Matrix Environmental Southeast, Inc.

Abbott Laboratories

Abbott Laboratories Facility
Laurinburg, North Carolina

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Comprehensive Site Assessment
Groundwater Incident No. 518280

June 2003

Release Date: 30 January 2001
Quantity: 1,500 Gallons of No. 2 Fuel Oil
Source: Subsurface AST Piping
Latitude: 34.799605992
Longitude: -79.454220773

Responsible Party:

Curtis Michols
Senior Environmental Specialist
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Corporate Environmental Services
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Prepared by:

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NORTH CAROLINA PROFESSIONAL SEAL 028693 ENGINEER CHARLA B. REINGANUM
6/11/03

DIVISION OF WATER QUALITY

Certification for the Submittal of a Comprehensive Site Assessment

Responsible Party: Abbott Laboratories
Contact Person: Mr. Curtis Michols
Address: 200 Abbott Park Road
City: Abbott Park **State:** IL **Zip Code:** 60064
Site Name: Abbott Laboratories - Laurinburg
Address: 16900 N. US 15/401 Bypass
City: Laurinburg **State:** NC **Zip Code:** 28353
Groundwater Incident Number: 518280 **Site Priority Ranking:** B

I, Charla Reinganum, a Professional Engineer/Licensed Geologist (circle one) for Matrix Environmental Southeast, Inc. (firm or company of employment) do hereby certify that the information indicated below is enclosed as part of the required Comprehensive Site Assessment (CSA) and that to the best of my knowledge the data, assessments, conclusions, recommendations and other associated materials are correct, complete and accurate.

(Each item must be initialed by the certifying licensed professional)

1. CBR The source of the contamination has been identified. A list of all potential sources of the contamination is attached.
2. CBR Imminent hazards to public health and safety have been identified.
3. CBR Potential receptors and significant exposure pathways have been identified.
4. CBR Geological and hydrogeological features influencing the movement of groundwater have been identified. The chemical and physical character of the contaminants have been identified.
5. CBR The CSA sufficiently characterizes the cause, significance and extent of groundwater and soil contamination such that a Corrective Action Plan can be developed.

If any of the above statements have been altered or items not initialed, provide a detailed explanation. Failure to initial any item or to provide written justification for the lack thereof will result in immediate return of the CSA to the responsible party.

(Please Affix Seal and Signature)

NORTH CAROLINA PROFESSIONAL SEAL 028693 ENGINEER CHARLA B. REINGANUM 6/11/03

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SECTION 6

SOIL INVESTIGATIONS

Three separate soil sampling efforts have been undertaken to characterize residual impacts associated with the fuel oil release as part of the Comprehensive Site Assessment. Table 6-1 summarizes the soil sampling effort methods and includes the following information: date of soil sample collection, sampling rationale, type of soil sample, sample collection method, collection depth of soil sample, laboratory analyses performed, and soil sample location identification. The locations of all the soil samples collected are shown in Figure 6-1. Analytical results were compared to the action levels presented in the *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater* (the Guidance, NCDENR Division of Water Quality Groundwater Section, July 2000).

The soil sampling efforts conducted in 2000 were performed by Radian Engineering of Research Triangle Park, North Carolina (Radian). The 2000 collected samples were analyzed by STL Laboratories of Austin, Texas (STL-Austin). The soil sampling effort conducted in 2002 was performed by Matrix and Excel Civil and Environmental Associates, PLLC of Gastonia, North Carolina (Excel) and the collected samples were analyzed by STL Laboratories of Chicago, Illinois (STL-Chicago). Sampling methods are described in Appendix E.

The soil laboratory analytical results are presented in Appendix F.

