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RETEC

ADDENDUM
To The
PRELIMINARY SITE ASSESSMENT REPORT

For
THE MINERAL SPRINGS ROAD
FORMER MANUFACTURED GAS PLANT SITE
WEST SENECA, NEW YORK

Prepared For:

NATIONAL FUEL GAS DISTRIBUTION CORPORATION
10 Lafayette Square
Buffalo, New York 14203

Prepared By:

REMEDIATION TECHNOLOGIES, INC.
1001 West Seneca Street
Ithaca, New York 14850

RETEC Project No. 3-2075-680

May 5, 1998

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Reviewed By: B Coulombe (LT)

May 5, 1998

EXECUTIVE SUMMARY

Based on the recommendations of the Preliminary Site Assessment Report for the Mineral Springs Road Former Manufactured Gas Plant Site, RETEC conducted additional investigative work and IRMs at the site from December, 1997, through April, 1998.

The stratigraphy of the site was confirmed to consist of several feet of soil and fill, a nearly continuous upper confining clay layer (UCL), a groundwater bearing strata of silt, sand and gravel, and a lower confining clay layer (LCL).

Approximately 3.0 acres of subsurface purifier residuals and approximately 3.0 acres of subsurface NAPL impacted soils have been delineated above the UCL. Approximately 4.3 acres of subsurface NAPL impacted soils have been delineated between the UCL and LCL. Analytical results indicate that the NAPL materials are non-hazardous hydrocarbons except for the interior contents of Separator Pit 2 which is hazardous for benzene.

Groundwater concentrations at all perimeter wells were below detection limits for BTEX and PAHs. The majority of the on-site wells had detectable levels of BTEX, PAHs and total cyanide. Additional groundwater testing revealed low levels (less than 100 µg/L) of weak acid dissociable cyanide in all the wells previously tested for total cyanide. Groundwater is not known to be used for any purpose, on- or off-site. Though the regulatory limit, which is based on total cyanide, was exceeded in two of the three down gradient perimeter wells, it appears that the groundwater does not pose a risk to on- or off-site receptors. Groundwater elevations were found to be influenced by the eastern drainage ditch though the off-site flow direction was still to the northwest as anticipated.

The hazardous materials from beneath the southwestern electric transmission tower (consisting of purifier box residuals and lead impacted soil) were excavated and disposed of off-site. Analysis of surface soil samples from under and around the remaining four towers identified isolated subareas of only slightly elevated lead concentrations (up to 890 mg/kg, total, and up to 0.24 µg/L, TCLP) below towers #2, #3 and #4. Lead concentrations are highest within the footprints of the towers and rapidly diminish radially. A composite sample of paint from the towers was 29% (290,000 mg/kg) lead.

Soil gas samples were analyzed from areas immediately adjacent to the routinely occupied building spaces of the site. The analytical results indicated the presence of MGP residuals but not in sufficient concentrations to warrant further action.

Except for on-site personnel performing excavations in impacted soil, the environmental risk associated with this site to on- and off-site receptors is negligible.

RETEC recommends the following remedial actions for the Mineral Springs Site:

a. Excavation and removal of the tar boils identified in the PSA.

b. Excavation and removal of the contents of Separator Pits 2 and 3 (approximately 400 cubic yards) and up to 1800 additional cubic yards of the most impacted surrounding soil from above the water table. This action is consistent with the work previously performed for Separator Pit 1.

c. Though not an MGP related issue, NFG should pursue a dialog with Niagara Mohawk Power Corporation regarding future electric tower maintenance and the surface soils below the transmission towers which were found to have up to 890 mg/kg total lead.

d. Excavate, cap or armor exposed purifier residuals near the Calais Avenue storm sewer inlet and around the Eastern Swale.

e. Continue annual surface water and groundwater monitoring for a period of 5 years, after which time the need for continued monitoring will be reevaluated.

f. Erect additional fence to further minimize site access by non-NFG personnel.

g. Proceed with institutional controls and property deed restrictions relevant to NFG's intended/continued future use of the site as a service center.

h. Due to the age, location and immobility of the NAPL residuals below the UCL, recovery is not recommended.

i. Based on a review of environmental receptors and pathways, excavation and/or recovery of the remaining on-site MGP residuals is not recommended.

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1.0 INTRODUCTION

On behalf of National Fuel Gas Distribution Company (NFG), Remediation Technologies, Inc. (RETEC) conducted a preliminary site assessment (PSA) at a former manufactured gas plant (MGP) site on Mineral Springs Road in the Town of West Seneca, Erie County, New York. The results of the PSA are presented in the *Preliminary Site Assessment Report for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York (RETEC, November 5, 1997).* The PSA recommended several interim remedial measures (IRMs) and additional investigation of the site, the results of which are presented in this Addendum to the PSA.

The objectives of the PSA were to:

- Identify the nature and extent of constituents of interest (COI);
- Determine if COI identified at the site constitute a significant threat to human health or the environment; and
- Determine whether interim remedial measures (IRMs) were appropriate at the site.

The significant observations and results of the PSA were:

- Subsurface hydrocarbon odors, sheens, or NAPL impacted soils were observed in several areas of the site.
- A surface deposit of purifier residuals and blue stained soil under the electric transmission tower in the southwest corner of the site was found to exhibit hazardous characteristics for corrosivity and lead.
- Other observed surface deposits of MGP residuals were limited to the eastern swale (purifier box residuals), the area south of Building 14 (purifier box residuals) and the vegetated area northeast of Building 14 (tar "boils").
- Subsurface lenses of purifier box residuals were observed in the Eastern Swale Area, in the area south of Building 14, and in the compressed natural gas fueling area south of Building 3.
- Subsurface NAPL was observed in the west bank of the eastern drainage ditch, inside of and in the immediate vicinity of two former oil-water separators, and in one soil boring east of Building 10.

- Groundwater throughout the site was found to contain measurable levels of total cyanide.

- BTEX and PAHs were not detected in the groundwater at the downgradient property boundary except at MW13, which may have contained benzene below the laboratory's quantitation limit.

- Groundwater at the center of the site contained elevated levels of BTEX, PAHs, and total cyanide.

- The risks presented to on-site and off-site personnel are minimal with the exception of NFG workers who may conduct excavations in areas with MGP residuals; such personnel should avoid areas of known subsurface contamination.

- The surface deposits of purifier residuals in the eastern swale and under the southwestern tower should be addressed by IRMs.

- Additional surface and subsurface investigation was required to delineate the extent of the MGP residuals detected.

Based on the PSA's recommendations, from January to April, 1998, RETEC conducted the following additional investigative work and IRMs, the results of which are presented in this Addendum to the PSA:

- Additional subsurface soil borings were performed to further delineate the locations of MGP residuals. See Section 2.0 for text, Appendix E for lab reports, and Figures 1, 2 and 3 in Appendix G for boring locations and lateral extent of residuals.

- Two additional monitoring wells (MW17 and MW18) were installed. Additional groundwater testing was also performed to quantify the risk associated with the elevated concentrations of total cyanide previously measured at the site perimeter. See Section 3.0 for text, Appendix F for lab reports, and Figure 4 in Appendix G for groundwater contours.

- The hazardous materials from beneath the southwestern electric transmission tower (consisting of purifier box residuals and lead impacted soil) were excavated and disposed of off-site. See Appendix A for results of the IRM and the IRM Complete Report.

- Additional surface soil sampling was performed beneath the five electric transmission towers. See Appendix B for the Interim and Final Results.

- Soil gas samples were obtained from areas immediately adjacent to the routinely occupied building spaces of the site. See Appendix C for results of the survey.

- Based on these new findings, RETEC has revised the PSA's evaluation of potential risks to site receptors and the remedial conclusions. See Section 4.0 for the evaluation of risks and Section 5.0 for the conclusions.

A site history and a summary of previous site investigations were presented in the PSA and are not reiterated in this Addendum.

2.0 RESULTS OF ADDITIONAL SOIL BORINGS

This section presents additional environmental data gathered at the Mineral Springs Road MGP Site between January and April, 1998. The data supplements information presented in the *Preliminary Site Assessment for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York (RETEC, November 5, 1997)*.

2.1 Scope of Work

As recommended by the PSA, additional Geoprobe and HSA (hollow stem auger) soil borings were completed to further define the nature, extent, depth and potential sources of NAPL and purifier box residuals found in several areas of the site. Several other areas which were not included in the original PSA were also investigated. The primary areas of interest were:

- South of Building 3.
- Around three former purifying boxes.
- Around and within the Separator Pits Area.
- Around and within the Subsurface Hydrocarbon Area.
- Within the footprint of former tanks to the east and west of Building 10.
- Within the footprint of the eastern gas holder.
- South and east of MW14.

The total number of borings, as specified in the field by the RETEC geologist, was 55 including 16 deep borings (see Figures 1, 2 and 3 in Appendix G; Borelogs in Appendix D). Two additional monitoring wells were also installed (see Section 3.0 of this report for groundwater analyses).

Drilling followed an "inside-out" approach, moving radially outward from the impacted area until field observations (visual, olfactory and PID readings) indicated that no significant contamination was present. Delineation of soils impacted by NAPL or purifier residuals (as shown in Figures 2 and 3) was based on field observations.

Northstar Drilling, Inc., of Cortland, New York was contracted to perform the borings. Galson Laboratories of Syracuse, New York, was contracted to complete the chemical analyses. RETEC's laboratory in Pittsburgh, Pennsylvania, completed the IR spectral analyses. RETEC's standard boring and sampling methods are presented in the *Field Sampling and Analysis Plan* (RETEC, 1997b) and the *Site Specific Health and Safety Plan* (RETEC, 1997c). The horizontal

location and ground surface elevation of 10 of the deep borings were surveyed by Douglas C. Myers, Professional Land Surveyor P.C., of Arcade, New York. The horizontal location and ground surface elevations of the other borings were surveyed by RETEC personnel.

All downhole equipment was pressure-washed between borings. Fluids generated during the decontamination were containerized on a lined bermed area and temporarily stored on-site in 55-gallon drums. Drill cuttings, PPE and sampling tubes were likewise containerized and temporarily stored. Analysis of the drummed water showed a hazardous level of benzene. The soil was non-hazardous. All drums were disposed of appropriately off-site.

2.2 Field Observations and Analytical Data

The following summarizes the field observations and analytical data from the additional subsurface soil borings performed between January and April, 1998.

2.2.1 Revised Description of Site Stratigraphy

Five stratigraphic units have been identified from soil borings completed at the site.

- A surface layer of mixed fill material was found on the majority of the site. The fill is comprised of silty clay, coal fragments, brick fragments, cinders, ashes and concrete fragments. The fill thickness is highly variable, ranging from 1 to 8 feet.

- Underlying the fill is a nearly continuous upper confining clay layer (UCL) comprised of dense silty clay. The UCL was observed in all of the borings completed at the site except near the Separator Pits. The UCL may also be absent in the eastern drainage ditch. The UCL was observed to range from 3 to 13 feet in thickness, at a typical top elevation of 584 to 580 feet above MSL.

- Underlying the UCL is a groundwater-bearing sand and gravel unit. Except near the Separator Pits and the eastern drainage ditch, the aquifer is confined under several feet of static head as evidenced during monitoring well installations. Static water elevation (above MSL) varies across the site, ranging from approximately 585.5 feet (3 feet bgs) at MW18 to approximately 579.2 feet (11 feet bgs) at MW14. Groundwater flow beneath the majority of the site is northwest towards Mineral Springs Road and the Buffalo River with a gradient (between MW11 and MW14) of 0.0016 feet/foot (July, 1997) to 0.0017 feet/foot (February, 1998). Due, presumably, to the influence of subsurface structures and the disturbed UCL, groundwater

is "mounded" in the Separator Pits Area. Groundwater also appears to be influenced by, and in direct contact with, the eastern drainage ditch.

- Underlying the groundwater-bearing sand and gravel unit is a lower confining clay layer (LCL) comprised (like the UCL) of tight silty clay. The LCL was encountered in all 16 deep borings (DBs) and appears to be continuous throughout the site. The elevation (above MSL) of the LCL varies from 567 feet to 562 feet in the Subsurface Hydrocarbon Area and from 568 feet to 565 feet in the Separator Pits Area.

- One deep boring (DB-3) was advanced to elevation 548 feet (39.5 feet bgs) where refusal was encountered, presumably on bedrock. Data from the Madison Wire investigations support the assumption that bedrock is at or near 40 feet bgs in this area of the Mineral Springs site. The LCL was approximately 13 feet thick at DB-3.

2.2.2 South of Building 3

The original PSA found an 18 inch thick subsurface lens of purifier residuals south of Building 3 at SB-51. Additional borings were conducted to delineate the lens.

The lens was found to be only 6 inches thick in boring SB-55 and to have tapered to 1 inch or less at SB-56. SB-54 and SB-57 did not contain purifier residuals (see Figure 2 in Appendix G).

2.2.3 Around Former Purifying Boxes

The original PSA located a 6 inch thick subsurface lens of purifier residuals north of Building 10 at SB-5. Additional borings were conducted to delineate the extent of the lens.

SB-58, SB-59, SB-60, SB-94 and SB-95 did not contain purifier residuals. SB-59 (near Building 10) did, however, contain an 8 inch lens of granular fill impacted by hydrocarbon NAPL. SB-60 was similarly impacted. SB-61, SB-63 and SB-68 did not contain visible hydrocarbons or purifier residuals except for a faint sheen at one interval in SB-68. A 4 inch thick lens of purifier materials was observed in SB-93.

2.2.4 Separator Pits Area

The original PSA roughly delineated the lateral impact of hydrocarbon residuals in and around the separator pits. Additional borings were conducted to determine the depth of the impact and to locate (and confirm the presence of) the LCL.

Deep boring DB-5, located midway between Separator Pits 2 and 3, revealed NAPL impacted soils extending to the LCL. DB-1 and DB-2, located down and cross gradient of the separator pits respectively, were free of NAPL. A 2 inch lens of granular fill with a hydrocarbon sheen was logged at DB-2 above the UCL.

Additional samples were also recovered from within the separator pits for TCLP analyses (see Table 2-1). The material in Separator Pit 2 was determined to be a hazardous petroleum and tar residual with 3.2 mg/L TCLP benzene. The material in Separator Pit 3 was determined to be a non-hazardous petroleum hydrocarbon with only 0.12 mg/L TCLP benzene.

2.2.5 Subsurface Hydrocarbon Area

During the PSA, Geoprobe borings in the Subsurface Hydrocarbon Area found hydrocarbon NAPL in the groundwater-bearing unit below the UCL. Based on field observations of the material and the IR Spectral analyses performed early in the scope of this additional work, 11 deep borings to the LCL (DB-3, DB-4, DB-16, and DB-6 through DB-13) were performed to confirm the presence, and lateral extent, of NAPL impacts in this area (see Figure 3 in Appendix E). Analysis of a sample of the hydrocarbon material, recovered from a fresh boring adjacent to SB-44, indicated it is a non-hazardous, weathered, carburetted water gas, DNAPL tar residual (see Table 2-1).

NAPL was also identified in several borings above the UCL, extending from the existing eastern fenceline towards Building 10 (see Figure 2 in Appendix E). Soil from one boring (SB-66) was observed in the field to have a "solvent-like" odor. Analysis of that material showed 8.6 mg/kg total benzene but no chlorinated constituents. Analysis of another NAPL-impacted sample (from SB-79) was non-detect for benzene.

2.2.6 Around Building 10

West of Building 10, in the footprint of several former MGP chemical tanks, MGP residuals were limited to a faint sheen on soil, at SB-68, between 8 feet and 10 feet bgs.

Northwest of Building 10, hydrocarbon NAPL was observed in two borings as described in Section 2.2.3. Northeast of Building 10 is the area of subsurface purifier residuals identified in the PSA as the Eastern Swale. Southeast of Building 10, hydrocarbon NAPL was observed in several borings as described in Section 2.2.5.

Table 2-1
Analytical Results
Separator Pits and Subsurface Hydrocarbons
Mineral Springs Gas Plant Site, February, 1998

Analyte	Separator Pit 2	Separator Pit 3	SB-44
TCLP Benzene (mg/L)	3.200 *	0.120	ND
Other TCLP VOAs (mg/L)	ND	ND	ND
TCLP Cresol ** (mg/L)	0.056	ND	ND
Other TCLP SVOAs (mg/L)	ND	ND	ND
TCLP Barium (mg/L)	1.2	1.0	ND
Other TCLP Metals (mg/L)	ND	ND	ND
Reactive Cyanide (mg/kg)	ND	ND	ND
Reactive Sulfide (mg/kg)	ND	ND	ND
Corrosivity / pH	10.4	9.4	7.4
Ignitability	negative	negative	negative
IR Spectral Analysis	Mixture of Petroleum and CWG/Coal Tar	Petroleum Hydro-carbon, Asphaltic	Weathered CWG/Coal Tar

Analyte	SB-66	SB-79
Total Benzene (mg/kg)	8.60	ND
Total Other BTEX (mg/kg)	232.0	5740
Total PAHs (mg/kg)	2679	1641
Total Chlorinated VOAs (mg/kg)	ND	---

* Value grater than regulatory hazardous definition.

** Cresol as 2-Methylphenol

Full Laboratory Reports Are Attached In Appendix E.

2.2.7 Eastern Gas Holder

One soil boring (SB-63) was performed within the footprint of the eastern ("500 M", i.e. 500,000 cubic feet) gas holder. A hollow stem auger was used to drill through the 12 inch thick concrete slab which still exists at approximately 3 feet bgs. No significant contaminants were detected above or below the slab, to a depth of 20 feet bgs.

A 2 to 6 foot thick lens of NAPL impacted soil (above the UCL) was, however, encountered in soil borings SB-82 and SB-83, located to the southeast of the holder. Impacts at SB-87, SB-88 and SB-89 were limited to strong hydrocarbon odors.

2.2.8 South of Class D Stream

Three soil borings were performed in the triangular parcel between the Class D stream and the southern railroad tracks. No field indications of contamination were detected in the soil or the groundwater.

Three additional borings were performed along the northern bank of the Class D stream (south of the existing fence line). Again, no contamination was detected.

2.3 Summary of Findings

Hydrocarbon materials were found in several parts of the site. In the Separator Pits Investigation Area, NAPL was found in Separator Pits numbered 2 and 3, in soil around the separators, and on the lower confining clay layer immediately below the pits (deep boring DB-5). TCLP analyses indicated that the material in Separator Pit 2 is hazardous for benzene. An IR Spectral analysis of the material identified it as a mixture of MGP and petroleum based residuals. The material in Separator Pit 3 was identified as a non-hazardous petroleum residual.

NAPL was found between the upper and lower confining clay layers in the Subsurface Hydrocarbon Investigation Area, apparently concentrated in a band below the eastern drainage ditch from DB-4 to MW11. An IR Spectral analysis of the material identified it as a coal tar residual. A TCLP analysis indicated the material is non-hazardous.

other tar material was hazardous for benzene see 2.2.4 pg 2-4

NAPL impacted soils were found in several areas above the upper clay layer: a small area north of Building 10 (SB-59 and SB-60), a larger area east of Building 10 from SB-09 to SB-49 to DB-3 to SB-79, and around the separator pits with additional impacts around SB-82 and SB-83.

Localized tar "boils" were previously identified in surficial soils at SB-26 and confirmed at SB-90.

Purifier residuals were found at a number of locations. Purifier residuals have been found up to three feet thick in the Eastern Swale Area, primarily in the subsurface but with some surface exposure due to erosion. Thin subsurface layers of purifier residuals were also found in two areas between Building 3 and the Class D stream. The surface deposit of purifier residuals under the southwestern electric transmission tower, which had been analyzed as hazardous for lead and corrosivity (RETEC, 1997a), was excavated and removed from the site (see Appendix A of this report).

3.0 RESULTS OF ADDITIONAL GROUNDWATER SAMPLING

This section presents additional groundwater data gathered at the Mineral Springs Road MGP Site during February, 1998. The data supplements information presented in the *Preliminary Site Assessment for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York (RETEC, November 5, 1997)*.

3.1 Scope of Work

Two new wells were installed at the site with the objective of further defining the nature, extent and potential source(s) of the COI in groundwater identified during the PSA. The well locations are (see also Figure 4):

- One new well (MW17) in the southeastern corner of the site.
- One new well (MW18) in the northeastern corner of the site.

Northstar Drilling, Inc., of Cortland, New York was contracted to install and develop the wells. Galson Laboratories of Syracuse, New York, was contracted to complete the chemical analysis of groundwater samples. Construction details, development procedures and sampling methods are presented in the *Field Sampling and Analysis Plan* (RETEC, 1997a) and the *Site Specific Health and Safety Plan* (RETEC, 1997b). The horizontal location, ground surface elevation, and the elevation of the PVC riser of the two new wells were measured by Douglas C. Myers, Professional Land Surveyor P.C., of Arcade, New York.

Groundwater testing consisted of:

- A complete round of depth-to-water measurements and verification of groundwater flow directions.
- Analysis of the two new wells for MGP indicators (BTEX, PAHs, TAL metals and total cyanide).
- Testing of all wells for weak-acid dissociable cyanide.
- Re-analysis of groundwater at MW13 for BTEX.

3.2 Results

During the installation of MW17 and MW18, no visible evidence of impacted soil or groundwater was encountered.

The groundwater-bearing sand unit is thin or absent at MW18 and the LCL and UCL appear to have nearly converged at this location. Consequently, recovery is slow in this well.

Table 3-1 presents the Monitoring Well Construction Summary and the groundwater elevations as measured on February 9, 1998. Table 3-2 presents a summary of the field parameters measured at that time.

Table 3-3 presents the Groundwater Analytical Results from February, 1998. For comparison, Table 3-4 presents the analytical results from July, 1997, which were originally presented in the PSA (RETEC, 1997a).

3.3 Summary of Findings

RETEC's review of the data reveals the following conclusions related to the groundwater at the site:

- BTEX and PAH compounds were found to exceed NYSDEC Groundwater Quality Standards in MW7, MW8, MW11, and MW12. These wells are all located in central areas of the site.
- BTEX and PAH compounds were below detection limits in MW10 and in all wells at the site perimeter.
- Detected metals concentrations exceeding NYSDEC Groundwater Standard Values were limited to iron, magnesium, manganese, sodium and thallium.
- Cyanide (total) was found in concentrations exceeding the NYSDEC Groundwater Standard (100 µg/L) in all 11 wells tested except MW15, MW17 and MW18.
- Cyanide (weak acid dissociable) was found in concentrations below 100 µg/L in all 11 monitoring wells tested. These data indicate that the groundwater does not pose a risk to off-site receptors (see Section 4.0).
- A single groundwater-bearing unit between the upper confining clay layer (UCL) and the lower confining clay layer (LCL) is present across the site except at MW18.

- Due to recent storm events at the time of the 1998 sampling, several soil samples taken from above the UCL were wet but did not appear to represent a contiguous aquifer.

- Except near the Separator Pits and the eastern drainage ditch, the groundwater aquifer is confined under several feet of static head as evidenced during monitoring well installations. Static water elevation (above MSL) varies across the site, ranging from approximately 585.5 feet (3 feet bgs) at MW18 to approximately 579.2 (11 feet bgs) at MW14. Groundwater flow beneath the majority of the site is northwest towards Mineral Springs Road and the Buffalo River with a gradient (between MW11 and MW14) of 0.0016 feet/foot (July, 1997) to 0.0017 feet/foot (February, 1998). Due, presumably, to the influence of subsurface structures and disturbances to the UCL, groundwater is "mounded" in the Separator Pits Area.

- Groundwater appears to be influenced by, and in direct contact with, the eastern drainage ditch. Sediment and surface water sampling and analysis conducted during the PSA indicates detectable levels of hydrocarbons and total cyanide, but no exceedences at the site perimeter.

Table 3-1
Monitoring Well Construction Summary
Mineral Springs Gas Plant Site

Well Number	Ground Surface Elevation (Feet above MSL)	Top of PVC Riser (Feet above MSL)	Total Depth Drilled (Feet)	Top of Screen Elevation (Feet above MSL)	Bottom of Screen Elevation (Feet above MSL)	Depth to Water 2/98 (Feet)	Elevation of Water Measured 2/98 (Feet above MSL)
MW 3	587.93	587.81	12.0	585.81	575.81	6.32	581.49
MW 4	588.18	587.95	14.4	583.55	573.55	6.30	581.65
MW 5	587.95	587.74	14.0	583.95	573.95	---	---
MW 6	588.77	588.55	15.0	583.77	573.77	4.00	584.55
MW 7	587.56	587.31	15.2	582.38	572.36	5.36	581.68
MW 8	588.14	587.90	14.2	583.94	573.94	6.49	581.41
MW 9	588.31	587.93	15.4	582.89	572.89	6.25	581.68
MW 10	587.97	587.71	15.0	582.97	572.97	6.27	581.44
MW 11	587.34	590.03	18.0	584.34	569.34	7.77	582.26
MW 12	588.74	591.40	15.0	583.74	573.74	10.33	581.07
MW 13	590.51	591.85	20.0	582.33	572.33	12.13	579.72
MW 14	590.02	589.81	20.0	580.02	570.02	10.62	579.19
MW 15	588.95	590.93	18.0	580.95	570.95	11.12	579.81
MW 16	586.46	588.99	18.0	578.46	568.46	7.50	581.49
MW 17	585.20	587.28	18.0	577.20	567.20	4.92	582.36
MW 18	589.00	591.64	26.0	575.00	565.00	6.18	585.46

Note : MW3 and MW4 installed by Empire Soils (ESI, 1995). MW5 through MW10 installed by RETEC in 1995. MW11 through MW16 installed by RETEC in 1997. MW17 and MW18 installed by RETEC in 1998. MW1 and MW2 have been decommissioned.

Table 3-2
Groundwater Field Parameters Summary
February 1998

Well Number	pH	Temperature (Degrees C)	Conductivity (µmho/cm)	Turbidity (NTU)
MW 7	7.31	9.8	860	5
MW 8	7.48	10.9	700	12
MW 10	7.51	10.5	890	15
MW 11	7.66	5.0	495	17
MW 12	7.06	9.5	2730	112
MW 13	7.44	12.0	389	5
MW 14	7.09	10.6	655	19
MW 15	6.87	9.7	755	52
MW 16	6.85	11.3	1402	10
MW 17	7.50	7.7	766	38
MW 18	8.50	8.4	252	20

Table 3.4

Groundwater Results
Mineral Springs Road MGP Site

07/22-23/97

Sample ID Date Sampled	MW-07 07/22/97			MW-08 07/22/97			MW-10 07/22/97			MW-11 07/22/97			MW-12 07/22/97			MW-13 07/22-23/97			MW-14 07/22-23/97			MW-15 07/22-23/97			MW-16 07/22/97			MW-17			MW-18			Groundwater Standard / Guidance Value	
	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ	Result	LQ	VQ		
BTEX (µg/L)																																			
Benzene	4900			1200			5	U		35			17			4	J		5	U		5	U		5	U								0.7	s
Toluene	750			62	U		5	U		17			5	U		5	U		5	U		5	U		5	U								5	s
Ethylbenzene	2900			220			5	U		94			5	U		5	U		5	U		5	U		5	U								5	s
Xylene (Total)	1200			230			5	U		83			5	U		5	U		5	U		5	U		5	U								5	s (ea.)
PAHs (µg/L)																																			
Naphthalene	2400	D	J	2000	D		10	U		140			10	U		11	U		3	J		1	J		10	U								10	g
2-Methylnaphthalene																																			NL
Acenaphthylene	95	U		120	U		10	U		9	J		10	U		11	U		10	U		10	U		10	U								20	g
Acenaphthene	180			15	J		10	U		7	J		10	U		11	U		10	U		10	U		10	U								20	g
Fluorene	45	J		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								50	g
Phenanthrene	37	J		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								50	g
Anthracene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								50	g
Fluoranthene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								50	g
Pyrene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								50	g
Benz(a)Anthracene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Chrysene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Benzo(b)Fluoranthene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Benzo(k)Fluoranthene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Benzo(a)Pyrene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Indeno(1,2,3-cd)Pyrene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	or MDL
Dibenz(a,h)Anthracene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U								0.002	g
Benzo(g,h,i)Perylene	95	U		120	U		10	U		10	U		10	U		11	U		10	U		10	U		10	U									NL
METALS (µg/L)																																		5	g
Aluminum	116	B		63	U		281			243			500			1200			242			245			495										
Antimony	9	U		9	U		9	U		9	U		9	U		9	U		9	U		9	U		9	U									NL
Arsenic	5	U		5	U		5	U		5	U		5	U		5	U		5	U		5	U		5	U								3	g
Barium	229			390			303			199	B		75.4	B		108	B		176	B		107	B		40.8	B								25	s
Beryllium	1	U		1	U		1	U		1	U		1	U		1	U		1	U		1	U		1	U								1000	s
Cadmium	1	U		1	U		1	U		1	U		1	U		1	U		1	U		1	U		1	U								3	g
Calcium	184000			183000			192000			184000			290000			114000			139000			98500			226000									10	s
Chromium	2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U									NL
Cobalt	2	B		2.3	B		1.7	B		2.4	B		2.4	B		1.3	B		3.5	B		2.8	B		4.5	B								50	s
Copper	2	B	U	1.9	B	U	81.6			5.4	B	U	6.5	B	U	9.9	B	U	5.7	B	U	5.4	B	U	8.1	B	U									NL
Iron	**14600**			**34100**			**24400**			**23400**			**109000**			**2180**			**5590**			**9330**			**146000**									200	s
Lead	2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U								300	s
Magnesium	28900			34400			31100			31500			109000			34800			29300			34300			104000									25	s
Manganese	1430			1520			3010			1650			15400			293			2180			565			1970									35000	s
Mercury	0.1	U		0.1	U		0.1	U		0.1	U		0.1	U		0.1	U		0.1	U		0.1	U		0.1	U								300	s
Nickel	2	U		2	U		2.7	B		2.1	B		2	U		6.4	B		6.9	B		4.9	B		4.7	B								2	s
Potassium	3310	B		3870	B		1870	B		1780	B		6520			936	B		2850	B		568	B		10400									NL
Selenium	4	U		4	U		4	U		4	U		4	U		4	U		4	U		4	U		4	U									NL
Silver	1	U		1.2	B		1	U		1	U		1	U		1	U		1	U		1	U		1	U								10	s
Sodium	98800		J	152000		J	99500		J	64300		J	150000		J	13700		J	144000		J	16800		J	61900		J							50	s
Thallium	6	U		6	U		6	U		6	U		7.4	B		6	U		6	U		6	U		6	U								20000	s
Vanadium	1	U		1	U		1	U		1	U		6.3	B		1.4	B		1	U		1	U		1	U								4	g
Zinc	2	U		2	U		55			3.4	B	U	2	U		14.3	B		9.4	B	U	5.8	B	U	2	U									NL
GENERAL (µg/L)																																		300	s
Cyanide, total	189		J	236		J	334		J	1040		J	375		J	323		J	644		J	78.8		J	346		J								
Cyanide, weak/dissoc.																																		100	s
																																			NL

Notes:
LQ - Laboratory Qualifier
VQ - Data Validation Qualifier
U - The material was analyzed for, but not detected. The associated numerical value is the minimum attainable detection limit for the sample.
J - The associated numerical value is an estimated quantity.
B - Below the Contract Required Quantitation Limit (CRQL), but above the Instrument Detection Limit (IDL). (Metals Analysis Only)
D - Indicates an analysis at a secondary dilution.
g - Guidance
s - Standard
MDL - Method Detection Limit
NL - Not listed
6 Concentrations exceeding Regulatory Limit.

