



March 11, 2001

Guilford County Planning and Development Department
201 South Eugene Street
Greensboro, NC 27401

Attention: Mr. Les Eger

Reference: **ACTIVE REMEDIATION MONITORING REPORT**
Semi-Annual Report
7105 Strawberry Road
Greensboro, Guilford County, North Carolina
Incident # 6119, Ranking B/170
Incident # 7188, Ranking B/205
S&ME Project No. 1584-98-131

Dear Mr. Eger:

This monitoring report includes active remediation sampling data collected during January 2002 at the Strawberry Road remediation site in Greensboro, North Carolina. This report describes groundwater sampling and analytical procedures, analytical results of monitor well samples, and on-going site operations representing the first quarter of system operation.

If you have any questions please call (336) 288-7180 at your convenience.

Sincerely,

S&ME, Inc.


Joanna H. Kirkland
Staff Professional


Wayne H. Watterson, P.E.
Senior Project Manager

cc: Guilford County Department of Public Health, Environmental Health

**ACTIVE REMEDIATION MONITORING REPORT
SEMI-ANNUAL REPORT
STRAWBERRY ROAD
GREENSBORO, NORTH CAROLINA
S&ME PROJECT NO. 1584-98-131**

*Simpson's
Auto
Parts*

MAR 12 2002

Prepared For

Guilford County Planning and Development Department
201 South Eugene Street
Greensboro, NC 27401

Prepared By

S&ME, Inc.
3718 Old Battleground Rd.
Greensboro, North Carolina 27410

March 11, 2001

TITLE PAGE

- Site Name: Strawberry Road
Location: 7105 Strawberry Road, Greensboro, NC
GW Incident Number: 6119 & 7188
Facility I.D. #:
- Date of Report: March 11, 2001
- Risk Classification: High (B/170 and B/205)
- Land Use Category: Commercial
- UST Owner/Operator: Guilford County Planning and Development Department
201 South Eugene Street
Greensboro, North Carolina 27401
(336)
- Current Property Owner: Guilford County Planning and Development Department
201 South Eugene Street
Greensboro, North Carolina 27401
(336)
- Consultant/Contractor: S&ME, Inc.
Attention: Wayne H. Watterson, P.E.
3718 Old Battleground Road
Greensboro, NC 27410
(336) 288-7180
- Release Information:
Date Discovered: November 1990, March 1991
Quantity of Release: Unknown
Source of Release: Suspected releases from:
Five (5) Underground Storage Tanks (1-250 gallon fuel oil,
3-1,000 gallon gasoline, 1-2,000 gallon gasoline) at Simpson's
Auto Parts site
Three (3) Underground Storage Tanks (2-6,000 gallon gasoline, 1-
2,000 gallon kerosene) at U-Filler-Up site
- Location of Release: Latitude: N 36° 10.5'
Longitude: W 79° 53.0'

1.0 SUMMARY OF ASSESSMENT ACTIVITIES

1.1 ANALYTICAL RESULTS

S&ME, Inc. (S&ME) completed one groundwater monitoring event at the Strawberry Road site (see **Figure 1**) for the sixth active remediation monitoring report. The samples were collected on January 31, 2002. The samples were taken from monitor wells MW-1B, MW-2, MW-2B, MW-4, MW-4B, MW-5, MW-6, MW-7, MW-9, MW-10, MW-11, and VM-1. Monitor wells MW-1, MW-3, MW-3B, and MW-8 were not sampled during this sampling event. **Figure 2** shows the location of these monitoring wells.

Each well was purged of three times the volume of water in the well. Groundwater samples were then collected with a disposable PVC bailer. Each sample was handled with a new pair of latex gloves and was placed into the laboratory provided sampling containers. The samples were submitted to Environmental Science Corporation (North Carolina Certification No. ENV 375) in Mt. Juliet, Tennessee, for laboratory analysis.

The groundwater samples collected on January 31, 2002, were analyzed for volatile organics by EPA Method 602. **Table 1** displays selected analytical data from this sampling event. A copy of the analytical report is included in **Appendix I**. Historical groundwater data is included in **Table 2**.

Appendix II includes plots displaying benzene, ethylbenzene, toluene, total xylenes, and total concentration of each of these compounds (BTEX) in the monitoring wells since 1995. **Appendix III** includes plots displaying total BTEX concentration and groundwater elevations over time in select monitoring wells. Monitor well MW-2 has the highest current total BTEX concentration.