6.1 2000 SAMPLING

Three rounds of soil sampling were performed during 2000. In April 2000, saturated soil samples were collected from the 25 gridded sampling locations shown in Figure 6-1 (G1 through G25). The soil samples were analyzed for Total Petroleum Hydrocarbon Gasoline Range Organics (TPH GRO), which generally includes C_5 –C_{12} hydrocarbons, and for Total Petroleum Hydrocarbon Diesel Range Organics (TPH DRO), which generally includes C_9 –C_{28} hydrocarbons. In October 2000, additional TPH DRO saturated soil sampling was repeated at sampling locations G8 and G19 at the 7 feet bgs to 8 feet bgs depth interval and three additional

locations were sampled at this depth interval (G3, G20 and the new location G26). In November 2000, VOC and SVOC saturated soil samples were collected at sample locations G8 and G19 at the 7 feet bgs to 8 feet bgs depth interval.

The TPH GRO April 2000 saturated soil sample analytical results are presented in Tables 6-2 and 6-3. TPH GRO was detected at three soil sample locations (G9 [4 feet bgs to 5 feet bgs], G8 [7 feet bgs to 8 feet bgs], and G13 [7 feet bgs to 8 feet bgs]). TPH GRO was not detected in any sample above the Guidance action level of 10 mg/kg. The TPH DRO April 2000 soil sample analytical results are presented in Tables 6-4 and 6-5. TPH DRO was detected in only two samples (G8 [7 feet bgs to 8 feet bgs], and G13 [7 feet bgs to 8 feet bgs]) and was reported at concentrations above the Guidance action level for TPH DRO (40 mg/kg).

The October 2000 TPH DRO saturated soil analytical results are presented in Table 6-6. The TPH DRO Guidance action level again was exceeded at sampling locations G8 and G19d at a depth of 7 feet bgs to 8 feet bgs.

The November 2000 VOC and SVOC saturated soil analytical results are summarized in Table 6-7. In the soil sample collected at G8, two VOCs, 1,2-dichloroethane and naphthalene, and one SVOC, 2-methylnaphthalene, were detected at concentrations above their respective Guidance action levels. In the soil sample collected at G19, only 1,2-dichloroethane was detected at a concentration above its Guidance action level.

6.2 2002 SAMPLING

In July 2002, additional soil samples were collected from sample locations G8 and G19 to characterize the unsaturated soil at these locations since the previous soil samples were collected as saturated soil samples. TPH DRO soil samples were collected at both locations at the 5 feet bgs to 7 feet bgs and at the 7 feet bgs to 9 feet bgs depth intervals. One VOC soil sample also was collected at sample location G8 at the 7 feet bgs to 9 feet bgs depth intervals. The depth to the water table during this sampling event was 10 feet bgs.

The TPH DRO soil analytical results for this sampling round are presented in Table 6-8; the VOC soil analytical results are presented in Table 6-7. The observed TPH DRO concentrations exceeded the Guidance action levels in three samples (G8 [both depth intervals] and G19 [at the 7 feet bgs to 9 feet bgs depth interval]). However no VOC exceedances of the Guidance action levels were observed.

TABLE 6-1

SUMMARY OF SOIL SAMPLING EFFORT METHODS

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample Location	*Sample Date*	*Purpose*	*Sample Type*	*Collection Method*	*Depth of Sample (in ft bgs)*	*Depth to Water Table*	*Laboratory Analysis*
G1 through G25	April 11 - 12, 2000	Gridded soil samples in vicinity of fuel oil release to assess impacts	Grab sample	DPT	4 to 5	3	TPH GRO (EPA Method 5030/ 8021B/8015)
							TPH DRO (EPA Method 3550/8015)
G7d, G8d, G9d, G12d, G13d, G14d, G17d, G18d, G19d	April 11 - 12, 2000	Evaluate potential vertical migration of fuel oil due to seasonal groundwater fluctuations	Grab sample	DPT	7 to 8	3	TPH GRO (EPA Method 5030/ 8021B/8015)
							TPH DRO (EPA Method 3550/8015)
G3 and G20	October 2, 2000	Define lateral extent of soil impacts	Grab sample	DPT	7 to 8	less than 8	TPH DRO (EPA Method 3550/8015)
G8 and G19	October 2, 2000	Reconfirm April 2000 results	Grab sample	DPT	7 to 8	less than 8	TPH DRO (EPA Method 3550/8015)
G26	October 2, 2000	Define extent of TPH DRO impacts west of G19	Grab sample	DPT	7 to 8	less than 8	TPH DRO (EPA Method 3550/8015)
G8 and G19	November 27, 2000	Speciation of VOCs and SVOCs in areas where TPH DRO soil screening levels exceeded	Grab sample	DPT	7 to 8	6 to 8	VOCs - SW846 8260
							SVOCs - SW846 8270
G8 and G19	July 24, 2002	Characterize unsaturated soils potential impact on groundwater migration pathway	Grab sample	DPT	5 to 7	10	TPH DRO (EPA Method 3550/8015)
G8 and G19	July 24, 2002	Characterize unsaturated soils potential impact on groundwater migration pathway	Grab sample	DPT	7 to 9	10	TPH DRO (EPA Method 3550/8015) and VOCs Method 5035/8260B for G8 only

