SEP 0 4 1998

LINCOLN
APPLIED GEOLOGY, INC.
Environmental Consultants

September 3, 1998

Mr. Robert Butler
Sites Management Section
Waste Management Division
Vermont Department of Environmental Conservation
103 South Main Street, West Building
Waterbury, VT 05671-0404

RE: Cumberland Farms Inc. (Station #4001), Newport, Vermont (VDEC Site# 97-2329) - Subsurface Investigation Summary Report

Dear Mr. Butler:

Lincoln Applied Geology, Inc. (LAG) is pleased to present this Subsurface Investigation Summary Report for Cumberland Farms Inc. (CFI) Station #4001, located at the corner of East Main Street and Sias Avenue in Newport, Vermont. As a result of petroleum related contamination present in soils during the underground storage tanks (USTs) system piping upgrade, which was conducted between November 17 and 20 1997, the Vermont Department of Environmental Conservation (VDEC) Sites Management Section (SMS) requested that a Subsurface Investigation be performed to determine the degree and extent of the contamination. The requested investigation was performed by LAG on June 29 and July 9, 1998 and is summarized in the following report.

The attached Subsurface Site Investigation report includes well logs, monitoring data, ground water quality results, and observations made during a sensitive receptor survey. The investigation shows that ground water beneath the site has been impacted by petroleum related contamination in the vicinity of MW-4 and the culvert well located north of the CFI building. The data clearly indicates that the existing ground water contamination extends beyond the current monitor well array. No detectable concentrations of petroleum related compounds were present in MW-1, 2, and 3, except for very low levels of total petroleum hydrocarbons (TPH) in MW-1. Data collected during the sensitive receptor survey shows that the ambient air space of the CFI store and surrounding commercial buildings have not been impacted by the petroleum related contamination present beneath the site. Based on data collected during the UST piping upgrade and this initial phase of the subsurface investigation, we recommend installing three additional ground water monitor wells to further delineate the extent of the subsurface contamination. We propose installing these wells at downgradient locations between the existing culvert well and the wetland area (ground water discharge zone) on the CFI property. Once the wells have been installed a second complete site monitoring and sampling event will be conducted. Data collected during the second phase will be summarized and presented to you in a Supplementary Subsurface Investigation Report.

We are looking forward to your review of this subsurface investigation summary report and approval of our recommendations. If you have any questions or comments, please contact me or Bill Norland, LAG Project Manager, at (802) 453-4384.

Sincerely,
Lincoln Applied Geology, Inc.

Jason S. Barnard
Geologist

JSB/jb
Enclosures
cc: Paul Dandarade

163 Revell Road • Lincoln, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Subsurface Investigation Summary Report

Cumberland Farms Inc.
Station No. 4001
East Main Street and Sias Avenue,
Newport, Vermont
(VDEC Site #97-2329)

Prepared for:

Cumberland Farms Inc.
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Phone: (802) 453-4384

September 3, 1998

Prepared by:

Jason Barnard
Geologist

Reviewed and Approved by:

Stephen Revell, CPG
Senior Hydrogeologist

Lincoln Applied Geology, Inc
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Executive Summary

Between November 17 and December 5, 1997 Cumberland Farms Inc. (CFI) and their subcontractors completed the removal, closure, and replacement of the underground storage tank (UST) system piping at the CFI facility (#3347745) in Newport, Vermont. Lincoln Applied Geology Inc. (LAG) conducted the piping removal assessment between November 17 and 20, 1997, and a UST piping closure report was submitted to the Vermont Department of Environmental Conservation (VDEC), Underground Storage Tank Program (USTP) on December 18, 1997. The removed piping was noted in good condition with no apparent leaks or perforations. Evidence of past leakage from the distribution piping was present beneath a "tee" fitting which connected the USTs to the dispenser islands.

Soils beneath the UST piping system were excavated to a maximum depth of 3 feet below grade. All excavated soils were screened with a PID for the presence of volatile organic compounds (VOCs) associated with petroleum products. Low to elevated PID readings were detected. As a result of UST piping upgrade activities approximately 70 cubic yards of highly contaminated soils were removed and polyencapsulated on-site. Following VDEC approval the soils were thermally treated at a permitted asphalt batching facility.

Based on the results of the November 1997 UST system piping upgrade, the VDEC Sites Management Section (SMS) requested that additional work be performed to further define the degree and extent of the contamination. LAG's services were secured by CFI to perform the requested subsurface investigation.

LAG installed four ground water monitor wells on-site on June 29, 1998. The wells were installed upgradient (MW-2), sidegradient (MW-1 and MW-3), and downgradient (MW-4) of the UST and dispenser island areas. All wells were properly developed and sampled the following week. On June 29th, LAG also completed a sensitive receptor survey of the CFI facility and surrounding commercial properties.

On July 7, 1998 LAG monitored static ground water levels, well headspace volatile organic vapor levels, and collected ground water quality samples from the four monitor wells and existing culvert well. All ground water quality samples were analyzed for the presence of the petroleum related compounds BTEX, MTBE, and TPH.

Based on the presence of elevated levels of dissolved BTEX in samples collected from MW-4 and the culvert well, LAG recommends the installation of three additional ground water monitor wells at the site in order to completely delineate the downgradient extent of the dissolved phase contamination. Once the wells have been installed they will be properly developed, allowed to stabilize for one week, and ground water samples will then be collected from the newly installed wells, existing monitor wells, ground water, culvert well, and the wetland area and downgradient stream. LAG will also conduct a complete ground water and well headspace site monitoring event in conjunction with the sampling event. Collected data will be reviewed and summarized in a Supplemental Subsurface Investigation Summary Report.

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Site Description

The CFI facility is located at the corner of East Main Street and Sias Avenue in Newport, Vermont. The General Location Map showing the site is presented as **Figure 1**. The property is bound by Sias Avenue to the west, East Main Street to the south, a private residence to the north, and commercial properties to the east. The one-story CFI building is provided municipal water and sewer and has a foundation consisting of a concrete slab on grade. Important site features including; the CFI building, existing UST area and dispenser islands, four ground water monitor wells, culvert well, and wetland point #1 are shown on **Figure 2**.

Site History

CFI and their subcontractors completed the excavation, removal, and replacement of the UST system distribution piping at the CFI facility between November 17 and December 5, 1997. LAG conducted the oversight and assessment of the piping between November 17 and 20, 1997. The UST Permanent Closure Form, photoionization detector (PID) data, and photographs of the site were prepared and submitted by LAG to the Vermont Department of Environmental Conservation (VDEC) Underground Storage Tank Program (USTP) in a report dated December 18, 1997. Excavated soils were screened for the presence of volatile organic compounds (VOCs) using a PID equipped with a 10.2 electron volt (eV) lamp. The findings presented in the December 18th UST closure report are summarized below.

During the UST piping upgrade all removed two inch diameter galvanized steel distribution piping was noted in good condition, with no apparent leaks or perforations. Data collected during the assessment indicated the possibility of a leak from a "tee" fitting which connects the distribution piping from the UST area and the north dispenser islands to the piping serving the south dispenser islands. Soil PID levels beneath this "tee" fitting ranged between 10 parts per million (ppm) and 300 ppm, and a strong gasoline odor was present. During the removal of the UST piping from the dispenser islands (#1, #2, #3, and #4) moderate levels of gasoline contamination was present in soils surrounding the piping. Soil PID levels ranged between 1.2 ppm at 2.5 feet below grade and saturated lamp (SL) at 1.5 feet below grade in the vicinity of the dispenser islands. It was our professional opinion that the gasoline contamination present in soils in the vicinity of the dispenser islands was the result of historical spills and overfills related to the changing of pump filters and/or refueling automobiles. During upgrade activities a very small amount of gasoline contamination was present in the peastone gravel lying atop the USTs. PID readings ranged between background (BG) levels and 24 ppm. We believed that this limited amount of contamination was the result of residual gasoline that dripped from the submersible pumps when they were removed from the UST's. All peastone gravel fill was reused on-site following completion of the piping upgrade.