Table 3.3

Groundwater Results
Mineral Springs Road MGP Site

02/05/98

Sample ID Date Sampled	MW-07 02/05/98		MW-08 02/05/98		MW-10 02/05/98		MW-11 02/05/98		MW-12 02/05/98		MW-13 02/05/98		MW-14 02/05/98		MW-15 02/05/98		MW-16 02/05/98		MW-17 02/05/98		MW-18 02/05/98		Groundwater Standard / Guidance Value
	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	Result	LQ VQ	
BTEX (µg/L)																							
Benzene											5	U							5	U	5	U	0.7 s
Toluene											5	U							5	U	5	U	5 s
Ethylbenzene											5	U							5	U	5	U	5 s
Xylene (Total)											5	U							5	U	5	U	5 s (ea.)
PAHs (µg/L)																							
Naphthalene																			10	U	10	U	10 g
2-Methylnaphthalene																			10	U	10	U	NL
Acenaphthylene																			10	U	10	U	20 g
Acenaphthene																			10	U	10	U	20 g
Fluorene																			10	U	10	U	50 g
Phenanthrene																			10	U	10	U	50 g
Anthracene																			10	U	10	U	50 g
Fluoranthene																			10	U	10	U	50 g
Pyrene																			10	U	10	U	50 g
Benz(a)Anthracene																			10	U	10	U	0.002 g
Chrysene																			10	U	10	U	0.002 g
Benzo(b)Fluoranthene																			10	U	10	U	0.002 g
Benzo(k)Fluoranthene																			10	U	10	U	0.002 g
Benzo(a)Pyrene																			10	U	10	U	0.002 or MDL
Indeno(1,2,3-cd)Pyrene																			10	U	10	U	0.002 g
Dibenz(a,h)Anthracene																			10	U	10	U	NL
Benzo(g,h,i)Perylene																			10	U	10	U	5 g
METALS (µg/L)																							
Aluminum																			5600		7600		NL
Antimony																			10	U	10	U	3 g
Arsenic																			10	U	17		25 s
Barium																			95		230		1000 s
Beryllium																			5	U	5	U	3 g
Cadmium																			5	U	5	U	10 s
Calcium																			230000		53000		NL
Chromium																			10	U	10	U	50 s
Cobalt																			10	U	10	U	NL
Copper																			14		19		200 s
Iron																			29000		9500		300 s
Lead																			4.6		8.8		25 s
Magnesium																			46000		15000		35000 s
Manganese																			920		210		300 s
Mercury																			0.2	U	0.2	U	2 s
Nickel																			20	U	20	U	NL
Potassium																			2800		4200		NL
Selenium																			5	U	5	U	10 s
Silver																			10	U	10	U	50 s
Sodium																			60000		43000		20000 s
Thallium																			10	U	10	U	4 g
Vanadium																			12		14		NL
Zinc																			40		31		300 s
GENERAL (µg/L)																							
Cyanide, total																			34		10	U	100 s
Cyanide, weak/dissoc.	24.2		26.6		40.3		31.4		63.5		26.6		79.5		11.6		93.7		10	U	10	U	NL

Notes:
LQ - Laboratory Qualifier
VQ - Data Validation Qualifier

U - The material was analyzed for, but not detected. The associated numerical value is the minimum attainable detection limit for the sample.
J - The associated numerical value is an estimated quantity.
B - Below the Contract Required Quantitation Limit (CRQL), but above the Instrument Detection Limit (IDL). (Metals Analysis Only)
D - Indicates an analysis at a secondary dilution.
g - Guidance
s - Standard
MDL - Method Detection Limit
NL - Not listed
6 Concentrations exceeding Regulatory Limit.

Full Laboratory Reports Are Attached In Appendix F.

4.0 REVISED EVALUATION OF POTENTIAL RISKS

This evaluation integrates existing data gathered at the Mineral Springs Road MGP Site and qualitatively identifies potential risks associated with impacted media. This evaluation is a revision to the Qualitative Evaluation of Potential Risks as presented in section 7.0 of the *Preliminary Site Assessment for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York (RETEC, November 5, 1997)*. This evaluation is accomplished by identifying potential sources, migration routes, receptors and exposure pathways at the Mineral Springs Road Site.

4.1 Site Setting

The Mineral Springs Road Site is owned by NFG. The site is the location of an NFG service center, a construction and demolition debris landfill, and electrical transmission towers. These uses are consistent with the zoning of the site for commercial or light industrial use. NFG's intended future use of the site will continue to be as a service center.

The service center occupies much of the site, encompasses the former MGP process area, and is partially fenced, so access is restricted to all but NFG personnel. Most of the service center is covered with buildings, pavement, gravel or landscaped grass. The landfill is east of the service center, is active and is covered with fill and some vegetation. The transmission towers run along the southern boundary of the site. The surface beneath these towers is covered with grasses and shrubs that are infrequently cut.

The northern boundary of the site runs along Mineral Springs Road, from Calais Avenue to a raised abandoned railroad track. To the north of this boundary are residences and a facility that treats sewage sludge. The western boundary consists of residential lots located on Calais Avenue. The eastern boundary is the raised abandoned railroad track. Further east is the New York Thruway. The southern boundary is a raised active railroad track. Further south is an abandoned industrial property (formerly Madison Wire) and undeveloped, wooded land.

4.2 Potential Sources, Migration Routes, Receptors and Exposure Pathways

The potential sources, migration routes, receptors and exposure pathways for the Mineral Springs site are discussed in this subsection.

4.2.1 Potential Sources and Migration Routes

There are principally two source materials for MGP constituents at the Mineral Springs site. One potential source material is hydrocarbon materials which were either used as feedstock or

generated during plant operation. The other potential source material is purifier residuals generated during the purification of the manufactured gas.

Lead in surface soil, while not necessarily an MGP constituent, has been found under the electric transmission towers along the southern property line.

Hydrocarbon materials were found in several parts of the site (see Section 2.0 and Appendix G of this report for text and drawings). In the Separator Pits Investigation Area, DNAPL was found in Separator Pits numbered 2 and 3, in soil around the separators, and on the lower confining clay layer immediately below the pits (deep boring DB-5). TCLP analyses indicated that the material in Separator Pit 2 is hazardous for benzene. An IR Spectral analysis of the material identified it as a mixture of MGP and petroleum based residuals. The material in Separator Pit 3 was identified as a non-hazardous petroleum residual.

DNAPL was found between the upper and lower confining clay layers in the Subsurface Hydrocarbon Investigation Area, apparently concentrated in a band below the eastern drainage ditch from DB-4 to MW11. An IR Spectral analysis of the material identified it as a coal tar residual. A TCLP analysis indicated the material is non-hazardous.

DNAPL was found in several areas above the upper clay layer, primarily a small area north of Building 10 (SB-59 and SB-60), a larger area east of Building 10 from SB-09 to SB-49 to DB-3 to SB-79, around the separator pits, and at SB-82 and SB-83.

Highly localized DNAPL impacts (consisting of tar "boils") were also found in surface and shallow subsurface soils in the Surface Hydrocarbon Investigation Area at SB-26.

Purifier residuals were found at a number of locations. Purifier residuals were found up to three feet thick in the Eastern Swale Area, primarily in the subsurface but with some surface exposure due to erosion. Thin subsurface layers of purifier residuals were also found in the Southern Investigation Area. Another thin subsurface layer was found between Building 3 and Building 14. The surface deposit of purifier residuals under the southwestern electric transmission tower, which had been analyzed as hazardous for lead and corrosivity, was excavated and removed from the site (see Section 4.0 of this report).

Based on these potential sources, the potential migration routes of the COI in the study area are summarized as follows:

- Emissions to air in the form of volatilized gases (primarily the lower molecular weight PAHs) and fugitive dust from surface soil.

- Volatilization of chemicals from subsurface soil to soil gas and subsequent intrusion of soil gas into a building.

- Erosion of surface soil during rainfall events, solubilization or desorption of COI to runoff water, and transport of eroded soil and dissolved COI with runoff to drainage ditches.

- Leaching of constituents from soil and tar-like materials to groundwater.

- Discharge of on-site groundwater to on-site drainage ditches.

- Transfer of constituents dissolved in on-site groundwater to off-site groundwater.

Emissions of volatilized gases and fugitive dust are unlikely to be significant for a variety of reasons. First, the most volatile constituents at MGP sites are BTEX. No surface soils had total BTEX concentrations exceeding 1 mg/Kg, so there is little BTEX available in surface soil to volatilize. Second, the PAH that is most volatile is naphthalene, which was present at concentrations of 2.8 mg/Kg or less in all surface soil samples except SS-1. Sample SS-1 was taken from a tar boil and is representative of a very small surface area of the site. There are, therefore, not enough tar boils at the surface to represent a significant source for volatile emissions of naphthalene. For fugitive dust emissions to be significant, a significant portion of the surface soil must be bare. However, little of the site surface has exposed, impacted soil, so fugitive contaminated dust emissions are unlikely to be significant at this site.

In addition to volatilization and release to the surface, chemicals can volatilize from subsurface soil into soil gas and then migrate into buildings through cracks in the building basement or foundation. This migration route is usually significant only if a building basement is built into NAPL impacted soil, or if there is LNAPL on the water table immediately beneath a building. A soil gas survey done by Buck Environmental Laboratories (see Section 6.0 of this report) quantified the concentrations of hydrocarbon vapors in the shallow soil around the continuously (workday) occupied buildings of the site. The vapor concentrations in the soil were below OSHA and NIOSH action levels for continuously occupied spaces and do not appear to present a risk to site occupants.

Surface water runoff occurs during rainfall events, where the COI are either attached to soil particles which are suspended in water flowing overland into drainage ditches or are dissolved into rainwater which flows overland into drainage ditches. If COI are present in groundwater and groundwater discharges to the drainage ditches, then COI can also be discharged into the drainage

ditches with groundwater. There is evidence that both migration mechanisms may be operating at the Mineral Springs site. The highest cyanide sediment concentrations occur near the two areas with purifier residuals at or near the surface. The cyanide concentration at SD-3 is 658 mg/Kg. This sample is located downstream of the Eastern Swale Investigation Area where purifier residuals were found. The next highest cyanide sediment concentration occurs at SD-1 (42.4 mg/Kg) which is adjacent to the Southern Investigation Area where purifier residuals were also observed. The highest BTEX and second highest PAH concentrations in sediment occur at SD-5 which is next to the Subsurface Hydrocarbon Investigation Area. DNAPL was found in the subsurface in this area and a sheen has been occasionally observed on the water at SW-5.

While BTEX, PAHs and cyanide have been detected in sediments, there is little evidence that these constituents impact surface water when it leaves the site and discharges to the Calais Avenue storm sewer. BTEX and PAHs were not detected above the analytical detection limits in any surface water samples. Total cyanide in the surface water appears to attenuate from the Eastern Swale Investigation Area, where the highest cyanide concentration was found (736 µg/L in SW-4), to the storm sewer inlet, where the lowest concentration was obtained (estimated 12.2 µg/L at SW-1). Also, the cyanide measured at this site is total cyanide and virtually all total cyanide at MGP sites is complexed cyanide. The most toxic form of cyanide is free cyanide, which is highly reactive. In contrast, complexed cyanide is very stable, unreactive and essentially nontoxic (GRI, 1996).

The potential for COI in groundwater to migrate off-site is addressed in Section 4.2.3.

4.2.2 Potential Receptors and Exposure Pathways

Potential current receptors for the Mineral Springs Road MGP Site are presented in Table 4-1. Under current site uses, possible receptors include indoor workers, outdoor workers, excavators and local residents. The site is expected to be used as a service center by NFG for the foreseeable future, therefore future receptors are the same as current receptors.

If there is LNAPL or DNAPL in the subsurface beneath a building, then constituents can partition from the NAPL to the soil water and then to the soil gas, and migrate with soil gas as it travels through cracks in the basement or foundation into the air within the building. As discussed previously, there is no evidence that such conditions exist at any buildings on the site and results of the recent soil gas survey indicated that soil gas does not present a risk to site occupants.

Table 4-1
Current and Future Receptors

Receptor	Source Medium	Exposure Medium	Intake Route	Comments
Indoor Worker	Subsurface Soil and NAPL	Air	Inhalation	Soil gas measurements indicated concentrations are low, so this pathway is essentially incomplete.
Outdoor Worker	Surface Soil	Soil	Ingestion & Dermal	Pathways potentially complete. Partial soil cover and grass limits access to soil during grounds keeping activities.
		Air	Inhalation	Gravel cover limits access to soil during staging of construction material.
Excavator	Surface Soil	Soil	Ingestion & Dermal	Pathways potentially complete but direct exposure to soil is infrequent.
	Subsurface Soil and NAPL	Air & Soil	Inhalation & Ingestion & Dermal	Pathways potentially complete but excavation work is infrequent.
Local Resident	Surface Soil	Air & Soil	Inhalation & Ingestion & Dermal	Volatile and fugitive dust emissions are expected to be very low, so this pathway is essentially incomplete except for dermal exposure to lead impacted soil outside the existing fenceline.
	Subsurface Soil and NAPL	Ground-water	Ingestion	Local residences are on City water supply, so this pathway is incomplete.

Outdoor workers are individuals who maintain the grassy areas of the site or who deposit or retrieve items from areas of the site where construction materials and pipes are staged. These individuals may be potentially exposed to COI in surface soils via incidental ingestion, dermal contact and inhalation of volatilized constituents and fugitive dust. Grass cutting and lawn maintenance, however, are limited to the warmer months and the existence of the grass provides a barrier to direct contact with the soil. Much of construction material staging work is done on an area covered by gravel, so the opportunity to directly contact soil and be exposed via incidental ingestion and dermal contact is limited.

On a very infrequent basis, subsurface utility lines may require repair or new building construction may occur. In this case, excavators may handle impacted soil and be exposed to constituents from both the surface and subsurface.. These exposures would be through incidental ingestion, dermal contact and inhalation of volatilized constituents and fugitive dust.

In theory, local residents can be indirectly exposed to constituents in surface soil through the processes of volatilization and fugitive dust emission and subsequent dispersion with wind to off-site areas. Exposure from these migration pathways are likely to be low. BTEX compounds were close to or below detection limits in all surface soil samples, so the only potentially volatile constituents are the low molecular weight PAHs (principally naphthalene) which have a much lower propensity to volatilize than BTEX and lower toxicities than benzene (i.e., the lower molecular weight PAHs are not considered carcinogenic). Also, the concentrations of naphthalene, the most volatile of the low molecular weight PAHs, were low in all the surface soil samples except the tar boil sample. Exposures from fugitive dust emissions are typically very low even at sites with high concentrations of constituents in surface soil and there are almost no residuals exposed to the surface at this site. Exposures to local residents from volatilization and fugitive dust emissions are thus likely to be essentially incomplete.

The concentration of lead in surface soils directly below three of the five on-site electric transmission towers is slightly above residential standards. Though the areas affected are vegetated, the towers are not, at this time, fenced so the soils could present a low level risk to trespassers from dermal contact and ingestion. The lead concentrations observed are low enough to be typically acceptable at commercial/industrial sites with limited access.

4.2.3 Evaluation of Groundwater Migration and Use

Groundwater on and near the site is currently not used as a source of drinking water. Since the Town of West Seneca and the City of Buffalo, including local residences, are serviced by a municipal water supply, the groundwater under the site is not expected to be used as a source of drinking water at any time in the foreseeable future.

Groundwater on the site either discharges to the drainage ditches or flows north toward the Buffalo River. The discharge of groundwater to the drainage ditches was discussed previously. The migration of COIs to the Buffalo River is not expected to be significant for a number of reasons, as discussed below.

The highest concentrations of BTEX and PAHs in groundwater occur in the central part of the site, such as MW7 (9,750 µg/L and 2,660 µg/L) and MW8 (1,650 µg/L and 2,015 µg/L), near

the Separator Pits Investigation Area. The concentrations in the down gradient site perimeter wells, MW13, MW14 and MW15, are below the detection limit. Likewise, BTEX and PAH concentrations in MW11 (229 µg/L and 156 µg/L) near the Subsurface Hydrocarbon Investigation Area are greater than MW12 (17 µg/L and non-detect) which is down gradient of that area.

BTEX are relatively mobile in groundwater, but they are also biodegradable. The dramatic reduction of concentrations between the center of the site and the down gradient perimeter suggests that (1) groundwater is moving slowly (the water table is relatively flat), (2) biodegradation is occurring, or (3) both phenomena are operating simultaneously. PAHs are much less mobile than the BTEX, although these chemicals are also biodegradable. The absence of PAHs in the down gradient wells is consistent with these chemical properties. The low levels of BTEX and the non-detects for PAHs in the groundwater at the down gradient perimeter wells suggests that any off-site discharges of these constituents will be insignificant.

The situation for cyanide is not as straightforward. As discussed in the PSA, virtually all of the total cyanide at MGP sites is complexed cyanide (RETEC, 1997a). The most toxic form of cyanide is free cyanide (measured conservatively as "weak acid dissociable cyanide"), which is highly reactive, while complexed cyanide is very stable, unreactive and essentially nontoxic (GRI, 1996, and Theis, et al, 1994). Total cyanide concentrations at the Mineral Springs site exceed the NYSDEC groundwater standard of 100 µg/L in most of the downgradient and central wells. The concentration of weak acid dissociable cyanide, however, is below 100 µg/L in all 11 wells tested. Thus, while total cyanide is present in down gradient wells and may be leaving the site and eventually discharging to the Buffalo River, the form of cyanide in the groundwater is an unreactive, nontoxic complexed cyanide. Thus, the off-site environment is not expected to be impacted by any discharges of cyanide that may be occurring.

5.0 REVISED CONCLUSIONS

This section presents RETEC's conclusions based on environmental data gathered at the Mineral Springs Road MGP Site between July, 1997, and April, 1998. The conclusions presented are revisions to those presented in the *Preliminary Site Assessment for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York (RETEC, November 5, 1997)*. Recommendations for remedial actions are also presented.

5.1 Site Geology and Hydrogeology

The site geology and stratigraphy consists of:

- A surface layer of mixed fill (silty clay, top soil, coal fragments, brick fragments, cinders, ashes and concrete fragments).

- Underlying the fill is an upper confining clay layer (UCL) comprised of dense silty clay ranging from 3 to 13 feet thick. The UCL appears to be continuous across the site except at the Separator Pits and, possibly, in the eastern drainage ditch.

- Underlying the UCL is a groundwater-bearing sand and gravel unit. Groundwater flow beneath the majority of the site is northwest towards the Buffalo River. Groundwater also appears to be influenced by, and in direct contact with, the eastern drainage ditch.

- Underlying the groundwater-bearing sand and gravel unit is a lower confining clay layer (LCL) comprised (like the UCL) of dense silty clay. The LCL appears to be continuous across the site.

- Underlying the LCL is bedrock at approximately 40 feet bgs.

5.2 Areas of Concern and Recommended Remedial Actions

Six media were initially identified as being of potential concern at the site: surface water, sediments, surface soil, subsurface soil, groundwater and MGP residual products (NAPL and purifier box waste). Analytical results presented in the PSA (RETEC, 1997a) indicated surface water and sediments did not present a risk to receptors. Surface soil which had been identified as hazardous

and presenting a risk has been addressed by interim remedial measures. Concerns involving subsurface soil, groundwater and/or MGP residual products are addressed in the following subsections.

5.2.1 Hydrocarbon COI in Separator Pits Area

The NAPL present in the bottom 3 feet of Separator Pit 2 has been determined hazardous for benzene and should be removed. The NAPL present in the bottom 1 foot of Separator Pit 3, while non-hazardous, should also be removed. Separator Pits 2 and 3 encompass a total volume of approximately 400 cubic yards.

The NAPL impacted soils around the Separator Pits extend downward to the LCL but are localized laterally. The material does not appear to be impacting off-site groundwater quality though excavation from above the water table of the most severely impacted soils (approximately 1800 cubic yards as determined by visible hydrocarbon NAPL saturation) would be consistent with the work previously conducted during the remediation of Separator Pit 1.

5.2.2 Lead and Purifier Box COI above Upper Confining Clay Layer

As described in Sections 2.2.2 and 2.2.3, purifier box residuals have been identified and roughly delineated in three areas of the site. Except for two sub-areas of surface exposure, the residuals do not appear to pose a risk to on- or off-site receptors. One sub-area (portions of the Eastern Swale) should be capped with clay or asphalt pavement, or armored with geo-fabric and anchor stone. The other sub-area (encompassing small sporadic patches of blue stained soil and wood chips near the Calais Avenue sewer inlet) should be similarly armored or capped.

Analyses of surface soils collected below the electric transmission towers along the southern property line indicate isolated concentrations of total lead up to 890 mg/kg (0.24 µg/L TCLP lead) with concentrations decreasing rapidly to less than 500 mg/kg outside the tower footprints. A sample of the tower paint was 29% lead. Though this does not appear to be an MGP related residual, NFG should pursue a dialog with Niagara Mohawk Power Corporation regarding future maintenance of the towers and the associated current and future impacts to surface soil.

Despite the minimal quantities of surface water and surface soil contamination at the site, NFG should erect additional chain link fence to further minimize site access by non-NFG personnel.

5.2.3 Hydrocarbon COI above Upper Confining Clay Layer

Approximately 3.0 acres of NAPL impacted subsurface soils (above the UCL) have been delineated. Analytical data so far indicate this material is non-hazardous though variable in constituency.

Because off-site groundwater is not adversely impacted, and based on a the review of environmental receptors and pathways, excavation and/or recovery of these MGP materials is not recommended.

Except for on-site personnel performing excavations in impacted soil, the environmental risk to on- and off-site receptors is negligible. To prevent worker exposure, however, institutional controls or deed restrictions should be implemented and excavation work in these areas should be performed by a certified remedial contractor.

5.2.4 Hydrocarbon COI between Confining Clay Layers

Approximately 4.3 acres of NAPL impacted subsurface soils (in the groundwater-bearing unit between the LCL and the UCL) have been delineated. The material is primarily located below the eastern drainage ditch and does not appear to emanate from the active landfill. Analytical data so far indicate this material is a non-hazardous, weathered, water gas tar. As mentioned in Section 5.2.1, another smaller plume is located directly below the Separator Pits but has limited lateral extent.

Due to its age, central location and immobility, the material does not appear to adversely impact off-site groundwater quality. Excavation of this material from below the water table would entail extensive water management, control of air emissions, and potentially adverse impacts to human health and the environment. Excavation is not recommended. Likewise, recovery of the material by pumping would have limited effect on overall risk reduction and is not recommended.

Additional surface water and groundwater monitoring, as per Section 5.2.5, is recommended to confirm that the NAPL is not migrating or causing a dissolved plume to go off-site.

5.2.5 COI in Groundwater

BTEX and PAH compounds were found to exceed NYSDEC Groundwater Quality Standards in MW7, MW8, MW11, and MW12. These wells are all located in central areas of the site. BTEX and PAH compounds were below the detection limits in MW10 and in all wells at the site perimeter.

Detected metals concentrations exceeding NYSDEC Groundwater Standard Values were limited to iron, magnesium, manganese, sodium and thallium.

Cyanide (total) was found in concentrations exceeding the NYSDEC Groundwater Standard (100 µg/L) in all 11 wells tested except MW15, MW17 and MW18. Free cyanide (measured conservatively as weak acid dissociable cyanide) was found in concentrations below 100 µg/L in all 11 monitoring wells tested. These data indicate that the total cyanide exceedences do not pose a risk to off-site receptors. Groundwater is not used by on- or off-site personnel.

Total and weak acid dissociable cyanide concentrations measured in MW14 are of the same magnitude as those seen in MW12 and MW16. Additional soil borings conducted in this area (DB-14 and SB-84 through SB-86) revealed no purifier residuals.

Additional annual groundwater monitoring of selected existing wells is recommended for a period of 5 years. After 5 years, the need to continue monitoring will be reevaluated based on any changes in the groundwater conditions. Due to the proximity of NAPL impacted soils below the eastern drainage ditch, surface water samples should also be included in the monitoring program.

6.0 REFERENCES

Gas Research Institute (GRI), 1996, *Management of Manufactured Gas Plant Sites*, Amherst Scientific Publishers, Amherst, Massachusetts, 1996.

RETEC, 1997a, *Preliminary Site Assessment Report for the Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York*.

RETEC, 1997b, *Field Sampling and Analysis Plan, Mineral Springs Road, West Seneca, New York.*

RETEC, 1997c, *Health and Safety Plan, Mineral Springs Road, West Seneca, New York.*

Theis, T. L. et al, 1994, *Leachate Characteristics and Composition of Cyanide-Bearing Wastes from Manufactured Gas Plants*, Environmental Science and Technology, Vol. 28, No. 1.

RETEC

1001 W. Seneca Street
Suite 204
Ithaca, NY 14850
(607) 277-5716
FAX (607) 277-9057

January 23, 1998

Mr. Charles Burke
National Fuel Gas Distribution Corporation
Building 11
365 Mineral Springs Road
Buffalo, NY 14210

RE: Project Complete Report -
Southwestern IRM : Excavation and Removal of Purifier Residuals
Mineral Springs Road MGP Site
West Seneca, New York

Dear Charlie:

Remediation Technologies, Inc. (RETEC) is pleased to submit this letter summarizing the work performed during the Southwestern Interim Remedial Measure (IRM) at 365 Mineral Springs Road in the month of December, 1997.

Background

The scope of work for this IRM was based on the recommendations of a Preliminary Site Assessment (PSA) completed by RETEC in October, 1997. The results of the PSA are reported in the document: *Preliminary Site Assessment Report For The Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York* (RETEC, 1997).

During the PSA, one surface sample of (apparent) MGP purifier box residuals was collected adjacent to the electrical transmission tower in the southwest corner of the site. Chemical analysis of the sample found, among other results, a corrosivity of 1.2 standard pH units, a total lead concentration of 2,650 mg/Kg and a TCLP lead concentration of 9.16 mg/L. The TCLP lead concentration and the corrosivity both indicated that the material was hazardous under RCRA Subtitle C rules. To prevent potential future exposure to site receptors, the PSA recommended (as an IRM) the excavation and proper disposal of approximately 45 cubic yards of the most impacted surface material from adjacent to, and beneath, the transmission tower. National Fuel Gas (NFG) requested RETEC to proceed with the proposed IRM.

Work Performed

Between December 3 and December 23, 1997, SLC Constructors, Inc. (SLC), excavated the material under the direction of a RETEC field engineer or geologist. The excavated material was placed in rolloffs or stockpiled on plastic. Rolloffs and stockpiles were covered.

All onsite personnel were up-to-date with their 40 hr OSHA HAZWOPER training and other requirements. All personnel operated under RETEC's site specific Health and Safety Plan for the Mineral Springs Road site.

The PSA had delineated a 20 foot by 24 foot area, 2.5-foot thick, as containing the most impacted materials. During excavation, it quickly became apparent that the delineated lens of surface material became deeper as it extended westward under the tower. On December 4th a small Bobcat trackhoe was also mobilized to the site in order to more effectively pursue the material below the tower. At that time NFG, in consultation with RETEC, determined to pro-actively pursue additional material (beyond that initially delineated) such as less impacted (though blue-stained) soils towards the south, east and west, and a significantly impacted subsurface lens towards the west and north.

Removal of visually delineated material from the south, east and west was substantially completed. Excavation to the north was halted within 15 feet of the assumed location of an underground 240 KVA electric transmission cable (see Figure 1) and 1 foot thick lens of blue stained material currently remains (at a depth of 4 feet) between the cable and the northern extent of the excavation. Geoprobe boring SB-53 taken north of the cable on January 8, 1998, by RETEC (see Figure 1) revealed no MGP residuals to a depth of 12 feet.

Decontamination of equipment was accomplished with a portable pressure-washer. A decontamination pad with a plastic liner collected the decontamination fluids which were containerized in drums. Dewatering of the excavation was required on several occasions. That water was also containerized. Disposal options for the containerized water are currently being considered.

Analytical Results and Disposal

The excavated material was tested for full RCRA hazardous characteristics to determine disposal options. Following receipt of the chemical analysis, the material was determined to be non-hazardous (TCLP lead 0.83 mg/L and corrosivity 3.99 units). It was transported to and disposed of at Modern Corporation's Model City landfill. Total weight disposed was 406.56 tons. Please find the attached copies of disposal weigh tickets.

Analysis of samples taken from the excavation bottom and sidewalls were likewise shown to be non-hazardous. The excavation bottom continues to exhibit a low pH (corrosivity 2.50 to 2.98) though all visually delineable source material was removed.

Significant analytical results are summarized in Table 1. Copies of the full reports are attached. See Figure 1 for sampling locations. Field sampling and analysis was conducted in accordance with the protocols established in RETEC's *Field Sampling and Analysis Plan* (RETEC, June 20, 1997).

Site restoration consisted of backfilling the excavation to original grade with uncompacted # 2 crushed stone.

RETEC

An associated IRM, as proposed in the PSA, was the regrading and armoring of an eroded swale northeast of Building 10. That work has been delayed until ground conditions allow access by heavy equipment. A section of temporary silt fence has been installed to prevent the possible migration of contaminated solids from the swale.

Should you have any questions or comments, please call me at (607) 277-5716.

Sincerely,

REMEDIATION TECHNOLOGIES, INC.