Key:
TPH DRO =Total Petroleum Hydrocarbon Diesel Range Organics
TPH GRO = Total Petroleum Hydrocarbon Gasoline Range Organics
bgs =below ground surface
DPT = Direct Push Technology
VOC =Volatile Organic Compound
SVOC =Semivolatile Organic Compound

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TABLE 6-2
SUMMARY OF SOIL TPH GRO (4-5 FEET BGS)
ANALYTICAL RESULTS – APRIL 2000

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample ID	TPH GRO[1] (µg/Kg)	Gasoline (µg/Kg)
G1	ND (437 U)	ND (437)
G2	ND (463 U)	ND (463)
G3	ND (448 U)	ND (448)
G4	ND (453 U)	ND (453)
G5	ND (480 U)	ND (480)
G6	ND (433 U)	ND (433)
G7	ND (443 U)	ND (443)
G8	ND (434 U)	ND (434)
G9	1420 below 10ppm	ND (437)
G10	ND (449 U)	ND (449)
G11	ND (460 U)	ND (460)
G12	ND (451 U)	ND (451)
G13	ND (435 U)	ND (435)
G14	ND (453 U)	ND (453)
G15	ND (446 U)	ND (446)
G16	ND (451 U)	ND (451)
G17	ND (446 U)	ND (446)
G18	ND (449 U)	ND (449)
G19	ND (448 U)	ND (448)
G20	ND (442 U)	ND (442)
G21	ND (450 U)	ND (450)
G22	ND (440 U)	ND (440)
G23	ND (438 U)	ND (438)
G24	ND (439 U)	ND (439)
G25	ND (439 U)	ND (439)

[1] Total Petroleum Hydrocarbons, Gasoline Range Organics
Method detection limit shown in parenthesis.
ND = Not detected
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Blank contamination exists.
NCDENR *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other than Petroleum Underground Storage Tanks* clean-up level for low boiling point fuels is 10 mg/kg (10,000 µg/kg) as TPH GRO.

NOTE: Data table prepared by URS Corporation.
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TABLE 6-3
SUMMARY OF SOIL TPH GRO (7-8 FEET BGS)
ANALYTICAL RESULTS – APRIL 2000

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample ID	TPH GRO[1] (µg/Kg)	Gasoline (µg/Kg)
G7d	ND (440 U)	ND (440)
G8d	7030	ND (435)
G9d	ND (427 U)	ND (427)
G12d	ND (429 U)	ND (429)
G13d	1280	ND (456)
G14d	ND (436 U)	ND (436)
G17d	ND (453 U)	ND (453)
G18d	ND (443 U)	ND (443)
G19d	ND (555 U)	ND (443)

[1] Total Petroleum Hydrocarbons, Gasoline Range Organics
Method detection limit shown in parenthesis.
ND = Not detected
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Blank contamination exists.
NCDENR *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other than Petroleum Underground Storage Tanks* clean-up level for low boiling point fuels is 10 mg/kg (10,000 µg/kg) as TPH GRO.