At the conclusion of the piping upgrade approximately 70 cubic yards of gasoline contaminated soils were removed and totally polyencapsulated on-site. Following VDEC

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approval the soils were loaded and transported to a permitted asphalt batching facility on December 1, 1997. During the assessment, soil samples were collected from beneath each of the dispenser islands, the leaky "tee" fitting, and the contaminated soil stockpile (one composite sample). The samples collected from beneath the dispensers and the "tee" fitting were analyzed for the presence of BTEX and MTBE by EPA Method 8020 and for total volatile hydrocarbons (TVH) by Modified EPA Method 8015, at Toxicon Laboratories in Bedford, Massachusetts. The piping upgrade soil analytical data indicates that very low levels of petroleum contamination remained in soils in the vicinity of the dispenser islands and elevated levels of gasoline contamination remained in soils beneath the leaky "tee" fitting.

This LAG Subsurface Investigation Summary Report presents the results of the requested site investigation which was completed on July 7, 1998, and the recommendations for appropriate future activities at the site.

Site Geology

Four monitor wells (MW-1, 2, 3, and 4) were drilled and installed using hollow stem auger drilling techniques on June 29, 1998 by Tri-State Drilling and Boring. Two foot long soil samples were collected at five foot depth intervals, descriptively logged, and screened for volatile organic compounds (VOCs) typically associated with petroleum products, using a properly calibrated PID equipped with 10.2 eV lamp. A two inch diameter PVC monitor well was installed in each of the borings. Each well was properly constructed with adequate well screen, annular sand pack to 0.5 feet above the top of the screen, two foot thick bentonite seal placed atop the sand pack, the remaining annulus was then backfilled with drill cuttings, and a bolt-down well box was cemented flush with grade. The location of the 4 wells are shown on **Figures 2** and **3**.

Soils encountered during drilling activities include fine to medium sands and silt as described in the well logs included as **Appendix A**. Bedrock was not encountered during drilling activities and is assumed to be present at depths greater than twenty feet below grade.

Review of **Appendix A** indicates that petroleum related vapor phase contamination by VOCs were present in soils from grade to a depth of 17 feet in MW-2 and MW-3 with PID levels that ranged from 6.1 ppm to 14.1 ppm. Elevated VOC levels were present in soils from MW-4 with ranges between BG at grade to 7.0 feet and 5.3 ppm to 860 ppm from at 10 to 17 feet below grade. Elevated vapor levels present in soil from MW-4 correlate very well with the July 7th water quality data which shows elevated levels of dissolved contaminants. Only BG PID levels were present in soil from MW-1. The data collected during the installation of the four monitor wells indicate that elevated levels of vapor phase and adsorbed phase contamination exist in the vicinity of MW-4, and low levels exist in the vicinity of MW-2 and MW-3.

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Ground Water Level and Headspace PID Monitoring

On June 29, 1998, LAG conducted a top of casing (TOC) stadia survey of MW-1, 2, 3, and 4, the culvert well, and other features pertinent to the subsurface investigation. On July 7th, LAG measured static ground water levels (below TOC) using an electronic interface probe capable of detecting 0.01 feet of free-floating petroleum product. LAG also assayed the headspace of each monitor well and the culvert well with a PID for the presence of VOCs. Ground water elevation data collected on July 7th is presented in **Table 1**, and PID assays are included in **Table 2**. Review of **Table 1** data indicates that depth to ground water varied from 10.36 feet (culvert well) to 13.4 feet (MW-4). Review of **Table 2** indicates that well headspace PID levels on July 7th ranged between BG (MW-2 and the culvert well) and 600 ppm (MW-4). This data indicates that elevated VOC levels are present in the vicinity of MW-4 and only very low levels are associated with MW-1 and MW-3. The PID data correlates very well with the ground water quality results, except the PID data collected from the culvert well. We believe that the BG levels recorded in the large diameter culvert well result from the lack of a sealed top on the well which allows vapors to escape into the atmosphere.

Site Hydrogeology

Ground water elevation data collected on July 7th was used to prepare the contour map of the shallow ground water system presented as **Figure 2**. Review of **Figure 2** shows that ground water flows across the site in a northerly direction. The relatively flat ground water gradient across the site ranges from 0.012 to 0.014 feet/foot. However, based on the site topography and the adjacent wetland drainage, we assume that the ground water gradient increases slightly to the north of the culvert well.

Water Quality Sampling

On July 7, 1998 ground water quality samples were collected from MW-1, 2, 3, 4, and the culvert well. A sample was not collected from wetland point #1 because it was dry. The collected samples were analyzed along with a trip blank for the presence of BTEX and MTBE by EPA Method 8020 with MTBE, and for total petroleum hydrocarbons (TPH) by Modified EPA Method 8015 at Toxicon Laboratories, Inc. in Bedford, Massachusetts.

The water quality results are summarized and presented as **Table 3** and are shown on **Figure 3**. Copies of the laboratory reports are included as **Appendix B**. Review of **Table 3**, **Figure 3**, and **Appendix B** indicate that elevated concentrations of BTEX, MTBE, and TPH were detected in ground water from MW-4 and the culvert well. MW-4 (located downgradient of the dispenser islands and UST areas) contained 58,370 parts per billion (ppb) total BTEX and 97.43 ppm TPH. Samples collected from the culvert well contained 63,660 ppb total BTEX and 137.4 ppm TPH. With the exception of 0.019 ppm TPH in MW-1, no other petroleum related compounds were quantified above analytical detection limits in the remaining wells sampled. MTBE was not quantified above analytical detection limits in any of the wells sampled.

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Potential Sensitive Receptors

Potential sensitive receptors at the site include: soil and ground water beneath the site and surrounding properties; indoor air of the CFI and several nearby buildings; and surface water in the small wetland area located downgradient (north) of the CFI property (**Figure 2**). The soil and ground water in the vicinity of MW-4 and the culvert well (and most likely to the north) have been impacted by elevated levels of vapor, dissolved, and adsorbed phase petroleum contamination. Soil in the vicinity of the existing dispenser islands have been minimally impacted by relatively low levels of vapor phase contamination. It is not known whether surface water and soils in the small wetland area downgradient of the confirmed contamination has been impacted.

On June 29, 1998 LAG conducted a PID evaluation of ambient air in the basements of the CFI and surrounding buildings (Adelphia Cable, Ray's Real Estate, and the Grocery Store). The air quality evaluation yielded only BG results. PID assays of the two storm sewers (SS-1 and SS-2) and wetland point #1 on June 29th also assayed only BG levels as shown in **Table 2**. Based upon site observations and the results of the PID receptor survey, it is apparent that indoor ambient air has not been impacted by the petroleum contamination from the CFI property. Based on the construction of the CFI and Adelphia Cable buildings (concrete slab on grade) and the sidegradient location of the Grocery Store and Ray's Real Estate buildings, it is unlikely that these receptors will become impacted in the future. However, based on the downgradient location of the small wetland area (which is a ground water discharge zone) and the elevated levels of dissolved phase petroleum contamination present in the culvert well, it is possible that the surface water in the intermittent wetland has already been or may become impacted in the future. In light of the data collected in July, we recommend the collection of surface water samples from the wetland point #1 and the downgradient stream during the next sampling event. This data will determine whether ground water contamination has migrated into and impacted the wetland area, as well as, the stream that flows out of and to the west of the wetland.

City of Newport officials indicated that the CFI store and surrounding residential and commercial buildings are all served by municipal sewer and water. The shallow aquifer in this area is not used for potable water supplies. These two facts certainly reduce the potential risk to human health from the subsurface contamination, however, sensitive receptors such as the small wetland area and downgradient stream located downgradient of the CFI property remain at risk of becoming impacted.

Conclusions

Based on the data collected, observations, and evaluation presented, the following conclusions are made:

1. The UST system distribution piping was removed and replaced with new flexible piping.

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2. The UST system piping was noted in good condition with no apparent holes or perforations.

3. Moderate levels of gasoline related contamination (10 ppm to 300 ppm) were present in soils directly beneath a leaky "tee" pipe fitting connecting the distribution piping from the dispenser islands to the USTs.

4. Low levels of gasoline related contamination were present in soils in the vicinity of the four dispenser islands and is most likely the result of historical small scale spills/overfills during pump filter changes and automobile refueling.

5. A small amount of vapor phase contamination was present in 3 feet of peastone gravel fill soils associated with the UST area. PID readings ranged between BG and 24 ppm.

6. Seventy cubic yards of the most highly contaminated soils were removed from the excavation, totally polyencapsulated and stockpiled on-site, and transported to a permitted asphalt batching facility for proper disposal.

7. The depth to the shallow ground water system on-site ranges from 10.36 feet (culvert well) to 13.4 feet (MW-4) below grade.