2.0 DESCRIPTION OF CURRENT PLUME SIZE AND LOCATION

The extent of the benzene plume at the water table (as indicated by the projected isoconcentration contour line representing the 2L Groundwater Quality Standard concentration) is generally within the areas delineated in **Figure 3**. The groundwater samples obtained from monitor wells MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-11 and VM-1 did not have benzene concentrations greater than 1 microgram per liter ($\mu\text{g/l}$). The highest benzene concentration (1,900 $\mu\text{g/l}$) occurred in monitoring well MW-2, which was an increase from the July 2001 concentration (340 $\mu\text{g/L}$). The reported benzene concentrations representing the Simpson's Auto Parts portion of the site have decreased at MW-2B from 2,500 $\mu\text{g/l}$ to 240 $\mu\text{g/l}$ and increased at MW-1B from 58 $\mu\text{g/l}$ to 94 $\mu\text{g/l}$ since the July 2001 sampling event. In the U-Fill-Er-Up portion of the site, the detected concentration at MW-4B has remained relatively unchanged since October 2000.

Toluene was detected in monitor wells MW-2 and MW-2B; however, only monitor well MW-2 had a toluene concentration greater than the NCAC 2L standard of 1,000 $\mu\text{g/l}$. The ethylbenzene plume is represented by monitor well MW-2 in the Simpson's Auto Parts portion of the site. Only monitor well MW-2 contained an ethylbenzene concentration exceeding the NCAC 2L standard of 29 $\mu\text{g/l}$. The total xylenes plume is represented by monitor wells MW-1B, MW-2, and MW-2B in the U-Fill-Er-Up portion of the site. Only monitor wells MW-1B and MW-2 contained a total xylenes concentration exceeding the NCAC 2L standard of 530 $\mu\text{g/l}$.

Monitor wells MW-2 and MW-1B exhibited an increase in BTEX concentration since the previous sampling event. The BETX data from monitor well MW-2B and MW-4B suggested that the detected concentration has decreased. The total BTEX plume is estimate in **Figure 4**. Total volatile organic compound (VOC) concentrations in the site groundwater are tracked based on laboratory data from groundwater sampling events (see **Table 2**).

The MTBE plume encompasses monitor wells MW-4B in the U-Fill-Er-Up portion of the site. Monitor well MW-4B has a MTBE concentration greater than the corresponding NCAC 2L

Active Remediation Monitoring Report
Strawberry Road, Greensboro, North Carolina

S&ME Project No. 1584-98-131
March 11, 2002

Standard of 200 $\mu\text{g/l}$. Please note that the detection limit for MTBE for monitor well sample MW-2 and MW-1B was 500 $\mu\text{g/l}$.

3.0 ACTIVE REMEDIATION MONITORING REPORTS

3.1 SUMMARY OF REMEDIATION

The subject remediation system was installed to use air sparging at up to six sparge points. Currently, four (SP-2, SP-3, SP-4, and SP-6) are being used (see **Figure 2**).

3.2 REMEDIATION SYSTEM STATUS

The air sparge system operated at system pressures ranging from 30 to 40 pounds per square inch and at pressures at each well ranging from 15 to 20 pounds per square inch. The flow rates have ranged from 4.5 to 6 cubic feet per minute per well.

3.3 TREATMENT SYSTEM MONTHLY SAMPLING AND OPERATIONAL DATA

S&ME currently performs site inspections periodically to monitor the progress of remediation at the site and to maintain the remediation equipment. The site inspections may include measuring pressure, dissolved oxygen concentrations in groundwater monitor wells, and water level measurements in monitor wells. Due to mechanical problems, the system operated for approximately five out of six months.

Dissolved oxygen concentrations in the site monitor wells are summarized in **Table 3**. The dissolved oxygen concentrations in wells MW-1, MW-1B, MW-2, MW-2B, MW-3, and MW-6 remain low.

3.4 TOTAL GALLONS OF WATER TREATED DURING THE PERIOD

The subject remediation system treats an indeterminate volume of contaminated groundwater in-situ with air sparge techniques and does not withdraw groundwater.

3.5 MASS OF CONTAMINANT REMOVED

Measurements were not performed to calculate the mass of contaminants removed.

3.6 FUTURE REMEDIATION ACTIVITIES

S&ME will continue air sparge activities. The next groundwater sampling event is scheduled for August 2002. The next Monitoring Report will be submitted following the sampling event.

3.7 GALLONS OF RECOVERED PRODUCT

Free product was detected in on-site monitoring well MW-3 at approximately 0.08 feet on May 15, 2000. Free product was detected in on-site monitoring well MW-3 at approximately 0.22 feet on January 31, 2002.

3.8 DISCHARGE PERMIT INFORMATION

No Discharge Permit is required for the remediation activities outlined in the Corrective Action Plan submitted for the subject site.