NOTE: Data table prepared by URS Corporation.

TABLE 6-4
SUMMARY OF SOIL TPH DRO (4-5 FEET BGS) ANALYTICAL RESULTS – APRIL 2000

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample ID	TPH DRO[1] (µg/g)	Diesel (µg/g)	Jet Fuel JP4 (µg/g)	Kerosene (µg/g)	Lubricating Oil (µg/g)
G1	ND (9.09 U)	ND (1.71)	ND (1.53)	ND (1.36)	ND (1.71)
G2	ND (7.44 U)	ND (1.82)	ND (1.62)	ND (1.44)	ND (1.82)
G3	ND (5.27 U)	ND (1.77)	ND (1.58)	ND (1.40)	ND (1.77)
G4	ND (6.97 U)	ND (1.78)	ND (1.59)	ND (1.41)	ND (1.78)
G5	ND (6.49 U)	ND (2.86)	ND (1.48)	ND (0.861)	ND (2.86)
G6	ND (6.25 U)	ND (1.70)	ND (1.51)	ND (1.34)	ND (1.70)
G7	ND (5.75 U)	ND (1.74)	ND (1.55)	ND (1.37)	ND (1.74)
G8	ND (6.52 U)	ND (6.52 U)	ND (1.35)	ND (0.784)	ND (2.60)
G9	ND (39.3 U)	ND (39.3 U)	ND (1.36)	ND (0.793)	ND (2.64)
G10	ND (6.65 U)	ND (1.76)	ND (1.57)	ND (1.39)	ND (1.76)
G11	ND (8.72 U)	ND (1.81)	ND (1.61)	ND (1.43)	ND (1.81)
G12	ND (4.72 U)	ND (2.70)	ND (1.40)	ND (0.813)	ND (2.70)
G13	ND (21.0 U)	ND (21.0 U)	ND (1.36)	ND (0.789)	ND (2.62)
G14	ND (7.13 U)	ND (2.73)	ND (1.41)	ND (0.821)	ND (2.73)
G15	ND (6.20 U)	ND (2.70)	ND (1.40)	ND (0.813)	ND (2.70)
G16	ND (8.33 U)	ND (2.74)	ND (1.42)	ND (0.823)	ND (2.74)
G17	ND (9.64 U)	ND (2.67)	ND (1.38)	ND (0.803)	ND (2.67)
G18	ND (6.47 U)	ND (2.68)	ND (1.39)	ND (0.807)	ND (2.68)
G19	ND (5.89 U)	ND (1.78)	ND (1.59)	ND (1.41)	ND (1.78)
G20	ND (6.84 U)	ND (1.73)	ND (1.54)	ND (1.36)	ND (1.73)
G21	ND (6.93 U)	ND (1.76)	ND (1.57)	ND (1.39)	ND (1.76)
G22	ND (7.23 U)	ND (1.72)	ND (1.53)	ND (1.36)	ND (1.72)
G23	ND (6.33 U)	ND (1.72)	ND (1.53)	ND (1.36)	ND (1.72)
G24	ND (6.67 U)	ND (1.71)	ND (1.53)	ND (1.35)	ND (1.71)
G25	ND (5.60 U)	ND (1.73)	ND (1.54)	ND (1.37)	ND (1.73)

[1] Total Petroleum Hydrocarbons, Diesel Range Organics
Method detection limit shown in parenthesis.
ND = Not detected
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Blank contamination exists.
NCDENR *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other than Petroleum Underground Storage Tanks* clean-up level for medium and high boiling point fuels is 40 mg/kg (40 µg/g) as TPH DRO.

NOTE: Data table prepared by URS Corporation.