Mark Hofferbert
Project Engineer

cc: Tanya Alexander - National Fuel Gas
J. Edwards, B. Coulombe - RETEC
John Kuhn - SLC
File: 3-2075-620

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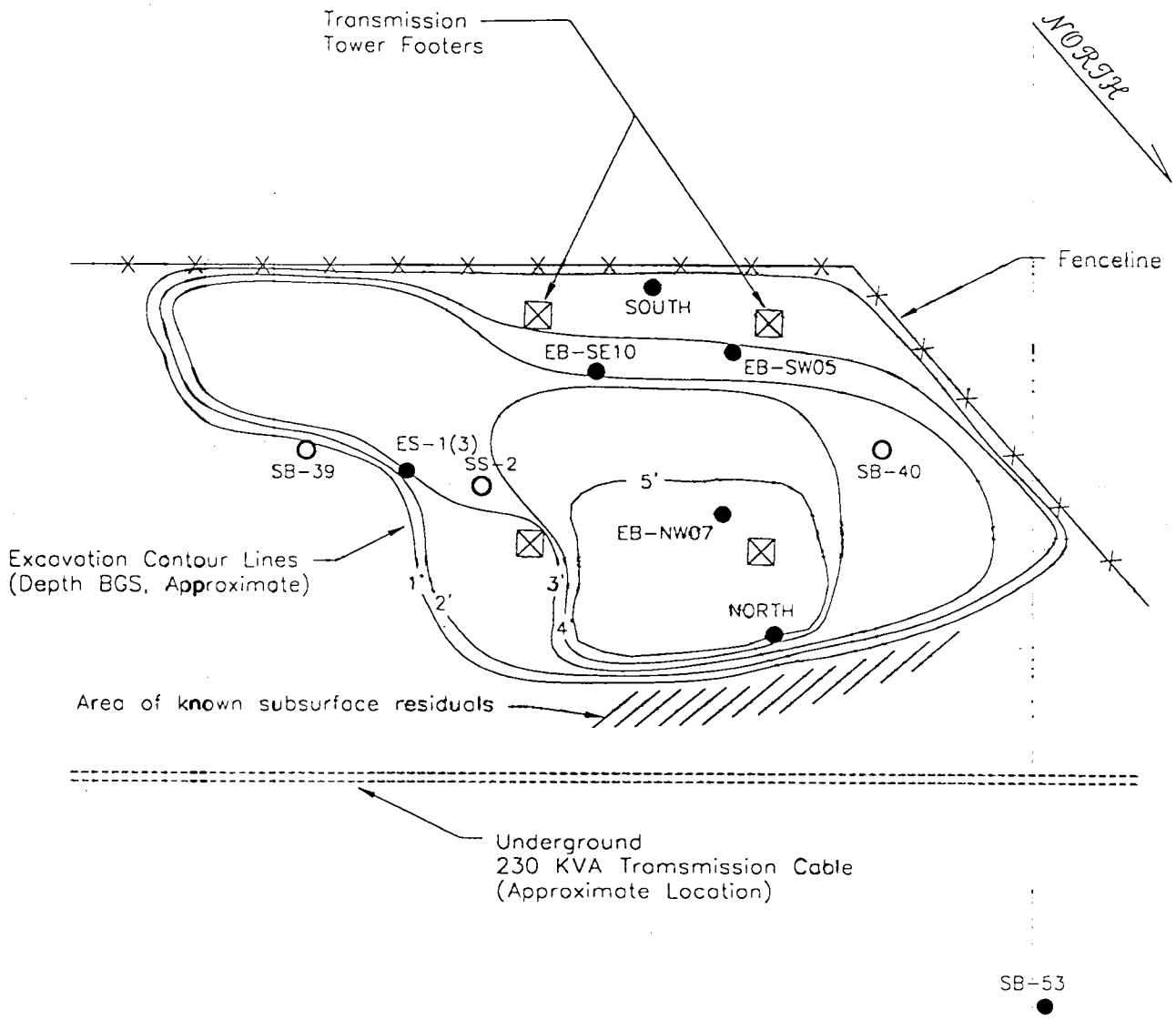


0 10 20 30 40 50

Scale
(feet)

o Pre-Excavation Soil Sampling Location

• Post-Excavation Soil Sampling Location

CAD FILE:			
0	WRN	1-13-98	minor issue
NO	DRAWN	DATE	REVISION

PREPARED FOR :

NATIONAL FUEL GAS
Mineral Springs Road

FIGURE 1
SOUTHWESTERN IRM
AS-BUILT
PLAN VIEW

RETEC
ITHACA, NEW YORK

TABLE 1

Summary of Sampling Results
Southwestern IRM

National Fuel Gas, Mineral Springs Road Site, West Seneca, NY
and
RETEC, Ithaca, NY

SAMPLE ID	SAMPLE TYPE	SAMPLE LOCATION	SIGNIFICANT RESULTS
Pre-Excavation			
SB-39	Geoprobe	East of tower	No visual MGP residuals from 0 to 16 feet bgs.
SB-40	Geoprobe	West of tower	2" lens of blue stained material (with faint hydrocarbon odor) at 3.5 feet bgs.
SS-2	Hand Auger/Composite	Center of surface deposit	Blue stained material from 0 to 2.5 feet bgs. Tested hazardous for TCLP lead (9.16 mg/L) and corrosivity (1.2 su).
Post-Excavation			
South	Grab	Excavation bottom	RCRA non-hazardous (corrosivity 6.9 su).
EB-se10	Grab	Excavation bottom	* RCRA non-hazardous (corrosivity 2.75 su, lead 63 mg/Kg).
EB-sw05	Grab	Excavation bottom	* RCRA non-hazardous (corrosivity 2.50 su, lead 63 mg/Kg).
EB-nw07	Grab	Excavation bottom	* RCRA non-hazardous (corrosivity 2.98 su, lead 63 mg/Kg).
ES-1(3)	Grab	Excavation sidewall/bottom	RCRA non-hazardous (corrosivity 3.8 su).
North	Composite	Excavation sidewall	RCRA non-hazardous (corrosivity 7.2 su).
SB-53	Geoprobe	North of 230 KVA cable	No visual MGP residuals from 0 to 12 feet bgs.
Composite 1	Composite	Excavated material	RCRA non-hazardous (TCLP lead 0.83 mg/L, corrosivity 3.99 su).
Excav/Decon	Composite (water)	Excavation and decon water	RCRA non-hazardous except lead (25 mg/L, probably associated with suspended solids).

mrh\c:\nfg2075\psa2\swirm01

* Lead analysis performed on composite of three excavation bottom samples.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE • BUREAU OF HAZARDOUS WASTE OPERATIONS
50 WOLF ROAD, ALBANY, NEW YORK 12233-4017

APPLICATION FOR TREATMENT OR DISPOSAL OF AN INDUSTRIAL WASTE STREAM

SEE APPLICATION INSTRUCTIONS ON REVERSE SIDE

SITE NO.	APPLICATION NO.	DATE RECEIVED
DEPARTMENT ACTION ☐ Approved ☐ Disapproved		DATE

1. NAME OF PROJECT/FACILITY	2. COUNTY	3. SITE NUMBER
MODERN LANDFILL INC	NIAGARA	32N30
4. NAME OF OWNER	**5. ADDRESS (Street, City, State, Zip Code)**	**6. TELEPHONE NO.**
MODERN LANDFILL INC	4746 MODEL CITY RD, MODEL CITY. NY 14107	(716)754-8226
7. NAME OF OPERATOR	**8. ADDRESS (Street, City, State, Zip Code)**	**9. TELEPHONE NO.**
RICHARD WASHUTA	PLETCHER & HAROLD RD, MODEL CITY, NY	(716)754-8226

10. METHOD OF TREATMENT OR DISPOSAL

SANITARY LANDFILL - D90

11. COMPANY GENERATING WASTE	12. ADDRESS OF FACILITY GENERATING WASTE (Street, City, State, Zip Code)	
NATIONAL FUEL GAS	365 MINERAL SPRINGS RD, BUFFALO, NY 14210	
13. REPRESENTATIVE OF WASTE GENERATOR	**14. MAILING ADDRESS OF REPRESENTATIVE**	**15. TELEPHONE NO.**
CHARLES BURKE	SAME	716-827-2359

16. DESCRIPTION OF PROCESS PRODUCING WASTE

PURIFICATION OF COAL GAS (MANUFACTURED GAS)

17. EXPECTED ANNUAL WASTE PRODUCTION	18. WASTE HAULED IN
_____ Tons/Year _____ Gallons/Year	☐ Drums ☐ Bulk Tank ☒ Roll-off Container ☒ Other DUMP

19. WASTE COMPOSITION	19b Physical State	19c pH Range
19a. Average Percent Solids 60	☐ Liquid ☐ Slurry ☐ Sludge ☒ Solid ☐ Contained Gas	3 to 5

19d COMPONENTS	CONCENTRATION (Dry Weight) Upper	Lower	Typical	UNITS (Check one) Wt.%	PPM
1) SOIL			99	☒	☐
2) FERRIC/FERROUS CYANIDE (NON-REACTIVE)			1	☒	☐
3) LEAD			0.83	☐	☒
4)				☐	☐

20. IS AN ANALYSIS OF WASTE ATTACHED?	21. WAS AN EP TOXICITY TEST CONDUCTED ON THE WASTE?	22. MATERIAL IS:
☒ Yes ☐ No	☒ Yes ☐ No If "Yes", attach results	☐ Hazardous ☒ Non-Hazardous

23. DETAIL ALL HAZARD AND NUISANCE PROBLEMS ASSOCIATED WITH THE WASTES. List necessary safety, handling, treatment, and disposal precautions.

SLIGHTLY ACIDIC.

24. WHERE WAS MATERIAL DISPOSED OF PREVIOUSLY?

N/A

25. NAME OF WASTE TRANSPORTER	26. ADDRESS (Street, City, State, Zip Code)	27. NYSDEC PERMIT No.	28. TELEPHONE NO.
BFC, TEC	BUFFALO, NY	9A-545; 9A-080	

29. CERTIFICATION

I hereby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

a. SIGNATURE AND TITLE OF REPRESENTATIVE OF WASTE GENERATOR	DATE
X Charles J Burke, ASSOCIATE ENGINEER	12/16/97
b. SIGNATURE AND TITLE OF REPRESENTATIVE OF TREATMENT OR DISPOSAL FACILITY	DATE
X	

PHYSICAL CHARACTERISTICS OF WASTE

The waste is at least 20% solid and contains no free liquid	Yes [X] No [ ]
The Flashpoint of the waste is >140 F	Yes [X] No [ ]
The pH level of the waste is between 2.0 and 12.5	Yes [X] No [ ]
Is the waste reactive (Cyanide/Sulfide)?	Yes [ ] No [X]
Is the waste free of PCBs?	Yes [X] No [ ]
Color: BROWN-BLUE	Odor: [ ] Strong [ ] Mild [X] None

TCLP TESTING AND CERTIFICATION

METALS

CONSTITUENT	NON-HAZARDOUS LIMIT (mg/l)	PRESENT	NOT PRESENT
ARSENIC	5.0		X
BARIUM	100.0		X
CADMIUM	1.0		X
CHROMIUM	5.0		X
LEAD	5.0		0.83
MERCURY	0.2		X
SELENIUM	1.0		X
SILVER	5.0		X

HERBICIDES/PESTICIDES

CONSTITUENT	NON-HAZARDOUS LIMIT (mg/l)	PRESENT	NOT PRESENT
2,4-D	10.0		
2,4,5-TP (SILVEX)	1.0		
ENDRIN	0.02		
LINDANE	0.4		
METHOXYCHLOR	10.0		
TOXAPHENE	0.5		
CHLORDANE	0.03		
HEPTACHLOR	0.008		

ACID EXTRACTABLES

CONSTITUENT	NON-HAZARDOUS LIMIT (mg/l)	PRESENT	NOT PRESENT
O-CRESOL	200.0		
M-CRESOL	200.0		
P-CRESOL	200.0		
PENTACHLOROPHENOL	100.0		X
2,4,5-TRICHLOROPHENOL	400.0		X
2,4,6-TRICHLOROPHENOL	2.0		X

BASE NEUTRALS EXTRACTABLES

CONSTITUENT	NON-HAZARDOUS LIMIT (mg/l)	PRESENT	NOT PRESENT
1,4-DICHLOROBENZENE	7.5		X
2,4-DINITROTOLUENE	0.13		X
HEXACHLOROBENZENE	0.13		X
HEXACHLOROBUTADIENE	0.5		X
HEXACHLOROETANE	3		X
NITROBENZENE	2		X
PYRIDINE	5		X

VOLATILE ORGANICS

CONSTITUENT	NON-HAZARDOUS LIMIT (mg/l)	PRESENT	NOT PRESENT
1,1-DICHLOROETHYLENE	0.7		X
METHYL ETHYL KETONE	200.0		
TETRACHLOROETHYLENE	0.7		X
VINYL CHLORIDE	0.2		X
BENZENE	0.5		X
CARBON TETRACHLORIDE	0.5		X
CHLOROBENZENE	100.0		X
CHLOROFORM	6.0		
TRICHLOROETHYLENE	0.5		X
1,2-DICHLOROETHANE	0.5		X

CERTIFICATION

I CERTIFY THAT ALL INFORMATION CONTAINED WITHIN THIS GENERATOR WASTE CHARACTERIZATION REPORT, INCLUDING ALL ATTACHED INFORMATION, IS COMPLETE AND ACTUAL AND IS AN ACCURATE REPRESENTATION OF KNOWN OR SUSPECTED HAZARDS DESCRIBED HEREIN.

SIGNATURE: Charles J Burke

PRINTED NAME: CHARLES J. BURKE

TITLE: ASSOCIATE ENGINEER

COMPANY: NATIONAL FUEL GAS

DATE: 12/10/97

GENERATOR WASTE CHARACTERIZATION REPORT

INSTRUCTIONS: The following form is required for disposal of nonhazardous industrial/commercial wastes at Modern Landfill. Please complete all sections of this report. Send completed report along with the analytical, chain of custody and the Application for Disposal of an Industrial Waste Stream (47-19-7) to this office. A separate form is required for each waste stream.

GENERATOR INFORMATION:

Generator Name: NATIONAL FUEL GAS

Generating Facility Address: 365 MINERAL SPRINGS RD
BUFFALO, NY 14210

Technical Contact: CHARLES BURKE Phone: (716) 827-2359

Alternate Contact: TANYA ALEXANDER Phone: (716) 857-7410

INVOICING INFORMATION:

Contracting Firm: SLC CONSTRUCTORS, INC.

Contact: JOHN KUHN Phone: (716) 433-0776 EXT. 227

Do you have an existing account with Modern Landfill? [X] Yes [ ] No

Billing Address: 295 MILL STREET
LOCKPORT, NY 14094

TRANSPORTER INFORMATION:

Hauler Name: BFC TEC NYSDEC Permit No. 9A-545 9A-080

Contact Person: JANE REYNOLDS MIKE MAYER Phone: 716 697-8002 (716) 873-9708

Is Modern Landfill currently on your Transporter Permit: [X] Yes [ ] No

If no, please enclose a Part C Application to cover this waste stream.

WASTE INFORMATION:

Common name of waste: PURIFIER BOX WASTE

Description of process generating this waste: COAL GASIFICATION (MANUFACTURED GAS)

Is this waste hazardous under US EPA Guidelines & 6NYCRR Part 371 (d)? [ ] Yes [X] No

Indicate the category which best describes this waste stream:

[X] Industrial Waste
[ ] Household Waste
[ ] Commercial Solid Waste
[ ] Construction & Demolition Debris
[ ] Other (Please Specify) _____

VOLATILE ANALYTICAL REPORT

Excavated Material

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97
Date Sampled : 05-DEC-97

Matrix : Leachate
Method : SW846/1311/8260-TCLP
Units : UG/L

Galson ID:	L40438-1	QCB120897-1	QCB120897-1TP
Client ID:	COMPOSITE 1	Method Blank	TCLP Blank
Vinyl Chloride	<100	<10	<100
1,1-Dichloroethene	<50	<5	<50
1,2-Dichloroethane	<50	<5	<50
2-Butanone	<100	<10	<100
Carbon Tetrachloride	<50	<5	<50
Trichloroethene	<50	<5	<50
Benzene	<50	<5	<50
Tetrachloroethene	<50	<5	<50
Chlorobenzene	<50	<5	<50
1,4-Dichlorobenzene	<50	<5	<50
Dilution Factor	10	1	10
Analysis Date	12/08/97	12/08/97	12/08/97

Approved by : PJT
Date : 09-DEC-97
QC by : [illegible]
Date : 12-12-97
NYS DOH # : 11626
Footnotes:
Sample run in accordance with ASP 95-1 Methodology.

LEACHATE VOLATILE SURROGATE RECOVERY

Client : Remediation Technologies, Inc. Login # : L40438

SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
Method Blank-QCB120897-1	91	94	88	BA1208	0
TCLP Blank	90	91	88	BA1208	0
COMPOSITE 1	87	90	94	BA1208	0

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(54-114)
SMC2 (BFB) = Bromofluorobenzene	(50-128)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(54-123)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

SEMIVOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97
Date Sampled : 05-DEC-97
Date Extracted: 08-DEC-97

Matrix : Leachate
Method : SW846/1311/3510/8270-TCLP
Units : UG/L

Galson ID:	L40438-1	Q-5168	Q-5168TP
Client ID:	COMPOSITE 1	SBLK5168	SBLK5168TP
Pyridine	<100	<100	<100
1,4-Dichlorobenzene	<10	<10	<10
2-Methylphenol	<10	<10	<10
3 & 4-Methylphenol	<20	<20	<20
Hexachloroethane	<100	<100	<100
Nitrobenzene	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10
2,4,5-Trichlorophenol	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10
Hexachlorobenzene	<10	<10	<10
Pentachlorophenol	<5	<5	<5
Dilution Factor	1	1	1
Analysis Date	12/08/97	12/08/97	12/08/97

Approved by : PJT
Date : 10-DEC-97
QC by : [illegible]
Date : 12-12-97
NYS DOH # : 11626
Footnotes:
TCLP extraction performed on 12/7/97.
Analysis performed in accordance with ASP 95-2 Methodology.

LEACHATE SEMIVOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L40438

SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
SBLK5168	41	23	66	61	53	84	63	56	0
SBLK5168TP	43	24	65	62	58	86	63	57	0
COMPOSITE 1	44	25	72	62	56	89	64	57	0

		QC LIMITS	
S1 (2FP)	= 2-Fluorophenol	(21-110)	
S2 (PHL)	= Phenol-d6	(10-110)	
S3 (NBZ)	= Nitrobenzene-d5	(35-114)	
S4 (FBP)	= 2-Fluorobiphenyl	(43-116)	
S5 (TBP)	= 2,4,6-Tribromophenol	(10-123)	
S6 (TPH)	= Terphenyl-d14	(33-141)	
S7 (2CP)	= 2-Chlorophenol-d4	(33-110)	(advisory)
S8 (DCB)	= 1,2-Dichlorobenzene-d4	(16-110)	(advisory)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

COMPOSITE 1

Lab Name: GALSON LABORATORIES Contract: Remediation

Lab Code: Case No.: 2 SAS No.: SDG No.: L40438

Matrix: (soil/water) SOIL Lab Sample ID: L40438-1

Sample wt/vol: 30.6 (g/mL) g Lab File ID: HP13A\C121212

% Moisture: 43 decanted: (Y/N) N Date Received: 12/06/97

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/97

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 12/12/97

Injection Volume: 1.0 (uL) Dilution Factor: 10.0 *

GPC Cleanup: (Y/N) Y pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
12674-11-2	Aroclor-1016	570	U
11104-28-2	Aroclor-1221	1100	U
11141-16-5	Aroclor-1232	570	U
53469-21-9	Aroclor-1242	570	U
12672-29-6	Aroclor-1248	570	U
11097-69-1	Aroclor-1254	570	U
11096-82-5	Aroclor-1260	570	U

* Diluted due to matrix interference

CVK
12/15/97

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

PBLK 5172

Lab Name: GALSON LABORATORIES Contract: Remediation

Lab Code: Case No.: 2 SAS No.: SDG No.: L40438

Matrix: (soil/water) SOIL Lab Sample ID: Q-5172

Sample wt/vol: 30 (g/mL) g Lab File ID: HP13A\C121207

% Moisture: 0 decanted: (Y/N) N Date Received: 00/00/00

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/97

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 12/12/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

FLBLK 5172

Lab Name: GALSON LABORATORIES Contract: Remediation

Lab Code: Case No.: 2 SAS No.: SDG No.: L40438

Matrix: (soil/water) SOIL Lab Sample ID: Q-5172FLB

Sample wt/vol: 30 (g/mL) g Lab File ID: HP13A\C121210

% Moisture: 0 decanted: (Y/N) N Date Received: 00/00/00

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/12/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

GPCBLK 5172

Lab Name: GALSON LABORATORIES Contract: Remediation

Lab Code: Case No.: 2 SAS No.: SDG No.: L40438

Matrix: (soil/water) SOIL Lab Sample ID: Q-5172GPC

Sample wt/vol: 30 (g/mL) g Lab File ID: HP13A\C121208

% Moisture: 0 decanted: (Y/N) N Date Received: 00/00/00

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/97

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 12/12/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97
Date Sampled : 05-DEC-97

Matrix : Leachate
Method : CLP-M

		Galson ID:	L40438-1	QM971208-1
		Client ID:	COMPOSITE 1	TCLP Blank
	Units			
Arsenic TCLP	mg/l		<0.2	<0.2
Barium TCLP	mg/l		<1	<1
Cadmium TCLP	mg/l		<0.005	<0.005
Chromium TCLP	mg/l		<0.01	<0.01
Lead TCLP	mg/l		0.83	<0.1
Mercury TCLP	mg/l		<0.0005	<0.0005
Selenium TCLP	mg/l		<0.1	<0.1
Silver TCLP	mg/l		<0.5	<0.5

Approved by : Karen S. Becker
Date : 09-DEC-97
QC by : [signature]
Date : 12.12.97
NYS DOH # : 11626
Footnotes:

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Excavated Material and confirmation samples from Excavation bottom.

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97 Matrix : Soil
Date Sampled : 05-DEC-97

Galson ID:			L40438-1	L40438-2	L40438-3
Client ID:			COMPOSITE 1	EB (NW7)	EB (SE10)
	Method	Units			
Reactive Cyanide	SW846	mg/kg	<100	NR	NR
Reactive Sulfide	SW846	mg/kg	<100	NR	NR
Corrosivity/pH	SW846 9045	SU	3.99	2.98	2.75
Ignitability	SW846 1030		NEG	NR	NR

Approved by : LM
Date : 11-DEC-97
QC by : [illegible]
Date : 12-12-97
NYS DOH # : 11626
Footnotes:

* The bulk pH was performed using SW846 method 9045. A sample is corrosive if pH is less than or equal to 2, or greater than or equal to 12.5 Standard Units(SU). Under these conditions, the samples are not corrosive.
* The samples do not ignite or support combustion. Under these conditions the sample is non-ignitable.
* The sample does not exceed the USEPA action levels of 250 mg HCN/kg waste and/or 500 mg H2S/kg waste as stated in SW846; therefore it is not reactive.

Galson Laboratories

INORGANIC ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97 Matrix : Soil
Date Sampled : 05-DEC-97

		Galson ID:	L40438-4
		Client ID:	EB (SW5)
	Method	Units	
Reactive Cyanide	SW846	mg/kg	NR
Reactive Sulfide	SW846	mg/kg	NR
Corrosivity/pH	SW846 9045	SU	2.50
Ignitability	SW846 1030		NR

Approved by : LM
Date : 11-DEC-97
QC by : [signature]
Date : 12-12-97
NYS DOH # : 11626
Footnotes:

* The bulk pH was performed using SW846 method 9045. A sample is corrosive if pH is less than or equal to 2, or greater than or equal to 12.5 Standard Units(SU). Under these conditions, the samples are not corrosive.
* The samples do not ignite or support combustion. Under these conditions the sample is non-ignitable.
* The sample does not exceed the USEPA action levels of 250 mg HCN/kg waste and/or 500 mg H2S/kg waste as stated in SW846; therefore it is not reactive.

REIEC
REMEDIATION TECHNOLOGIES INC
REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0645

PAGE 1 OF 1

PROJECT NAME: Mineral Springs IRM	PROJECT NUMBER: 3-2075-680
SEND REPORT TO: Mark Hofferbert	SAMPLER (PRINT NAME): Edwards
ADDRESS: Above	SAMPLER (PRINT NAME):
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER: 367505139 1
PHONE:	LABORATORY RECEIVING: Lawson
FAX:	

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	Full RCRA Characteristic Hazardous Testing (X)	TCLP VOC	TCLP Semi-VOC	Ignitability	Corrosivity	pH	PCBs	TCLP Metals	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
Composite 1	12/5/97	1000	Soil	4		X	X	X	X	X	X	X	(X) NO Herbicides/pesticides for sample composite 1 complete all RCRA Hazardous characteristics testing except Herbicides & pests extra sample volume included	
EB (NW7)	12/5/97	1446	Soil	1					X					
EB (SE10)	12/4/97	1542	Soil	1					X					
EB (SW5)	12/5/97	1305	Soil	1					X					

Remediation Technologies, Inc [illegible]
[illegible] Soil Composite 1

[illegible], In [illegible]
[illegible], In [illegible]
EB (SE10)
[illegible], In [illegible]
EB (SW5)

* RUSH *
TURNAROUND
Time
Request

Relinquished by: (Signature) Jane M. Edwards	Received by: (Signature) Fed ex	Date: 1600	Time: 12/5/97
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature) Fed Ex	Received by: (Signature) (LAB) M.D. Buchanan	Date: 12/6/97	Time: 14:00

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☐
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER RUSH	X

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	7
COC SEALS PRESENT ?	
COC SEALS INTACT ?	
RECEIVED CONTAINERS INTACT ?	
TEMPERATURE ?	4°C

Galson Laboratories

6601 Kirkville Road
E. Syracuse, NY 13057-0369
Phone: (315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

December 18, 1997

DOH ELAP# 11626

Mr. Mark Hofferbert
Remediation Technologies, Inc.
1001 West Seneca Street
Ithaca, NY 14850

Re: Client Account# 12013 Login# L40438

Dear Mr. Hofferbert:

Enclosed is the revised report for the samples received by our laboratory December 6, 1997. We have reported chloroform for 8260 TCLP for sample COMPOSITE 1 (Galson ID L40438-1) as requested.

Please contact our Client Services Department at (315) 437-7252, extension 116, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories

6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057
(315) 437-7252

Phone: (315) 437-7252 extension 116
Fax: (315) 437-0571

TELECOPY

NUMBER OF PAGES SENT (INCLUDING THIS COVER): 1

TO: Mark Hofferbert DATE: 12/17/97

COMPANY: RETEC FROM: Pam Weaver

FAX#: 607-277-9057 SUBJECT: Mineral Springs

MESSAGE:

Mark - MEK is reported as 2-butanone.
Chloroform < 50 ppb.

Thanks,
Pam

MEK	< 100	µg/L
Chloroform	< 50	ppb
"Cresol" = "Methylphenol"	all	N/D

HARD COPY TO FOLLOW: YES _____ NO ✓

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97
Date Sampled : 05-DEC-97

Matrix : Leachate
Method : SW846/1311/8260-TCLP
Units : UG/L

Galson ID:	L40438-1	QCB120897-1	QCB120897-1TP
Client ID:	COMPOSITE 1	Method Blank	TCLP Blank
Vinyl Chloride	<100	<10	<100
1,1-Dichloroethene	<50	<5	<50
1,2-Dichloroethane	<50	<5	<50
2-Butanone	<100	<10	<100
Chloroform	<50	<5	<50
Carbon Tetrachloride	<50	<5	<50
Trichloroethene	<50	<5	<50
Benzene	<50	<5	<50
Tetrachloroethene	<50	<5	<50
Chlorobenzene	<50	<5	<50
1,4-Dichlorobenzene	<50	<5	<50
Dilution Factor	10	1	10
Analysis Date	12/08/97	12/08/97	12/08/97

Approved by : PJT
Date : 09-DEC-97
QC by : [illegible]
Date : 12-8-97
NYS DOH # : 11626
Footnotes:
Sample run in accordance with ASP 95-1 Methodology.

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Excavation Bottom and side wall

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 12-DEC-97 Matrix : Soil
Date Sampled : 11-DEC-97

Galson ID:			L40540-2	L40540-3	L40540-4
Client ID:			NORTH	ES-1 (3)	SOUTH
	Method	Units			
Corrosivity/pH	SW846 9045	SU	7.2	3.8	6.9

Approved by : LM
Date : 16-DEC-97
QC by : [signature]
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

* The bulk pH was performed using SW846 method 9045. A sample is corrosive if pH is less than or equal to 2, or greater than or equal to 12.5 Standard Units(SU). Under these conditions, the samples are not corrosive.

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-DEC-97
Date Sampled : 05-DEC-97

Matrix : Soil
Method : SW846 6010A

Galson ID:		L40531-1	QM971217-1
Client ID:		EB NW7,SE10,SW5	BLANK
	Units		
Inorganic Lead	mg/kg	63	<0.3

Approved by : Karen S. Becker
Date : 17-DEC-97
QC by : EJ
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

Results are reported on a dry wieght basis. See enclosed sheet for percent moisture values.

SOIL MOISTURE ANALYSIS

LOGIN: L40531 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2204

Wet Weight by: AP
Date : 16-DEC-97
Time : 11:25

Dry Weight by:
Date : 17-DEC-97
Time : 11:32

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L40531-1		N	0.99	6.86	4.55	3.56	48.1	51.9
L40531-1D		N	0.99	5.41	4.23	3.24	40.1	59.9

$$\text{Percent Moisture} = \frac{(\text{net wet weight}) - (\text{net dry weight})}{\text{net wet weight}} \times 100$$

12/17/97 15:45

REIEC
REMEDIATION TECHNOLOGIES INC

[redacted] TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0345

PAGE 1 OF 1

PROJECT NAME: Mineral Springs IRM	PROJECT NUMBER: 3-2075-680
SEND REPORT TO: Mark Hoffee, Bert	SAMPLER (PRINT NAME): Edwards
ADDRESS: above	SAMPLER (PRINT NAME):
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER: 367505139 1
PHONE:	LABORATORY RECEIVING: Lancaster
FAX:	

ANALYSIS REQUESTED

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	Full RCRA Characteristic Hazardous Test (*)	TCLP VOC	TCLP Com-VOC	TCLP Metals	Corrosivity	pH	PCBs	TCLP metals	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
Composite 1	12/5/97	1000	Soil	4	*	X	X	X	X	X	+		(*) NO Herbicides/Pesticides For Sample Composite complete all RCRA Hazardous Characteristics testing except Herbicides & Pests extra sample volume included	
EB (NW7)	12/5/97	1446	Soil	1				X						
EB (SE10)	12/4/97	1542	Soil	1				X						
EB (SW5)	12/5/97	1305	Soil	1				X						

Remediation Technologies, Inn L40531-1
12/06/97 Soil. EB NW7, SE10, SW5

per Mark 12/11/97 composite samples - del analyze for total lead. PW 12/11/97

* RUSH *
TURNAROUND
Time
Request

Relinquished by: (Signature) Jane M Edwards	Received by: (Signature) Fed ex	Date: 1600	Time: 12/5/97
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature) Fed Ex	Received by: (Signature) M. D. Buchanan (LAB)	Date: 12/6/97	Time: 14:00

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☐
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER RUSH	X

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	7
COC SEALS PRESENT ?	
COC SEALS INTACT ?	
RECEIVED CONTAINERS INTACT ?	
TEMPERATURE ?	4°C

Custody.dwg

Galson Laboratories

6601 Kirkville Road
E. Syracuse, NY 13057-0369
Phone: (315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

December 18, 1997

DOH ELAP# 11626

Mr. Mark Hofferbert
Remediation Technologies, Inc.
1001 West Seneca Street
Ithaca, NY 14850

Excavation and Decontamination Water

Re: Client Account# 12013 Login# ~~L40438~~ L40540

Dear Mr. Hofferbert:

Enclosed are the analytical results of the samples received by our laboratory December 12, 1997. Samples submitted for TOC were subcontracted to Buck Environmental Laboratories, Inc. Their report is enclosed in its entirety.