3.9 PROXIMITY OF PLUME TO POTENTIAL RECEPTORS

According to the benzene isoconcentration map (see **Figure 3**), the Lake Brandt reservoir is approximately 100 feet from the plume edge.

3.10 GROUNDWATER FLOW DIRECTION

Figure 5 displays the water table elevations determined for the site based on depth to water measurements in selected monitoring points in January 2002. Groundwater elevation data and well details can be found in **Table 4**.

4.0 CONCLUSIONS

Analytical results for groundwater samples obtained from monitor wells suggest an overall trend of reduction of petroleum constituent concentrations in groundwater from the inception of remediation to the present. By examining past data, there may be a relationship between variations in dissolved concentrations and fluctuations of the water table within monitoring wells located near the source area in the Simpson's Auto Parts portion of the site. The most recent data indicate an increase in dissolved concentrations with a lower water table. Air sparge remediation activities should continue.

TABLE 1
MOST RECENT GROUNDWATER ANALYTICAL RESULTS
STRAWBERRY ROAD
GUILFORD COUNTY, NORTH CAROLINA
S&ME PROJECT NO. 1584-98-131

WELL ID	SAMPLE DATE	BENZENE	ETHYL-BENZENE	TOLUENE	TOTAL XYLENES	BTEX	MTBE	DIPE	1,2-DCB
<i>Method</i>									
MW-2	1/31/2002	602	602	602	602	602	602	602	602
MW-4	1/31/2002	1900	130	3,600	4,200	9,830	<500	<500	<500
MW-5	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
MW-6	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
MW-7	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
MW-1B	1/31/2002	94	<1	<1	2500	2596	<500	<500	<500
MW-2B	1/31/2002	240	25	38	62	365	<25	96	<25
MW-4B	1/31/2002	<25	<25	<120	<75	0	320	<120	<120
MW-10 (TW-10)	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
MW-11 (TW-11)	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
MW-9	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
VM-1	1/31/2002	<1	<1	<5	<3	all BQL	<5	<5	<5
2L Standard		1	29	1,000	530	-	200	70	620

Notes: Concentrations in bold exceed the corresponding NCAC 2L Groundwater Quality Standards

All concentrations reported in micrograms per liter (µg/l)

MTBE = Methyl tert butyl ether

DIPE = Diisopropyl ether

1,2-DCB = 1,2-dichlorobenzene

<1 = Concentration less than the method detection limit of 1 microgram per liter

Only detected constituents are displayed on this table.

TABLE 4
MONITORING WELL AND GROUNDWATER ELEVATIONS
STRAWBERRY ROAD
GREENSBORO, NORTH CAROLINA
S&ME PROJECT NO. 1584-98-131