TABLE 6-5
SUMMARY OF SOIL TPH DRO (7-8 FEET BGS)
ANALYTICAL RESULTS – APRIL 2000

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample ID	TPH DRO[1] (µg/g)	Diesel (µg/g)	Jet Fuel JP4 (µg/g)	Kerosene (µg/g)	Lubricating Oil (µg/g)
G7d	ND (3.52 U)	ND (2.68)	ND (1.39)	ND (0.806)	ND (2.68)
G8d	**1260**	1260	ND (27.1)	ND (15.8)	ND (52.4)
G9d	ND (12.2 U)	ND (12.2 U)	ND (1.34)	ND (0.777)	ND (2.58)
G12d	ND (5.47 U)	ND (2.60)	ND (1.35)	ND (0.783)	ND (2.60)
G13d	ND (34.4 U)	ND (34.4 U)	ND (1.41)	ND (0.821)	ND (2.73)
G14d	ND (4.41 U)	ND (2.65)	ND (1.37)	ND (0.796)	ND (2.65)
G17d	ND (7.34 U)	ND (1.78)	ND (1.59)	ND (1.41)	ND (1.78)
G18d	ND (6.13 U)	ND (2.66)	ND (1.38)	ND (0.801)	ND (2.66)
G19d	**52.5**	52.5	ND (1.37)	ND (0.796)	ND (2.65)

[1] Total Petroleum Hydrocarbons, Diesel Range Organics
Method detection limit shown in parenthesis.
ND = Not detected
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Blank contamination exists.
NCDENR *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other than Petroleum Underground Storage Tanks* clean-up level for medium and high boiling point fuels is 40 mg/kg (40 µg/g) as TPH DRO.
Results shown in bold are above the clean-up level for medium and high boiling point fuels.

NOTE: Data table prepared by URS Corporation.

TABLE 6-6
SUMMARY OF SOIL TPH DRO (7-8 FEET BGS) ANALYTICAL RESULTS – OCTOBER 2000

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sample ID	Analyte				
	TPH DRO[1]	Diesel	Jet Fuel JP4	Kerosene	Lubricating Oil
G3	ND (1.76) U	ND (1.74)	ND (1.55)	ND (1.37)	ND (1.74)
G8	**517**	517	ND (15.0)	ND (13.3)	ND (16.9)
G19	**194**	194	ND (3.12)	ND (2.77)	ND (3.50)
G20	ND (3.65) U	ND (1.70)	ND (1.51)	ND (1.34)	ND (1.70)
G26	ND (3.16) U	ND (1.71)	ND (1.53)	ND (1.35)	ND (1.71)

[1] Total Petroleum Hydrocarbons, Diesel Range Organics
bgs = below ground surface
ND = Analyte not detected above method detection limit.
Method detection limits are shown in parentheses.
All results and method detection limits are in µg/g.
U = Blank contamination exists. The sample quantitation limit has been elevated to the concentration found in the sample and the sample has been designated as not present above this limit (ND).
NCDENR *Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater* action level for medium and high boiling point fuels is 40 mg/kg (40 µg/g) as TPH DRO.
Results shown in bold are above the action level for medium and high boiling point fuels.

NOTE: Data table prepared by URS Corporation.

TABLE 6-7

VOC and SVOC SOIL ANALYTICAL RESULTS

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Sampling Location: / Sample Depth (in ft bgs): / Sample Date: / Sample Condition: / Parameter (in ug/kg)	G8 / 7 to 9 / 11/27/2000 / Saturated	G19 / 7 to 9 / 11/27/2000 / Saturated	G8 / 7 to 9 / 7/24/2002 / Unsaturated	Soil-to-Groundwater Maximum Contaminant Concentration Levels [1] (in ug/kg)
Volatile Organic Compounds				
1,2-Dichloroethane	63.2	63.4	0.68 U	1.8
Toluene	0.305 U	0.34 UJ	7.1	7,000
Tetrachloroethene	3.22 J	0.542 UJ	0.79 U	7.4
Ethylbenzene	152 J	0.474 UJ	17	240
m&p-Xylenes	NA	NA	52	5,000
o-Xylene	NA	NA	32	5,000
Total Xylenes	1,180 J	0.903 UJ	NA	5,000
Isopropylbenzene	128 J	0.513 UJ	6.1	2,000
n-Propylbenzene	413 J	0.834 UJ	10	2,000
1,3,5-Trimethylbenzene	1,070 J	16.2 J	29	7,000
1,2,4-Trimethylbenzene	3,410 J	53.2 J		8,000
sec-Butylbenzene	467 J	6.11 J	9.3	3,000
n-Butylbenzene	1,010 J	23 J	0.99 U	4,000
Naphthalene	1,410	44.2	46	580
Semi-Volatile Organic Compounds				
Acenapththene	474	178 J	NS	8,000
Fluorene	699	8.83 U	NS	44,000
2-Methylnaphthalene	5,170	1380	NS	3,000
Phenanthrene	1,410	457	NS	60,000
Pyrene	212 J	7.35 U	NS	286,000