8. The ground water flow direction on-site is toward the north at a relatively flat gradient of 0.012 to 0.014 feet/foot.

9. Ground water to the north (downgradient) of the CFI building has been impacted by elevated levels of petroleum related vapor, dissolved, and adsorbed contaminants. Elevated concentrations of total BTEX were present in samples collected from MW-4 and the culvert well. MTBE was not quantified above analytical detection limits in any of the collected samples. A very low detection of TPH was present in the sample collected from MW-1.

10. Indoor air of the CFI and surrounding commercial buildings have not been impacted by the petroleum contamination present in ground water north of the CFI building.

11. It is not known whether the small wetland area located downgradient of the CFI facility has been impacted by contamination present beneath the site.

12. The downgradient petroleum contamination in soil and ground water to the north of the CFI facility extends beyond the existing ground water monitor well array.

Recommendations

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As a result of the findings from the piping upgrade activities and this Subsurface Investigation, the following recommendations are made:

1. Three additional ground water monitor wells should be installed using vibratory drilling techniques at the locations shown on **Figure 4**. Soil samples will be descriptive logged and screened by PID for the presence of petroleum related VOCs.

2. Perform a second complete site monitoring and ground water sampling event about one week after the installation and proper development of the three proposed monitor wells. Site monitoring will include: the collection of ground water level measurements and PID assays of all monitor wells and the culvert well; and the PID evaluation of the CFI store, surrounding buildings, two storm sewers, and wetland area. Ground water samples will be collected from all monitor wells, the culvert well, wetland point #1, and the stream draining the wetland area.

3. Submit a summary report that includes data collected during the installation of the three additional monitor wells and the second complete site monitoring and ground water sampling event. These data will be used to determine the future status of the site [i.e. a monitoring program and/or Corrective Action Feasibility Investigation (CAFI)].

A cost estimate to implement these recommendations is provided as **Appendix C**. We look forward to your review of this Subsurface Investigation Report and cost estimate. With your approval we will proceed with the well installation and sampling.

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Project: Cumberland Farms, Inc.
Location: Newport, Vermont

Table 1
VDEC Site # 97-2329
Sheet 1 of 1

Ground Water Elevation/Product Level (feet)

Data Point	TOC	07/09/98					
MW-1	100.00	87.83					
MW-2	99.28	87.43					
MW-3	99.58	88.98					
MW-4	100.56	87.16					
Culvert Well	96.41	86.05					

Notes:
1 - Elevation datum assumed
2 - Reference elevation is elevation of top of PVC well casing
Light Grey Cell = DRY
Dark Grey Cell = Inaccessible

Project: Cumberland Farms, Inc.
Location: Newport, Vermont

Table 2
VDEC Site # 97-2329
Sheet 1 of 1

Photoionization Detector Results (PID - ppm)

Data Point	06/29/98	07/09/98				
MW-1		1.0				
MW-2		BG				
MW-3		0.8				
MW-4		600				
Culvert Well		BG				
Wetland Point #1	BG					
SS-1	BG					
SS-2	BG					
CFI Building	BG					
Adelphia Cable Building	BG					
Ray's Real Estate Basment	BG					
Grocery Store Basement	BG					

Notes:
BG - Background
SL - Saturated Lamp

Project: Cumberland Farms, Inc.
Location: Newport, Vermont

Table 3
VDEC Site # 97-2329
Sheet 1 of 2

Ground Water Quality Results

Data Point	Compound	07/09/98				
MW-1	Benzene	<1				
	Toluene	<2				
	Ethylbenzene	<2				
	Xylenes	<2				
	MTBE	<2				
	BTEX	<7				
	BTEX + MTBE	<9				
	TPH	0.019				
MW-2	Benzene	<1				
	Toluene	<2				
	Ethylbenzene	<2				
	Xylenes	<2				
	MTBE	<2				
	BTEX	<7				
	BTEX + MTBE	<9				
	TPH	<0.01				
MW-3	Benzene	<1				
	Toluene	<2				
	Ethylbenzene	<2				
	Xylenes	<2				
	MTBE	<2				
	BTEX	<7				
	BTEX + MTBE	<9				
	TPH	<0.01				
MW-4	Benzene	3,120				
	Toluene	32,500				
	Ethylbenzene	3,750				
	Xylenes	19,000				
	MTBE	<200				
	BTEX	58370				
	BTEX + MTBE	58570				
	TPH	97.43				
Culvert Well	Benzene	7,230				
	Toluene	26,300				
	Ethylbenzene	4,930				
	Xylenes	25,200				
	MTBE	<500				
	BTEX	63660				
	BTEX + MTBE	64160				
	TPH	137.4				

NOTES:
< - Contaminant not detected at specified detection limit
Light Grey Cell = Dry
Dark Grey Cell = Inaccessible
* - All contaminant concentrations in parts per billion (ppb) except TPH which is in parts per million (ppm)

Project: Cumberland Farms, Inc.
Location: Newport, Vermont

Table 3
VDEC Site # 97-2329
Sheet 2 of 2

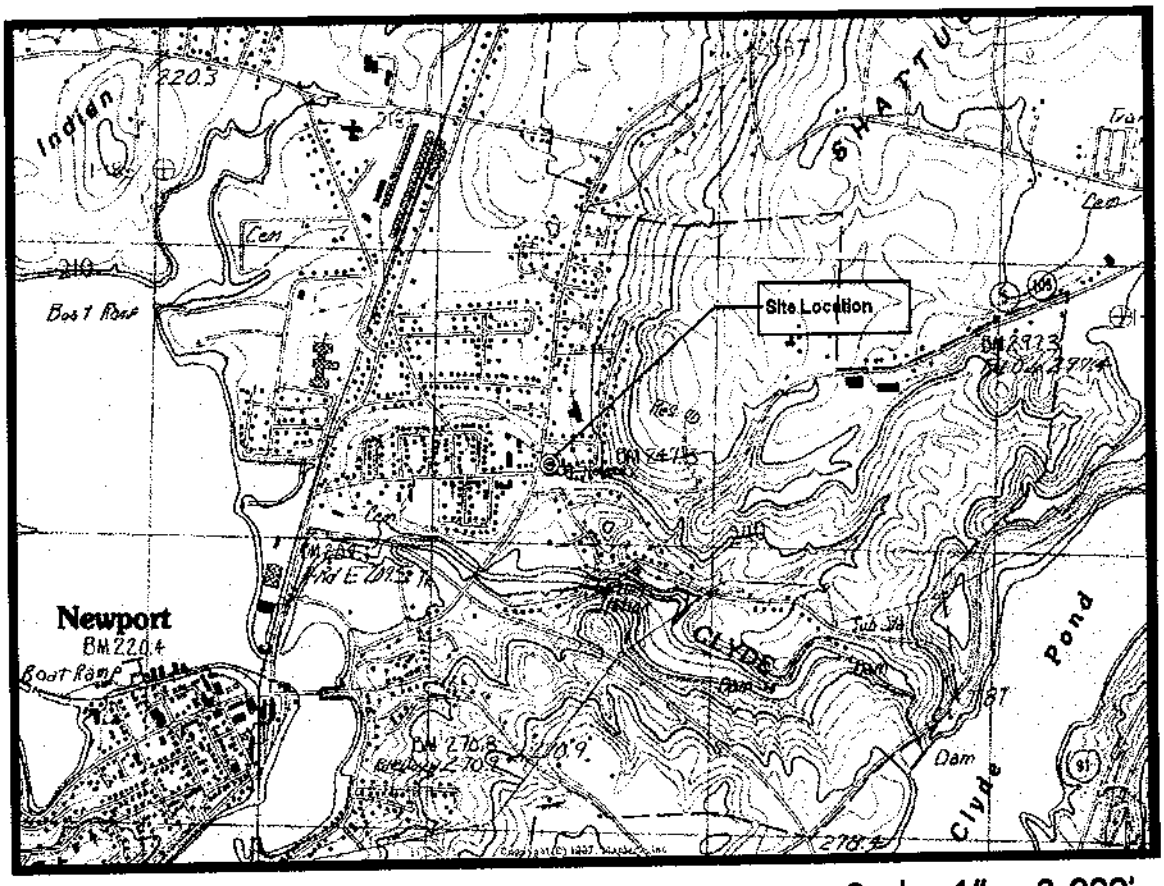
Ground Water Quality Results

Wetland Point	Benzene					
	Toluene					
	Ethylbenzene					
	Xylenes					
	MTBE					
	BTEX					
	BTEX + MTBE					
	TPH					
Trip Blank	Benzene	<1				
	Toluene	<2				
	Ethylbenzene	<2				
	Xylenes	<2				
	MTBE	<2				
	BTEX	<7				
	BTEX + MTBE	<9				
	TPH	<0.01				