Please contact our Client Services Department at (888) 577-5227, extension 116, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

FOR:

F. Joseph Unangst
Laboratory Director

Enclosure(s)

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 12-DEC-97
Date Sampled : 11-DEC-97

Matrix : Water
Method : SW846 8260
Units : UG/L

Galson ID:	L40540-1	QCC121497-1
Client ID:	EXCAVATION/DECON	Method Blank
Benzene	<5	<5
Dilution Factor	1	1
Analysis Date	12/14/97	12/14/97

Approved by : PJT
Date : 16-DEC-97
QC by : [signature]
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

WATER VOLATILE SURROGATE RECOVERY

Client : Remediation Technologies, Inc. Login # : L40540

SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
Method Blank-QCC121497-1	102	96	92	CA1214	0
EXCAVATION/DECON	109	100	89	CA1214	0

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(54-114)
SMC2 (BFB) = Bromofluorobenzene	(50-128)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(54-123)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

PESTICIDE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 12-DEC-97
Date Sampled : 11-DEC-97
Date Extracted: 14-DEC-97

Matrix : Water
Method : SW846 8080
Units : ug/L

Galson ID:	L40540-1	Q-5176
Client ID:	EXCAVATION/DECON	PBLK 5176
Aroclor-1016	<0.48	<0.5
Aroclor-1221	<0.48	<0.5
Aroclor-1232	<0.48	<0.5
Aroclor-1242	<0.48	<0.5
Aroclor-1248	<0.48	<0.5
Aroclor-1254	<0.48	<0.5
Aroclor-1260	<0.48	<0.5
Analysis Date	12/17/97	12/17/97
Dilution Factor	1	1
Surrogate Recovery Control Limits (24-154)	5 % *	93 %

Approved by : Oommen Kappil
Date : 17-DEC-97
QC by : [signature]
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

*Results may be biased low.
Surrogate recovery below acceptable control limits
(may be due to matrix interferences).

Printed : 12/17/97 15:54 Report Reference # : 95411

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 12-DEC-97
Date Sampled : 11-DEC-97

Matrix : Water
Method : SW846 6010A/7470A

Galson ID:		L40540-1	QM971216-1
Client ID:		EXCAVATION/DECON	BLANK
	Units		
Arsenic	mg/l	0.83	<0.01
Barium	mg/l	7.4	<0.01
Cadmium	mg/l	0.018	<0.005
Chromium	mg/l	0.048	<0.01
Lead	mg/l	25	<0.003
Mercury	mg/l	0.066	<0.0002
Selenium	mg/l	0.0073	<0.005
Silver	mg/l	0.092	<0.01

Approved by : Karen S. Becker
Date : 16-DEC-97
QC by : [signature]
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 12-DEC-97 Matrix : Water
Date Sampled : 11-DEC-97

Galson ID:			L40540-1
Client ID:			EXCAVATION/DECON
	Method	Units	
Reactive Cyanide	SW846	mg/kg	<100
Reactive Sulfide	SW846	mg/kg	<100
pH *	EPA 150.1	SU	2.30
T. Dissolved Solids	160.1	mg/L	2250

Approved by : LM
Date : 17-DEC-97
QC by : [signature]
Date : 12/17/97
NYS DOH # : 11626
Footnotes:

* "Overaged"; sample analyzed after 15 minute hold time.
* The sample does not exceed the USEPA action levels of 250 mg HCN/kg waste and/or 500 mg H2S/kg waste as stated in SW846; therefore it is not reactive.

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9712209

Client: GALSON LABORATORIES
6601 KIRKVILLE ROAD
EAST SYRACUSE NY 13057

Site: L40540

Report Date: 12/17/97
Sampling Date: 12/11/97
Sampled By: CLIENT
Date Received: 12/15/97

Sample ID: EXCAVATION / DI

ANALYTE	METHOD	ANALYZED	BY	UNITS	DL	RESULTS
Total Organic Carbon	415.2/9060	12/16/97	JEC	mg/L	0.5	***24.4***

This laboratory analysis has been performed in accordance with generally accepted laboratory practices and requirements of the New York State Department of Health ELAP Program. Buck Environmental Laboratories, Inc. makes no recommendations, representations or warranties other than as specifically set forth in this report and shall not be responsible or liable for any action or the consequences of any action taken in connection with this report.

(ND => not detected above DL indicated)
(DL => detection limit)
(mg/L => ppm in water)
(ug/g => ppm in solid)

Inorganic.frx

Christine E. Buck
for John H. Buck, P.E.
Laboratory Director
ELAP ID: 10795

REMEDIATION TECHNOLOGIES INC
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD

0500

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: Mark Hoffenberg	SAMPLER (PRINT NAME)
ADDRESS: RETEC	SAMPLER (PRINT NAME)
I. Ithaca	SHIPMENT METHOD:
	AIRBILL NUMBER:
PHONE: 6072775716	LABORATORY RECEIVING:
FAX:	

PAGE __OF__

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB	Reactive Metals	TPS + pH	TOC	Reactive CN and/or S	8260 (specify)	Corrosivity	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
Excavation and Pelton Water	12/11		Water	7	✓	✓	✓	✓	✓	✓		Remediation Technologies, In L40540-1 In 1250 Water EXCAVATION/PE	
North	12/11		Soil	1							✓	Remediation Technologies, In L40540-2 NORTH Soil	
ES-1(3)	12/9		Soil	1							✓	Technologies, In Laborato ES-1(3)	
~~ES-2(3)~~	~~12/9~~		~~Soil~~	0							~~✓~~		
SOUTH	12/11		Soil	1							✓	nologies, In L40540-4 SOUTH	

Relinquished by: (Signature)	Received by: (Signature)	Date: 12/11	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 12-12-97	Time: 1050

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☐
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	10
COC SEALS PRESENT ?	yes
COC SEALS INTACT ?	yes
RECEIVED CONTAINERS INTACT ?	yes
TEMPERATURE ?	4°C

RETEC

1001 W. Seneca Street
Suite 204
Ithaca, NY 14850
(607) 277-5716
FAX (607) 277-9057

March 3, 1998

Mr. Charles Burke
National Fuel Gas Distribution Corporation
10 Lafayette Place
Buffalo, NY 14203

RE: Surface Soil Quality Under Electric Transmission Towers
Interim Results
Mineral Springs Road, West Seneca, New York

Dear Charlie:

On February 17 and 18, 1998, RETEC performed surface soil sampling for total lead beneath the five electrical transmission towers at the NFG Mineral Springs Road site. The scope of that work, the analytical results and RETEC's conclusions and recommendations are attached.

SCOPE OF WORK

The scope of this work was based on recommendations made by RETEC in the Preliminary Site Assessment Report for the Mineral Springs Road Site, my proposal to you dated November 19, 1997, and our subsequent meeting on November 25, 1997, with NYSDEC in Buffalo.

A single composite surface (and a single composite subsurface) soil sample was collected beneath four of the five electrical transmission towers. Other samples were collected around Tower #1 to confirm complete remediation of the previously hazardous level of lead detected there (see the Project Complete Report - Southwestern IRM, January 23, 1998). One composite paint sample was also collected.

The towers were arbitrarily labeled sequentially across the site, moving from the southwest corner (Tower #1) to the southeast corner (Tower #5). The sampling sub-areas were labeled as shown in the attached sketch.

RESULTS

Only the surface samples and the paint were initially analyzed. The sub-surface samples were held by the laboratory. Results are summarized in the following table. The laboratory's reports are also attached.

REIEC

Lead Concentrations in Surface Soil

Sample Identification	Tower Number	Subarea Number	Lead Concentration (mg/Kg)	Comments
T1-SW (0-0.5)	1	SW	64	Field observations indicate that soil is a fill material associated with adjacent railroad bed.
T1-S (0-0.5)	1	S	290	Field observations indicate that soil is a fill material associated with adjacent railroad bed.
T1-SE (0-0.5)	1	SE	260	Field observations indicate that soil is a fill material associated with adjacent railroad bed.
T1-W (0-0.5)	1	W	110	Field observations indicate that soil is a topsoil; no industrial fill material noted
T1-NW (0-0.5)	1	NW	19	Field observations indicate that soil is a topsoil; no industrial fill material noted
T2-X (0-0.5)	2	X	890*	Field observations indicate the surface soil is mixed with industrial fill material. Some blue stained soils were found to be mixed with fill.
T3-X (0-0.5)	3	X	850*	Field observations indicate that soil is a topsoil; no industrial fill material noted.
T4-X (0-0.5)	4	X	54	Field observations indicate that soil is a topsoil; no industrial fill material noted.
T5-X (0-0.5)	5	X	300	Field observations indicate that soil is a topsoil; no industrial fill material noted.
Tower Paint	1, 2, 3, 4 and 5	---	290,000	Paint sample encompassed all layer present.

CONCLUSIONS

The paint used on the towers contains 29% lead (290,000 mg/kg) and is the likely source of the lead impacts to the surface soils, either as it chips off or due to overspray during application.

Total lead concentrations in the surface soils around the Southwestern Tower (in the non-excavated areas) were found to be below 500 mg/Kg. The other four sub-areas were comprised of clean fill placed during the IRM.

RETEC

Likewise, lead concentrations in the surface soil directly beneath Towers #4 and #5 were found to be below 500 mg/Kg.

Lead concentrations in surface soils beneath Towers #2 and #3, however, were found to be greater than 500 mg/Kg.

RETEC has asked the analytical laboratory, Galson Labs of Syracuse, NY, to perform TCLP analyses on the samples from Towers #2 and #3 (additional material had been submitted for this contingency). Based on the total lead results tabulated above, the soils are not anticipated to be hazardous. The laboratory will also analyze, for total lead, the subsurface samples from these towers.

As proposed, sampling of the remaining 8 quadrants beneath these towers will be performed when weather permits.

It appears likely that, should total lead be detected at concentrations greater than 500 mg/kg outside of the proposed site perimeter fenceline, then remedial actions may be required.

Should you have any questions, comments or require any additional information, please call me at (607) 277- 5716.

Sincerely,

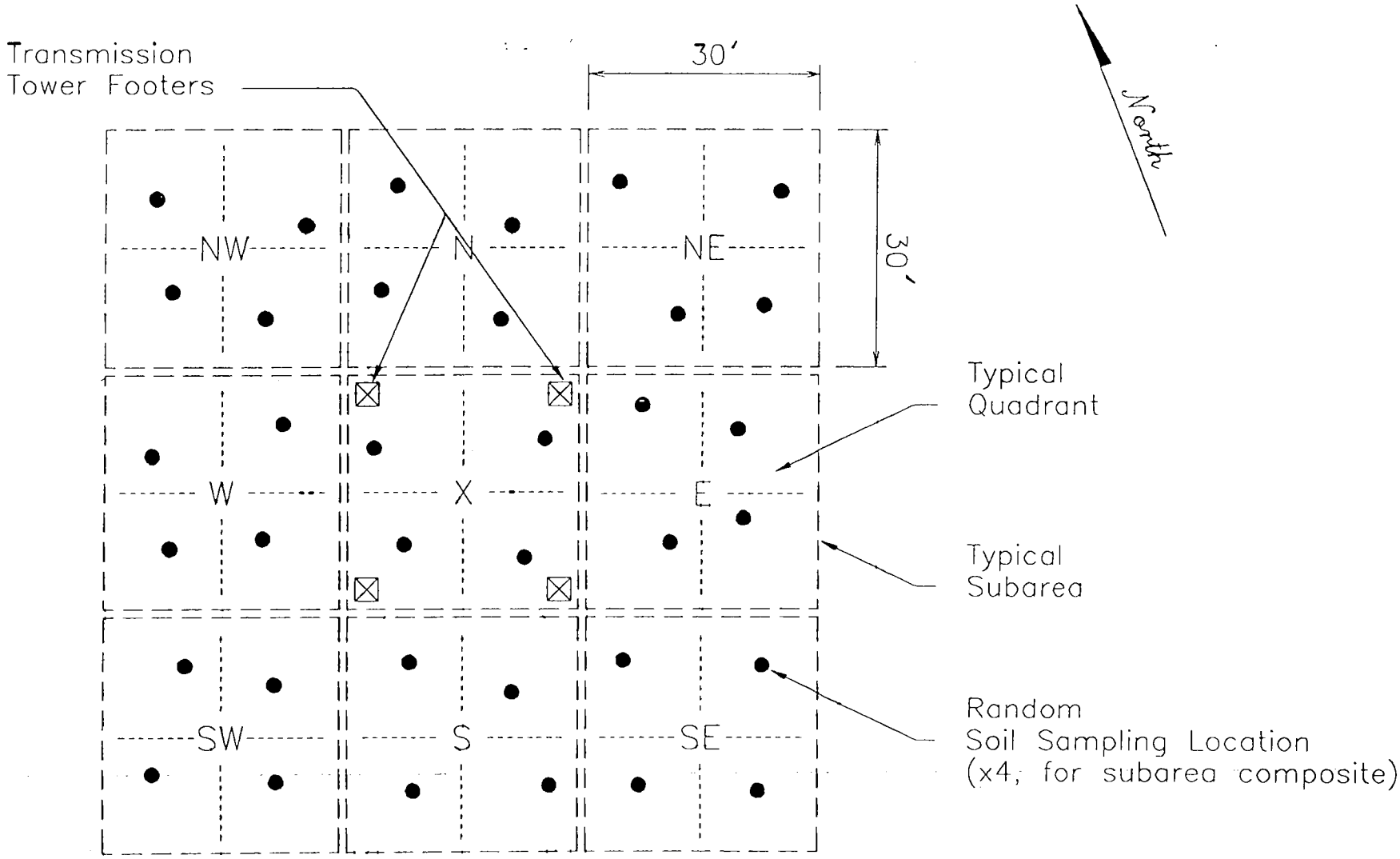
REMEDIATION TECHNOLOGIES, INC.

Mark Hofferbert
Project Engineer

Enclosure

cc: T. Alexander - NFG
J. Edwards, B. Coulombe - RETEC
File: 3-2075-650

TYPICAL EXPOSURE AREA



Galson
Laboratories

6601 Kirkville Road
E. Syracuse, NY 13057-0369
Phone: (315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

February 25, 1998

DOH ELAP# 11626

Mr. Mark Hofferbert
Remediation Technologies, Inc.
1001 W. Seneca Street
Ithaca, NY 14850

Client Account# 12013 Login# L41489 & L41499

Dear Mr. Hofferbert:

Enclosed are the analytical results of the samples received by our laboratory February 19, 1998.

Results in this report are based on the sampling data provided by the client. Unless otherwise requested, all samples will be discarded two weeks from the date of this report.

Please contact Pamela Weaver at (888) 577-5227, extension 116, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

FOR

Gale G. Sutton, CIH
Laboratory Director

Enclosure(s)

LABORATORY ANALYSIS REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Site : MINERAL SPRINGS
Date Sampled : 17-FEB-98
Date Received : 19-FEB-98

Project No.: 3-2075-620
Account No.: 12013
Login No. : L41499

Inorganic Lead

Sample ID	Lab ID	mg/kg
TOWER PAINT	L41499-1	290000

Level of quantitation: 50 mg/kg
Analytical Method : EPA Pb 92-114172 Mod; ICP
OSHA PEL (TWA) : NA
Collection Media : Paint

Submitted by: LK
Approved by : Karen S. Becker
Date : 25-FEB-98
QC by:
NYS DOH # : 11626

<	-Less Than	mg	-Milligrams	m3	-Cubic Meters	kg	-Kilograms
>	-Greater Than	ug	-Micrograms	l	-Liters	NS	-Not Specified
NA	-Not Applicable	ND	-Not Detected	ppm	-Parts per Million		

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 18-FEB-98 - 19-FEB-98 Matrix : Soil
Date Sampled : 18-FEB-98 Method : SW846 6010B

Galson ID:		L41489-1	L41489-2	L41489-3
Client ID:		T1SW (0-0.5)	T1S (0-0.5)	T1SE (0-0.5)
	Units			
Inorganic Lead	mg/kg	64	290	260

Approved by : Karen S. Becker
Date : 25-FEB-98
QC by :
Date : 2/25/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 18-FEB-98 - 19-FEB-98 Matrix : Soil
Date Sampled : 18-FEB-98 Method : SW846 6010B

Galson ID:		L41489-4	L41489-5	L41489-6
Client ID:		T1W (0-0.5)	T1NW (0-0.5)	T2X (0-0.5)
	Units			
Inorganic Lead	mg/kg	110	19	890

Approved by : Karen S. Becker
Date : 25-FEB-98
QC by : [signature]
Date : 3/25/98
NYS DOH # : 11626
Footnotes:
Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 18-FEB-98 - 19-FEB-98 Matrix : Soil
Date Sampled : 18-FEB-98 Method : SW846 6010B

Galson ID:		L41489-7	L41489-8	L41489-9
Client ID:		T3X (0-0.5)	T4X (0-0.5)	T5X (0-0.5)
	Units			
Inorganic Lead	mg/kg	850	54	300

Approved by : Karen S. Becker
Date : 25-FEB-98
QC by : DMC
Date : 2/25/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 18-FEB-98 - 19-FEB-98 Matrix : Soil
Date Sampled : 18-FEB-98 Method : SW846 6010B

Galson ID:		QM980223-1
Client ID:		BLANK
	Units	
Inorganic Lead	mg/kg	<0.3

Approved by : Karen S. Becker
Date : 25-FEB-98
QC by :
Date : 3/3/98
NYS DOH # : 11626
Footnotes:
Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

SOIL MOISTURE ANALYSIS

LOGIN: L41489 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2240

Wet Weight by: PH
Date : 23-FEB-98
Time : 09:15

Dry Weight by: PH
Date : 24-FEB-98
Time : 08:30

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L41489-1	T1SW (0-0.5)	N	1.00	6.27	5.42	4.42	29.5	70.5
L41489-2	T1S (0-0.5)	N	1.00	7.15	4.36	3.36	53.0	47.0
L41489-3	T1SE (0-0.5)	N	1.00	6.47	4.23	3.23	50.1	49.9
L41489-4	T1W (0-0.5)	N	1.00	5.75	4.76	3.76	34.6	65.4
L41489-5	T1NW (0-0.5)	N	1.01	7.81	7.22	6.21	20.5	79.5
L41489-6	T2X (0-0.5)	N	1.00	5.63	4.67	3.67	34.8	65.2
L41489-7	T3X (0-0.5)	N	1.00	6.60	4.01	3.01	54.4	45.6
L41489-8	T4X (0-0.5)	N	1.00	6.32	3.99	2.99	52.7	47.3
L41489-9	T5X (0-0.5)	N	0.99	6.70	5.79	4.80	28.4	71.6

$$\text{Percent Moisture} = \frac{\text{(net wet weight) - (net dry weight)}}{\text{net wet weight}} \times 100$$

02/25/98 09:55

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0644

PAGE 1 OF 1

PROJECT NAME: MINERAL SPRINGS	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: MARK HOFFERBERT	SAMPLER (PRINT NAME) JAMES EDWARDS
ADDRESS: ABOVE	SAMPLER (PRINT NAME)
	SHIPMENT METHOD: FED EX
	AIRBILL NUMBER: 535091638 6
PHONE:	LABORATORY RECEIVING: LANCASTER LABS
FAX:	

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	TOTAL LEAD 6010A	* ARCHIVE SAMPLE (2)	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by la
T1SW (0-0.5)	2/18	9:10	Soil	1	X	X	* Archive Sample	
T1S (0-0.5)	2/18	9:20	Soil	1	X	X		
T1SE (0-0.5)	2/18	9:30	Soil	1	X	X	(1) Upon Receipt of	
T1W (0-0.5)	2/18	9:40	Soil	1	X	X	total lead results	
T1NW (0-0.5)	2/18	9:45	Soil	1	X	X	RETEC will notify	
T2X (0-0.5)	2/17	1300	Soil	1	X	X	Balson to	
T3X (0-0.5)	2/17	1400	Soil	1	X	X		
T4X (0-0.5)	2/17	1500	Soil	1	X	X	(2) complete	
T5X (0-0.5)	2/17	1600	Soil	1	X	X	TCLP Lead via	
TOWER PAINT	2/17	1700	~~Soil~~ paint	1	~~X~~	~~X~~ SHE	SW 846 7420	

→ logged in separately

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
James D. Edwards	FED EX	2/18/98	1700
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 2/19/98	Time: 1030

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	10
COC SEALS PRESENT ?	YES
COC SEALS INTACT ?	Y
RECEIVED CONTAINERS INTACT ?	Y
TEMPERATURE ?	4°C

RETEC

1001 W. Seneca Street
Suite 204
Ithaca, NY 14850
(607) 277-5716
FAX (607) 277-9057

April 13, 1998

Mr. Charles Burke
National Fuel Gas Distribution Corporation
10 Lafayette Place
Buffalo, NY 14203

RE: **Surface Soil Quality Under Electric Transmission Towers**
Final Results
Mineral Springs Road, West Seneca, New York

Dear Charlie:

On April 2, 1998, RETEC completed surface soil sampling for total lead beneath the five electrical transmission towers at the NFG Mineral Springs Road site. The scope of that work, the analytical results, and RETEC's conclusions and recommendations are attached.

SCOPE OF WORK

The scope of this work was based on recommendations made by RETEC in the Preliminary Site Assessment Report for the Mineral Springs Road Site, my proposal to you dated November 19, 1997, our subsequent meeting on November 25, 1997 with NYSDEC in Buffalo, and my March 3, 1998 Interim Results letter to you.

The towers were arbitrarily labeled sequentially across the site, moving from the southwest corner (Tower #1) to the southeast corner (Tower #5). The sampling subareas were labeled as shown in the attached Summary.

In February, 1998, RETEC collected a single composite surface (and a single composite subsurface) soil sample beneath Towers #2, #3, #4 and #5. Two of the four surface samples had total lead concentrations greater than 500 mg/kg. Five other samples collected at that time around Tower #1 confirmed complete remediation of the previously elevated level of lead detected there. These data are presented in my March 3, 1998, Interim Results letter to you.

In March and April of 1998, RETEC collected composite surface (and composite subsurface) soil samples from the previously unsampled subareas around Towers #2, #3, #4 and #5. The analytical laboratory was also asked to proceed with the analysis of the subsurface samples submitted in February. Surface samples were collected between 0 and 6 inches below grade; subsurface samples were collected between 6 and 12 inches below grade.

RESULTS and CONCLUSIONS

The tower paint contains 29% lead (290,000 mg/kg) and is the likely source of the lead impacts to the surface soils, either as it flakes or due to overspray during application.

Total lead concentrations in the surface and subsurface soils around Tower #1 were found to be below 500 mg/Kg. This area had been remediated during the Southwestern Tower IRM.

Lead concentrations greater than 500 mg/kg were detected within the footprints of Towers #2, #3 and #4. As you can see in the attached summary figure, however, the depths and lateral extents of these impacts are minimal. (There is some indication that the samples from subarea X under tower #4 were mislabeled, hence the apparent incongruity.)

TCLP analyses indicate the most impacted soils, Tower #2 - subarea X, and Tower # 3 - subarea X, are non-hazardous.

RECOMMENDATIONS

The lead concentrations identified herein are typically acceptable at commercial/industrial sites with limited access such as Mineral Springs. RETEC recommends, however, that NFG proceed with construction of the proposed perimeter fence at the earliest convenience.

RETEC also recommends that NFG open a dialog with Niagara Mohawk Power Corporation to ensure that future maintenance of the towers does not lead to additional impacts.

Should you have any questions, comments or require any additional information, please call me at (607) 277-5716.

Sincerely,

REMEDIATION TECHNOLOGIES, INC.

Mark Hofferbert
Project Engineer

Enclosure

cc: T. Alexander - NFG
J. Edwards, B. Coulombe - RETEC
File: 3-2075-650

SUMMARY OF LEAD CONCENTRATIONS IN SOIL BELOW ELECTRIC TRANSMISSION TOWERS

National Fuel Gas, Mineral Springs Road Site

KEY

Tower Footers

NW	N	NE
W	X	E
SW	S	SE

> 500 mg/kg

North

NA : not analyzed

Analytical results in mg/kg (dry weight)

TOWER #1

Surface

19	clean fill	clean fill
110	clean fill	clean fill
64	290	260

Subsurface

NA	clean fill	clean fill
NA	clean fill	clean fill
NA	NA	NA

TOWER #2

Surface

81	77	130
160	890	210
230	180	210

Subsurface

NA	NA	NA
NA	170	NA
NA	NA	NA

TOWER #3

Surface

370	590	560
220	850	350
210	230	150

Subsurface

NA	210	110
NA	73	NA
NA	NA	NA

TOWER #4

Surface

71	140	68
220	54	57
260	230	89

Subsurface

NA	NA	NA
NA	760	NA
NA	NA	NA

TOWER #5

Surface

67	92	200
stream	300	76
stream	270	180

Subsurface

NA	NA	NA
stream	17	NA
stream	NA	NA

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98
Date Sampled : 17-FEB-98

Matrix : Soil
Method : SW846 6010B

Galson ID:		L41623-1	L41623-2	L41623-3
Client ID:		T2X (0.5-1)	T3X (0.5-1)	T4X (0.5-1)
	Units			
Inorganic Lead	mg/kg	170	73	760

Approved by : Karen S. Becker
Date : 06-MAR-98
QC by :
Date : 3/6/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values,

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98
Date Sampled : 17-FEB-98

Matrix : Soil
Method : SW846 6010B

Galson ID:		L41623-4	QM980305-1
Client ID:		T5X (0.5-1)	BLANK
	Units		
Inorganic Lead	mg/kg	17	<0.3

Approved by : Karen S. Becker
Date : 06-MAR-98
QC by : [signature]
Date : 3/6/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values,

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98
Date Sampled : 17-FEB-98

Matrix : Leachate
Method : SW846 6010B

Reanalyze Surface Samples

Galson ID:		L41623-1	L41623-2	QM980303-1
Client ID:		T2X (0.5-1)	T3X (0.5-1)	TCLP Blank
	Units			
Lead TCLP	mg/l	0.15	<0.02	<0.02

Approved by : Karen S. Becker
Date : 03-MAR-98
QC by :
Date : 3/6/98
NYS DOH # : 11626
Footnotes:

SOIL MOISTURE ANALYSIS

LOGIN: L41623 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2247

Wet Weight by: PH
Date : 02-MAR-98
Time : 14:00

Dry Weight by: PH
Date : 03-MAR-98
Time : 07:10

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L41623-1	T2X (0.5-1)	N	0.99	5.54	5.07	4.08	26.4	73.6
L41623-2	T3X (0.5-1)	N	0.99	7.53	4.91	3.92	47.9	52.1
L41623-3	T4X (0.5-1)	N	1.00	8.31	4.15	3.15	62.1	37.9
L41623-4	T5X (0.5-1)	N	0.98	9.64	8.91	7.93	17.7	82.3

$$\text{Percent Moisture} = \frac{(\text{net wet weight}) - (\text{net dry weight})}{\text{net wet weight}} \times 100$$

03/06/98 13:12

REIEC
REMEDIATION TECHNOLOGIES INC
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0714

PROJECT NAME: Mark Hofferbert	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: Above	SAMPLER (PRINT NAME): James Edwards
ADDRESS:	SAMPLER (PRINT NAME):
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER: 535091038 6
PHONE:	LABORATORY RECEIVING: Galson
FAX:	

PAGE __ OF __

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUESTED: Hold Samples In Laboratory Archive	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
T1SW (0.5-1)	2/18	900	Soil	1	X		
T1S (0.5-1)	2/18	915	Soil	1	X	REIEC will	
T1SE (0.5-1)	2/18	925	Soil	1	X	NOTIFY GALSON	
T1W (0.5-1)	2/18	935	Soil	1	X	prior to performing	
T1NW (0.5-1)	2/18	950	Soil	1	X	ANALYSES	
T2X (0.5-1) *(*)	2/17	1230	Soil	1	X		
T3X (0.5-1) *(*)	2/17	1330	Soil	1	X	(1) TOTAL	LEAD
T4X (0.5-1) **	2/17	1430	Soil	1	X	(2) TCLP	LEAD
T5X (0.5-1) **	2/17	1530	Soil	1	X		

* Per Jim Edwards analyze for TCLP Pb

** Per Jim Edwards analyze for Total Pb only. PALS 2/26/98

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
James Ed. Edwards	Fed Ex	2/18/98	1700
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
	T. Kay	2-19-98	1030

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL	TURNAROUND:
LEVEL I ☐	ROUTINE ☐
LEVEL II ☐	24 HOUR ☐
LEVEL III ☐	1 WEEK ☐
OTHER ☐	OTHER ___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	9
COC SEALS PRESENT ?	yes
COC SEALS INTACT ?	↓
RECEIVED CONTAINERS INTACT ?	↓
TEMPERATURE ?	4°C