Key:
ug/kg = micrograms per kilogram
ft = feet
bgs = below ground surface
UJ = Not detected above reported estimated level
U = Not detected above reported level
J = Estimated concentration
UJ = Not detected above estimated reported level

= Exceeds Guidance concentration
NS = Not sampled
NA = Not Analyzed

Notes:
[1] Values obtained from *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater,* State of North Carolin Department of Environment and Natural Resources, Division of Water Quality Groundwater Section, July 2000.

TABLE 6-8

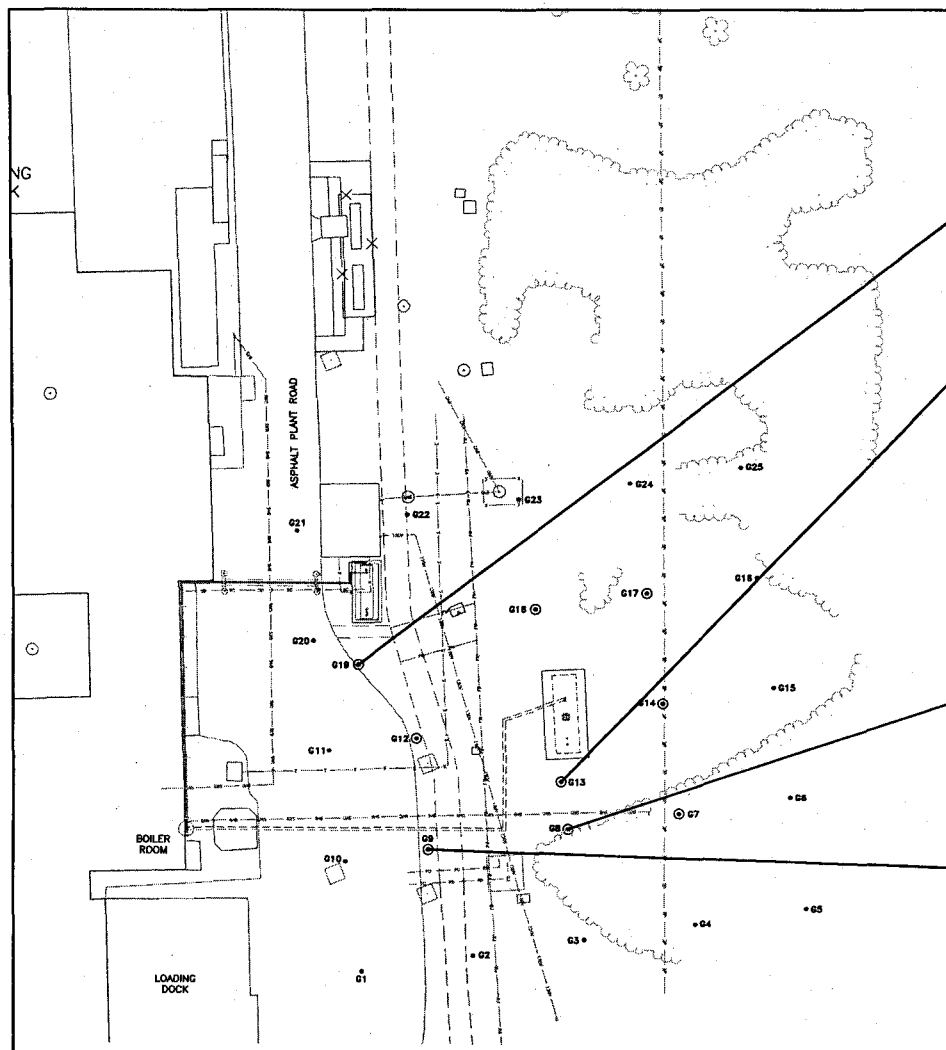
SUMMARY OF SOIL TPH DRO ANALYTICAL RESULTS -- JULY 2002