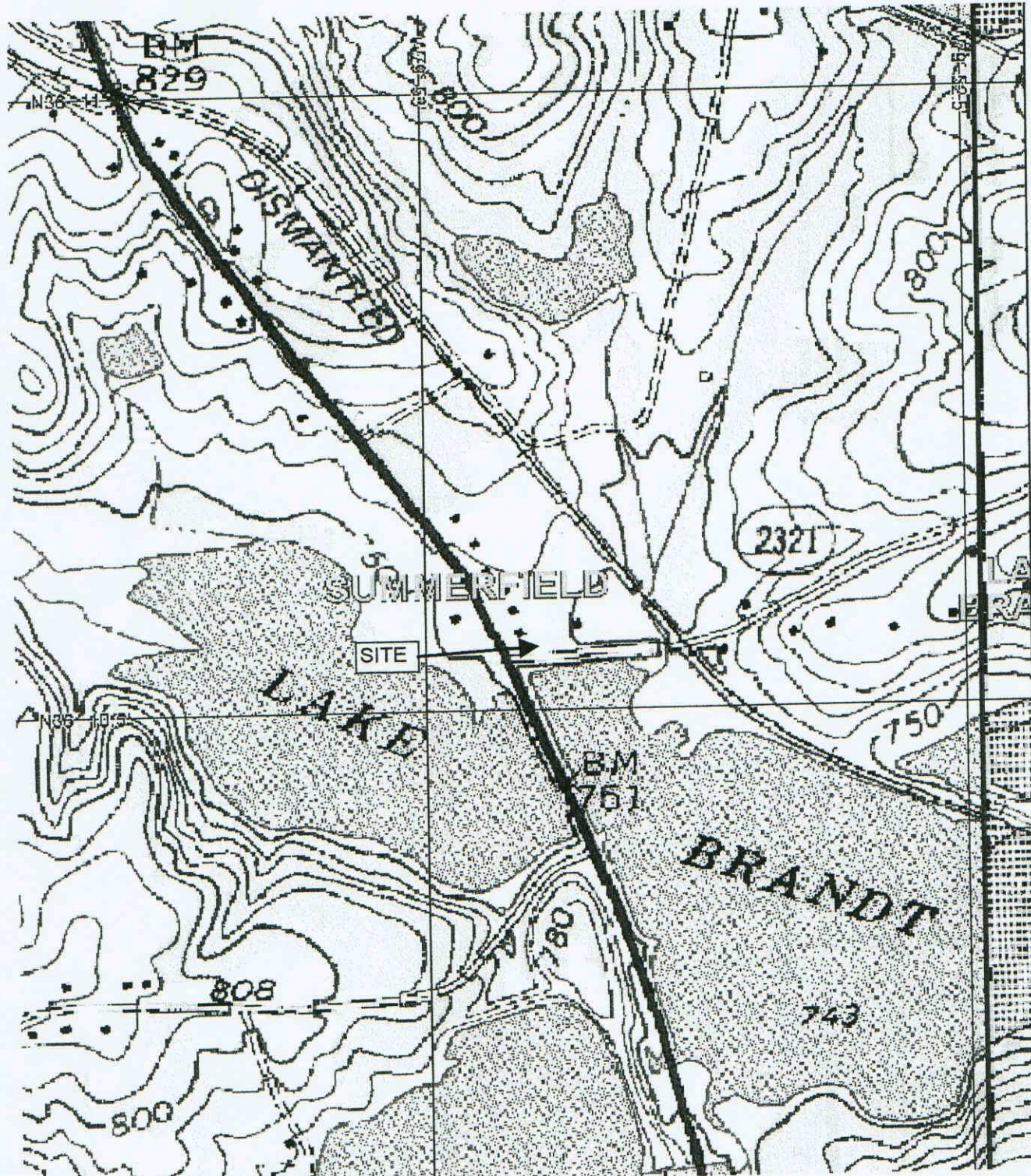
Well #	DATE	TOC Elevation (ft)	BS Elevation (ft)	DTW (ft)	GW Elevation (ft)
MW-1	11/1/1995	102.21	85.31	6.99	95.22
	2/24/2000	102.21	85.31	7.41	94.80
	4/24/2000	102.21	85.31	7.50	94.71
	8/8/2000	102.21	85.31	9.19	93.02
	8/22/2000	102.21	85.31	9.35	92.86
MW-2	11/1/1995	100.34	87.74	5.43	94.91
	2/24/2000	100.34	87.74	6.36	93.98
	8/8/2000	100.34	87.74	7.66	92.68
	8/22/2000	100.34	87.74	7.82	92.52
	10/18/2000	100.34	87.74	7.00	93.34
	1/30/2001	100.34	87.74	6.70	93.64
	7/25/2001	100.34	87.74	7.71	92.63
	1/31/2002	100.34	87.74	8.37	91.97
MW-3	11/1/1995	101.47	86.92	6.50	94.97
	*2/24/00	101.47	86.92	5.90	95.57
	4/24/2000	101.47	86.92	7.49	93.98
	8/8/2000	101.47	86.92	8.78	92.69
	8/22/2000	101.47	86.92	8.92	92.55
	10/18/2000	101.47	86.92	8.18	93.29
	1/30/2001	101.47	86.92	7.80	93.67
	7/25/2001	101.47	86.92	9.10	92.37
	*1/31/02	101.47	86.92	9.51	91.96
	MW-4	11/1/1995	97.93	83.93	3.84
2/24/2000		97.93	83.93	4.31	93.62
4/24/2000		97.93	83.93	4.12	93.81
8/8/2000		97.93	83.93	6.19	91.74
8/22/2000		97.93	83.93	6.31	91.62
1/30/2001		97.93	83.93	5.06	92.87
7/25/2001		97.93	83.93	6.30	91.63
1/31/2002		97.93	83.93	6.40	91.53
MW-5	11/1/1995	95.66	81.96	6.41	89.25
	2/24/2000	95.66	81.96	11.20	84.46
	4/24/2000	95.66	81.96	4.94	90.72
	8/8/2000	95.66	81.96	6.54	89.12
	8/22/2000	95.66	81.96	6.52	89.14
	10/18/2000	95.66	81.96	5.76	89.90
	1/30/2001	95.66	81.96	5.41	90.25
	7/25/2001	95.66	81.96	8.81	86.85
1/31/2002	95.66	81.96	5.42	90.24	
MW-6	11/1/1995	94.74	84.94	4.67	90.07
	2/24/2000	94.74	84.94	1.99	92.75
	4/24/2000	94.74	84.94	2.35	92.39
	10/18/2000	94.76	84.94	3.20	91.56
	1/30/2001	94.76	84.94	1.69	93.07
	7/25/2001	94.76	84.94	1.70	93.06
	1/31/2002	94.76	84.94	2.68	92.08
MW-7	11/1/1995	95.03	82.43	5.10	89.93
	2/24/2000	95.03	82.43	6.01	89.02
	4/24/2000	95.03	82.43	4.76	90.27
	8/8/2000	95.03	82.43	5.36	89.67
	8/22/2000	95.03	82.43	5.28	89.75
	10/18/2000	95.03	82.43	5.12	89.91
	1/30/2001	95.03	82.43	3.71	91.32
	7/25/2001	95.03	82.43	6.99	88.04
	1/31/2002	95.03	82.43	4.16	90.87