Galson Laboratories

Client: Remediation Technologies, Inc.
1001 W. Seneca St.
Ithaca,, NY 14850

Account # : 12013
Laboratory No. : L42325
Report Date : 04/07/98

Attn : Mr. Mark Hofferbert

SAMPLE INFORMATION

Sample Date : 03/31/98 - 04/01/98
Site : Mineral Springs

Date Received : 04/02/98
Matrix : Soil

CLIENT ID	LAB#	Inorganic Lead SW846 6010B mg/kg
T3E(0.0.5)	1	350
T3NE(0.0.5)	2	560
T3N(0.0.5)	3	590
T3SE(0.0.5)	4	150
T3W(0.0.5)	5	220
T3NW(0.0.5)	6	370
T3S(0.0.5)	7	230
T3SW(0.0.5)	8	210
T4SW(0.0.5)	9	260
T4SE(0.0.5)	10	89
T4NW(0.0.5)	11	71
T4E(0.0.5)	12	57
T4NE(0.0.5)	13	68
T4W(0.0.5)	14	220
T4N(0.0.5)	15	140
T4S(0.0.5)	16	230
Method Blank	1	< 0.3

Approved by : Karen S. Becker Date : 04/07/98
QC by : EH Date : 4/7/98 NYS DOH # : 11626

Footnotes :

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

SOIL MOISTURE ANALYSIS

LOGIN: L42325 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2272

Wet Weight by: JK
Date : 03-APR-98
Time : 12:35

Dry Weight by: JK
Date : 06-APR-98
Time : 08:15

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L42325-1		N	1.00	6.10	4.23	3.23	47.0	53.0
L42325-2		N	1.00	6.73	5.01	4.01	40.4	59.6
L42325-3		N	1.00	5.40	4.00	3.00	44.4	55.6
L42325-4		N	1.00	5.41	4.77	3.77	30.3	69.7
L42325-5		N	1.00	6.47	5.11	4.11	36.5	63.5
L42325-6		N	1.00	5.76	4.44	3.44	40.3	59.7
L42325-7		N	1.00	5.59	3.87	2.87	48.7	51.3
L42325-8		N	1.00	5.81	3.88	2.88	50.4	49.6
L42325-9		N	1.00	6.72	3.58	2.58	61.6	38.4
L42325-10		N	1.00	5.98	4.72	3.72	37.8	62.2
L42325-11		N	1.00	5.55	4.34	3.34	39.8	60.2
L42325-12		N	1.00	5.83	4.85	3.85	34.0	66.0
L42325-13		N	1.00	5.55	4.55	3.55	36.0	64.0
L42325-14		N	1.00	5.95	3.25	2.25	62.2	37.8
L42325-15		N	1.00	5.91	4.51	3.51	40.6	59.4
L42325-16		N	1.00	6.09	3.37	2.37	61.1	38.9

$$\text{Percent Moisture} = \frac{(\text{net wet weight}) - (\text{net dry weight})}{\text{net wet weight}} \times 100$$

04/07/98 14:02

REMEDIATION TECHNOLOGIES INC
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0706

PAGE __ OF __

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-650
SEND REPORT TO: Mark Hoffenbert	SAMPLER (PRINT NAME) James Edwards
ADDRESS:	SAMPLER (PRINT NAME)
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER: 535691637 5
PHONE:	LABORATORY RECEIVING: Galson
FAX:	

ANALYSIS REQUESTED: TOTAL LEAD

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS		COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
T3E(0-0.5)	4/1	310	Soil	1	X	Remediation Technologies, In L42325-1	ANALYZE FOR TOTAL
T3NE(0-0.5)	4/1	320	Soil	1	X	Remediation Technologies, In L42325-2	LEAD THEN ARCHIVE
T3N(0-0.5)	4/1	325	Soil	1	X	Remediation Technologies, In L42325-3	REMAINING SOIL IN
T3SE(0-0.5)	4/1	255	Soil	1	X	Remediation Technologies, In L42325-4	LABORATORY - RETEC
T3W(0-0.5)	4/1	217	Soil	1	X	Remediation Technologies, In L42325-5	WILL NOTIFY GALSON
T3NW(0-0.5)	4/1	340	Soil	1	X	Remediation Technologies, In L42325-6	TO RUN TCLP LEAD
T3S##(0-0.5)	4/1	245	Soil	1	X	Remediation Technologies, In L42325-7	ON SOIL
T3SW(0-0.5)	4/1	240	Soil	1	X	Remediation Technologies, In L42325-8	
T4SW(0-0.5)	4/1/98	1205	Soil	1	X	Remediation Technologies, In L42325-9	
T4SE(0-0.5)	4/1/98	1640	Soil	1	X	Remediation Technologies, In L42325-10	
T4NW(0-0.5)	4/1/98	1040	Soil	1	X	Remediation Technologies, In L42325-11	
T4E(0-0.5)	3/1/98	1709	Soil	1	X	Remediation Technologies, In L42325-12	
T4NE(0-0.5)	4/1/98	820	Soil	1	X	Remediation Technologies, In L42325-13	
T4W(0-0.5)	4/1/98	1120	Soil	1	X	Remediation Technologies, In L42325-14	
T4N(0-0.5)	4/1/98	959	Soil	1	X	Remediation Technologies, In L42325-15	
T4S(0-0.5)	3/31/98	1608	Soil	1	X	Remediation Technologies, In L42325-16	
						04/02/98 Soil T4S(0.0.5)	

Relinquished by: (Signature) James H. Edwards	Received by: (Signature) Fed ex	Date: 4/1/98	Time: 1700
Relinquished by: (Signature)	Received by: (Signature)	Date: 4-2-98	Time: 1010
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	32
COC SEALS PRESENT ?	Yes
COC SEALS INTACT ?	Yes
RECEIVED CONTAINERS INTACT ?	Yes
TEMPERATURE ?	4°C

Custody.dwg

Galson Laboratories

Client: Remediation Technologies, Inc.
1001 W. Seneca St.
Ithaca,, NY 14850

Account # : 12013
Laboratory No. : L42352
Report Date : 04/09/98

Attn : Mr. Mark Hofferbert

SAMPLE INFORMATION

Sample Date : 04/02/98
Site : Mineral Springs

Date Received : 04/03/98
Matrix : Soil

CLIENT ID	LAB#	Inorganic Lead SW846 6010B mg/kg
T2SW (0.0-0.5)	1	210
T2E (0.0-0.5)	2	210
T2NE (0.0-0.5)	3	130
T2N (0.0-0.5)	4	77
T2S (0.0-0.5)	5	180
T2SW (0.0-0.5)	6	230
T2W (0.0-0.5)	7	160
T2NW (0.0-0.5)	8	81
T5E (0.0-0.5)	9	76
T5NW (0.0-0.5)	10	62
T5SE (0.0-0.5)	11	180
T5S (0.0-0.5)	12	270
T5N (0.0-0.5)	13	92
T5NE (0.0-0.5)	14	200
Method Blank	1	< 0.3

Approved by : Karen S. Becker Date : 04/09/98
QC by : [signature] Date : 4/9/98 NYS DOH # : 11626

Footnotes :

Results are reported on a dry weight basis. See enclosed sheet for percent moisture analysis.

SOIL MOISTURE ANALYSIS

LOGIN: L42352 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2275

Wet Weight by: JK
Date : 08-APR-98
Time : 09:05

Dry Weight by: MB
Date : 09-APR-98
Time : 08:00

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L42352-1	T2SW (0.0-0.	N	1.00	5.53	4.61	3.61	34.7	65.3
L42352-2	T2E (0.0-0.5	N	1.00	5.31	4.51	3.51	33.9	66.1
L42352-3	T2NE (0.0-0.	N	1.00	5.71	5.11	4.11	28.0	72.0
L42352-4	T2N (0.0-0.5	N	1.00	6.02	6.22	5.22	13.3	86.7
L42352-5	T2S (0.0-0.5	N	1.00	5.76	5.01	4.01	30.4	69.6
L42352-6	T2SW (0.0-0.	N	1.00	5.45	4.29	3.29	39.6	60.4
L42352-7	T2W (0.0-0.5	N	1.00	6.62	5.69	4.69	29.2	70.8
L42352-8	T2NW (0.0-0.	N	1.00	6.11	6.35	5.35	12.4	87.6
L42352-9	T5E (0.0-0.5	N	1.00	6.03	5.09	4.09	32.2	67.8
L42352-10	T5NW (0.0-0.	N	1.00	5.48	4.61	3.61	34.1	65.9
L42352-11	T5SE (0.0-0.	N	1.00	6.20	5.52	4.52	27.1	72.9
L42352-12	T5S (0.0-0.5	N	1.00	6.11	5.44	4.44	27.3	72.7
L42352-13	T5N (0.0-0.5	N	1.00	6.10	5.25	4.25	30.3	69.7
L42352-14	T5NE (0.0-0.	N	1.00	5.49	5.32	4.32	21.3	78.7

$$\text{Percent Moisture} = \frac{(\text{net wet weight}) - (\text{net dry weight})}{\text{net wet weight}} \times 100$$

04/09/98 09:28

REMEDIATION TECHNOLOGIES INC
1001 W. Seneca Street, Suite 204
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CHAIN OF CUSTODY RECORD 0710

PAGE 1 OF 1

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-650
SEND REPORT TO: Mark Hufferbert	SAMPLER (PRINT NAME) David Y-dlkiwicz
ADDRESS:	SAMPLER (PRINT NAME)
	SHIPMENT METHOD: Fedex
	AIRBILL NUMBER:
PHONE:	LABORATORY RECEIVING: Galson
FAX:	

ANALYSIS REQUESTED: Total Lead

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
T2 SW (0.0-0.5)	4/2/98	10:40	Soil	1	Remediation Technologies, In L42352-1	Analyze for total lead then archive remaining soil in jar - Possible TCLP
T2 E (0.0-0.5)	"	11:00	"	1	Remediation Technologies, In L42352-2	
T2 NE (0.0-0.5)	"	11:20	"	1	Remediation Technologies, In L42352-3	
T2 N (0.0-0.5)	"	11:40	"	1	Remediation Technologies, In L42352-4	
T2 S (0.0-0.5)	"	12:00	"	1	Remediation Technologies, In L42352-5	lead - RETEC will
T2 SW (0.0-0.5)	"	12:20	"	1	Remediation Technologies, In L42352-6	call
T2 W (0.0-0.5)	"	10:00	"	1	04/(Remediation Technologies, In L42352-7	
T2 NW (0.0-0.5)	"	10:20	"	1	Remediation Technologies, In L42352-8	
T5 E (0.0-0.5)	"	8:20	"	1	Remediation Technologies, In L42352-9	
T5 NW (0.0-0.5)	"	8:00	"	1	Remediation Technologies, In L42352-10	
T5 SE (0.0-0.5)	"	8:40	"	1	Remediation Technologies, In L42352-11	
T5 S (0.0-0.5)	"	9:00	"	1	Remediation Technologies, In L42352-12	
T5 N (0.0-0.5)	"	9:20	"	1	Remediation Technologies, In L42352-13	
T5 NE (0.0-0.5)	"	9:40	"	1	Remediation Technologies, In L42352-14	
					04/03/98 Soil T5NE (0.0-0.5)	

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	____

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	14
COC SEALS PRESENT ?	Yes
COC SEALS INTACT ?	Yes
RECEIVED CONTAINERS INTACT ?	Yes
TEMPERATURE ?	4A

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98 - 09-APR-98 Matrix : Soil
Date Sampled : 17-FEB-98 - 01-APR-98 Method : SW846 6010B

		Subsurface	subsurface	Reanalysis
Galson ID:		L42455-1	L42455-2	L42455-3
Client ID:		T3N (0.5-1)	T3NE (0.5-1)	T4X (0.-0.5)
	Units			
Inorganic Lead	mg/kg	210	110	42

Approved by : Karen S. Becker
Date : 13-APR-98
QC by :
Date : 4/13/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98 - 09-APR-98 Matrix : Soil
Date Sampled : 17-FEB-98 - 01-APR-98 Method : SW846 6010B

Reanalysis

Galson ID:		L42455-4	QM980413-1
Client ID:		T4X (0.5-1)	BLANK
	Units		
Inorganic Lead	mg/kg	720	<0.3

Approved by : Karen S. Becker
Date : 13-APR-98
QC by :
Date : 4/13/98
NYS DOH # : 11626
Footnotes:

Results are reported on a dry weight basis. See enclosed sheet for percent moisture values.

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 19-FEB-98
Date Sampled : 17-FEB-98

Matrix : Leachate
Method : SW846 6010B

Galson ID:		L42455-5	L42455-6	QM980413-1
Client ID:		T3X (0.-0.5)	T2X (0.-0.5)	TCLP Blank
	Units			
Lead TCLP	mg/l	0.056	0.24	<0.02

Approved by : Karen S. Becker
Date : 13-APR-98
QC by :
Date : 4/13/98
NYS DOH # : 11626
Footnotes:

SOIL MOISTURE ANALYSIS

LOGIN: L42455 QC BATCH: [illegible] LAB GROUP: INORGANIC REF. #: 2280

Wet Weight by: PH
Date : 09-APR-98
Time : 12:00

Dry Weight by: MB
Date : 10-APR-98
Time : 13:50

GALSON ID	SAMPLE DESC	DCT	PAN WT (gm)	NET WET WT (gm)	GROSS DRY WT (gm)	NET DRY WT (gm)	% MOIST	% SOLID
L42455-1	T3N (0.5-1)	N	1.00	8.62	7.02	6.02	30.2	69.8
L42455-2	T3NE (0.5-1)	N	0.99	5.03	4.05	3.06	39.2	60.8
L42455-3	T4X (0.-0.5)	N	0.99	6.25	3.92	2.93	53.1	46.9
L42455-4	T4X (0.5-1)	N	0.99	8.18	4.46	3.47	57.6	42.4
L42455-5	T3X (0.-0.5)	N						
L42455-6	T2X (0.-0.5)	N						

$$\text{Percent Moisture} = \frac{\text{(net wet weight) - (net dry weight)}}{\text{net wet weight}} \times 100$$

04/13/98 10:29

REIEC
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Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0705

PAGE __OF__

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-650
SEND REPORT TO: Mark Hofferbert	SAMPLER (PRINT NAME) JAMES EDWARDS
ADDRESS: Above	SAMPLER (PRINT NAME)
	SHIPMENT METHOD: Fed ex
	AIRBILL NUMBER: 535004603-5
PHONE:	LABORATORY RECEIVING: LAWSON
FAX:	

ANALYSIS REQUESTED: Archive in LAB

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS		COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
T3SE (0.5-1)	4/1/98	300	Soil	1	X		
T3NE(0.5-1) ✓	4/1/98	315	Soil	1	X	* Archive	soil
T3S(0.5-1)	4/1/98	250	soil	1	X	samples in	LABoratory
T3E (0.5-1)	4/1/98	305	soil	1	X	Retec will	notify
T3NW(0.5-1)	4/1/98	335	soil	1	X	LAWSON to	ANALYZE
T3N (0.5-1) ✓	4/1/98	330	Soil	1	X	FOR total	LEAD
T3SW (0.5-1)	4/1/98	235	Soil	1	X	AND/OR	TCLP
T3W(0.5-1)	4/1/98	230	Soil	1	X		LEAD
T4NE(0.5-1)	4/1/98	1138	soil	1	X		
T4W(0.5-1)	4/1/98	1135	soil	1	X	✓= sample to	be analyzed
T4SW(0.5-1)	4/1/98	1215	Soil	1	X	for total lead	per Mark
T4S (0.5-1)	3/31/98	1120	Soil	1	X	Hofferbert to	FAX 4/8/98
T4NW (0.5-1)	4/1/98	1055	Soil	1	X		
T4E (0.5-1)	3/31/98	1720	Soil	1	X		
T4N (0.5-1)	4/1/98	1015	Soil	1	X		
T4S (0.5-1)	3/31/98	1650	Soil	1	X		

nologies, In L42455-1 T3N (0.5-1)

gies, In L42455-2 T3NE (0.5-1)

Relinquished by: (Signature) James D. Edwards	Received by: (Signature) Fed ex	Date: 4/1/98	Time: 1700
Relinquished by: (Signature)	Received by: (Signature)	Date: 4-2-98	Time: 1010
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	
COC SEALS PRESENT ?	
COC SEALS INTACT ?	
RECEIVED CONTAINERS INTACT ?	
TEMPERATURE ?	

Custody.dwg

REIEC
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REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
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Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0144

PAGE 1 OF 1

PROJECT NAME: MINERAL SPRINGS	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: MARY HOFFERBERT	SAMPLER (PRINT NAME): JAMES EDWARDS
ADDRESS: ABOVE	SAMPLER (PRINT NAME):
	SHIPMENT METHOD: FED EX
	AIRBILL NUMBER: 535091638 6
PHONE:	LABORATORY RECEIVING: LANCASTER
FAX:	

ANALYSIS REQUESTED: TOTAL LEAD 6010A; * ARCHIVE SAMPLE (2)

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	TOTAL LEAD 6010A	* ARCHIVE SAMPLE			COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lo
T1SW (0-0.5)	2/18	9:10	Soil	1	X	X			* Archive Sample	
T1S (0-0.5)	2/18	9:20	Soil	1	X	X				
T1SE (0-0.5)	2/18	9:30	Soil	1	X	X			(1) Upon receipt of	
T1W (0-0.5)	2/18	9:40	Soil	1	X	X			total lead results	
T1NW (0-0.5)	2/18	9:45	Soil	1	X	X			RETEC will notify	
T2X (0-0.5)	2/17	1300	Soil	1	X	X		✓	Laboratories, In L42455-6 T2X (0.-0.5)	
T3X (0-0.5)	2/17	1400	Soil	1	X	X		✓	Laboratories, In L42455-3 T3X (0.-0.5)	
T4X (0-0.5)	2/17	1500	Soil	1	X	X		X	Laboratories, In L42455-8 4X (0.-0.5)	
T5X (0-0.5)	2/17	1600	Soil	1	X	X				
TOWER PAINT	2/17	1700	Soil Paint	1	X	X Hold Aw 2/19/98				

Remediation Technologies, In L41499-1
02/19/98 Paint
TOWER PAINT

(1) Upon receipt of total lead results RETEC will notify Balson to

(2) complete TCLP Lead via SW 846 7040

√ - TCLP lead per Mark to Pam 4/9/98

X - total lead per Mark to Pam 4/9/98

Relinquished by: (Signature) James D. Edwards	Received by: (Signature) FED EX	Date: 2/18/98	Time: 1700
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) Tim Kay	Date: 2-19-98	Time: 1030

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	X
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	____

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	10
COC SEALS PRESENT ?	yes
COC SEALS INTACT ?	↓
RECEIVED CONTAINERS INTACT ?	↓
TEMPERATURE ?	4°C

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
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CHAIN OF CUSTODY RECORD 0714

PAGE __ OF __

PROJECT NAME: Mark Hufferbert
PROJECT NUMBER: 3-7075-620
SEND REPORT TO: Above
SAMPLER (PRINT NAME): JAMES EDWARDS
ADDRESS:
SAMPLER (PRINT NAME):
SHIPMENT METHOD: Fed Ex
AIRBILL NUMBER: 835091038 6
PHONE:
LABORATORY RECEIVING: GALSON
FAX:

ANALYSIS REQUESTED: HOLD SAMPLES / IN LABORATORY / ARCHIVE

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
T1SW (0.5-1)	2/18	900	Soil	1	RETEC will NOTIFY GALSON Prior to performing Analyses	
T1S (0.5-1)	2/18	915	Soil	1		
T1SE (0.5-1)	2/18	925	Soil	1		
T1W (0.5-1)	2/18	935	Soil	1		
T1NW (0.5-1)	2/18	950	Soil	1		
T2X (0.5-1)	2/17	1230	Soil	1		
T3X (0.5-1)	2/17	1330	Soil	1	(1) TOTAL LEAD (2) TCLP LEAD	
T4X (0.5-1)	2/17	1430	Soil	1	✓	
T5X (0.5-1)	2/17	1530	Soil	1	✓ - Total lead per Mark to Pam 4/1/98	

✓ Technologies, Inc [illegible] T4X (0.5-1)

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
James Ed. Edward	Fed Ex	2/18/98	1700
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:		SAMPLE RECEIPT	
LEVEL I	☐	ROUTINE	☐	TOTAL # CONTAINERS RECEIVED ?	
LEVEL II	☐	24 HOUR	☐	COC SEALS PRESENT ?	
LEVEL III	☐	1 WEEK	☐	COC SEALS INTACT ?	
OTHER	☐	OTHER	___	RECEIVED CONTAINERS INTACT ?	
				TEMPERATURE ?	

WHITE: LAB COPY YELLOW: RETEC COPY PINK: FIELD COPY GOLD: PM/QA/QC COPY

REIEC

1001 W. Seneca Street
Suite 204
Ithaca, NY 14850
(607) 277-5716
FAX (607) 277-9057

February 5, 1998

Mr. Charles Burke
National Fuel Gas Distribution Corporation
10 Lafayette Place
Buffalo, NY 14203

RE: Soil Gas Sampling and Analysis Results
Mineral Springs Road MGP Site
West Seneca, New York

Dear Charlie:

On January 14, 1998, Buck Environmental Laboratories, Inc., performed soil gas sampling and analysis at NFG's Mineral Springs Road Site. Their Laboratory Reports and Narrative is attached. Also included is a Soil Gas Sample Locations sketch. The locations sampled are the areas of the site which are adjacent to continuously occupied (8 hours per day) building spaces, such as offices.

RESULTS

Naphthalene was detected in none of the samples. BTEX constituents were detected in all but one sample. The trip blank consisted of an unopened sample tube which was carried to and from the site. The field blank consisted of an opened tube placed in the sample train but without a vacuum being drawn.

The highest (and only) detection of benzene was in sample B-1-South and measured 11.6 ug/m^3. The NIOSH time weighted average exposure limit (TWA) for benzene is 325 ug/m^3 over a 10 hour day or a 40 hour week.

The highest detection of toluene was in sample B-9 and measured 24,400 ug/m^3. The NIOSH TWA for toluene is 375,000 ug/m^3.

The highest (and only) detection of ethyl-benzene was also in sample B-9 and measured 15.3 ug/m^3. The NIOSH TWA for ethyl-benzene is 435,000 ug/m^3.

The highest detection of xylene was also in sample B-9 and measured 14.4 ug/m^3 for o-xylene and 23 ug/m^3 for m- and p-xylene. The NIOSH TWA for xylene is 435,000 ug/m^3.

All of the NIOSH TWA's quoted above are equal to, or lower than, the corresponding OSHA permissible exposure limits.

RETEC

CONCLUSIONS

The results outlined above indicate the presence of varying concentrations of subsurface hydrocarbon residuals. They do not, however, indicate a significant potential for exposure by site workers to excessive concentrations of airborne constituents resulting from soil gas migration into occupied building spaces. Airborne concentrations of soil gas constituents are typically much lower within a building than in the adjacent soils. The construction of the buildings, all of which have slab-on-grade foundations (rather than full basements), further limits the potential for exposure.

It is RETEC's opinion that no further work, such as indoor air sampling, is required.

The scope of work for this soil gas survey was based on recommendations by RETEC in the *Preliminary Site Assessment Report For The Mineral Springs Road Former Manufactured Gas Plant Site, West Seneca, New York* (RETEC, 1997).

Should you have any questions, comments or require any additional information, please give me a call at (607) 277-5716.

Sincerely,

REMEDIATION TECHNOLOGIES, INC.

Mark Hofferbert
Project Engineer

Enclosure

cc: T. Alexander - NFG
B. Coulombe - RETEC
File: 3-2075-620

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150
607-753-3403

LABORATORY NARRATIVE

Client: Mr. Mark Hofferbert
RETEC
1001 West Seneca Street
Suite 204
Ithaca, NY 14850

Lab Log No: 9801164

Date: January 27, 1998

INTRODUCTION

The data in this package represent the results of a soil vapor survey at the National Fuel Gas Distribution Corporation, Mineral Springs Road facility, located in Buffalo, New York. Soil vapor samples were collected from eight (8) locations around the facility. The sampling event was conducted on January 14, 1998 by Ernest Spencer and Brian Jones of Buck Environmental Laboratories.

Mr. Charlie Burke of RETEC was on-site for the duration of the sampling event to assist Buck personnel in locating sample points and provide on-site support for identifying and avoiding underground utilities.

SCOPE OF WORK

The soil vapor survey was conducted for RETEC to measure concentrations of volatile organic compounds (BTEX and naphthalene) in soil vapor samples collected from eight (8) locations around the National Fuel Gas facility as follows:

Sample I.D. #	Sample Depth	Sample Location
B-1, north	3 feet	Adjacent to Building #1, North side
B-1, south	3 feet	Adjacent to Building #1, South side
B-2	3 feet	Adjacent to Building #2, South west corner
B-3	3 feet	Adjacent to Building #3, West side
B-5	3 feet	Adjacent to Building #5, Southeast corner
B-9	3 feet	Adjacent to Building #9, North side
B-10	3 feet	Adjacent to Building #10, Northeast corner
B-11	3 feet	Adjacent to Building #11, East side
Field Blank	N/A	Sample trap installed in B-2 sample set-up prior to sampling
Trip Blank	N/A	N/A

ANALYTICAL AND SAMPLING PROTOCOLS

The collection of soil vapor samples was conducted by following the company standard operating procedure for soil vapor sampling. Hollow steel probe section(s) are driven into the ground to the desired depth using an electric impact hammer. All soil vapor samples were collected from 3' below the ground at locations designated by RETEC. Soil vapors were extracted from the ground by creating a vacuum in the soil probe using an electric vane pump. Soil vapors extracted from the ground were collected on an absorbent tube (Porpak-N) specifically prepared for the collection of

volatile organic compounds. Prior to sampling the pump flow rate was set at one (1) liter per minute as established in the field using a laboratory calibrated rotameter. Soil vapor samples were collected over a 20 minute period for a total flow of 20 liters at each sample location. Vacuum readings were monitored throughout the sample collection period to ensure that vacuum did not exceed 15 in/Hg.

Soil vapor samples were analyzed for BTEX and Naphthalene.

RESULTS

Laboratory reports of the analyses on soil vapor samples are attached. Results are summarized on the following table for convenience.

Sample I.D. #	Total BTEX	Naphthalene
B-1, north	28.2	0
B-1, south	483	0
B-2	3,920	0
B3	6,640	0
B-5	9,500	0
B-9	24,500	0
B-10	8,370	0
B-11	0	0
Field blank	39.8	0
Trip blank	0	0

Thank you for the opportunity to provide these services and please let me know if there are questions.

Sincerely,

John H. Buck, P.E.
Laboratory Director

n:\office\air\retec.sg

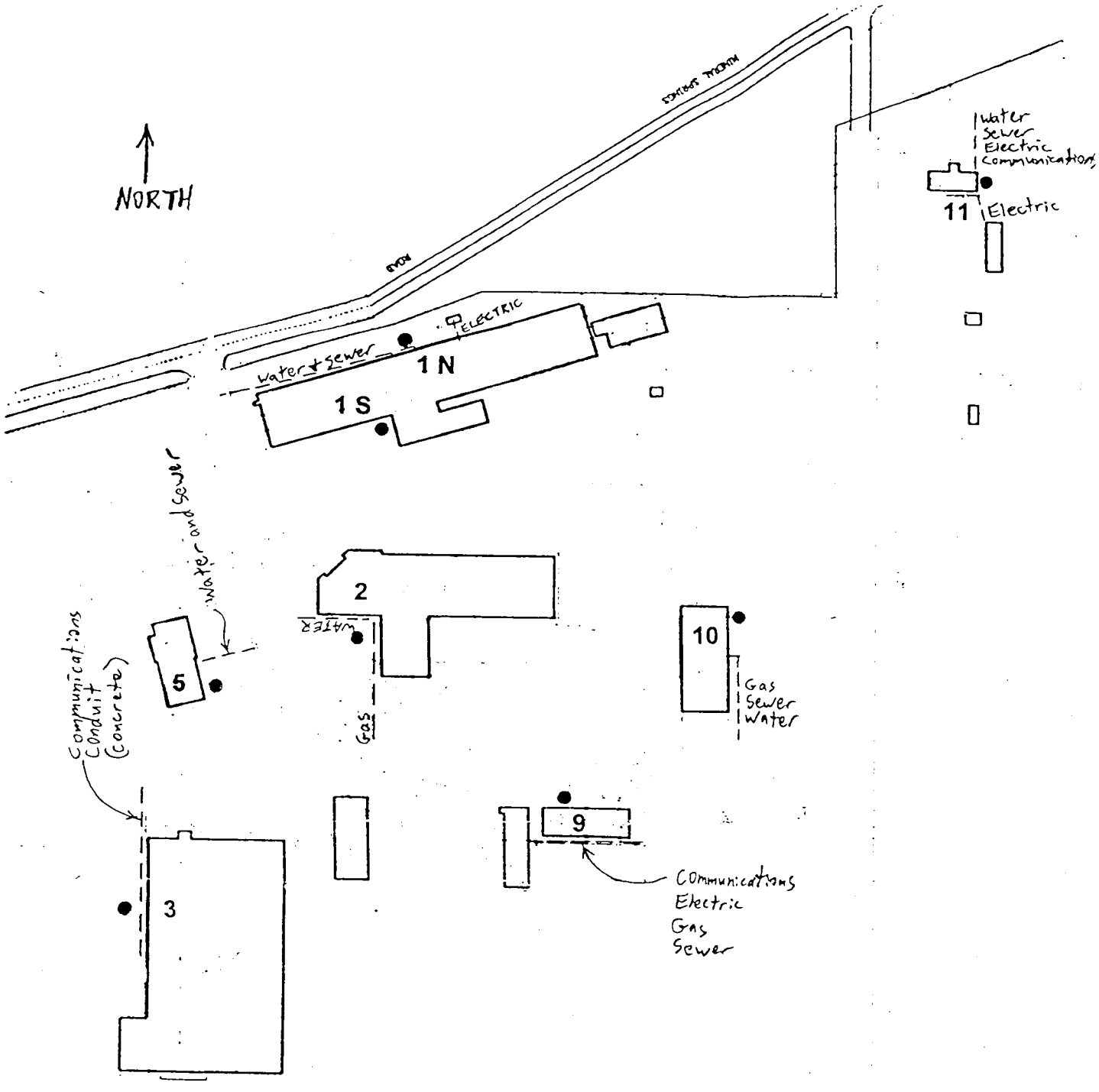
SOIL GAS SAMPLE LOCATIONS

National Fuel Gas

Mineral Springs Road Site

Sampled January 14, 1998, by Buck Environmental Laboratories, Cortland, NY

RETEC Project Number 3-2075



MRH 1/15/99

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150
607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-11 **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	ND
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	ND
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*108*

This laboratory analysis has been performed in accordance with generally accepted laboratory practices and requirements of the New York State Department of Health ELAP Program. Buck Environmental Laboratories, Inc. makes no recommendations, representations or warranties other than as specifically set forth in this report and shall not be responsible or liable for any action or the consequences of any action taken in connection with this report.