NOTES:
< - Contaminant not detected at specified detection limit
Light Grey Cell = Dry
Dark Grey Cell = Inaccessible
* - All contaminant concentrations in parts per billion (ppb) except TPH which is in parts per million (ppm)

Figure 1

Cumberland Farms, Inc.
Station #4001
Newport, Vermont



Scale 1" = 2,000'

QUADRANGLE LOCATION

NEWPORT, VERMONT

PROVISIONAL EDITION 1986

44072-H2-TM-024

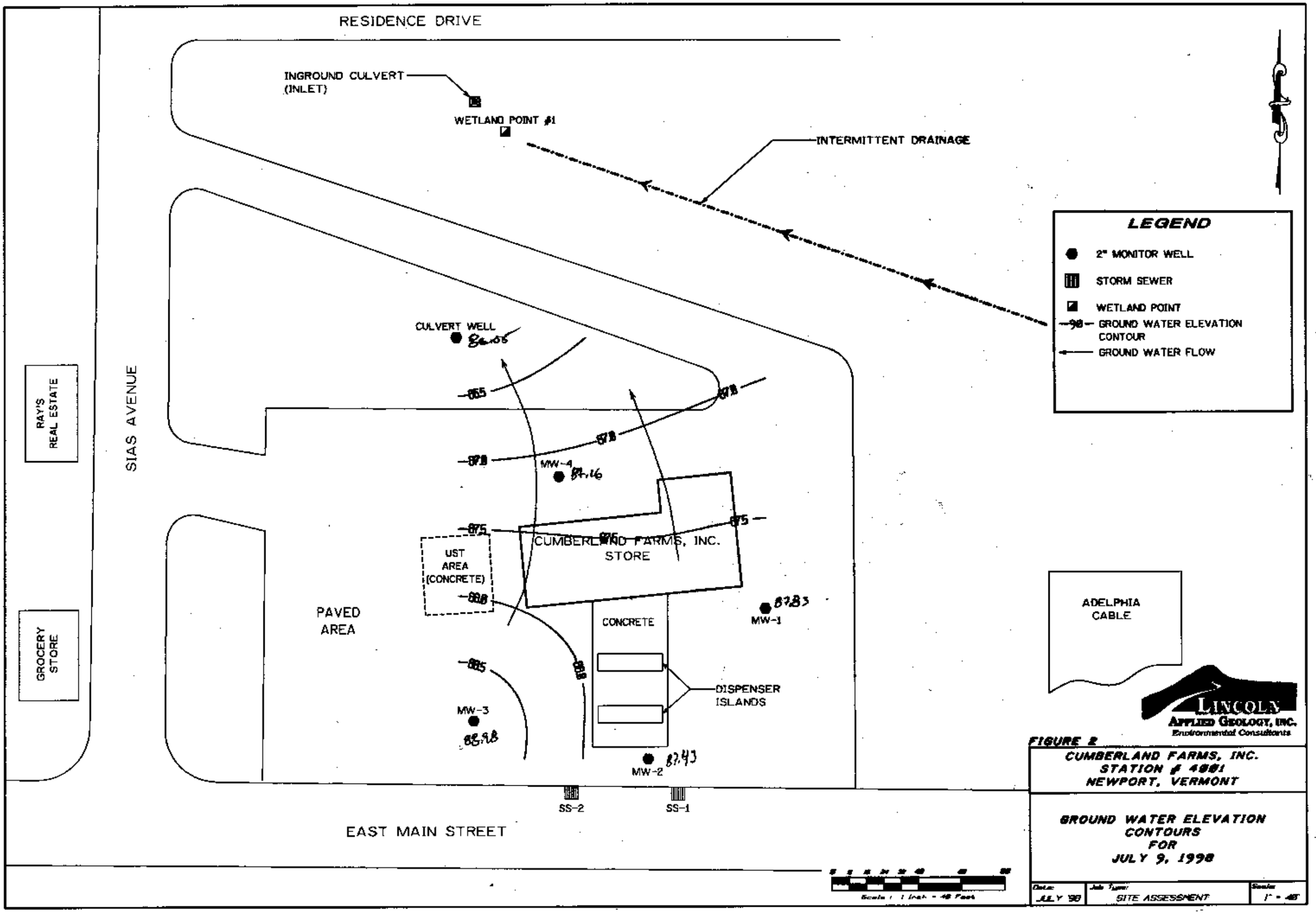

RESIDENCE DRIVE
INGROUND CULVERT (INLET)
WETLAND POINT #1
INTERMITTENT DRAINAGE
LEGEND
2" MONITOR WELL
STORM SEWER
WETLAND POINT
GROUND WATER ELEVATION CONTOUR
GROUND WATER FLOW
CULVERT WELL
86.05
MW-4
84.16
CUMBERLAND FARMS, INC. STORE
UST AREA (CONCRETE)
PAVED AREA
CONCRETE
DISPENSER ISLANDS
MW-1
87.83
MW-3
88.98
MW-2
87.43
SS-2
SS-1
SIAS AVENUE
RAY'S REAL ESTATE
GROCERY STORE
ADELPHIA CABLE
EAST MAIN STREET
LINCOLN APPLIED GEOLOGY, INC.
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FIGURE 2
CUMBERLAND FARMS, INC.
STATION # 4881
NEWPORT, VERMONT
GROUND WATER ELEVATION CONTOURS FOR JULY 9, 1998
Date: JULY '98
Job Type: SITE ASSESSMENT
Scale: 1" = 48'

RESIDENCE DRIVE

INGROUND CULVERT (INLET)

WETLAND POINT #1

INTERMITTENT DRAINAGE

LEGEND

- 2" MONITOR WELL
- STORM SEWER
- WETLAND POINT

<7; <2 BTEX; MTBE CONTAMINANT CONCENTRATION (PPB)

RAY'S REAL ESTATE

SIAS AVENUE

CULVERT WELL
63,660; <500

58,370; <200
MW-4

UST AREA (CONCRETE)

CUMBERLAND FARMS, INC. STORE

PAVED AREA

CONCRETE

MW-1
<7; <2

GROCERY STORE

<7; <2
MW-3

DISPENSER ISLANDS

ADELPHIA CABLE

MW-2
<7; <2

SS-2

SS-1

EAST MAIN STREET

Scale: 1 Inch = 40 Feet

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FIGURE 3

CUMBERLAND FARMS, INC.
STATION # 4881
NEWPORT, VERMONT

WATER QUALITY SUMMARY MAP FOR JULY 9, 1998

Date	Job Type	Scale
JULY '98	SITE ASSESSMENT	1" = 40'

RESIDENCE DRIVE

INGROUND CULVERT (INLET)

WETLAND POINT #1

INTERMITTENT DRAINAGE

LEGEND

- 2" MONITOR WELL
- STORM SEWER
- WETLAND POINT
- PROPOSED MONITOR WELL LOCATION

CULVERT WELL

RAY'S REAL ESTATE

SIAS AVENUE

MW-4

CUMBERLAND FARMS, INC. STORE

UST AREA (CONCRETE)

PAVED AREA

CONCRETE

MW-1

GROCERY STORE

DISPENSER ISLANDS

MW-3

MW-2

ADELPHIA CABLE

SS-2

SS-1

EAST MAIN STREET

Scale : 1 Inch = 48 Feet

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FIGURE 4

CUMBERLAND FARMS, INC.
STATION # 4881
NEWPORT, VERMONT

PROPOSED GROUND WATER MONITORING WELL LOCATIONS

Date:	Job Type:	Scale:
JULY '98	SITE ASSESSMENT	1" = 48'

Appendix A

Detailed Well Logs

WELL LOG

WELL: MW-1
LOCATION: Cumberland Farms Inc., Newport, Vermont - Near southeast corner of CFI building.
DRILLER: Tri-State Drilling & Boring
HYDROGEOLOGIST: Jason S. Barnard, Lincoln Applied Geology, Inc.
DATE: 6/29/98

Soils Description: (BG = Background [ ], SL = Saturated Lamp [>500], ppm = Parts Per Million)