Notes: All measurements based on an arbitrary benchmark of 100.00 feet.
Date TOC Elev. Measured = 5/1/2000
* = Groundwater Elevation Corrected for Free Product.
nd = no data

TABLE 4
 MONITORING WELL AND GROUNDWATER ELEVATIONS
 STRAWBERRY ROAD
 GREENSBORO, NORTH CAROLINA
 S&ME PROJECT NO. 1584-98-131

Well #	DATE	TOC Elevation (ft)	BS Elevation (ft)	DTW (ft)	GW Elevation (ft)	
MW-1B	11/1/1995	101.17	83.07	4.27	96.90	
	2/24/2000	101.17	83.07	6.52	94.65	
	4/24/2000	101.17	83.07	6.90	94.27	
	8/8/2000	101.17	83.07	8.70	92.47	
	8/22/2000	101.17	83.07	8.88	92.29	
	10/18/2000	101.17	83.07	7.93	93.24	
	1/30/2001	101.17	83.07	7.68	93.49	
	7/25/2001	101.17	83.07	8.88	92.29	
	1/31/2002	101.17	83.07	9.24	91.93	
	MW-2B	11/1/1995	99.39	86.51	1.66	97.73
2/24/2000		99.39	86.51	5.08	94.31	
8/8/2000		99.39	86.51	6.98	92.41	
8/22/2000		99.39	86.51	7.14	92.25	
10/18/2000		99.39	86.51	6.20	93.19	
1/30/2001		99.39	86.51	5.95	93.44	
7/25/2001		99.39	86.51	7.18	92.21	
1/31/2002		99.39	86.51	7.48	91.91	
MW-3B		11/1/1995	100.00	56.00	3.04	96.96
		2/24/2000	100.00	56.00	5.61	94.39
	4/24/2000	100.00	56.00	5.76	94.24	
	8/8/2000	100.00	56.00	7.47	92.53	
	8/22/2000	100.00	56.00	7.63	92.37	
	MW-4B	11/1/1995	95.79	81.29	4.40	91.39
2/24/2000		95.79	81.29	5.83	89.96	
4/24/2000		95.79	81.29	5.06	90.73	
8/8/2000		95.79	81.29	6.03	89.76	
8/22/2000		95.79	81.29	6.02	89.77	
10/18/2000		95.79	81.29	6.09	89.70	
1/30/2001		95.79	81.29	5.10	90.69	
7/25/2001		95.79	81.29	6.05	89.74	
1/31/2002		95.79	81.29	5.48	90.31	
MW-10		2/24/2000	96.28	nd	1.75	94.53
	8/22/2000	96.28	nd	1.34	94.94	
	10/18/2000	96.28	nd	1.93	94.35	
	1/30/2001	96.28	nd	1.31	94.97	
	7/25/2001	96.28	nd	2.64	93.64	
	1/31/2002	96.28	nd	0.72	95.56	
MW-11	2/24/2000	91.17	83.42	0.50	90.67	
	8/22/2000	91.17	83.42	1.90	89.27	
	10/18/2000	91.17	83.42	1.11	90.06	
	1/30/2001	91.17	83.42	0.58	90.59	
	7/25/2001	91.17	83.42	2.03	89.14	
	1/31/2002	91.17	83.42	0.90	90.27	
VM-1	11/1/1995	89.74	83.24	2.98	86.76	
	8/8/2000	89.74	83.24	5.10	84.64	
	8/22/2000	89.74	83.24	5.11	84.63	
	10/18/2000	89.74	83.24	4.37	85.37	
	1/30/2001	89.74	83.24	4.01	85.73	
	7/25/2001	89.74	83.24	5.36	84.38	
MW-8	1/31/2002	89.74	83.24	5.34	84.40	
	2/24/2000	96.38	57.58	6.91	89.47	
	4/24/2000	96.38	57.58	6.91	89.47	
	8/8/2000	96.38	57.58	7.06	89.32	
	8/22/2000	96.38	57.58	7.10	89.28	
MW-9	11/1/1995	96.13	85.83	2.64	93.49	
	2/24/2000	96.13	85.83	2.73	93.40	
	4/24/2000	96.13	85.83	2.82	93.31	
	8/8/2000	96.13	85.83	6.08	90.05	
	8/22/2000	96.13	85.83	6.12	90.01	
	10/18/2000	96.13	85.83	4.23	91.90	
	1/30/2001	96.13	85.83	3.70	92.43	
	7/25/2001	96.13	85.83	6.53	89.60	
1/31/2002	96.13	85.83	4.06	92.07		