(ND => not detected above DL indicated)
(NEG => not detected)

BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH. P.O. BOX 5150
CORTLAND, N.Y. 13045 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-1 NORTH **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*14.2*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	*14.6*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*118*

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(NEG => not detected)

BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-1 SOUTH — **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	*11.6*
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*446*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	*25.4*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*106*

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BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES, INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/21/98

Sample ID: B-2 **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	120	ND
Ethylbenzene	100-41-4	ug/m3	120	ND
Naphthalene	91-20-3	ug/m3	120	ND
Toluene	108-88-3	ug/m3	120	*3920*
o-Xylene	108-38-3	ug/m3	120	ND
m,p-Xylene	95-47-6	ug/m3	120	ND
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*111*

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BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-3 — **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*6640*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	*11.9*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*107*

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(NEG => not detected)

BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH. P.O. BOX 5150
CORTLAND, N.Y. 13045 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-5 **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*9490*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	*13.6*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*122*

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(ND => not detected above DL indicated)
(NEG => not detected)

BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-9 **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	*15.3*
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*24400*
o-Xylene	108-38-3	ug/m3	10	*14.4*
m,p-Xylene	95-47-6	ug/m3	10	*23*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*121*

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(NEG => not detected)
BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: B-10 **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*8350*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	*17.6*
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*115*

This laboratory analysis has been performed in accordance with generally accepted laboratory practices and requirements of the New York State Department of Health ELAP Program. Buck Environmental Laboratories, Inc. makes no recommendations, representations or warranties other than as specifically set forth in this report and shall not be responsible or liable for any action or the consequences of any action taken in connection with this report.

(ND => not detected above DL indicated)
(NEG => not detected)
BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: FIELD BLANK **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	*39.8*
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	ND
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*112*

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(ND => not detected above DL indicated)
(NEG => not detected)
BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

BUCK ENVIRONMENTAL LABORATORIES INC.
ACCREDITED ENVIRONMENTAL ANALYSIS
3845 ROUTE 11 SOUTH, CORTLAND, N.Y. 13045
P.O. BOX 5150 607-753-3403

Laboratory Report
Lab Log No: 9801164

Client: RETEC-REMEDIATION TECHNOLOGIES
1001 WEST SENECA STREET
SUITE 204
ITHACA NY 14850-
Site: NATIONAL FUEL GAS

Report Date: 01/28/98
Sampling Date: 01/14/98
Sampled By: E.S., B.J.
Date Received: 01/15/98
Analyzed By: SS
Analyzed: 01/16/98

Sample ID: TRIP BLANK — **BTEXN IN AIR**

ANALYTE	CAS #	UNITS	DL	RESULTS
Benzene	71-43-2	ug/m3	10	ND
Ethylbenzene	100-41-4	ug/m3	10	ND
Naphthalene	91-20-3	ug/m3	10	ND
Toluene	108-88-3	ug/m3	10	ND
o-Xylene	108-38-3	ug/m3	10	ND
m,p-Xylene	95-47-6	ug/m3	10	ND
Z_SURROGATE1 (75%-130%)	BCB	ug/m3	0	*109*

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(ND => not detected above DL indicated)
(NEG => not detected)
BTEX1.FRX

John H. Buck, P.E.
Laboratory Director
ELAP ID 10795

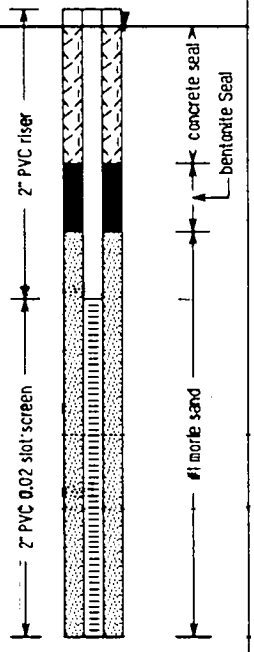
REMEDIATION TECHNOLOGIES, INC.

WELL INSTALLATION LOG
BORING: MW-17

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION: 587.28
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 585.28
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING:
START DATE: 1-22-98	CASING I.D.:	STICK-UP: 2 1/2'
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D. 4.25" ID

DEPTH (feet)	SAMPLE TIME	BLOW COUNTS	RECOVERY	PID Headspace (ppm)	SAMPLE DEPTH	SOIL CLASS	LITHOLOGY	DESCRIPTION
				3.5	0-2	FILL		0 - 0.5 Topsoil
								CLAY
				3.5	2-4	CL		Grey, firm, low plasticity, moist, no odor.
5				2.1	4-6			Becomes wet at 5.0.
				3.1	6-8			At 7.5 yo 8.0 - 6-inch lense of peat, no odor.
				2.2	8-10			
10				1.7	10-12			At 11.0 becomes sandy clay, wet, no odor.
				2.6	12-14	SP		SAND
								Grey, fine grained, loose, uniform, well sorted.
15				3.0	14-16	GP		SANDY GRAVEL
								Grey, loose, poorly sorted, wet, no odor.
				3.2	16-18			
								End of boring.
20								
25								
30								
35								
40								

WELL CONSTRUCTION



REMARKS:

RETEC

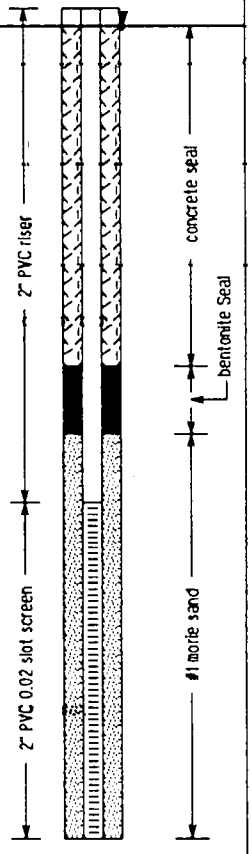
REMEDIATION TECHNOLOGIES, INC.

WELL INSTALLATION LOG
BORING: MW-18

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION: 591.64
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING:
START DATE: 1-26-98	CASING I.D.:	STICK-UP: 2 1/2'
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 26	AUGER O.D./I.D. 4.25" ID

DEPTH (feet)	SAMPLE TIME	BLOW COUNTS	RECOVERY	PID Headspace (ppm)	SAMPLE DEPTH	SOIL CLASS	LITHOLOGY	DESCRIPTION
				0.3	0-2	FILL / CL		0 - 0.5 Topsoil SILTY CLAY
				0.3	2-4			Grey, firm, moist, no odor.
5				0.7	4-6	SP		SAND Grey, loose, poorly sorted, wet, no odor.
				0.4	6-8	CL		CLAY
				0.5	8-10			Grey, firm, uniform, low plasticity, moist, no odor.
10				0.7	10-12			
				0.6	12-14			
15				0.4	14-16			At 14.5 - becomes gravelly clay
				0.5	16-18			At 16.0 - becomes soft
				0.5	18-20			
20				0.5	20-22			Grey, soft, medium plasticity, moist, no odor.
				0.5	22-24			
25				0.5				
								End of boring.
30								
35								
40								

WELL CONSTRUCTION



REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-53

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 12	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.5		CL		0-0.5 CLAY mixed with gravel
			3.9		SP		SAND Black, loose, no odor, moist
5			2.7				
			0.8		OL		SILT
			1.1		CL		Grey, firm, low plasticity, moist, no oder
10			1.1				
							End of boring.
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-54

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.5		GP		GRAVEL Grey, poorly sorted, loose, moist, no odor
			5.2				
5			11.8		CL		CLAY Grey, firm, uniform, moist, no odor
			11.8				
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-55

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 7	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			8.8		GP		GRAVEL
					FILL		Grey, poorly sorted
			3.3		CL		Fill material consisting of: blue stained sand and gravel, slight hydrocarbon odor
							CLAY
5			4.2				Grey, firm, low plasticity, moist, no odor
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-56

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 7	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.0		FILL		Fill material consisting of: silt, gravel, ash. At 1.0 – 1-inch lense of blue stained silt.
			1.9				
5					CL		CLAY Grey, firm, uniform, moist, no odor
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-57

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			5.3		FILL		Fill material consisting of: grey gravel mixed with ash, moist, no odor
			2.0				
5			3.0				At 5.0 gravel becomes fine grained.
					CL		At 8.0 becomes clay.
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-58

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589.8
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 20	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.9		FILL		Fill material consisting of 50% silt and 50% gravel.
			3.8				At 2.0 - lense of very fine coal fragments mixed with silty clay.
5			2.3		CL		CLAY
			2.3				Grey, firm, uniform, trace orange staining in mottled pattern, no odor.
10			2.4				
			2.4				
			2.7				
15			2.4				
			4.4		SP		SAND
			3.8				Grey, well sorted, wet, slight hydrocarbon odor.
20					GP		GRAVEL
							Subround, grey, loose.
							End of boring.
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-59

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.0		GP		Topsoil then gravel
			40.0				Grey, rounded, trace silty clay.
			49.9				At 3.2 becomes saturated with hydrocarbon product.
5			10.8		CL		CLAY
							Grey, firm, low plasticity, hydrocarbon odor.
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-60

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-08-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			3.5		CL		Topsoil then gravely clay
					GP		Silty gravel
			8.0		CL		GRAVELLY CLAY
							Trace hydrocarbon staining
5			11.8				At 4.0 becomes saturated with hydrocarbon product
			4.7				Clay
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-61

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 590
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-09-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 20	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			1.8		FILL		Asphalt (2")
							Fill material consisting of: sand and gravel
			2.7		CL		At 1.8 – 2-inch lense of organic debris, trace hydrocarbon odor
							CLAY
5			2.5		GP		Grey, firm, low plasticity, moist
							GRAVEL
			0.5		CL		Coarse grained, poorly sorted, wet, slight hydrocarbon odor
							Clay
			1.3				Grey, firm, low plasticity, wet
10							
			1.0				
15							
			4.1				
			1.8		GP		SANDY GRAVEL
20							Poorly sorted, loose, trace silt, wet
							End of boring.
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-62

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-09-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 12	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			3.3		FILL		0 – 0.5 feet Asphalt pavement Fill material consisting of: Sand and gravel.
			5.5				At 3.2 – Driller reports refusal 4-inch lense of sandy gravel, trace hydrocarbon staining, trace hydrocarbon odor.
5			2.5		CL		From 3.2 to 4.2 – Concrete slab CLAY Grey, firm, uniform, moist, no odor
					SP		At 8.0 – 6-inch sand lense, no oder
			3.5		CL		Clay
10							
							End of boring.
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-63

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 20	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.3		FILL		Fill material consisting of: gravel mixed with ashes, no odor, moist.
			0.5		CL		CLAY
5			1.2				Grey, firm, slight plasticity, moist, no odor.
			0.3				
10			1.1				At 12.2 - Silt content increases, trace gravel.
			0.2		SP		SAND
15			0.4				Grey, fine grained, well sorted, wet, no odor.
					GP		Trace gravel from 19.0 to 20.0
20							End of boring.
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-64

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
					FILL		Fill material consisting of gravel and metal fragments
			2.0		GP		GRAVEL
			2.0		CL		Grey, wet, slight hydrocarbon odor.
5							CLAY
							Grey, firm, moist, no odor.
10			0.5				Silty clay, firm, wet, no odor.
15			0.5		GP		SANDY GRAVEL
							Poorly sorted, loose, slight hydrocarbon odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-65

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			9.0		FILL		Fill material consisting of gravel and sand.
			58.0				At 3.5 - 8-inch lense of ashes and sand, strong hydrocarbon odor.
5			2.0		CL		CLAY Grey, firm, low plasticity, no odor.
10			1.0				At 11.0 becomes silty clay, wet, no odor.
			1.3		SP		SAND Grey, fine grained, loose, well sorted, wet.
15							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-66

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
					FILL		Fill material consisting of clay mixed with ashes, no odor.
			3.5				
5			144				At 4.0 – becomes wet, slight hydrocarbon odor.
			129				
			18.1		CL		CLAY
							Grey, firm, low plasticity.
10							At 11.0 – becomes silty
			10.0				
					SP		SAND
15							Grey, fine grained, well sorted, wet, no odor.
			5.4				
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-67

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.4		FILL		Fill material consisting of gravel and clay, no odor.
5	20		0.2		CL		CLAY Grey, firm, low plasticity, no odor.
			2.5				Becomes wet at 9.0
10					SP		SAND Grey, loose, fine grained, well sorted, slight hydrocarbon odor.
							End of boring.
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-68

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-19-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.0		FILL		Topsoil then fill material consisting of black sand and gravel, no odor.
			0.7				
5			8.3		CL		CLAY Black, slight hydrocarbon staining and odor, trace hydrocarbon sheen.
			15.5				
10							Becomes wet at 12.0.
			7.8				
15					SP		SAND Grey, loose, fine grained, wet.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-69

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
0			0.5		FILL / CL		0 - 0.5 - Topsoil CLAY Grey, firm, low plasticity.
5	10		0.3				At 7.0 - Trace fine gravel, wet.
10			1.7				At 9.0 - Silt content increases.
15							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-70

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 584
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 16	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.5		FILL		0 - 0.5 - Topsoil
					CL		CLAY Grey, firm, low plasticity, moist Becomes wet at 3.5.
5			0.5				Trace organic peat at 6.0.
			1.5		SP		SAND Grey, loose, fine grained, wet, no odor.
10			0.5				
					GP		SANDY GRAVEL Loose, wet, poorly sorted, no odor.
15							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-71

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 584
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 16	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.8		FILL		0 - 0.5 - Topsoil
					CL		CLAY
							Grey, firm, no odor.
							At 2.0 trace gravel, wet.
5			0.5				At 4.0 - 6-inch lense of black peat material.
							Becomes silty clay at 7.0.
			0.9		SP		SAND
10							Grey, fine grained, loose, wet, no odor.
			8.3				
15					GP		SANDY GRAVEL
							Poorly sorted, wet, no odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-72

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
0			13.4		FILL		Fill material consisting of: sandy gravel, firm.
			23.2				
							At 3.8 – 4-inch lense of sandy gravel with hydrocarbon sheen and odor.
					CL		CLAY
5			7.1				Grey, firm, low plasticity, moist.
			18				
10							
					SP		Becomes wet at 12.0.
			2.3				SAND
					GP		Grey, fine grained, loose, no odor, wet.
15							SANDY GRAVEL
							Poorly sorted, loose, wet, no odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-73

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.4		FILL		Fill material consisting of sand and gravel.
			4.8				At 3.8 – 4-inch lense of gravel, trace hydrocarbon odor and sheen.
5			0.4		CL		CLAY Grey, firm, low plasticity.
10			3.2				Clay becomes silty and wet at 13.0.
15					gp		GRAVEL Grey, poorly sorted, wet, no odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-74

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			4.8		FILL		Fill material consisting of sand and gravel.
			121.5				At 3.0 – 4-inch lense of gravel, with hydrocarbon sheen and odor.
					CL		CLAY
5			10.7				Grey, firm, low plasticity, moist.
10							
			8.8				Becomes silty at 13.0.
15					SP		GRAVELLY SAND
							Poorly sorted, loose, wet.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-75

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-20-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
0			2.0		FILL		Fill material consisting of sand and gravel.
			34.0				At 3.8 - 4-inch lense of sandy gravel with hydrocarbon odor and sheen, wet.
5			1.0		CL		CLAY Grey, firm, low plasticity, moist.
							Becomes silty clay at 8.0.
10			0.5				
			2.8		SP		SAND Grey, fine grained, loose, wet, trace fine gravel.
15							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-76

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.5		FILL / CL		0 - 0.5 Topsoil SANDY CLAY Trace organic debris consisting of peat, roots, moist, no odor.
5			0.9				CLAY Grey, firm, low plasticity.
							Becomes wet at 8.0.
10			16				Becomes silty clay at 9.0.
			0.2		SP		SAND Grey, fine grained, loose, trace fine gravel.
15							
							End of boring.
20							
25							
30							
35							
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REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-77

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 585
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.9		FILL		0 - 0.5 Topsoil
					CL		CLAY Grey, firm, low plasticity, no odor.
5			1.2				Becomes wet at 6.5. Increasing silt content at 7.0.
			1.0				
10					GP		SANDY GRAVEL Grey, poorly sorted, loose, wet, no odor.
			0.8				
15							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-78

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 585
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.3		FILL		0 - 2.0 Topsoil and clay, no odor
5			2.0		CL		SILTY CLAY Grey, firm, low plasticity, moist, no odor.
10			1.7		SP		SAND Grey, fine grained, loose, wet, no odor.
15			1.7		GP		SANDY GRAVEL Grey, loose, poorly sorted, wet, no odor.
							End of boring.
20							
25							
30							
35							
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REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-79

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			9.8		FILL		Fill material consisting of gravel and ashes.
			280				At 3.8 - 4.8 sandy gravel mixed with hydrocarbon product.
5			5.8		CL		CLAY
							Grey, firm, low plasticity, moist.
							Becomes wet at 8.0.
10			3.9				
			5.8				
15					SP		SAND
							Grey, fine grained, loose, wet, no odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-80

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.5
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.2		FILL		Fill material consisting of sand, gravel, clay and ashes, moist, no odor.
5			1.0		CL		CLAY Grey, firm, low plasticity, no odor.
10			14.8				Silty clay become wet at 13.0.
15					SP		SAND Grey, fine grained, loose, wet, slight hydrocarbon odor.
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-81

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			1.8		FILL		Fill material consisting of sand, gravel and ashes, moist, no odor.
			4.3				
5							
					CL		CLAY
							Grey, firm, low plasticity, moist, no odor.
			1.4				Becomes wet at 9.0.
10							
			2.8				
					SP		SAND
15							Grey, fine grained, loose, wet, no odor.
							End of boring.
20							
25							
30							
35							
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REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-82

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-28-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.8		FILL		Fill material consisting of sand and gravel, moist.
			43.0				3.0 to 7.0 sand with hydrocarbon product.
5			11.5				
			10.7		CL		CLAY
					SP		Grey, firm.
			8.8				SAND
10					CL		Grey, loose, saturated with hydrocarbon product.
			3.9				CLAY
			4.0				Grey, firm, wet, trace silt, trace sand, no odor.
15			8.3				
							End of boring.
20							
25							
30							
35							
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REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-83

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: GEOPROBE	WATER LEVEL DURING DRILLING: NA
START DATE: 1-28-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: MARK HOFFERBERT	TOTAL DEPTH: 10	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.4		FILL		Fill material consisting of sand and gravel.
			55.2				At 3.0 – 5.0 fill mixed with hydrocarbon product.
5			52.3		CL		CLAY
			5.1				Grey, firm, low plasticity, wet.
			5.1				
10							End of boring.
15							
20							
25							
30							
35							
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REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-84

PROJECT NO.: 3-2075-690	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: DAVID YUDIKAITIS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	60		5.8		FILL		0 - 0.5 Asphalt pavement Fill material consisting of mixed gravel, silt and sand, light brown
			4.2		CL		Silty clay - Grey and brown, firm, wet, no odor
5	70		5.2				Silty clay - Grey firm, wet Gravel lense, wet
			5.8				Obstruction at 7.0 - gravel plug in core tip
	100		4.1				Silty clay - Grey firm, orange staining in mottled pattern
10			7.0				
	100		5.5				
15			6.0				Silty clay - Grey with orange staining in mottled pattern, firm, uniform, wet
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-85

PROJECT NO.: 3-2075-690	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: DAVID YUDIKAITIS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (in)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	70		3.5		FILL		0 - 0.5 Asphalt pavement Fill material consisting of mixed rock fragments, brown silt and sand
			4.5		CL		At 2.0 - 6" lense of black cinders Silty clay - Grey, uniform
5	80		5.0				Silty clay - Grey with orange staining in mottled pattern, dry
			4.3				Driller reports obstruction at 7.0 feet
	70		6.1				Silty clay - Grey with orange staining in mottled pattern, firm, uniform
10			6.0		SP		Silty sand - Grey, loose, trace gravel
	100		6.5				Silty sand - Grey
15			6.6		GP		Gravel - Grey, trace cobbles
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-86

PROJECT NO.: 3-2075-690	DRILLING CO.: NAXIN	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	90		3.0		FILL		0 - 0.5 Asphalt pavement Fill material consisting of rock fragments, coal chips and brown sand
			3.8		CL		Silty clay - Black, firm, uniform, no odor, moist Becomes grey at 3.0, trace brown staining in mottled pattern
5	100		3.8				Clay - Grey with orange staining in mottled pattern, firm, moist, no odor
			8.1				Clay - Grey and brown
	100		8.8				
10			5.8		SM		Silty sand - Brown and grey, firm, very fine, no odor, wet Becomes coarse at 11.7
	100		8.9				Silty sand - Grey, loose, wet. 20% rounded gravel, trace cobble, no odor
15			8.1		GP		Sandy gravel - Grey, loose, wet, poorly sorted, no odor
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-87

PROJECT NO.: 3-2075-890	DRILLING CO.: MAXIM	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	80		22.1		FILL		Fill material consisting of brown, silty gravel and sand
							Becomes brown and black cinders and ash fragments
			588				Becomes black, wet, strong hydrocarbon odor
5	100		77		CL		Grey silty clay
							Silty clay - Grey, trace orange staining in mottled pattern, slight hydrocarbon odor, moist, uniform, firm
			54.8				←
	70		75.7				Silty clay - Grey, trace orange staining in mottled pattern, slight hydrocarbon odor, firm, uniform, moist
10							
			59.7				Lense 2" - Gravel with strong hydrocarbon odor
	100		51				Becomes soft
					SP		Sand - Grey, loose, well sorted, wet, slight hydrocarbon odor
15			25.2				
							End of boring.
20							
25							
30							
35							
40							

REMARKS

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-88

PROJECT NO.: 3-2075-690	DRILLING CO.: MAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	70		28.1		FILL		Fill material consisting of black, silty clay mixed with rock fragments and debris
			33.2				At 3.2 becomes broken red brick fragments and broken rock fragments
5	40		32.7				Brick fragments mixed with grey clayey silt
							Driller reports refusal at 8.0 concrete fragments found in core tip
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-89

PROJECT NO.: 3-2075-890	DRILLING CO.: NAXIN	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	70		10.1		FILL		Fill material consisting of black cinders and gravel
							Brown clayey silt
			18.2				Black fine grained silt and ash
							Black ashes, cinders, silt mixture
5	100		24.7				Fill material consisting of ashes, cinders, gravel, wet, hydrocarbon odor, spots of sheen in water
			8.4		CL		Silty clay - Grey, uniform
	100		29.0				Silty clay - Grey with orange staining in mottled pattern, uniform, firm, no odor
10			44.5		SP		Silty sand - Loose, grey, uniform, wet, well sorted, slight hydrocarbon odor
	100		18.0				
15			37.0				Silty sand - Grey, uniform, loose well sorted, wet, slight hydrocarbon odor
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-90

PROJECT NO.: 3-2075-690	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 587
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 3-31-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 12	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	80		19.2		FILL		Fill material consisting of silty clay mixed with gravel
			38.8				6-inch lense of tar-like material, hardened, black, strong odor
					GP		Gravel fill material
5	100		28.8		CL		Silty clay - Grey, uniform, firm, trace orange staining in mottled pattern, no odor, moist
			13.2				
	100		41				
10							Silty clay - Grey and tan, moist, wet, uniform, slight hydrocarbon odor, increasing silty content
			48				
							End of boring.
15							
20							
25							
30							
35							
40							

REMARKS

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-91

PROJECT NO.: 3-2075-890	DRILLING CO.: NAXIN	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 4-1-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			13.3		FILL		Fill material consisting of brown silty sand
							Black ashes, cinders, wood fragments, nodule of white paste, trace blue staining
							Grey silty clay
							Wood fragments
5			30.1		CL		Silty clay
			17.8				Silty clay - Grey with orange staining in mottled pattern, uniform, stiff, moist, no odor
			19.8				
10			3.2				Silty clay - Grey and orange in mottled pattern, uniform, stiff, moist, no odor
			28.2		SP		Silty sand - Grey, loose, uniform, well sorted, slight hydrocarbon odor
15			19.5		GP		Silty gravel - Grey, rounded, coarse, poorly sorted, slight hydrocarbon odor
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-92

PROJECT NO. 3-2075-890	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 4-1-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	100		8.1		FILL		Fill material consisting of topsoil then
			8.1				Grey and brown silty clay and gravel, trace ashes, coal fragments
					CL		Silty clay - Grey, firm, uniform, moist
5	100		9.2				Silty clay - Grey, uniform, firm, mottled orange staining, no odor
			10.1				
	70		8.0		SP		Silty sand - Grey, loose, uniform, no odor, wet
10			9.1				
	100		5.1				Silty sand - Grey, loose, uniform, wet
15			8.2		GP		Silty gravel - Round, poorly sorted, loose, wet
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-93

PROJECT NO.: 3-2075-890	DRILLING CO.: MAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 4-1-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			14.0		FILL		Fill material consisting of grey, gravel road base
			12.8		CL		4" Lense of blue stained wood chips Grey clay, stiff, uniform, trace blue staining
5			3.4				Silty clay - Grey and orange mottled pattern, uniform, firm, moist, no odor
			4.2				
			13.5				Silty clay - Grey, orange stain in mottled pattern, firm, uniform, moist
10			11.0				
			12.1		SP		Silty sand - Poor recovery in core, loose sand, trace gravel in spoon core tip, slight hydrocarbon odor, wet
15							
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-94

PROJECT NO.: 3-2075-690	DRILLING CO.: MAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 588
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 4-1-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 8	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	90		10.2		FILL		Fill material consisting of broken rock fragments, silt and sand
			18.2		CL		2" lense of black cinders
							Silty clay - Grey, firm, uniform
5	100		18.2				Grey silty clay, uniform, firm, no odor, moist
			11.2				
							End of boring.
10							
15							
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING SB-95

PROJECT NO.: 3-2075-690	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: STEVE BOCHENEK	SURFACE ELEVATION: 587
LOCATION: MINERAL SPRINGS ROAD	METHOD: DIRECT PUSH	WATER LEVEL DURING DRILLING: NA
START DATE: 4-1-98	CASING I.D.:	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 18	AUGER O.D./I.D.: 2"

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	90		12.2		FILL		Fill material consisting of silt and gravel mixture (road base)
			14.0				
5	100		8.2		CL		At 3.8 - 2" lense of blue stained wood chips, strong odor
			3.3				Silty clay - Grey uniform, stiff
	100		7.8				Silty clay - Grey and orange in mottled pattern, stiff, uniform, no odor
10			11.2				Increasing silt content
	100		11.8		SP		Silty sand - Grey, loose, well sorted
							Becomes coarse
15			11.5		GP		Gravel - Round to subround, poorly sorted, slight hydrocarbon odor
							End of boring.
20							
25							
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB1

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.9
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-21-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 30.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			2.1		FILL		Fill material consisting of sandy gravel. At 2.0 fill consists of wood fragments mixed with clay.
5			1.2		CL		At 4.0 slight hydrocarbon odor and 1-inch lense of blue stained soil. CLAY Grey, firm, low plasticity, moist, no odor.
10			1.3				
			0.4		SP		SAND Grey, loose, fine grained, wet, no odor. Becomes coarse at 13.0.
15					GP		GRAVEL Grey, fine grained, poorly sorted, wet, no odor.
20			1.8				
			2.3				
			2.9		CL		CLAY Grey, soft, medium plasticity, wet, no odor.
25			2.0				
			0.5				
			0.8				
30							End of boring.
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB2

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.9
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-28-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 30.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			12		FILL		Fill material consisting of gravel and clay.
			10				
5			19				
			2.0		CL		At 5.8 – 2-inch lense of sandy gravel, hydrocarbon sheen.
			12				CLAY
							Grey, firm, low plasticity, moist, no odor.
10			12				
			0.8				At 13.0 increasing sand content.
15			1.0				
					SP		SAND
			0.7				Grey, fine grained, loose, wet, no odor.
20			1.3		GP		SANDY GRAVEL
			1.3				Grey, poorly sorted, loose, wet, no odor.
25			1.8		CL		CLAY
			0.9				Grey, soft, moist, trace gravel.
			0.7				
30							End of boring.
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB3

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588.53
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-27-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 39.5 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			9.1		FILL		0 – 0.5 Topsoil.
			19.0				Fill material consisting of clay and debris.
							At 2.0 – 3-inch lense of blue stained wood chips.
5			31.0		GP		SANDY GRAVEL
			51.3				Mixed with hydrocarbon product.
							At 8.0 – becomes saturated with hydrocarbon product, non-viscious.
			84.5		CL		CLAY
10			44.0				Grey, firm, low plasticity, strong hydrocarbon odor.
			28.5				
15			48.2				At 15.0 – increasing gravel content.
			43.0				
			24.8		GP		SANDY GRAVEL
20			13.8				Grey, loose, poorly sorted, trace hydrocarbon sheen.
			14.2				Slight hydrocarbon sheen, wet
25			39.3				At 25.0 strong hydrocarbon sheen.
			5.8		CL		CLAY
			7.3				Grey, soft, medium plasticity, trace hydrocarbon odor and sheen.
30			2.0				
			1.0				
35			2.3				
			2.3				
			2.7		GP		At 38.0 – Becomes sandy gravel, no odor
40							At 39.5 – Driller reports refusal
REMARKS:							End of boring.