Depth	Description	PID (ppm)
5.0 - 5.5'	Light Brown, very fine to fine sand, trace small gravel, dry.	BG
5.5 - 7.0'	Light Brown to grey, very fine sand, trace silt, damp.	BG
10.0 - 10.5'	Brown, very fine sandy silt, weak blocky structure, moist.	BG
10.5 - 10.8'	Brown, fine to medium sand, moist.	BG
10.8 - 11.3'	Brown to grey, very fine sandy silt, trace clay, weak blocky structure, damp.	BG
15 - 16.4'	Light brown to brown, silt, trace very fine sand, saturated.	BG

Well Construction:

Bottom of Boring: 18.0'
Bottom of Well: 18.0'
Well Screen: 10.0' (8.0 - 18.0') of 2" sch. 40 PVC 0.010" slot
Solid Riser: 7.5' (0.5 - 8.0') of 2" sch. 40 PVC
Sand Pack: 12.0' (6.0 - 18.0') of No.1 sand
Bentonite Seal: 2.0' (4.0 - 6.0') of bentonite chips
Backfill: 3.0' (1.0 - 4.0')
Well Box: Cemented Flush to Grade

WELL LOG

WELL:	MW - 2
LOCATION:	Cumberland Farms Inc., Newport, Vermont - In the small grassy island south of the dispenser island area.
DRILLER:	Tri-State Drilling & Boring
HYDROGEOLOGIST:	Jason S. Barnard, Lincoln Applied Geology, Inc.
DATE:	6/29/98

Soils Description: (BG = Background [ ], SL = Saturated Lamp [>500], ppm = Parts Per Million)

Depth	Description	PID (ppm)
0.0 - 0.2'	Light brown, fine sand, loose granular structure, dry.	6.1
5.0 - 7.0'	Light brown, very fine to fine sand, loose granular structure, moist at 6.7'	7.9
10.0 - 10.5'	Dark brown to reddish brown, very fine sandy silt, damp.	7.0
10.5 - 11.0'	Reddish brown, very fine sandy silt, saturated.	7.0
11.0 - 11.6'	Brown, very fine sand, some silt, saturated.	7.0
11.6 - 12.0'	Light brown, very fine to fine sand, trace silt, saturated.	7.0

Well Construction:

Bottom of Boring:	16.0'
Bottom of Well:	16.0'
Well Screen:	10.0' (6.0 - 16.0') of 2" sch. 40 PVC, 0.010" slot
Solid Riser:	5.5' (0.5 - 6.0') of sch. 40 PVC
Sand Pack:	12.0' (4.0 - 16.0') of No.1 sand
Bentonite Seal:	2.0' (2.0 - 4.0') of bentonite chips
Backfill:	1.0' (1.0 - 2.0')
Well Box:	Cemented Flush

WELL LOG

WELL:	MW-3
LOCATION:	Cumberland Farms Inc., Newport, Vermont - Near the corner of East Main Street and Sias Avenue in front of the CFI building.
DRILLER:	Tri-State Drilling & Boring
HYDROGEOLOGIST:	Jason S. Barnard, Lincoln Applied Geology, Inc.
DATE:	6/29/98

Soils Description: (BG = Background [ ], SL = Saturated Lamp [>500], ppm = Parts Per Million)

Depth	Description	PID (ppm)
0.5 - 2.0'	Brown, medium to coarse sand, some small gravel, trace quartz rock fragments, dry.	14.1
5.0 - 7.0'	Dark brown, very fine to fine sand, some silt, weak blocky structure, dry.	10.6
10.0 - 10.7'	Dark brown to grey, silt, some clay, moist.	6.1
10.7 - 12.0'	Dark brown, very fine sand, little silt, moist.	6.1
15.0 - 17.0'	Light grey to brown, silt, little very fine sand, trace clay, weak angular blocky structure, dry.	7.0

Well Construction:

Bottom of Boring:	19.0'
Bottom of Well:	19.0'
Well Screen:	10.0' (9.0 - 19.0') of 2" sch. 40 PVC, 0.010" slot
Solid Riser:	8.5' (0.5 - 9.0') of 2" sch. 40 PVC
Sand Pack:	12.0' (7.0 - 19.0') of No.1 sand
Bentonite Seal:	2.0' (5.0 - 7.0') of bentonite chips
Backfill:	4.0' (1.0 - 5.0')
Well Box:	Cemented Flush

WELL LOG

WELL: MW - 4
LOCATION: Cumberland Farms Inc., Newport, Vermont - On the rear of the CFI property.
DRILLER: Tri-State Drilling & Boring
HYDROGEOLOGIST: Jason S. Barnard, Lincoln Applied Geology, Inc.
DATE: 6/29/98

Soils Description: (BG = Background [ ], SL = Saturated Lamp [>500], ppm = Parts Per Million)

Depth	Description	PID (ppm)
0.5 - 1.0'	Dark brown, medium to coarse sand, some medium gravel, dry.	BG
1.0 - 2.0'	Light brown, fine sand, trace silt, trace large gravel, dry.	BG
5.0 - 7.0'	Light brown, very fine sand, trace silt, dry.	BG
10.0 - 11.3'	Light brown, very fine sand, trace silt, dry.	5.3
11.3 - 12.0'	Dark grey to black, fine to medium sand, trace asphalt fragments, damp. Faint hydrocarbon odor.	76.4
15.0 - 16.9'	Dark brown, fine to medium sand, loose granular structure, saturated. Strong hydrocarbon odor present.	860

Well Construction:

Bottom of Boring: 20.0'
Bottom of Well: 20.0'
Well Screen: 10.0' (10.0 - 20.0') of 2" sch. 40 PVC. 0.010" slot
Solid Riser: 9.5' (0.5 - 10.0') of 2" sch. 40 PVC
Sand Pack: 12.0' (8.0 - 20.0') of No.1 sand
Bentonite Seal: 2.0' (6.0 - 8.0') of bentonite chips
Backfill: 5.0' (1.0 - 6.0')
Well Box: Cemented Flush

ri-State Drilling & Boring, Inc.

RR#2 Box 113, Gaskell Hill
est Burke,Vermont 05871
2-467-3123

BIT # ___ FTG _____

BIT # ___ FTG _____

SHEET 1 of 4

TO Lincoln Applied Tech Address

DATE June 29, 1998

OJECT NAMECumberland Farms Location Newport, Vermont

HOLE NO. MW-1

REPORT SENT TO

PROJECT #

LINE & STA.

MPLES SENTTO

OUR JOB # 398

OFFSET

OUND WATER OBSERVATIONS

T _____ AFTER _____ HRS

AT _____ AFTER _____ HRS

	CASING	SAMPLER	CORE BAR
TYPE	4.25		
SIZE ID			
HAMMER WT.	140		BIT
HAMMER FALL	30		

SURFACE ELEV.

DATE STARTED 6/29/98

DATE COMPLE. 6/29/98

BORING FOREMAN Wayne

INSPECTOR Jason

SOILS ENGR.

LOCATION OF BORING

DEPTH	CASING BLOWS PER/FT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6' ON SAMPLER FROM 0-6	TO 6-12	12-18	18-24	MOISTURE DENSITY/ CONSIST.	NO.	PEN.	REC.	SOIL IDENTIFICATION REMARKS, INCLUDE COLOR, GRADATION, TYPE OF SOIL ROCK-COLOR, TYPE, CONDITION, HARNESS, DRILLING TIME, SEAMS AND ETC.
		5-7	Dry	2	1	1	1	Dry	1	24	18	Light brown very fine sand
		10-12	Dry	4	9	4	10	Moist/ Sat	2	24	16	Very fine to medium sand/some coarse sand, trace clay
		15-17	Dry	3	4	6	7	Sat	3	24	20	No clay- silty very fine sand
												augured to 18'
												End of hole

RECEIVED

LINCOLN APPLIED GEOLOGY, INC.