Notes: All measurements based on an arbitrary benchmark of 100.00 feet.
 Date TOC Elev. Measured = 5/1/2000
 * = Groundwater Elevation Corrected for Free Product.
 nd = no data



3-D Topo Land - Copyright © 2000 Tetra Tech, Inc. Source Data: USGS

SCALE: AS SHOWN
 CHECKED BY: WHW
 DRAWN BY: JEC
 DATE: 4/28/2000



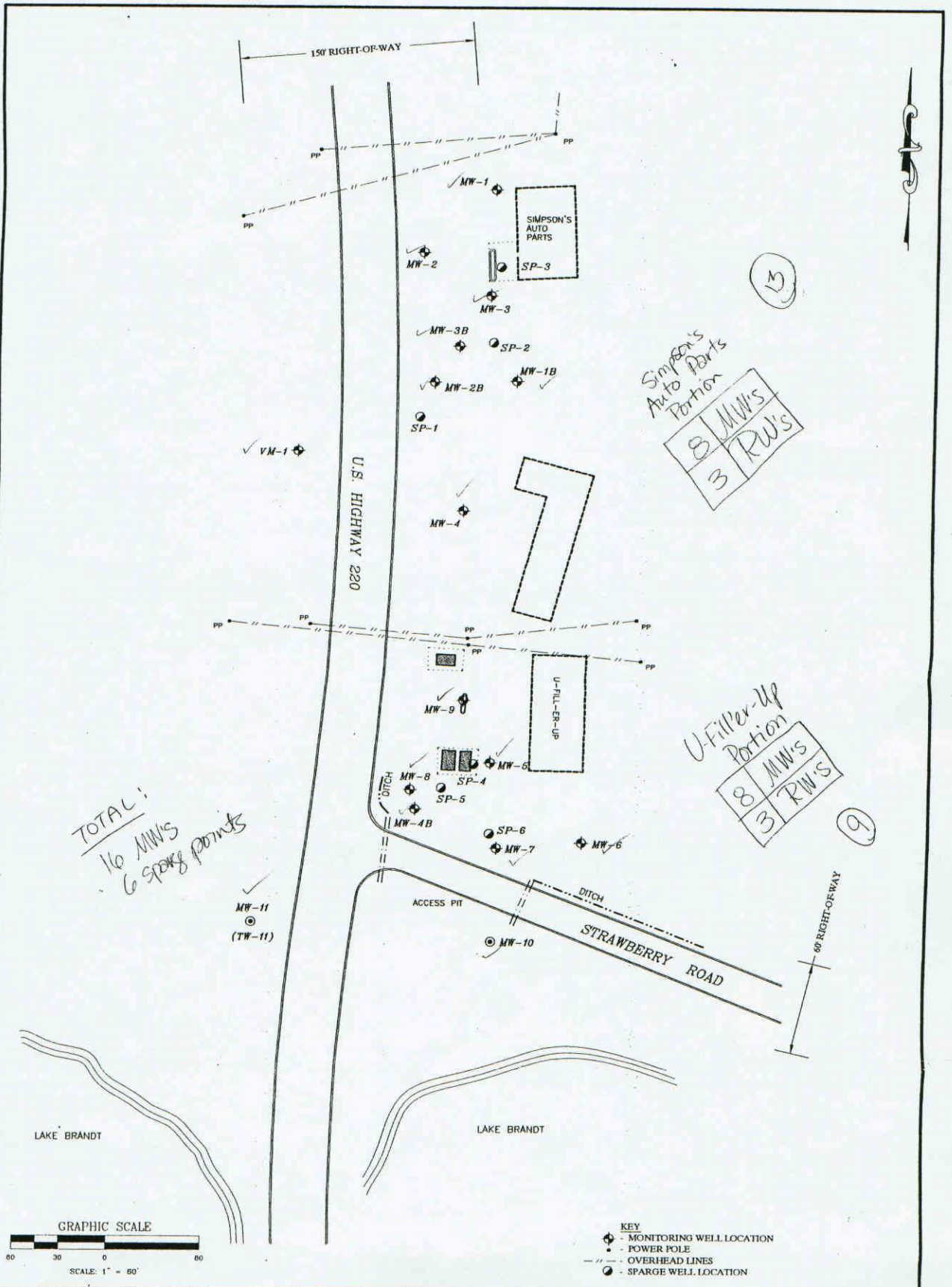
U.S.G.S. TOPO PROJECT LOCATION MAP

STRAWBERRY ROAD
 7105 STRAWBERRY RD., GREENSBORO, NC

JOB NO. 1584-98-131

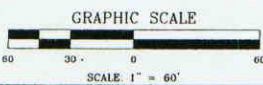
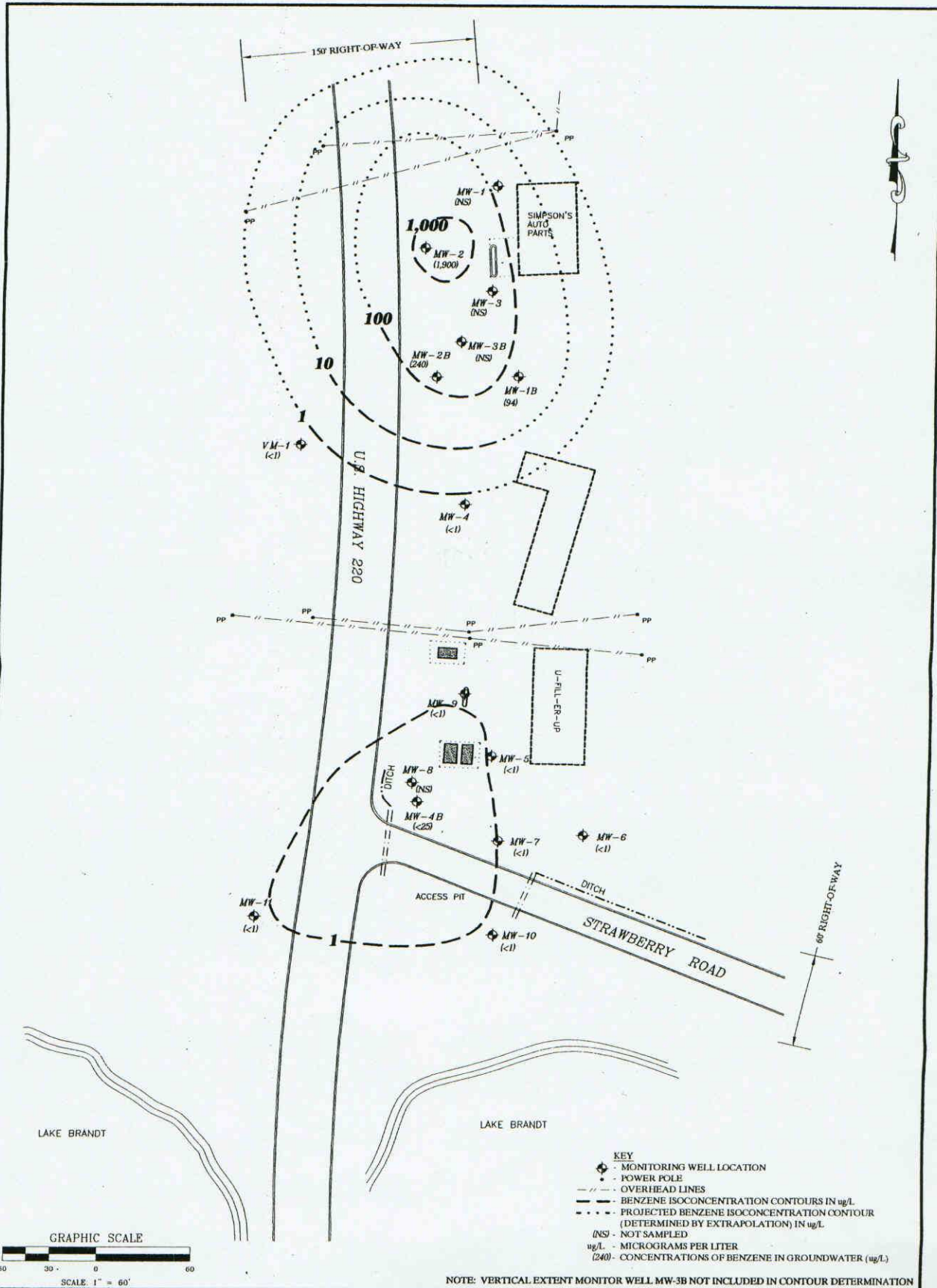
FIGURE NO.