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB4

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.27
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-29-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 24 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			1.5		FILL		Fill material consisting of sand and gravel, ashes and brick fragments, moist, no odor.
			7.8				
5			0.7		CL		CLAY Grey, firm, moist, no odor.
			0.8				
			1.2				
10			1.3				
							Becomes wet at 12.0.
			0.9		SP		SAND Grey, fine, loose, no odor.
15			1.1				
			8.8		GP		SANDY GRAVEL Grey, loose, poorly sorted.
			10.3				At 18.0 - Slight hydrocarbon odor.
20							At 21.0 - 12-inch lense of hydrocarbon product.
			15.4		CL		CLAY Grey, soft, medium plasticity, no odor.
25							End of boring.
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB5

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 589
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-30-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 24 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			8.5		FILL		Fill material consisting of sand and gravel, no odor, moist.
			8.3		CL		CLAY
5			53.0				Grey, firm, moist.
			12.2				At 5.0 – 1-inch lense of sand, trace hydrocarbon sheen.
			18.3				At 8.0 – 10.0 – trace hydrocarbon product in thin lenses in clay.
10			18.0		SP		SAND
			29.7				Grey, fine grained, loose, trace hydrocarbon sheen.
15			36.4		GP		SANDY GRAVEL
			40.5				Poorly sorted, loose, strong hydrocarbon sheen.
			30.8				At 18.0 to 21.5 gravel mixed with hydrocarbon product.
20			8.3		CL		CLAY
			8.8				Grey, soft, medium plasticity, wet.
25							End of boring.
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB6

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 588.38
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-29-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 28 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.8		FILL		0 - 0.5 Topsoil Fill material consisting of 3-foot thick layer of blue stained wood chips, slight hydrocarbon odor.
			13.4				
5			5.3		CL		CLAY Grey, firm, moist, no odor.
			2.0				
			1.1				
10			3.0		SP		SAND Grey, fine grained, loose, wet, no odor.
			0.8				
			1.0		GP		SANDY GRAVEL Loose, poorly sorted, wet, no odor.
15			1.5				
			0.5				
20			1.3		CL		CLAY Grey, soft, uniform, wet, no odor.
			1.9				
25			1.3				
							End of boring.
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB7

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION: 587.52
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 1-29-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 28 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
			0.6		FILL		Fill material consisting of sand and gravel mixed with ashes, no odor, moist.
			0.8				
5			0.8		CL		CLAY Grey, firm, low plasticity, moist, no odor.
			1.1				
			0.5				
10			1.1				
			0.8				Increasing silt content at 12.0.
			2.3		SP		SAND Grey, fine grained, loose, uniform, wet, no odor.
			3.0		GP		SANDY GRAVEL Grey, poorly sorted, loose, wet, no odor.
20			5.1				
			0.9				
			0.4		CL		CLAY Grey, soft, medium plasticity, trace gravel.
25			1.4				
							End of boring.
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB8

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-2-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 34 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	10				FILL		FILL MATERIAL 50% angular gravel chips, 50% clay - brown, moist, no odor
	70		2.1				90% silty clay - brown, moist, no odor, trace brick fragments 10% granular gravel chips
							70% silty clay - brown, moist, no odor, mixed with 30% concrete fragments
5	30		5.2				
	70		4.2				90% silty clay and 10% gravel, brick fragments, trace concrete fragments
							50% brick fragments trace (nodule) coal fragments and 50% gray silty clay, moist
	50		3.8				
10							90% silty clay, brown, moist, trace rounded gravel
	70		4.2				
							At 11.7 Metal screen, slight hydrocarbon odor
	85		2.0				Gravel chips, concrete fragments, brick fragments, wood plug in spoon tip, refusal at 13.5
					CL		CLAY
15	75		3.3				Dark grey, firm, moist, trace roots, trace nodules of orange staining, no odor
	80		10.8				Dark grey, uniform, moist, trace hydrocarbon odor and thin black partings of silt
							Dark grey, uniform, moist, slight hydrocarbon odor
	100		28				
20					SP		SAND
	80		22				Very fine, wet, 2-inch lense of hydrocarbon product
							Grey, coarse, poorly sorted, hydrocarbon odor, spots of sheen at 21.8, wet
	80		14.0				Grey, coarse, poorly sorted at 23.8 becomes fine, 1-inch lense of hydrocarbon product, (black tar-like material)
25	70		28				Grey, coarse, poorly sorted
					GP		GRAVEL
	80		32				Grey, rounded, poorly sorted, wet, strong hydrocarbon odor, hydrocarbon sheen
	40		172				Grey, rounded, poorly sorted, loose, wet, slight hydrocarbon odor
30							Grey, rounded, poorly sorted, loose, wet, at 29.8 becomes saturated with hydrocarbon product, nonviscous
	70		371		CL		Saturated with tar-like material from 30.0 to 30.8
	30		38				CLAY Grey, soft, uniform and moist
							Grey, soft, uniform and moist
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB9

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	KP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: LANDFILL NORTH	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-2-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 34.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	10				FILL		FILL MATERIAL 90% brown silty clay and 10% gravel, angular, wet, no odor
	80		13				90% brown silty clay and 10% gravel, angular, wet, no odor
5	40		14				50% brown silty clay, wet and 50% broken rock fragments
	70		22				80% grey gravel, 20% concrete fragments, and 20% grey silt, trace coal in nodule, trace spots of sheen
	40		18				80% clay - brown, stiff, mixed with 40% rounded gravel, wet, no odor
10	70		18				Gravel and clay mixture, wet, no odor. At 11.8 becomes red and tan brick fragments - broken, no odor
	10		18				Refusal at 13.0, fill material - grey silty gravel, compact, wet, no odor
15	70		19		NL		Grey gravel mixed with tan clay
			20		CL		Black organic silt lense, 2-inches thick
			18				CLAY Grey, no odor, wet, trace roots
20							Grey, uniform, wet, no odor
	10		19				Trace brown silt in horizontal partings. At 19.7 trace orange peat/organic debris in lense
	30		18		SW		Poor recovery, clay in spoon tip CLAYEY SAND Very fine, uniform, wet, soft, no odor
25	70		24				Very fine, uniform, well sorted, wet, no odor
	30		12		GP		GRAVEL Medium, poorly sorted, round to subrounded, wet, loose, slight hydrocarbon odor
	100		10				Coarse, poorly sorted, wet, loose, no odor. At 29.8 becomes grey clay
30	80		18		CL		CLAY Uniform, grey, soft, wet, no odor
	70		19				Uniform, trace gravel, wet, no odor
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB10

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-3-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 38.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	50		1.7		FILL		FILL MATERIAL 50% concrete fragments and 50% silty clay, brown, firm, wet, no odor
	30		1.8				90% brown clay - firm and 10% concrete and rock fragments
5	40		1.2				90% clay, brown, firm, moist, no odor and 10% brick and concrete fragments
	10		0				90% rock fragments and 10% grey silt, wet, no odor
	0		0				No sample due to poor recovery - driller reports refusal at 9.0
10	70		1.0				70% broken rock fragments, 10% brown clay, silt mix and 10% asphalt pavement
	60		1.2				90% clay - brown, firm, moist, no odor and 10% rock fragments
15	20		1.9				50% broken bricks and 50% black silt, no odor, wet
	40		2.4		CL		CLAY Grey, firm, uniform, moist, no odor
	0		3.1				No recovery, clay plug in spoon tip
20	30		2.2				Grey, firm, wet, no odor
	50		2.8		SP		SAND Very fine, grey, loose, uniform, no odor Very fine, uniform, well sorted, wet, loose, no odor
25	50		1.2		GP		GRAVEL Medium, loose, poorly sorted, rounded, no odor
	40		2.0				Loose, poorly sorted, rounded, slight hydrocarbon odor, wet
	90		2.1				Poorly sorted, rounded, slight hydrocarbon odor, wet, loose
30	40		3.2				Poorly sorted, rounded, wet, loose, very slight hydrocarbon odor
	80		3.6		CL		CLAY Grey, soft, uniform, slight hydrocarbon odor
35	30		3.0				Grey, soft, uniform, wet, slight hydrocarbon odor
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB11

PROJECT NO.: 3-2075-880	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: LANDFILL CENTRAL	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-3-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 34.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (in)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	20		1.2		FILL		FILL MATERIAL 90% silty clay and 10% broken rock fragments, firm, moist, no odor
	50		3.2				90% silty clay - firm, brown, no odor and 10 % rock, concrete, asphalt fragments
5	60		4.8				80% clay - brown, firm, no odor and 20% wood fragments
	100		7.1				90% clay - brown, firm, no odor, mixed with 10% rock fragments, coal chips, concrete fragments, moist, no odor
	40		7.6				90% clay - grey and brown, firm, mixed with 10% rock fragments, trace coal chips, moist, no odor
10	10		5.1				Limited recovery due to concrete plug in spoon tip
	30		8.1				90% silty clay mixed with 10% brick and rock fragments - moist, no odor
	70		9.8				At 15.0 - 1-inch lense of black organic silt.
15	60		13.0		CL		CLAY Grey, uniform, stiff, moist, no odor
	80		28.0				Grey, firm, uniform, mottled with orange stain in nodules, moist, no odor
	20		53.0		SP		SAND Grey, uniform, well sorted, loose, at 19.7 saturated with hydrocarbon product
20	100		82.0				Grey, loose, wet, strong hydrocarbon odor and sheen
	100		49.0		GP		GRAVEL Poorly sorted, loose, wet, strong hydrocarbon odor and hydrocarbon sheen
	70		48.0				Sandy, poorly sorted, angular, trace cobbles, hydrocarbon sheen 24-25
25	70		97.5				Sandy, poorly sorted, loose, trace cobbles, wet angular and subround, strong hydrocarbon odor, hydrocarbon sheen
	70		30.1		CL		Sandy, poorly sorted, loose, hydrocarbon sheen, strong odor, becomes firm at 29.6.
30	0		11.9				CLAY Grey, soft, uniform, moist, strong hydrocarbon odor
							Grey, soft, uniform, slight hydrocarbon odor
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB12

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: CENTER LANDFILL/EAST	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-3-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 38.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	70		7.3		FILL		FILL MATERIAL 95% clay – brown, firm, moist, no odor and 5% gravel – rounded
	20		0.2				90% clay – brown, firm, wet and 10% gravel – rounded
5	40		2.9				90% clay – brown, stiff, moist, no odor mixed with 10% broken rock fragments
	20		6.4				90% clay – brown, stiff, wet, no odor, and 10 % rock fragments, trace coal chips
	0		0				No sample, auger through concrete, brick, wood and metal fence
10	100		3.1				80% clay – brown, stiff, no odor and 20% rock fragments, wood fragments at 11.0 – strong hydrocarbon odor in wood
	30		2.1				60% concrete fragments and 40% clay – brown, stiff, trace hydrocarbon stain and odor from 13.8 to 13.8
15	20		5.2				90% clay – brown, soft, black staining and hydrocarbon odor 15.5 – 16.0
	60		4.2				Brown, firm. At 17.2 – 2-inch lense of black organic silt
	40		3.5		CL		CLAY Grey, stiff, moist, no odor
20	10		4.2				Grey, stiff, low plasticity
	20		9.7				Poor recovery, grey, no odor Grey, soft, no odor. At 24.0 sand – grey, well sorted, uniform, wet, no odor
25	30		34.4		GP		SANDY GRAVEL Poorly sorted, angular and rounded, loose, wet, very slight hydrocarbon odor
	60		8.8				Poorly sorted, angular to subround, loose, wet, slight hydrocarbon odor.
	100		11.3				Poorly sorted, angular to subround, firm, wet, slight hydrocarbon odor
30	0		3.4				Poorly sorted, loose, wet, rounded, slight hydrocarbon odor
	0		13.4				Poorly sorted, rounded, slight hydrocarbon odor.
35	0		3.2		CL		CLAY Grey, soft, medium plasticity Soft, grey, medium plasticity, slight hydrocarbon odor
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB13

PROJECT NO.: 3-2075-680	DRILLING CO.: NORTHSTAR	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: JEFF THEW	SURFACE ELEVATION:
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 2-4-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 28.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (in)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	50		2.0		FILL		FILL MATERIAL consisting of:
							90% brown clay - dry, firm, no odor, mixed with 10% broken concrete fragments
	50		4.0				90% clay - brown, firm, moist, no odor, mixed with 10% brick fragments, gravel, nails
5	30		2.1				90% brown clay and rock fragments
	50		4.4		CL		CLAY
							Grey, firm, black silt lense 2-inches thick
	30		3.4				Grey, firm, high silt content, low plasticity
10							Grey, firm, uniform, low plasticity, moist, no odor
	45		5.1				Grey, firm, uniform, low plasticity, moist, no odor
							Grey, loose, low plasticity
	50		2.1		SP		SAND
15	60		2.2				Very fine, grey, wet, loose, no odor
							Grey, loose, wet, no odor
	60		2.8				Loose, poorly sorted, no odor, wet, 10% gravel rounded
	40		3.8		GP		SANDY GRAVEL
20							Rounded to subrounded, loose, 20% grey sand, wet, no odor
	50		5.2				Grey, loose, rounded, poorly sorted, wet, no odor
							Poor recovery due to cobble plug in spoon tip - Driller reports change at 23.0'
	10		5.0		CL		CLAY
25	70		5.0				Grey, soft, high silt content, 10% grey pebbles and cobbles in random pattern, no odor
	60		2.0				Grey, soft, medium plasticity, 15% grey rounded pebbles in random unsorted pattern, wet, no odor
30							
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB14

PROJECT NO.: 3-2075-890	DRILLING CO.: NAXIN	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: RON BROWN	SURFACE ELEVATION: 590
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 4-2-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 30.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	10		0.0		FILL		Fill material consisting of road base gravel fill - loose, wet
	90		3.0		CL		SILTY CLAY Grey, trace black staining at 3.0, trace brown silt in pockets, no odor, moist
5	70		2.3				Grey, trace orange staining, firm, uniform, no odor, moist
	10		4.4				Grey and orange staining in mottled pattern, firm, uniform, moist, no odor
	80		8.1				Increasing sand content
10	85		7.2		SP		SILTY SAND No odor, moist
	50		13.1				Grey and brown, fine grained, loose, uniform, moist, no odor
							Becomes all grey at 13.7
15	90		2.1				Grey, uniform, very fine grained
	100		4.2		GP		GRAVEL Round, grey, moist, no odor
	60		4.1				Very loose, poorly sorted, round to subround, wet, no odor Grey, loose, poorly sorted, wet, no odor
20	80		4.5				Grey, loose, poorly sorted, trace cobbles, wet, no odor
	70		12.7				Grey, loose, poorly sorted, trace cobbles, wet, no odor
25	100		8.8		CL		CLAY Grey to tan, soft, uniform, thin seams of silt in horizontal partings
	100		11.1				Grey with tan, soft, uniform, medium plasticity, trace rounded gravel
	100		8.1				Grey and tan, soft, uniform, no odor, wet
30							End of boring
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB15

PROJECT NO.: 3-2075-890	DRILLING CO.: MAXIM	MP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: RON BROWN	SURFACE ELEVATION: 590
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 4-2-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 30.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	80		4.2		FILL		0 - 8" asphalt
							Unable to sample due to obsturction, augered to 4.0
	80		3.1		CL		Black silt lense, no odor
							SILTY CLAY
5	100		3.2				Grey and brown in mottled pattern, firm, moist, no odor
							Grey and orange in mottled pattern, firm, uniform, no odor
	80		4.1				
	80		4.1				Orange and grey, uniform, firm, moist, no odor
10							Increasing sand content
	50		4.1		SP		SILTY SAND
							Grey and orange
	70		2.1				Loose, moist, poorly sorted, no odor, 20% rounded gravel
15	80		3.8		GP		SILTY GRAVEL
							Loose, poorly sorted, wet, slight hydrocarbon odor
	80		3.2				Coarse, trace cobbles, poorly sorted, grey, loose, no odor
	90		2.1				Coarse, angular to subround, poorly sorted, loose grey, no odor
20							
	70		4.1				Grey, poorly sorted, coarse, angular and rounded, slight hydrocarbon odor
	40		2.1				Grey poorly sorted, loose, angular and subround, slight hydrocarbon odor
25	60		1.1		CL		CLAY
	70		3.1				Grey to tan, soft, uniform, wet, no odor, trace rounded cobbles
	90		3.8				
30							End of boring.
35							
40							

REMARKS:

REMEDIATION TECHNOLOGIES, INC.

BORING LOG
BORING DB16

PROJECT NO.: 3-2075-890	DRILLING CO.: MAXIN	NP ELEVATION:
CLIENT: NATIONAL FUEL GAS	DRILLER: RON BROWN	SURFACE ELEVATION: 590
LOCATION: MINERAL SPRINGS ROAD	METHOD: HSA	WATER LEVEL DURING DRILLING: NA
START DATE: 4-2-98	CASING I.D.: NA	STICK-UP: NA
GEOLOGIST: JAMES EDWARDS	TOTAL DEPTH: 28.0 Feet	AUGER O.D./I.D.: 4.25 ID

DEPTH (feet)	RECOVERY (ft)	SAMPLE DEPTH	PID HEADSPACE (ppm)	BLOW COUNTS	SOIL CLASS	LITHOLOGY	DESCRIPTION
	10		1.0		FILL		Fill material consisting of mixture of broken rock fragments, brown clayey silt and sand, moist, no odor
	40		8.1				Black cinders and ash fragments, trace coal fragments, dry, no odor
5	10		5.1				Black cinders and ash fragments, poor recovery due to cobble in spoon tip
	10		7.1				No recovery due to plug in spoon tip (cobble)
	90		8.2		CL		SILTY CLAY
					SP		Grey and orange in mottled pattern, no odor
10	80		4.5				SILTY SAND
					GP		Grey, uniform, fine, well sorted, slight hydrocarbon odor
	80		8.0				Grey, fine, uniform, wet
							GRAVEL
15	70		7.1				Grey, poorly sorted, round to subround, wet, loose, slight hydrocarbon odor
							Increasing sand content
	100		8.8				SILTY GRAVEL
							Grey, loose, round to subround, poorly sorted, slight hydrocarbon odor, wet
	100		7.2				
20	50		14.0				GRAVEL
							Grey, poorly sorted, loose, angular to subround, slight hydrocarbon odor, wet
	50		7.8				Grey, poorly sorted, wet, slight hydrocarbon odor
					CL		SILTY CLAY
25	100		4.2				Uniform, grey (light), medium plasticity, moist to wet, slight odor
	100		5.8				CLAY
							Grey, uniform, soft, medium plasticity
							End of boring.
30							
35							
40							

REMARKS:

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98

Matrix : Leachate
Method : SW846 1311/8260-TCLP
Units : UG/L

taken near SB-44

Galson ID:	*L40900-1	L40900-2	L40900-3
Client ID:	SEPARATOR PIT 2	SEPARATOR PIT 3	SS HYDROCARBON
Vinyl Chloride	<100	<100	<100
1,1-Dichloroethene	<50	<50	<50
Chloroform	<50	<50	<50
1,2-Dichloroethane	<100	<50	<50
2-Butanone	<100	<100	<100
Carbon Tetrachloride	<50	<50	<50
Trichloroethene	<50	<50	<50
Benzene	3200	120	<50
Tetrachloroethene	<50	<50	<50
Chlorobenzene	<50	<50	<50
Dilution Factor	10	10	10
Analysis Date	01/16/98	01/16/98	01/16/98

Approved by : PJT
Date : 19-JAN-98
QC by : EM
Date : 1/20/98
NYS DOH # : 11626
Footnotes:

* : Benzene result reported from 20x dilution of sample. Elevated detection limit for 1,2-dichloroethane due to intereference from benzene peak.

Galson Laboratories

VOLATILE ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98

Matrix : Leachate
Method : SW846 1311/8260-TCLP
Units : UG/L

Galson ID:	QCB011698-2	QCB011698-2TP	QCB011698-3TP
Client ID:	VBLK1	TCLP Blank	TCLP Blank
Vinyl Chloride	<10	<100	<100
1,1-Dichloroethene	<5	<50	<50
Chloroform	<5	<50	<50
1,2-Dichloroethane	<5	<50	<50
2-Butanone	<10	<100	<100
Carbon Tetrachloride	<5	<50	<50
Trichloroethene	<5	<50	<50
Benzene	<5	<50	<50
Tetrachloroethene	<5	<50	<50
Chlorobenzene	<5	<50	<50
Dilution Factor	1	10	10
Analysis Date	01/16/98	01/16/98	01/16/98

Approved by : PJT
Date : 19-JAN-98
QC by : EM
Date : 1/20/98
NYS DOH # : 11626
Footnotes:

LEACHATE VOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L40900

SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
VBLK1	91	88	82	BA0116	0
SEPARATOR PIT 2	95	92	86	BA0116	0
SEPARATOR PIT 3	94	90	84	BA0116	0
SS HYDROCARBON	94	94	86	BA0116	0
TCLP Blank	92	89	84	BA0116	0
TCLP Blank	95	89	84	BA0116	0

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(54-114)
SMC2 (BFB) = Bromofluorobenzene	(50-128)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(54-123)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

SEMIVOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98
Date Extracted: 15-JAN-98

Matrix : Leachate
Method : SW846 1311/3510/8270-TCLP
Units : UG/L

Galson ID:	*L40900-1	L40900-2	L40900-3
Client ID:	SEPARATOR PIT 2	SEPARATOR PIT 3	SS HYDROCARBON
Pyridine	<50	<10	<10
1,4-Dichlorobenzene	<50	<10	<10
2-Methylphenol	56.	<10	<10
3 & 4-Methylphenol	<100	<20	<20
Hexachloroethane	<50	<10	<10
Nitrobenzene	<50	<10	<10
Hexachlorobutadiene	<50	<10	<10
2,4,6-Trichlorophenol	<50	<10	<10
2,4,5-Trichlorophenol	<50	<10	<10
2,4-Dinitrotoluene	<50	<10	<10
Hexachlorobenzene	<50	<10	<10
Pentachlorophenol	<120	<25	<25
Dilution Factor	5	1	1
Analysis Date	01/19/98	01/15/98	01/19/98

Approved by : PJT
Date : 20-JAN-98
QC by : EJM
Date : 1/20/98
NYS DOH # : 11626
Footnotes:
* : Elevated detection limit due to high level of naphthalene in sample.

Galson Laboratories

SEMIVOLATILE ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98
Date Extracted: 15-JAN-98

Matrix : Leachate
Method : SW846 1311/3510/8270-TCLP
Units : UG/L

Galson ID:	Q-5240	Q-5240TP
Client ID:	SBLK5240	SBLK5240TP
Pyridine	<10	<10
1,4-Dichlorobenzene	<10	<10
2-Methylphenol	<10	<10
3 & 4-Methylphenol	<20	<20
Hexachloroethane	<10	<10
Nitrobenzene	<10	<10
Hexachlorobutadiene	<10	<10
2,4,6-Trichlorophenol	<10	<10
2,4,5-Trichlorophenol	<10	<10
2,4-Dinitrotoluene	<10	<10
Hexachlorobenzene	<10	<10
Pentachlorophenol	<25	<25
Dilution Factor	1	1
Analysis Date	01/15/98	01/15/98

Approved by : PJT
Date : 20-JAN-98
QC by : EM
Date : 1/20/98
NYS DOH # : 11626
Footnotes:

LEACHATE SEMIVOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L40900

SAMPLE NO.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	S7 (2CP)#	S8 (DCB)#	TOT OUT
SBLK5240	56	26	60	48	62	78	69	66	0
SBLK5240TP	37	15	41	46	46	70	48	46	0
SEPARATOR PIT 3	47	23	48	56	54	76	63	59	0
SEPARATOR PIT 2	25	26	48	64	73	77	65	56	0
SS HYDROCARBON	63	32	61	78	82	81	85	74	0

		QC LIMITS	
S1 (2FP)	= 2-Fluorophenol	(21-100)	
S2 (PHL)	= Phenol-d6	(10- 94)	
S3 (NBZ)	= Nitrobenzene-d5	(35-114)	
S4 (FBP)	= 2-Fluorobiphenyl	(43-116)	
S5 (TBP)	= 2,4,6-Tribromophenol	(10-123)	
S6 (TPH)	= Terphenyl-d14	(33-141)	
S7 (2CP)	= 2-Chlorophenol-d4	(25-125)	(advisory)
S8 (DCB)	= 1,2-Dichlorobenzene-d4	(25-125)	(advisory)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98

Matrix : Leachate
Method : SW846 6010B/7470A

Galson ID:		L40900-1	L40900-2	L40900-3
Client ID:		SEPARATOR PIT 2	SEPARATOR PIT 3	SS HYDROCARBON
	Units			
Arsenic TCLP	mg/l	<0.2	<0.2	<0.2
Barium TCLP	mg/l	1.2	1.0	<1
Cadmium TCLP	mg/l	<0.005	<0.005	<0.005
Chromium TCLP	mg/l	<0.01	<0.01	<0.01
Lead TCLP	mg/l	<0.1	<0.1	<0.1
Mercury TCLP	mg/l	<0.0005	<0.0005	<0.0005
Selenium TCLP	mg/l	<0.1	<0.1	<0.1
Silver TCLP	mg/l	<0.5	<0.5	<0.5

Approved by : Karen S. Becker
Date : 20-JAN-98
QC by : [signature]
Date : 1/22/98
NYS DOH # : 11626
Footnotes:

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98
Date Sampled : 09-JAN-98

Matrix : Leachate
Method : SW846 6010B/7470A

Galson ID:		QM980120-1
Client ID:		TCLP Blank
	Units	
Arsenic TCLP	mg/l	<0.2
Barium TCLP	mg/l	<1
Cadmium TCLP	mg/l	<0.005
Chromium TCLP	mg/l	<0.01
Lead TCLP	mg/l	<0.1
Mercury TCLP	mg/l	<0.0005
Selenium TCLP	mg/l	<0.1
Silver TCLP	mg/l	<0.5

Approved by : Karen S. Becker
Date : 20-JAN-98
QC by : [signature]
Date : 1/30/98
NYS DOH # : 11626
Footnotes:

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 13-JAN-98 Matrix : Soil
Date Sampled : 09-JAN-98

Galson ID:			L40900-1	L40900-2	L40900-3
Client ID:			SEPARATOR PIT 2	SEPARATOR PIT 3	SS HYDROCARBO
	Method	Units			
Reactive Cyanide	SW846	mg/kg	<100	<100	<100
Reactive Sulfide	SW846	mg/kg	<100	<100	<100
Corrosivity/pH	SW846 9045	SU	10.4	9.4	7.4
Ignitability	SW846 1030		NEG	NEG	NEG

Approved by : LM
Date : 20-JAN-98
QC by : EM
Date : 1/20/98
NYS DOH # : 11626
Footnotes:

* Actual result for PIT 3 (L40900-2) is 19.8 mg HCN/kg waste. When corrected for average spike recovery of 8.42%, result is 235 mg HCN/kg. The corrected result is below the EPA guidance level of 250 mg HCN/kg waste.
* The bulk pH was performed using SW846 method 9045. A sample is corrosive if pH is less than or equal to 2, or greater than or equal to 12.5 Standard Units(SU). Under these conditions, the samples are not corrosive.
* The samples do not ignite or support combustion. Under these conditions the samples are non-ignitable.

No.

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3-2075-620	Mineral Springs

SAMPLERS: M Hoffelbord

RECEIVING LABORATORY: Galson

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	Full RCRA except Herb/Pest.	REMARKS
	1/9/98		Separator Pit #2	3	✓	Remediation Technologies, In L40900-1 01/13/98 Bulk Prep SEPARATOR PIT 2
	"		Separator Pit #3	3	✓	Remediation Technologies, In L40900-2
	"		Subsurface Hydrocarbon	3	✓	Remediation Technologies, In L40900-3 01/13/98 Bulk Prep SS HYDROCARBON

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	1/12/98				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for laboratory by: (Signature)	Date/Time		
		Tim Rust	1-13-98 1950		

REMARKS: cooler temp 4°C

REMEDIATION TECHNOLOGIES INC

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

PINK COPY - Sampler YELLOW COPY - Laboratory WHITE COPY - RETEC

REMEDIATION TECHNOLOGIES, INC.

MEMORANDUM

TO: Mark Hofferbert

FROM: John Flaherty JMF

DATE: January 15, 1998

RE: Analytical Results - Mineral Springs (3-2075-620)

Your samples from the above referenced site have been examined by a carbon disulfide (CS_2) extraction - infrared spectral (FT-IR) technique for identification of the organic material present in each, as requested. Prior to instrumental analysis, the samples were first extracted into CS_2 in order to isolate the organic material from the soil matrix. The amounts of extractable material obtained from each sample are as follows:

Sample Identification	CS_2 Extractables (mg/Kg)
Separator Pit #2	16,780
Separator Pit #3	73,330
Subsurface Hydrocarbons	5200

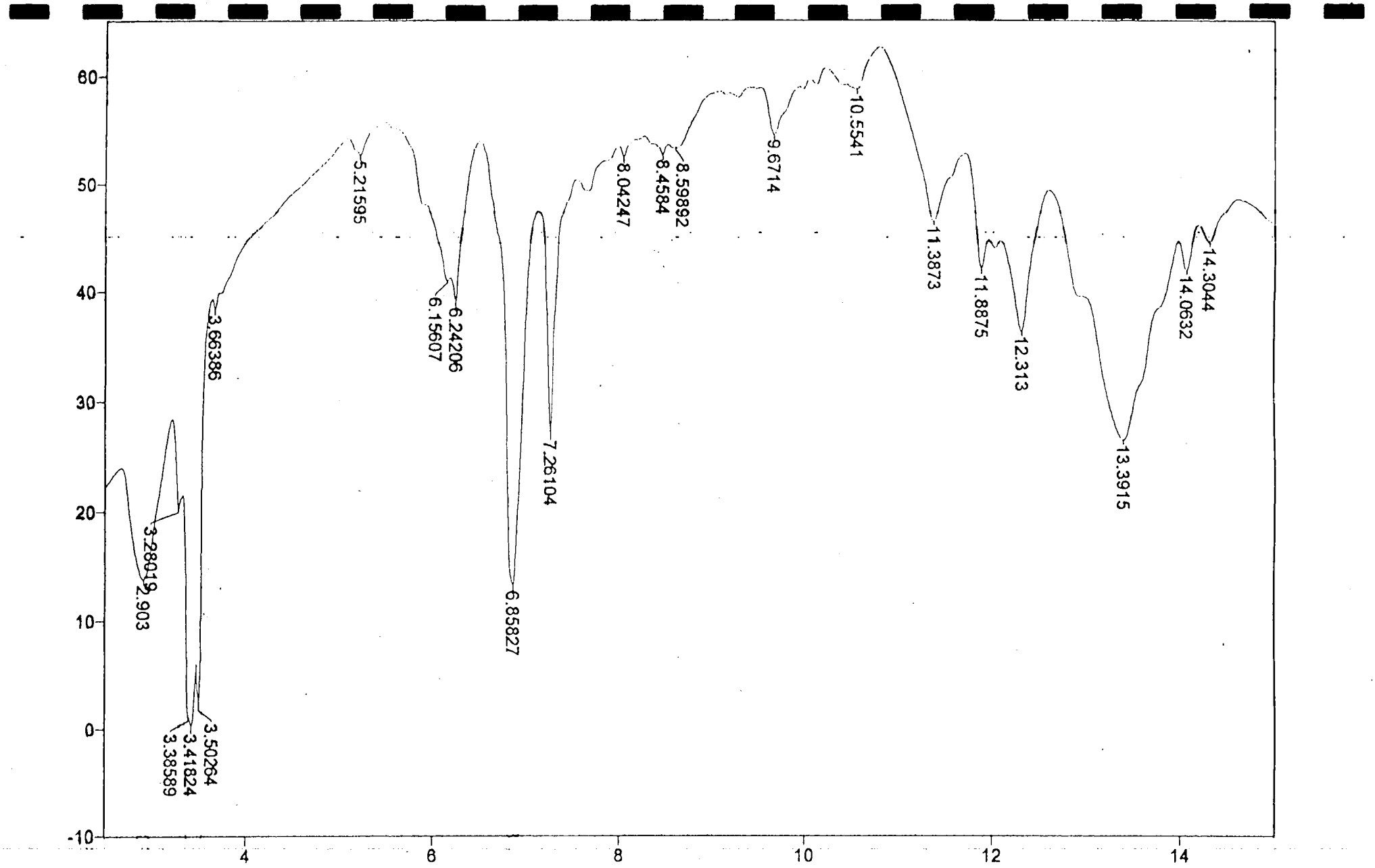
The CS_2 extracts from Separator Pit #2 exhibit IR absorptions characteristic of "heavy" polynuclear aromatic hydrocarbons (PAHs) and an oxidized petroleum hydrocarbon. The components observed here and the ratios of each are consistent for a mixture of a weathered petroleum oil and a carburetted water gas (CWG) or coal carbonization tar.