FUEL OIL RELEASE CSA
ABBOTT LABORATORIES
LAURINBURG, NORTH CAROLINA

Parameter	Units	Sampling Location: G19 Sample Depth (in ft bgs): 5 to 7 Sample ID: ALLSIG19 5-7 Sample Date: 7/24/2002 Lab ID: 210958-3	Sampling Location: G19 Sample Depth (in ft bgs): 7 to 9 Sample ID: ALLSIG19 7-9 Sample Date: 7/24/2002 Lab ID: 210958-4	Sampling Location: G8 Sample Depth (in ft bgs): 5 to 7 Sample ID: ALLSIG8 5-7 Sample Date: 7/24/2002 Lab ID: 210958-1	Sampling Location: G8 Sample Depth (in ft bgs): 7 to 9 Sample ID: ALLSIG8 7-9 Sample Date: 7/24/2002 Lab ID: 210958-2	Total Petroleum Hydrocarbon Action Level[1] (in mg/kg)
Total Petroleum Hydrocarbons Diesel Range Organics	(mg/kg)	7.2 U	250	250	210	40
% Solids	%	85.2	85.2	81.3	86.4	

Key:
mg/kg = milligrams per kilogram
ft = feet
bgs = below ground surface
NE = Not Established
[redacted] = Detected concentration exceeds Total Petroleum Hydrocarbon Action Level
U = Not detected above reported level

Notes:
[1] Values obtained from *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater*, State of North Carolina Department of Environment and Natural Resources, Division of Water Quality Groundwater Section, July 2000.



G19								
SAMPLE DEPTH:		4 TO 5	7 TO 8	7 TO 8	5 TO 7	7 TO 9	7 TO 9	ACTION LEVEL
DATE:		APR-00	APR-00	OCT-00	JUL-02	JUL-02	NOV-00	
CONDITION:		SATURATED	SATURATED	SATURATED	UNSATURATED	UNSATURATED	SATURATED	
TPH GRO	ug/kg	448 U	555 U					10,000
TPH DRO	mg/kg	5.89 U	52.5	194	7.2 U	250		40
VOLATILE ORGANIC COMPOUNDS								
1,2-DICHLOROETHANE	ug/kg						63.4	1.8
1,3,5-TRIMETHYLBENZENE	ug/kg						16.2 J	7,000
1,2,4-TRIMETHYLBENZENE	ug/kg						53.2 J	8,000
SEC-BUTYLBENZENE	ug/kg						6.11 J	3,000
N-BUTYLBENZENE	ug/kg						23 J	4,000
NAPHTHALENE	ug/kg						44.2	580
SEMI-VOLATILE ORGANIC COMPOUNDS								
ACENAPTHTHENE	ug/kg						178 J	8,000
2-METHYLNAPHTHALENE	ug/kg						1,380	3,000
PHENANTHRENE	ug/kg						457	60,000

G13				
SAMPLE DEPTH:		4 TO 5	7 TO 8	ACTION LEVEL
DATE:		APR-00	APR-00	
CONDITION:		SATURATED	SATURATED	
TPH GRO	ug/kg	435 U	1,280	10,000
TPH DRO	mg/kg	21.0 U	34.4 U	40

