.40	16.9	18.1	13.5	24.0	28.4	17.8	18.7	8
POTASSIUM	P	25.6	186	180	128	297	220	231	147	1000
SELENIUM	P	0.60	0.70 U	0.65 U	0.63 U	0.69 U	0.66 U	0.69 U	0.68 U	1
SILVER	P	0.40	0.46 U	0.44 U	0.42 U	0.46 U	0.44 U	0.46 U	0.45 U	2
SODIUM	P	16.0	229 U	252 U	232 U	239 U	239 U	237 U	223 U	1000
THALLIUM	P	0.40	0.66 UJ	0.44 U	0.42 U	0.46 U	0.44 U	0.46 U	0.45 U	2
VANADIUM	P	0.20	10.2	11.3	7.1	12.1	11.0	10.8	15.5	10
ZINC	P	0.40	34.2	38.0	37.1	53.4	41.9	42.6	43.3	4
CYANIDE	AS	0.10	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.5

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
AS - SEMI AUTOMATED
SPECTROPHOTOMETRIC
AV - AUTOMATED COLD VAPOR AA

NOTE: J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED
IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_I
LABORATORY: SOUTHWEST LABORATORY
OF OKLAHOMA

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER: DAF08C
SAMPLE LOCATION: SD-08
LABORATORY NUMBER: 35987.11
PERCENT SOLIDS: 80.3

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)		CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	2.4	7150	40
ANTIMONY	P	0.60	0.71 U	12
ARSENIC	P	0.40	3.0 J	2
BARIUM	P	0.20	11.5	40
BERYLLIUM	P	0.20	0.24 U	1
CADMIUM	P	0.20	0.24 U	1
CALCIUM	P	2.2	909	1000
CHROMIUM	P	0.20	15.4	2
COBALT	P	0.40	6.0	10
COPPER	P	0.40	6.4	5
IRON	P	2.4	16300	20
LEAD	P	0.20	4.2 J	0.6
MAGNESIUM	P	4.4	4270	1000
MANGANESE	P	0.20	384 J	3
MERCURY	AV	0.05	0.06 U	0.1
NICKEL	P	0.40	15.1	8
POTASSIUM	P	25.6	190	1000
SELENIUM	P	0.60	0.71 U	1
SILVER	P	0.40	0.47 U	2
SODIUM	P	16.0	295 U	1000
THALLIUM	P	0.40	0.47 U	2
VANADIUM	P	0.20	12.1	10
ZINC	P	0.40	46.0	4
CYANIDE	AS	0.10	NA	0.5

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
AS - SEMI AUTOMATED
SPECTROPHOTOMETRIC
AV - AUTOMATED COLD VAPOR AA

NOTE: J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED
IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED
R = VALUE IS REJECTED.
NA = NOT ANALYZED

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: SPACE RESEARCH, INC.
CASE: 0184F SDG: DAF01C_I
LABORATORY: SOUTHWEST LABORATORY
OF OKLAHOMA

TABLE 2
INORGANIC WATER ANALYSIS
ug/L

SAMPLE NUMBER: DAF10C
SAMPLE LOCATION: RB-03
LABORATORY NUMBER: 35987.13

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (ug/L)		CONTRACT DETECTION LIMITS (ug/L)
ALUMINUM	P	9.0	9.0 U	200
ANTIMONY	P	4.0	4.0 U	60
ARSENIC	P	4.0	4.0 U	10
BARIUM	P	1.0	1.0 U	200
BERYLLIUM	P	1.0	1.0 U	5
CADMIUM	P	1.0	1.0 U	5
CALCIUM	P	13.0	40.2 U	5000
CHROMIUM	P	1.0	1.0 U	10
COBALT	P	2.0	2.0 U	50
COPPER	P	1.0	1.7 UJ	25
IRON	P	19.0	19.0 U	100
LEAD	P	2.0	2.0 U	3
MAGNESIUM	P	72.0	72.0 U	5000
MANGANESE	P	1.0	1.0 U	15
MERCURY	AV	0.10	0.10 U	0.2
NICKEL	P	1.0	1.0 U	40
POTASSIUM	P	36.0	36.0 U	5000
SELENIUM	P	4.0	4.7 J	5
SILVER	P	3.0	3.0 U	10
SODIUM	P	104	110 UJ	5000
THALLIUM	P	6.0	6.0 UJ	10
VANADIUM	P	2.0	2.0 U	50
ZINC	P	2.0	21.6	20
CYANIDE	AS	2.0	2.0 U	10

ANALYTICAL METHOD

F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR
AS - SEMI AUTOMATED
SPECTROPHOTOMETRIC
AV - AUTOMATED COLD VAPOR AA

NOTE: J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED
IN THE QUALITY CONTROL REVIEW (DATA REVIEW)
U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.