WELL REPORT

Set well @ 18', used 10' screen, 8' Riser, sand from 18' to 6', chips to 5.5, Backfill w/natural

GROUND SURFACE TO	USED	CASING: THEN		
MPLE TYPE	PROPORTIONS USED	140LB WT. X30' FALL ON 2' O.D. SAMPLER		
D=DRY C=CORED W=WASHED	TRACE 0 TO 10%	COHESIONLESS DENSITY		COHESIVE CONSISTENCY
=UNDISTURBED PISTON	LITTLE 10 TO 20%	0-10	LOOSE	0-4 SOFT
=TEST PIT A=AUGER V=VANE TEST	SOME 20 TO 35%	10-30	MED.DENSE	4-8 M/STIFF
UT=UNDISTURBED THINWALL	AND 35 TO 50%	30-50	DENSE	8-15 STIFF
		50+	VERY DENSE	15-30 VERY STIFF

SUMMARY

EARTH BORING 18'

Steam 20'

SAMPLES 3

ATERIALS USED

CREEN	10	SAND	3	ROAD BOX	1
RISER	8	BENTONITE	1/2	WELL GUARDS	
APS	1	HOLE PLUG		MIS:	cement
PLUG	1	ENV GROUT			

ri-State Drilling & Boring, Inc.

RR#2 Box 113, Gaskell Hill
est Burke,Vermont 05871
2-467-3123

BIT # ___ FTG _____

BIT # ___ FTG _____

SHEET 4 of 4

DATE June 29, 1998

HOLE NO. MW-2

LINE & STA.

OFFSET

TO Lincoln Applied Tech — Address

OJECT NAMECumberland Farms — Location Newport, Vermont

EPORT SENT TO — PROJECT #

AMPLES SENTTO — OUR JOB # 39B

OUND WATER OBSERVATIONS

AT _____ AFTER _____ HRS

T _____ AFTER _____ HRS

	CASING	SAMPLER	CORE BAR
TYPE	4¼		
SIZE ID			
HAMMER WT.	140		BIT
HAMMER FALL	30"		

SURFACE ELEV.

DATE STARTED 6/29/98

DATE COMPLE. 6/29/98

BORING FOREMAN Wayne

INSPECTOR Jason

SOILS ENGR.

LOCATION OF BORING

DEPTH	CASING BLOWS PER/FT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6' ON SAMPLER FROM 0-6	TO 6-12	12-18	18-24	MOISTURE DENSITY/ CONSIST.	NO.	PEN.	REC.	SOIL IDENTIFICATION REMARKS, INCLUDE COLOR, GRADATION, TYPE OF SOIL ROCK-COLOR, TYPE, CONDITION, HARNESS, DRILLING TIME, SEAMS AND ETC.
		0-2	Dry	6	12	3	3	Dry	1	24	18	Very fine silty sand with coarse sand & stone layer , 1' brown 2" thick
		5-7	Dry	2	1	1	1	Wet	2	24	16	Very fine silty sand
		10-12	Dry	1	1	6	9	Sat	3	24	24	Very fine sand like silt/some medium sand into fine sanc
		15-17	Dry	8	7	2	1	Sat	4	24	14	Very fine to meium sand into silty with very fine sand Some coarse in top
												End of hole

WELL REPORT

t well @ 16', used 10' screen, 5.5' Riser, sand from 16' to 4', chips to 2, Backfill w/natural

GROUND SUFACE TO — USED — CASING: THEN

SAMPLE TYPE
DRY C=CORED W=WASHED
=UNDISTURBED PISTON
TP=TEST PIT A=AUGER V=VANE TEST
UT=UNDISTURBED THINWALL

PROPORTIONS USED
TRACE 0 TO 10%
LITTLE 10 TO 20%
SOME 20 TO 35%
AND 35 TO 50%

140LB WT. X30' FALL ON 2' O.D. SAMPLER

COHESIONLESS DENSITY		COHESIVE CONSISTENCY
0-10	LOOSE	0-4 SOFT
10-30	MED.DENSE	4-8 M/STIFF
30-50	DENSE	8-15 STIFF
50+	VERY DENSE	15-30 VERY STIFF

SUMMARY

EARTH BORING

ROCK CORING

SAMPLES

ATERIALS USED

SCREEN	10	SAND	3	ROAD BOX	1
RISER	5.5	BENTONITE	1/2	WELL GUARDS	
CAPS	1	HOLE PLUG		MIS:	cement
L.PLUG	1	ENV GROUT			

ri-State Drilling & Boring, Inc.

RR#2 Box 113, Gaskell Hill
est Burke,Vermont 05871
2-467-3123

BIT # ___ FTG _____

BIT # ___ FTG _____

SHEET 3 of 4

DATE June 29, 1998

HOLE NO. MW-3

LINE & STA.

OFFSET

TO Lincoln Applied Tech Address

OJECT NAMECumberland Farms Location Newport, Vermont

EPORT SENT TO PROJECT #

SAMPLES SENTTO OUR JOB # 39B

OUND WATER OBSERVATIONS

AT _____ AFTER _____ HRS

T _____ AFTER _____ HRS

	CASING	SAMPLER	CORE BAR
TYPE	4 1/4		
SIZE ID			
HAMMER WT.	140		BIT
HAMMER FALL	30"		

SURFACE ELEV.

DATE STARTED 6/29/98

DATE COMPLE. 6/29/98

BORING FOREMAN Wayne

INSPECTOR Jason

SOILS ENGR.

LOCATION OF BORING

DEPTH	CASING BLOWS PER/FT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6' ON SAMPLER FROM 0-6	TO 6-12	12-18	18-24	MOISTURE DENSITY/ CONSIST.	NO.	PEN.	REC.	SOIL IDENTIFICATION REMARKS, INCLUDE COLOR, GRADATION, TYPE OF SOIL ROCK-COLOR, TYPE, CONDITION, HARNESS, DRILLING TIME, SEAMS AND ETC.
		0-2	Dry	20	25	17	16	Dry	1	24	18	Fine to coarse sand with fine gravel
												Auger Refusal @ 4' offset ten feet close to Island
												Auger Refusal @ 4'/ moved ahead 20'
		5-7	Dry	4	4	7	6	Dry	2	24	4	Fine to coarse sand with fine gravel
		10-12	Dry	4	9	25	34	Moist	3	24	18	Silty clay into fine sand
		15-17	Dry	21	26	34	30	Dry	4	24	16	Silty very fine sand/till like
												End of hole

WELL REPORT

Set well @ 19', used 10' screen, 8'.5 Riser, sandpack to 7', chips to 5

GROUND SUFACE TO

APLE TYPE

D=DRY C=CORED W=WASHED

=UNDISTURBED PISTON

=TEST PIT A=AUGER V=VANE TEST

U1=UNDISTURBED THINWALL

USED

PROPORTIONS USED

TRACE 0 TO 10%

LITTLE 10 TO 20%

SOME 20 TO 35%

AND 35 TO 50%

CASING: THEN

140LB WT. X30' FALL ON 2' O.D. SAMPLER

COHESIONLESS DENSITY		COHESIVE CONSISTENCY
0-10	LOOSE	0-4 SOFT
10-30	MED.DENSE	4-8 M/STIFF
30-50	DENSE	8-15 STIFF
50+	VERY DENSE	15-30 VERY STIFF

SUMMARY

EARTH BORING 19'

ROCK CORING 20'

SAMPLES 4

ATERIALS USED

CREEN	10	SAND	3	ROAD BOX	1
RISER	8.5	BENTONITE	1	WELL GUARDS	
APS	1	HOLE PLUG		MIS:	cement
PLUG	1	ENV GROUT			

ri-State Drilling & Boring, Inc.

RR#2 Box 113, Gaskell Hill
est Burke,Vermont 05871
2-467-3123

BIT # ___ FTG _____

BIT # ___ FTG _____

SHEET 2 of 4

DATE June 29, 1998

HOLE NO. MW-4

LINE & STA.

OFFSET

TO Lincoln Applied Tech Address

ROJECT NAMECumberland Farms Location Newport, Vermont

REPORT SENT TO PROJECT #

AMPLES SENTTO OUR JOB # 39B

ROUND WATER OBSERVATIONS	CASING	SAMPLER	CORE BAR
AT ____ AFTER ____ HRS	TYPE 4.25		
	SIZE ID		
AT ____ AFTER ____ HRS	HAMMER WT. 140		BIT
	HAMMER FALL 30		

SURFACE ELEV.
DATE STARTED 6/29/98
DATE COMPLE. 6/29/98
BORING FOREMAN Wayne
INSPECTOR Jason
SOILS ENGR.