The CS_2 extracts from Separator Pit #3 consist primarily of an oxidized "heavy" petroleum hydrocarbon. The absorption pattern observed for this sample is consistent for an asphalt or similar residuum. A small amount of PAHs were also detected, although the source of these could not be identified.

The CS_2 extracts from the Subsurface Hydrocarbon sample consist mainly of "heavy" PAHs containing a small amount of oxidized petroleum products. The components observed and the ratios of each are consistent for a weathered/devolatilized CWG tar.

Copies of the IR spectra are enclosed with this report for your reference.

As always, please contact me if you have any questions concerning these results.



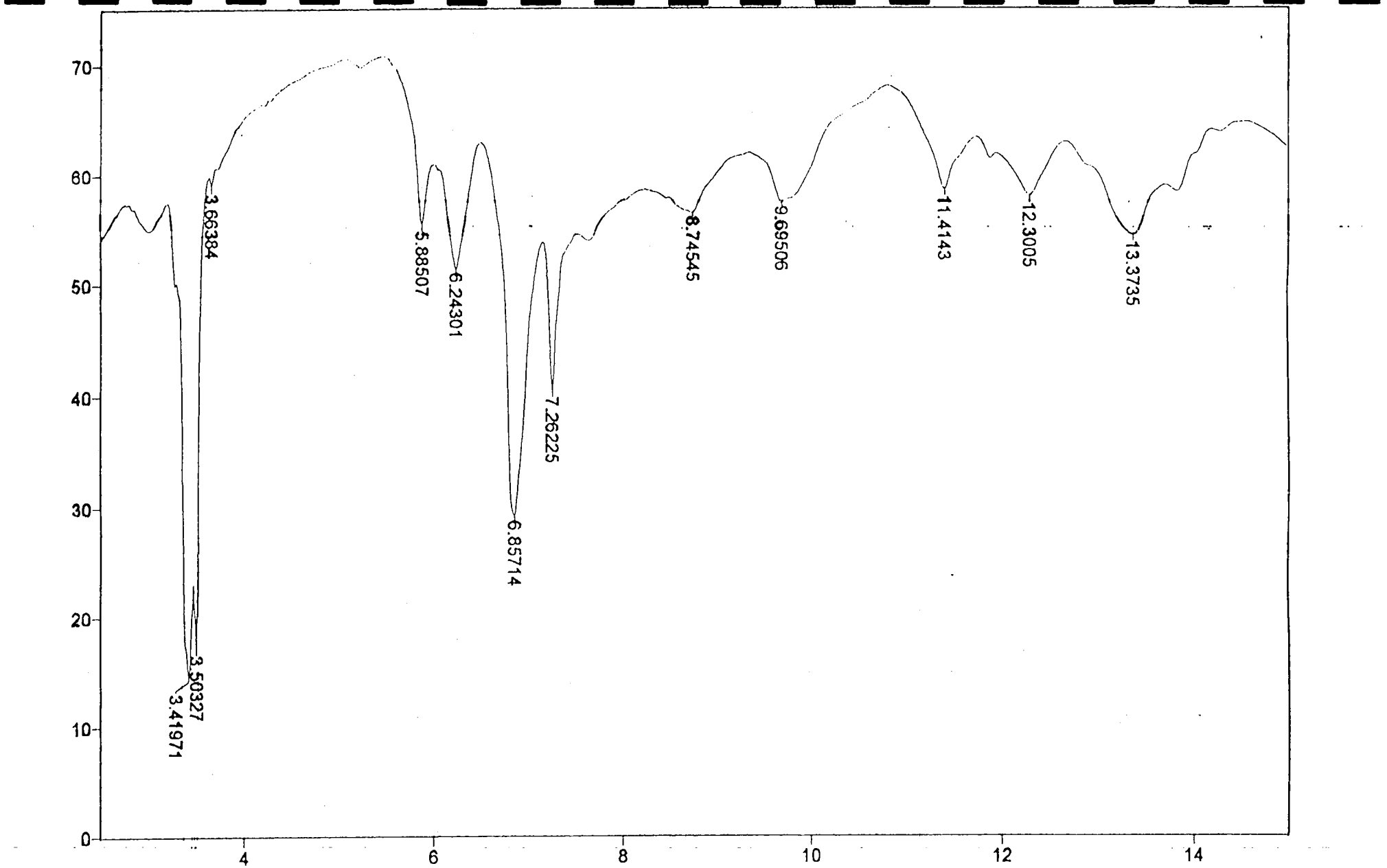
Transmittance / Micrometers

Number of Scans= 32 Apodization= Strong

File # 1 : AL-28423

1/14/98 9:18 AM Res=4 cm-1

Separator Plt #2 (CS2 Extracts)



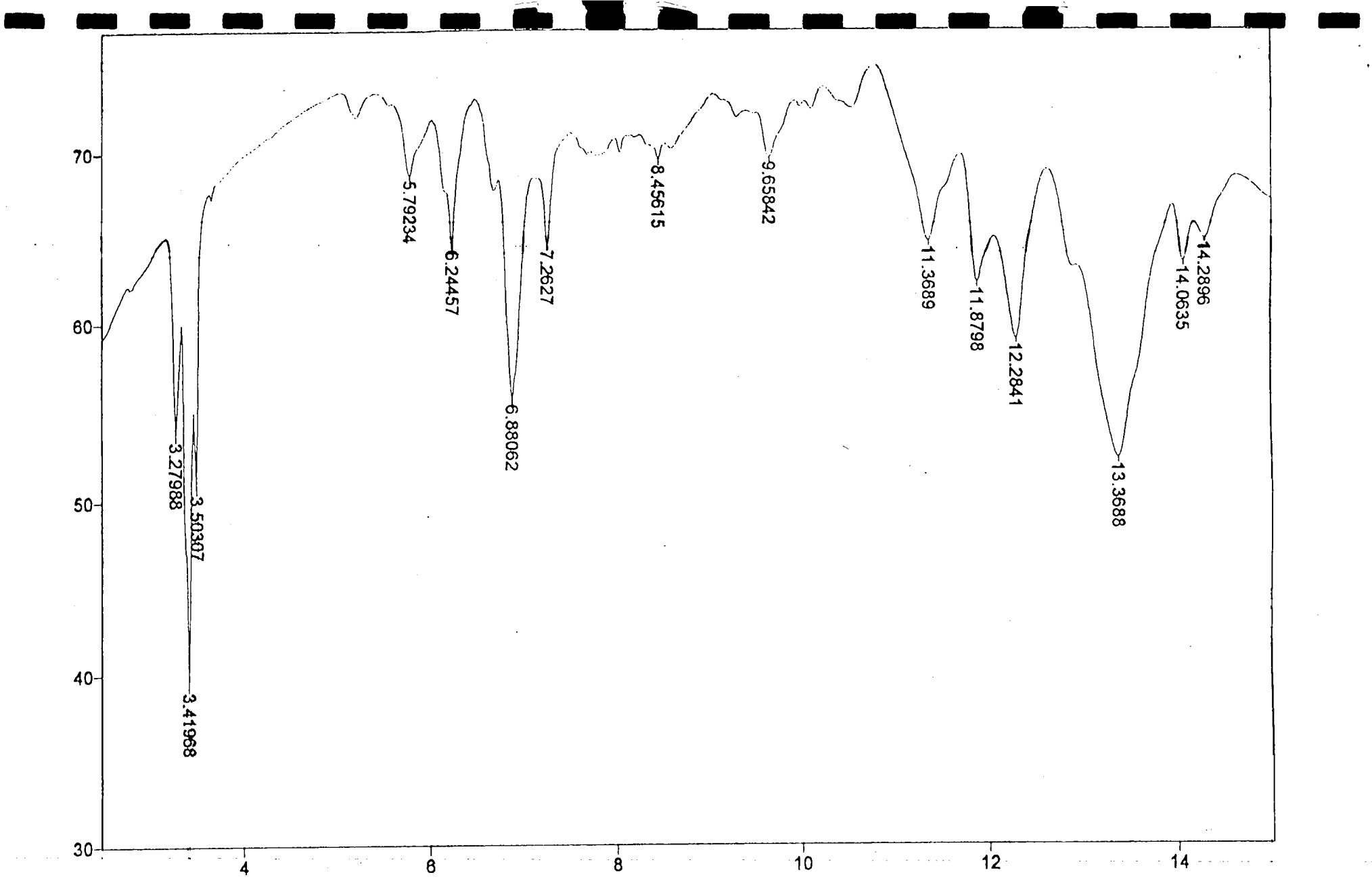
Transmittance / Micrometers

File # 1 : AL-28424

Separator Plt #3 (CS2 Extracts)

Number of Scans= 32 Apodization= Strong

1/14/98 9:51 AM Res=4 cm-1



Transmittance / Micrometers

File # 1 : AL-28425

"Subsurface Hydrocarbon" (CS2 Extracts)

Number of Scans= 32 Apodization= Strong

1/14/98 10:11 AM Res=4 cm-1

No.

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3-2075-620	Mineral Springs

SAMPLERS: M Hofferbert

RECEIVING LABORATORY: RETEC (Pittsburgh)

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	IR Spectra	REMARKS
	1/9/98		Separator Pit #2	1	✓	
	11		Separator Pit #3	1	✓	
	11		Subsurface Hydrocarbon	1	✓	

Deliver to:
John Flaherty

Call me when you get these.

Thanks, Mark H.

Relinquished by: (Signature)	Date/Time 1/12/98	Received by: (Signature) John Flaherty	Relinquished by: (Signature)	Date/Time 1/13/98 10:15	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for laboratory by: (Signature)	Date/Time		

REMARKS:

PINK COPY - Sampler

YELLOW COPY - Laboratory

WHITE COPY - RETEC

RETEC
REMEDIATION TECHNOLOGIES INC

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

Galson Laboratories

6601 Kirkville Road
E. Syracuse, NY 13057-0369
Phone: (315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

February 11, 1998

SB-66
SB-79

DOH ELAP# 11626

Mr. Mark Hofferbert
Remediation Technologies, Inc.
1001 West Seneca Street
Ithaca, NY 14850

Re: Client Account# 12013 Login# L41160

Dear Mr. Hofferbert:

Enclosed are the analytical results of the samples received by our laboratory January 30, 1998.

GC/MS Semivolatiles

Due to dilutions performed on the sample extracts during GPC cleanup and instrumental analyses, surrogate recovery data is unavailable for both samples.

Please contact our Client Services Department at (315) 437-7252, extension 305 or 116, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

E. Joseph Unangst

F. Joseph Unangst
Laboratory Director

Enclosure(s)

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 30-JAN-98
Date Sampled : 19-JAN-98 - 21-JAN-98

Matrix : Soil
Method : NYSDEC ASP 95-1
Units : UG/KG

Galson ID:	*L41160-1	*L41160-2	QCB020698-1
Client ID:	SB-66 (5.5-7)	SB-79 (3.5-4.5)	METHOD BLANK
Chloromethane	<7700	NR	<1200
Bromomethane	<7700	NR	<1200
Vinyl Chloride	<7700	NR	<1200
Chloroethane	<7700	NR	<1200
Methylene Chloride	1400 J B	NR	230 J
Acetone	<7700	NR	<1200
Carbon Disulfide	<7700	NR	<1200
1,1-Dichloroethene	<7700	NR	<1200
1,1-Dichloroethane	<7700	NR	<1200
1,2-Dichloroethene (Total)	<7700	NR	<1200
Chloroform	<7700	NR	<1200
1,2-Dichloroethane	<7700	NR	<1200
2-Butanone	<7700	NR	630 J
1,1,1-Trichloroethane	<7700	NR	<1200
Carbon Tetrachloride	<7700	NR	<1200
Bromodichloromethane	<7700	NR	<1200
1,2-Dichloropropane	<7700	NR	<1200
cis-1,3-Dichloropropene	<7700	NR	<1200
Trichloroethene	<7700	NR	<1200
Dibromochloromethane	<7700	NR	<1200
1,1,2-Trichloroethane	<7700	NR	<1200
Benzene	8600	<9300	<620
trans-1,3-Dichloropropene	<7700	NR	<1200
Bromoform	<7700	NR	<1200
4-Methyl-2-Pentanone	<7700	NR	<1200
2-Hexanone	<7700	NR	<1200
Tetrachloroethene	<7700	NR	<1200
1,1,2,2-Tetrachloroethane	<7700	NR	<1200
Toluene	7100 J	36000	<620
Chlorobenzene	<7700	NR	<1200
Ethylbenzene	1000 J	38000	<620
Styrene	3100 J	NR	<1200
Xylene (total)	12000	500000	<620
Percent Moisture (%)	35	33	NA
Dilution Factor	4	10	1
Analysis Date	02/06/98	02/06/98	02/06/98

Approved by : PJT
Date : 11-FEB-98
QC by : EJT
Date : 2/11/98
NYS DOH # : 11626

Footnotes:

* : Sample analyzed as a medium level extract.
J : Estimated value. Value is below quantitation limit.
B : This compound was also detected in the method blank.
Results are reported on a dry weight basis.

2B
SOIL VOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L41160

Level: (low/med) MED

SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
VBLK1	105	91	102	BA0206	0
SB-79 (3.5-4.5)	103	94	108	BA0206	0
SB-66 (5.5-7)	101	97	101	BA0206	0

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(84-138)
SMC2 (BFB) = Bromofluorobenzene	(59-113)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

SEMIVOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 30-JAN-98
Date Sampled : 19-JAN-98 - 21-JAN-98
Date Extracted: 04-FEB-98

Matrix : Soil
Method : NYSDEC ASP 95-2
Units : UG/KG

Galson ID:	L41160-1	L41160-2	Q-5268
Client ID:	SB-66 (5.5-7)	SB-79 (3.5-4.5)	SBLK5268
Naphthalene	420000	780000	<330
2-Methylnaphthalene	120000	270000	<330
Acenaphthylene	220000	50000 J	<330
Acenaphthene	36000 J	<99000	<330
Fluorene	160000	36000 J	<330
Phenanthrene	480000	140000	<330
Anthracene	140000	42000 J	<330
Fluoranthene	300000	100000	<330
Pyrene	290000	80000 J	<330
Benzo(a)anthracene	100000	32000 J	<330
Chrysene	85000	30000 J	<330
Benzo(b)fluoranthene	61000	24000 J	<330
Benzo(k)fluoranthene	98000	26000 J	<330
Benzo(a)pyrene	92000	31000 J	<330
Indeno(1,2,3-cd)pyrene	38000 J	<99000	<330
Dibenzo(a,h)anthracene	<51000	<99000	<330
Benzo(g,h,i)perylene	39000 J	<99000	<330
Percent Moisture (%)	35	33	NA
Dilution Factor	10	20	1
Analysis Date	02/09/98	02/09/98	02/08/98

Approved by : PJT
Date : 11-FEB-98
QC by : EJ
Date : 2/11/98
NYS DOH # : 11626
Footnotes:
J : Estimated value. Value is below quantitation limit.
Results are reported on a dry weight basis.

2D
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L41160

Level:(low/med) LOW

SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (DCB)#	S5 ( )#	S6 ( )#	S7 ( )#	S8 ( )#	TOT OUT
SBLK5268	96	102	109	105					0
SB-79 (3.5-4.5)	D	D	D	D					0
SB-66 (5.5-7)	D	D	D	D					0

	QC LIMITS
S1 (NBZ) = Nitrobenzene-d5	(23-120)
S2 (FBP) = 2-Fluorobiphenyl	(30-115)
S3 (TPH) = Terphenyl-d14	(18-137)
S4 (DCB) = 1,2-Dichlorobenzene-d4	(20-130)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

No.

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3-2075-620	Mineral Springs

SAMPLERS: Mark Hofferbert, RETEC

RECEIVING LABORATORY: GALSON

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	8260 VOA TCL list	8260 VOA BTEX only	8270 SVOA 16 PAH's only			REMARKS
	1/19		SB-66 (5.5-7.0)	1	✓		✓			Remediation Technologies, In L41160-1 01/30/98 Soil SB-66 (5.5-7)
	1/21		SB-79 (3.5-4.5)	1		✓	✓			Remediation Technologies, In L41160-2 01/30/98 Soil SB-79 (3.5-4.5)
										Samples have been kept at, or near, freezing temp since collection. ~~May be frozen when received @ Lab.~~
										Routine TAT requested.
										per Jim Edward 1/30/98 use ASP methods and provide standard report. NO MS/MSD. PAW

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	1/29/98				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for laboratory by: (Signature)	Date/Time		
		[signature]	1-30-98 1000		

REMARKS:

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

PINK COPY - Sampler YELLOW COPY - Laboratory WHITE COPY - RETEC

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Drill cuttings
Decon Water

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98

Matrix : Leachate
Method : SW846/1311/8260-TCLP
Units : UG/L

Galson ID:	L41284-1	QCB020998-1	QCB020998-1TP
Client ID:	DRUM COMPOSITE SOIL	Method Blank	TCLP Blank
Benzene	<50	<5	<50
Dilution Factor	10	1	10
Analysis Date	02/09/98	02/09/98	02/09/98

Approved by : PJT
Date : 10-FEB-98
QC by : [signature]
Date : 2/10/98
NYS DOH # : 11626
Footnotes:

LEACHATE VOLATILE SURROGATE RECOVERY

Client : Remediation Technologies, Inc. Login # : L41284

SAMPLE NO.	SMC1 (DCE) #	SMC2 ( ) #	SMC3 ( ) #	OTHER	TOT OUT
Method Blank-QCB020998-1	86			BA0209	0
TCLP Blank	90			BA0209	0
DRUM COMPOSITE SOIL	92			BA0209	0

QC LIMITS

SMC1 (DCE) = 1,2-Dichloroethane-d4 (54-123)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98

Matrix : Water
Method : SW846 8260
Units : UG/L

Galson ID:	L41284-2	L41284-3	QCB020998-1
Client ID:	DRUM COMPOSITE WATER	TRIP BLANK	Method Blank
Benzene	790	<5	<5
Dilution Factor	10	1	1
Analysis Date	02/09/98	02/09/98	02/09/98

Approved by : PJT
Date : 10-FEB-98
QC by : [signature]
Date : 2/10/98
NYS DOH # : 11626
Footnotes:

WATER VOLATILE SURROGATE RECOVERY

Client : Remediation Technologies, Inc. Login # : L41284

SAMPLE NO.	SMC1 (DCE)#	SMC2 ( )#	SMC3 ( )#	OTHER	TOT OUT
Method Blank-QCB020998-1	86			BA0209	0
DRUM COMPOSITE WATER	90			BA0209	0
TRIP BLANK	87			BA0209	0

SMC1 (DCE) = 1,2-Dichloroethane-d4 QC LIMITS (76-107)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

REMEDIATION TECHNOLOGIES
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0715

PAGE 1 OF 1

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: Mark Hofferbert	SAMPLER (PRINT NAME) James Edwards
ADDRESS: Above	SAMPLER (PRINT NAME)
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER: 535091357 3
PHONE:	LABORATORY RECEIVING: Galson
FAX:	

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSES REQUESTED: SW 8461311 8260 (TCLP VOC)	SW 8460 VOC	COMMENTS, SPECIAL INSTRUCTIONS, ETC.	LAB SAMPLE ID (to be completed by lab)
Drum Composite Soil	2/5/98	252	Soil	1	X		Remediation Technologies, In L41284-1	
Drum Composite WATER	2/5/98	258	AQ	2		X	Remediation Technologies, In L41284-2	
Trip BLANKS				2		X	Remediation Technologies, In L41284-3	

TCLP Benzene only on soil ~~+ water~~ per Mark to PAW 2/6/98 PAW 2/6/98

3 day TAT per Mark H. to PAW 2/6/98

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
James M. Edwards		2-6-98	1057
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☒	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER	☐	OTHER	____

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	
COC SEALS PRESENT ?	
COC SEALS INTACT ?	
RECEIVED CONTAINERS INTACT ?	
TEMPERATURE ?	

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98

Matrix : Water
Method : ASP10/95
Units : UG/L

Galson ID:	L41285-6	L41285-10	L41285-11
Client ID:	MW-13	MW-17	MW-18
Benzene	<5	<5	<5
Toluene	<5	<5	<5
Ethylbenzene	<5	<5	<5
Xylene (total)	<5	<5	<5
Dilution Factor	1	1	1
Analysis Date	02/10/98	02/10/98	02/10/98

Approved by : PJT
Date : 18-FEB-98
QC by :
Date 2/20/98
NYS DOH # : 11626
Footnotes:

Galson Laboratories

VOLATILE ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98

Matrix : Water
Method : ASP10/95
Units : UG/L

Galson ID:	L41285-12	QCB021098-2
Client ID:	TRIP BLANK	VBLK1
Benzene	<5	<5
Toluene	<5	<5
Ethylbenzene	<5	<5
Xylene (total)	<5	<5
Dilution Factor	1	1
Analysis Date	02/10/98	02/10/98

Approved by : PJT
Date : 18-FEB-98
QC by :
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L41285

SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
VBLK1	102	90	103	BA0210	0
TRIP BLANK	103	93	105	BA0210	0
MW-13	102	92	104	BA0210	0
MW-17	100	94	107	BA0210	0
MW-18	100	94	103	BA0210	0

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(88-110)
SMC2 (BFB) = Bromofluorobenzene	(86-115)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

SEMIVOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98
Date Extracted: 10-FEB-98

Matrix : Water
Method : ASP10/95
Units : UG/L

Galson ID:	L41285-10	L41285-11	Q-5290
Client ID:	MW-17	MW-18	SBLK5290
Naphthalene	<10	<10	<10
2-Methylnaphthalene	<10	<10	<10
Acenaphthylene	<10	<10	<10
Acenaphthene	<10	<10	<10
Fluorene	<10	<10	<10
Phenanthrene	<10	<10	<10
Anthracene	<10	<10	<10
Fluoranthene	<10	<10	<10
Pyrene	<10	<10	<10
Benzo(a)anthracene	<10	<10	<10
Chrysene	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10
Dibenzo(a,h)anthracene	<10	<10	<10
Benzo(g,h,i)perylene	<10	<10	<10
Dilution Factor	1	1	1
Analysis Date	02/13/98	02/13/98	02/13/98

Approved by : PJT
Date : 18-FEB-98
QC by : [signature]
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: GALSON LABORATORIES Contract:

Lab Code: Case No.: 1 SAS No.: SDG No.: L41285

SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (DCB)#	S5 ( )#	S6 ( )#	S7 ( )#	S8 ( )#	TOT OUT
SBLK5290	96	101	116	106					0
MW-17	93	96	63	107					0
MW-18	100	101	43	109					0

	QC LIMITS
S1 (NBZ) = Nitrobenzene-d5	(35-114)
S2 (FBP) = 2-Fluorobiphenyl	(43-116)
S3 (TPH) = Terphenyl-d14	(33-141)
S4 (DCB) = 1,2-Dichlorobenzene-d4	(16-110)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

METALS ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98
Date Sampled : 05-FEB-98

Matrix : Water
Method : CLP-M

Galson ID:		L41285-10	L41285-11	QM980209-2
Client ID:		MW-17	MW-18	BLANK
	Units			
Aluminum	mg/l	5.6	7.6	<0.1
Antimony	mg/l	<0.01	<0.01	<0.01
Arsenic	mg/l	<0.01	0.017	<0.01
Barium	mg/l	0.095	0.23	<0.005
Beryllium	mg/l	<0.005	<0.005	<0.005
Cadmium	mg/l	<0.005	<0.005	<0.005
Calcium	mg/l	230	53	<0.1
Chromium	mg/l	<0.01	<0.01	<0.01
Cobalt	mg/l	<0.01	<0.01	<0.01
Copper	mg/l	0.014	0.019	<0.01
Iron	mg/l	29	9.5	<0.05
Lead	mg/l	0.0046	0.0088	<0.003
Magnesium	mg/l	46	16	<0.1
Manganese	mg/l	0.92	0.21	<0.005
Mercury	mg/l	<0.0002	<0.0002	<0.0002
Nickel	mg/l	<0.02	<0.02	<0.02
Potassium	mg/l	2.8	4.2	<1
Selenium	mg/l	<0.005	<0.005	<0.005
Silver	mg/l	<0.01	<0.01	<0.01
Sodium	mg/l	60	43	<2
Thallium	mg/l	<0.01	<0.01	<0.01
Vanadium	mg/l	0.012	0.014	<0.01
Zinc	mg/l	0.040	0.031	<0.01

Approved by : Karen S. Becker
Date : 11-FEB-98
QC by :
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98 Matrix : Water
Date Sampled : 05-FEB-98

Galson ID:			L41285-1	L41285-2	L41285-3
Client ID:			MW-7	MW-8	MW-10
	Method	Units			
Cyanide, Total	CLP-M	mg/L	NR	NR	NR
WEAK & DISSOCIABLE C	SM 4500	mg/L	0.0242	0.0266	0.0403

Approved by : LM
Date : 20-FEB-98
QC by : [signature]
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

Galson Laboratories

INORGANIC ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98 Matrix : Water
Date Sampled : 05-FEB-98

Galson ID:			L41285-4	L41285-5	L41285-6
Client ID:			MW-11	MW-12	MW-13
	Method	Units			
Cyanide, Total	CLP-M	mg/L	NR	NR	NR
WEAK & DISSOCIABLE C	SM 4500	mg/L	0.0314	0.0635	0.0266

Approved by : LM
Date : 20-FEB-98
QC by : [signature]
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

Galson Laboratories

INORGANIC ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98 Matrix : Water
Date Sampled : 05-FEB-98

Galson ID:			L41285-7	L41285-8	L41285-9
Client ID:			MW-14	MW-15	MW-16
	Method	Units			
Cyanide, Total	CLP-M	mg/L	NR	NR	NR
WEAK & DISSOCIABLE C	SM 4500	mg/L	0.0795	0.0116	0.0937

Approved by : LM
Date : 20-FEB-98
QC by : [signature]
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

Galson Laboratories

INORGANIC ANALYTICAL REPORT

Client : Remediation Technologies, Inc.
Account # : 12013
Site : Mineral Springs

Date Received : 06-FEB-98 Matrix : Water
Date Sampled : 05-FEB-98

Galson ID:			L41285-10	L41285-11
Client ID:			MW-17	MW-18
	Method	Units		
Cyanide, Total	CLP-M	mg/L	0.034	<0.01
WEAK & DISSOCIABLE C	SM 4500	mg/L	<0.01	<0.01

Approved by : LM
Date : 20-FEB-98
QC by : [signature]
Date : 2/20/98
NYS DOH # : 11626
Footnotes:

REMEDIATION TECHNOLOGIES INC
1001 W. Seneca Street, Suite 204
Ithaca, NY 14850
(607) 277-5716
Fax (607) 277-9057

CHAIN OF CUSTODY RECORD 0716

PAGE 1 OF 1

PROJECT NAME: Mineral Springs	PROJECT NUMBER: 3-2075-620
SEND REPORT TO: Mark Hofferbert	SAMPLER (PRINT NAME) 5350913573
ADDRESS: ABOVE	SAMPLER (PRINT NAME) James Edwards
	SHIPMENT METHOD: Fed Ex
	AIRBILL NUMBER:
PHONE:	LABORATORY RECEIVING: CALSON
FAX:	

FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	VOC 95-1 BTEX	PAH 95-2	TOTALCN CLP-M/C	TAL METALS	WEAK ACID DISSOCIABLE CYANIDE SW4500/C	COMMENTS, SPECIAL	LAB SAMPLE ID (noted by lab)
MW7	2/5/98	130	AQ	1					X		Remediation Technologies, In L41285-1
MW8	2/5/98	1245	AQ	1					X		Remediation Technologies, In L41285-2
MW10	2/5/98	135	AQ	1					X		Remediation Technologies, In L41285-3
MW11	2/5/98	1115	AQ	1					X		Remediation Technologies, In L41285-4
MW12	2/5/98	1145	AQ	1					X		Remediation Technologies, In L41285-5
MW13	2/5/98	0915	AQ	4	X				X		Remediation Technologies, In L41285-6
MW14	2/5/98	229	AQ	1					X		Remediation Technologies, In L41285-7
MW15	2/5/98	1014	AQ	1					X		Remediation Technologies, In L41285-8
MW16	2/5/98	1033	AQ	1					X		Remediation Technologies, In L41285-9
MW17	2/4/98	410	AQ	7	X	X	X	X	X		Remediation Technologies, In L41285-10
MW18	2/5/98	821	AQ	6	X	X	X	X	X		Remediation Technologies, In L41285-11 02/06/98 Water MW-18
TB					X						Remediation Technologies, In L41285-12 02/06/98 Water TRIP BLANK

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
James A. Edwards		2-6-98	1055
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

SAMPLE CUSTODIAN REMARKS (COMPLETED BY LABORATORY):

QA/QC LEVEL		TURNAROUND:	
LEVEL I	☐	ROUTINE	☒
LEVEL II	☐	24 HOUR	☐
LEVEL III	☐	1 WEEK	☐
OTHER NYSDEC ASP	☐	OTHER	___

SAMPLE RECEIPT	
TOTAL # CONTAINERS RECEIVED ?	27
COC SEALS PRESENT ?	yes
COC SEALS INTACT ?	yes
RECEIVED CONTAINERS INTACT ?	yes
TEMPERATURE ?	4° Tm

WHITE - LAB COPY YELLOW - RM COPY PINK - FIELD COPY GOLD - PM/LAB COPY Custody.dwg