G8									
SAMPLE DEPTH:		4 TO 5	7 TO 8	7 TO 8	5 TO 7	7 TO 9	7 TO 9	7 TO 9	ACTION LEVEL
DATE:		APR-00	APR-00	OCT-00	JUL-02	JUL-02	NOV-00	JUL-02	
CONDITION:		SATURATED	SATURATED	SATURATED	UNSATURATED	UNSATURATED	SATURATED	UNSATURATED	
TPH GRO	ug/kg	434 U	7,030						10,000
TPH DRO	mg/kg	6.52 U	1,260	517	250	210			40
VOLATILE ORGANIC COMPOUNDS									
1,2-DICHLOROETHANE	ug/kg						63.2	0.68 U	1.8
TOLUENE	ug/kg						0.31 U	7.1	7,000
TETRACHLOROETHENE	ug/kg						3.22 J	0.79 U	7.4
ETHYLBENZENE	ug/kg						152 J	17	240
M&P-XYLENES	ug/kg						NA	52	5,000
O-XYLENE	ug/kg						NA	32	5,000
TOTAL XYLENES	ug/kg						1,180 J	NA	5,000
N-PROPYLBENZENE	ug/kg						413 J	10	2,000
1,3,5-TRIMETHYLBENZENE	ug/kg						1,070 J	29	7,000
1,2,4-TRIMETHYLBENZENE	ug/kg						3,410 J		8,000
SEC-BUTYLBENZENE	ug/kg						467 J	9.3	3,000
N-BUTYLBENZENE	ug/kg						1,010 J	0.99 U	4,000
NAPHTHALENE	ug/kg						1,410	46	580
SEMI-VOLATILE ORGANIC COMPOUNDS									
ACENAPTHTHENE	ug/kg						474		8,000
FLUORENE	ug/kg						699		44,000
2-METHYLNAPHTHALENE	ug/kg						5,170		3,000
PHENANTHRENE	ug/kg						1,410		60,000
PYRENE	ug/kg						212 J		286,000

G9				
SAMPLE DEPTH:		4 TO 5	7 TO 8	ACTION LEVEL
DATE:		APR-00	APR-00	
CONDITION:		SATURATED	SATURATED	
TPH GRO	ug/kg	1,420	427 U	10,000
TPH DRO	mg/kg	39.3 U	12.2 U	40

LEGEND

- LIGHT
- MANHOLE
- WOODS
- EXISTING CONCRETE DRAINAGE DITCH
- FENCE
- FIRE WATER LINE
- FIBER OPTIC CABLE
- GAS LINE
- ELECTRIC LINE
- STORM DRAIN
- 120 VOLT POWER LINE
- 3" SCH. 80 EFFLUENT DISCHARGE LINE
- • INITIAL SOIL SAMPLE COLLECTED FROM DEPTH OF 4 TO 5 FEET BGS
- ⊙ INITIAL SOIL SAMPLE COLLECTED FROM DEPTH OF 4 TO 5 FEET BGS AND 7 TO 8 FEET BGS

N

0 40'
SCALE

NOTES:

1. TPH GRO = TOTAL PETROLEUM HYDROCARBON GASOLINE RANGE ORGANICS.
2. TPH DRO = TOTAL PETROLEUM HYDROCARBON DIESEL RANGE ORGANICS.
3. ACTION LEVELS ARE FOR SOIL-TO-GROUNDWATER PATHWAY.
4. RESULTS SHOWN FOR LOCATIONS AT WHICH AT LEAST ONE POSITIVE DETECTION OCCURED.
5. SOIL SAMPLES COLLECTED AT ALL LOCATIONS DURING INITIAL SAMPLING (APRIL 2000). SOIL SAMPLES COLLECTED FROM LIMITED LOCATIONS DURING SUBSEQUENT SAMPLING EVENTS.

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FIGURE 6-1

Soil Sampling Analytical Results
Fuel Oil Release
Abbott Laboratories
Laurinburg, North Carolina