LOCATION OF BORING

DEPTH	CASING BLOWS PER/FT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6' ON SAMPLER FROM 0-6	TO 6-12	12-18	18-24	MOISTURE DENSITY/ CONSIST.	NO.	PEN.	REC.	SOIL IDENTIFICATION REMARKS, INCLUDE COLOR, GRADATION, TYPE OF SOIL ROCK-COLOR, TYPE, CONDITION, HARNESS, DRILLING TIME, SEAMS AND ETC.
		0-2	Dry	13	13	13	12	Dry	1	24	18	Very fine sand
		5-7	Dry	6	5	6	5	Dry	2	24	18	Very fine sand
		10-12	Dry	4	1	2	4	Dry	3	24	6	Fine to medium sand (odor on tip)
		10-17	Dry	2	1	8	10	Sat	4	24	22	Fine to medium sand, some coarse sand (odor)
												Set at 20'
												End of hole

WELL REPORT

Set well @ 20', used 10' screen, 9.5' Riser, sand to 8", chips to 6, Backfill to top

GROUND SUFACE TO	USED	CASING: THEN		
MPLE TYPE	PROPORTIONS USED	140LB WT. X30' FALL ON 2' O.D. SAMPLER		
D=DRY C=CORED W=WASHED	TRACE 0 TO 10%	COHESIONLESS DENSITY		COHESIVE CONSISTENCY
=UNDISTURBED PISTON	LITTLE 10 TO 20%	0-10	LOOSE	0-4 SOFT
=TEST PIT A=AUGER V=VANE TEST	SOME 20 TO 35%	10-30	MED.DENSE	4-8 M/STIFF
UT=UNDISTURBED THINWALL	AND 35 TO 50%	30-50	DENSE	8-15 STIFF
		50+	VERY DENSE	15-30 VERY STIFF

SUMMARY

EARTH BORING 20'

Steam 20'

SAMPLES 4

ATERIALS USED

CREEN	10	SAND	3	ROAD BOX	1
RISER	9.5	BENTONITE	1/1	WELL GUARDS	
CAPS	1	HOLE PLUG		MIS:	cement
PLUG	1	ENV GROUT			

Appendix B

Water Quality Laboratory Reports
for
July 7, 1998

 TOXIKON CORP. REPORT Work Order # 98-07-248

Received: 07/14/98 07/20/98 10:20:57

REPORT LINCOLN APPLIED GEOLOGY
TO REVELL DRIVE
LINCOLN, VT. 05443
802-453-4384 FAX: 453-5399
ATTEN BILL NORLAND

PREPARED TOXIKON CORPORATION
BY 15 WIGGINS AVE
BEDFORD, MA 01730
ATTEN PAUL LEZBERG
PHONE (617)275-3330

CERTIFIED BY

CONTACT JOHNM

CLIENT LINCOLN APP SAMPLES 6
COMPANY LINCOLN APPLIED GEOLOGY
FACILITY REVELL DRIVE
LINCOLN, VT. 05443

MA CERT # M-MA064: TRACE METALS, SULFATE,CYANIDE,RES. FREE CHLORINE, Ca, TOTAL ALK., TDS, pH, THMs, VOC, PEST.,NUTRIENTS. DEMAND. O&G, PHENOLICS, PCBs . CT DHS #PH-0563, NY #10778 FL HRS E87143, NJ DEP 59538, NC DNR286, SC 88002, NH 204091-C.

WORK ID CFI NEWPORT
TAKEN 7/13/98
TRANS
TYPE WATER
P.O. #
INVOICE under separate cover

VERIFIED BY:
CERT # MMA064

SAMPLE IDENTIFICATION

01 TRIP BLANK
02 MW-1
03 MW-2
04 MW-3
05 MW-4
06 CULVERT WELL

TEST CODES and NAMES used on this workorder

8020M PURGEABLE AROMATICS
GRO GASOLINE RANGE ORGANICS

RECEIVED
JUL 29 1998
LINCOLN APPLIED GEOLOGY INC.

Received: 07/14/98

TOXIKON CORP. REPORT
Results by Sample

Work Order # 98-07-248

SAMPLE ID TRIP BLANK FRACTION 01A TEST CODE 8020M NAME PURGEABLE AROMATICS
Date & Time Collected not specified Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	ND	1.0
TOLUENE	ND	2.0
ETHYLBENZENE	ND	2.0
XYLENES (TOTAL)	ND	2.0
Methyl-t-Butyl Ether	ND	2.0

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/16/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 1

ND = not detected at detection limit

RECEIVED
JUL 29 98
LINCOLN APPLIED GEOL

Received: 07/14/98

TOXIKON CORP. REPORT Work Order # 98-07-248

Results by Sample

SAMPLE ID TRIP BLANK FRACTION 01A TEST CODE GRO NAME GASOLINE RANGE ORGANICS

Date & Time Collected not specified Category WATER

8015 MODIFIED GRO

	RESULT *	LIMIT
ALIPHATICS	ND	0.010
AROMATICS	ND	0.010

Notes and Definitions for this Report:

DATE RUN 07/16/98
ANALYST NLC
INSTRUMENT V5
DIL. FACTOR 1
UNITS = mg/L

ND = not detected at detection limit

RECEIVED
JUL 29
APPLIED GEOLOGY

Received: 07/14/98

TOXIKON CORP. REPORT

Results by Sample

Work Order # 98-07-248

SAMPLE ID MW-1 FRACTION 02A TEST CODE 8020M NAME PURGEABLE AROMATICS

Date & Time Collected 07/13/98 12:45:00 Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	ND	1.0
TOLUENE	ND	2.0
ETHYLBENZENE	ND	2.0
XYLENES (TOTAL)	ND	2.0
Methyl-t-Butyl Ether	ND	2.0

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/17/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 1

ND = not detected at detection limit

RECEIVED
JUL 29 1998
APPLIED GEOLOGY

Received: 07/14/98

TOXIKON CORP. REPORT
Results by Sample

Work Order # 98-07-248

SAMPLE ID MW-1 FRACTION 02A TEST CODE GRO NAME GASOLINE RANGE ORGANICS
Date & Time Collected 07/13/98 12:45:00 Category WATER

8015 MODIFIED GRO

	RESULT	LIMIT
	*	
ALIPHATICS	ND	0.010
AROMATICS	0.019	0.010

Notes and Definitions for this Report:

DATE RUN	07/17/98
ANALYST	NLC
INSTRUMENT	V5
DIL. FACTOR	1
UNITS =	mg/L

ND = not detected at detection limit

RECEIVED
[illegible] 98
[illegible] APPLIED GEOLOGY, INC

TOXIKON CORP. REPORT Work Order # 98-07-248

Received: 07/14/98

Results by Sample

SAMPLE ID MW-2 FRACTION 03A TEST CODE 8020M NAME PURGEABLE AROMATICS

Date & Time Collected 07/13/98 13:05:00 Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	ND	1.0
TOLUENE	ND	2.0
ETHYLBENZENE	ND	2.0
XYLENES (TOTAL)	ND	2.0
Methyl-t-Butyl Ether	ND	2.0

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/17/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 1

ND = not detected at detection limit

LINCOLN APPLIED G

 TOXIKON CORP. REPORT Work Order # 98-07-248

Received: 07/14/98 Results by Sample

SAMPLE ID MW-2 FRACTION 03A TEST CODE GRO NAME GASOLINE RANGE ORGANICS

Date & Time Collected 07/13/98 13:05:00 Category WATER

8015 MODIFIED GRO

	RESULT	LIMIT
	*	
ALIPHATICS	ND	0.010
AROMATICS	ND	0.010

Notes and Definitions for this Report:

DATE RUN 07/17/98
ANALYST NLC
INSTRUMENT V5
DIL. FACTOR 1
UNITS = mg/L

ND = not detected at detection limit

LINCOLN APPLIED GEOLOGY, INC.

Received: 07/14/98 Results by Sample

SAMPLE ID MW-3 FRACTION 04A TEST CODE 8020M NAME PURGEABLE AROMATICS
Date & Time Collected 07/13/98 13:20:00 Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	ND	1.0
TOLUENE	ND	2.0
ETHYLBENZENE	ND	2.0
XYLENES (TOTAL)	ND	2.0
Methyl-t-Butyl Ether	ND	2.0

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/17/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 1

ND = not detected at detection limit

RECEIVED
JUL 9 1998
LINCOLN APPLIED GEOLOGY, INC.

Received: 07/14/98

TOXIKON CORP. REPORT
Results by Sample

Work Order # 98-07-248

SAMPLE ID MW-3 FRACTION 04A TEST CODE GRO NAME GASOLINE RANGE ORGANICS
Date & Time Collected 07/13/98 13:20:00 Category WATER

8015 MODIFIED GRO

	RESULT	LIMIT
	*	
ALIPHATICS	ND	0.010
AROMATICS	ND	0.010

Notes and Definitions for this Report:

DATE RUN 07/17/98
ANALYST NLC
INSTRUMENT V5
DIL. FACTOR 1
UNITS = mg/L

ND = not detected at detection limit

RECEIVED
JUL 29 1998
APPLIED GEOLOGY, INC.

Received: 07/14/98

TOXIKON CORP. REPORT Work Order # 98-07-248

Results by Sample

SAMPLE ID MW-4 FRACTION 05A TEST CODE 8020M NAME PURGEABLE AROMATICS

Date & Time Collected 07/13/98 13:35:00 Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	3120	100
TOLUENE	32500	200
ETHYLBENZENE	3750	200
XYLENES (TOTAL)	19000	200
Methyl-t-Butyl Ether	ND	200

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/17/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 100

ND = not detected at detection limit

RECEIVED
JUL 9 1998
LINCOLN APPLIED GEOLOGY, INC.

Received: 07/14/98

TOXIKON CORP. REPORT
Results by Sample

Work Order # 98-07-248

SAMPLE ID MW-4 FRACTION 05A TEST CODE GRO NAME GASOLINE RANGE ORGANICS
Date & Time Collected 07/13/98 13:35:00 Category WATER

8015 MODIFIED GRO

	RESULT	LIMIT
	*	
ALIPHATICS	3.13	1.0
AROMATICS	94.3	1.0

Notes and Definitions for this Report:

DATE RUN 07/17/98
ANALYST NLC
INSTRUMENT V5
DIL. FACTOR 100
UNITS = mg/L

ND = not detected at detection limit

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APPLIED BIOLOGY, INC

Received: 07/14/98

TOXIKON CORP. REPORT

Results by Sample

Work Order # 98-07-248

SAMPLE ID CULVERT WELL FRACTION 06A TEST CODE 8020M NAME PURGEABLE AROMATICS

Date & Time Collected 07/13/98 14:00:00 Category WATER

EPA Method 8020 with MTBE

	RESULT	REPORTING LIMIT
BENZENE	7230	250
TOLUENE	26300	500
ETHYLBENZENE	4930	500
XYLENES (TOTAL)	25200	500
Methyl-t-Butyl Ether	ND	500

Notes and Definitions for this Report:

UNITS: ug/L
DATE RUN: 07/16/98
ANALYST: NLC
INSTRUMENT: V5
DIL. FACTOR: 250

ND = not detected at detection limit

RECEIVED
JUL 2 98
APPLIED TECHNOLOGY, INC

Received: 07/14/98 Results by Sample

SAMPLE ID CULVERT WELL FRACTION 06A TEST CODE GRO NAME GASOLINE RANGE ORGANICS
Date & Time Collected 07/13/98 14:00:00 Category WATER

8015 MODIFIED GRO

	RESULT *	LIMIT
ALIPHATICS	10.4	2.5
AROMATICS	127	2.5

Notes and Definitions for this Report:

DATE RUN 07/16/98
ANALYST NLC
INSTRUMENT V5
DIL. FACTOR 250
UNITS = mg/L

ND = not detected at detection limit

RECEIVED
98
LINCOLN APPLIED GEOLOGY, INC.

TEST CODE 8020M NAME PURGEABLE AROMATICS

EPA Method 8020: Volatile Aromatic Compounds incl. MTBE.

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE GRO NAME GASOLINE RANGE ORGANICS

METHOD:EPA METHOD 8015 Modified;Gasoline Range Organics

Nonhalogenated Volatile Organics. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods 3rd Edition, Final Update I.

Quantitation for BTEX/MTBE is performed by analysis on a PID detector. Miscellaneous aromatics eluting between o-xylene and 1,2,4-trimethylbenzene are quantitated on the PID detector using the response factor of o-xylene.Miscellaneous aliphatics eluting between 3-methylpentane and isooctane are quantitated on the FID detector using the response factor of n-hexane.

This method meets the specifications of Maine DEP Method 3.1.1.2.6

RECEIVED
JUL 29 1998
APPLIED GEOLOGY

TOXICON
15 Wiggins Ave., Bedford, MA 01730
Telephone: (781) 275-3330
Fax: (781) 275-7478

CHAIN OF CUSTODY RECORD

WORK ORDER #: 98-07-2[illegible]

DUE DATE: 07-21-98

COMPANY: Lincoln Applied Geology
ADDRESS: 163 Revell Drive
Lincoln VT 05443
PHONE #: (802) 453-4384 FAX #: (802) 453-5[illegible]
P.O. #:
PROJECT MANAGER: Bill Norland
PROJECT ID/LOCATION: CFI Newport

SAMPLE TYPE: 1. WASTEWATER 2. SOIL 3. SLUDGE 4. OIL 5. DRINKING WATER 6. WATER (GW/MW/SW) 7. OTHER (SPECIFY

CONTAINER TYPE: P - PLASTIC G - GLASS V - VOA

ANALYSES

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	EPA 8020+ MTBE	TPH EPA Modified 8020											SPECIAL INSTRUCTIONS/ COMMENTS
1	Trip Blank	GW	40mL	G	1	—	—	HCl	X	X											
—	~~Wetland Point #1~~	~~GW~~	~~40mL~~	~~G~~	~~2~~	~~7-9-98~~	~~12:30~~	~~HCl~~													
2	MW-1						12:45														
3	MW-2						1:05														
4	MW-3						1:20														
5	MW-4						1:35														
6	Culvert well						2:00														

SAMPLED BY: Jeremy Revell	DATE: 7-13-98 TIME: 7:00 AM	QUOTATION #:	
RELINQUISHED BY: [signature]	DATE: 7-13-98 TIME: 7:20 AM	RECEIVED BY: [signature]	DATE: - - TIME: - -
RELINQUISHED BY:	DATE: - - TIME: - -	RECEIVED FOR LAB BY: [signature]	DATE: 07-14-98 TIME: 15-18 -
METHOD OF SHIPMENT		COOLER TEMPERATURE 2-7	

☐ RUSH ..... BUSINESS DAY TURN AROUND
☐ ROUTINE

Sample disposal information
Are there any other known or suspected contaminants in these samples other than those listed above?
Yes No If Yes, 1st Known

Appendix C

Monitor Well Installation and Sampling Cost Estimate

Appendix C

Cumberland Farms, Inc. (CFI)
East Main & Sias, Newport, Vermont
VDEC #97-2329
13-Aug-98
ost Estimate for Additional Monitor Well Installation, Site Monitoring, and Water Quality Sampling

A. Monitor Well Installation (HSA, 2" diameter)

Three 20' deep borings/wells-	3		@	$600.00	per well	$	1,800.00 DRILL
Principal/Senior Hydrogeologist -	1.0	hr(s)	@	$85.00	per hour	$	85.00
Hydrogeologist -	2.0	hr(s)	@	$55.00	per hour	$	110.00
Geologist -	15	hr(s)	@	$45.00	per hour	$	675.00
Mileage -	200	mile(s)	@	$0.30	per mile	$	60.00
					Subtotal	$	2,730.00

B. Ground Water Sampling (One Round)

Hydrogeologist/Site Manager -	1	hr(s)	@	$55.00	per hour	$	55.00
Field Technician -	8	hr(s)	@	$35.00	per hour	$	280.00
Field Technician O.T. -	4	hr(s)	@	$52.50	per hour	$	210.00
Disposable Bailer (1.5") -	8		@	$8.89	each	$	71.12
EPA 8020 + MTBE-	10		@	$31.00	each	$	310.00 LAB
Mileage -	200	mile(s)	@	$0.30	per mile	$	60.00
Sampling Equipment -	1	day(s)	@	$110.00	per day	$	110.00
					Subtotal	$	1,096.12

C. Reporting (Including the need for a long term treatment and/or monitor plan)

Principal/Senior Hydrogeologist -	1	hr(s)	@	$85.00	per hour	$	85.00
Hydrogeologist/Site Manager -	2	hr(s)	@	$55.00	per hour	$	110.00
Geologist -	11	hr(s)	@	$45.00	per hour	$	495.00
Computer/CAD Technician -	4	hr(s)	@	$40.00	per hour	$	160.00
Administrative Assistant -	2	hr(s)	@	$35.00	per hour	$	70.00
					Subtotal	$	920.00

Grand Total >>> $ 4,746.12