1



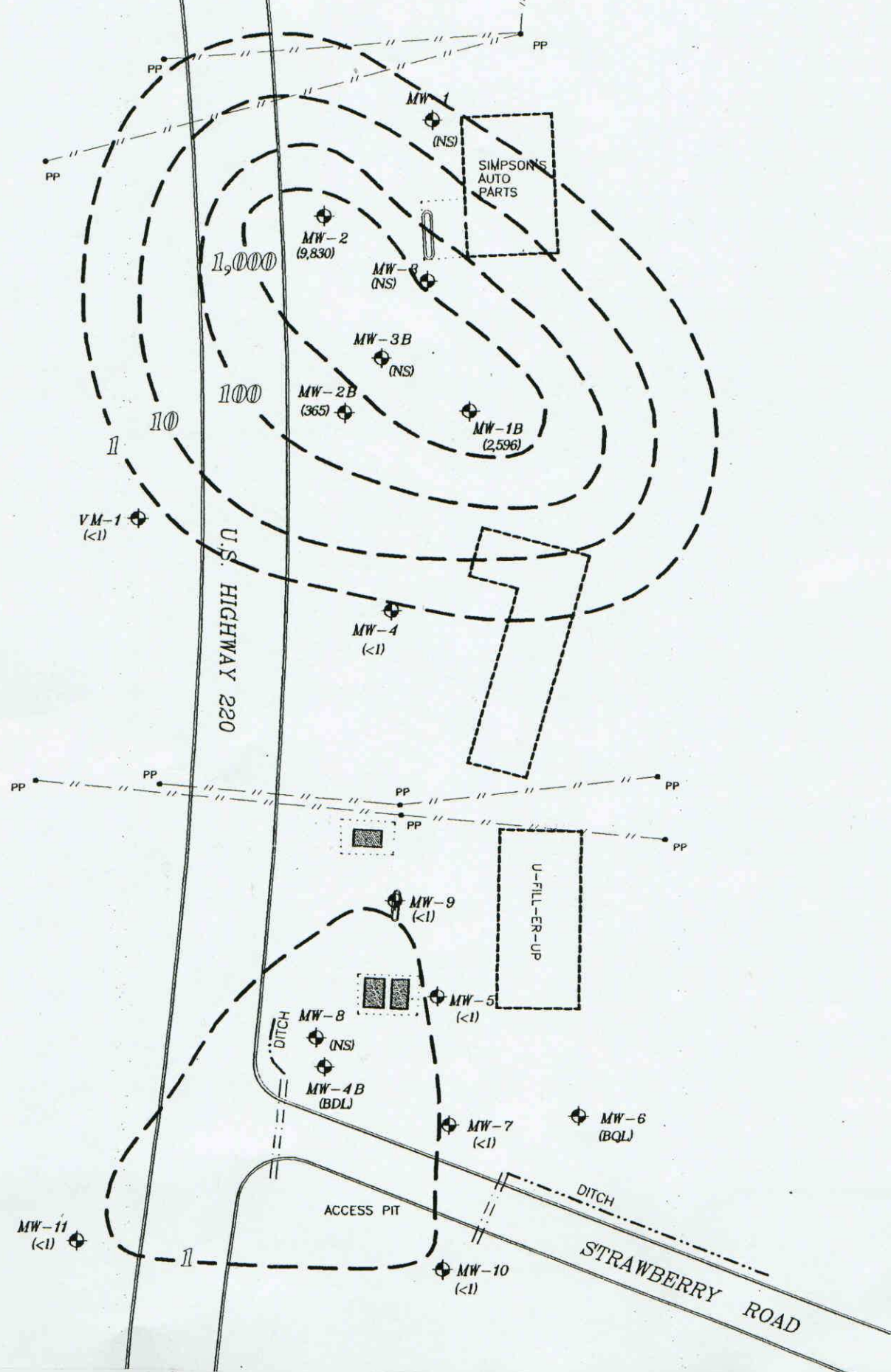
SITE BASE MAP
STRAWBERRY ROAD SITE
GREENSBORO, NORTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: DRL
JOB NO. 1584-98-131	DATE: FEBRUARY, 2002	FIGURE NO. 2



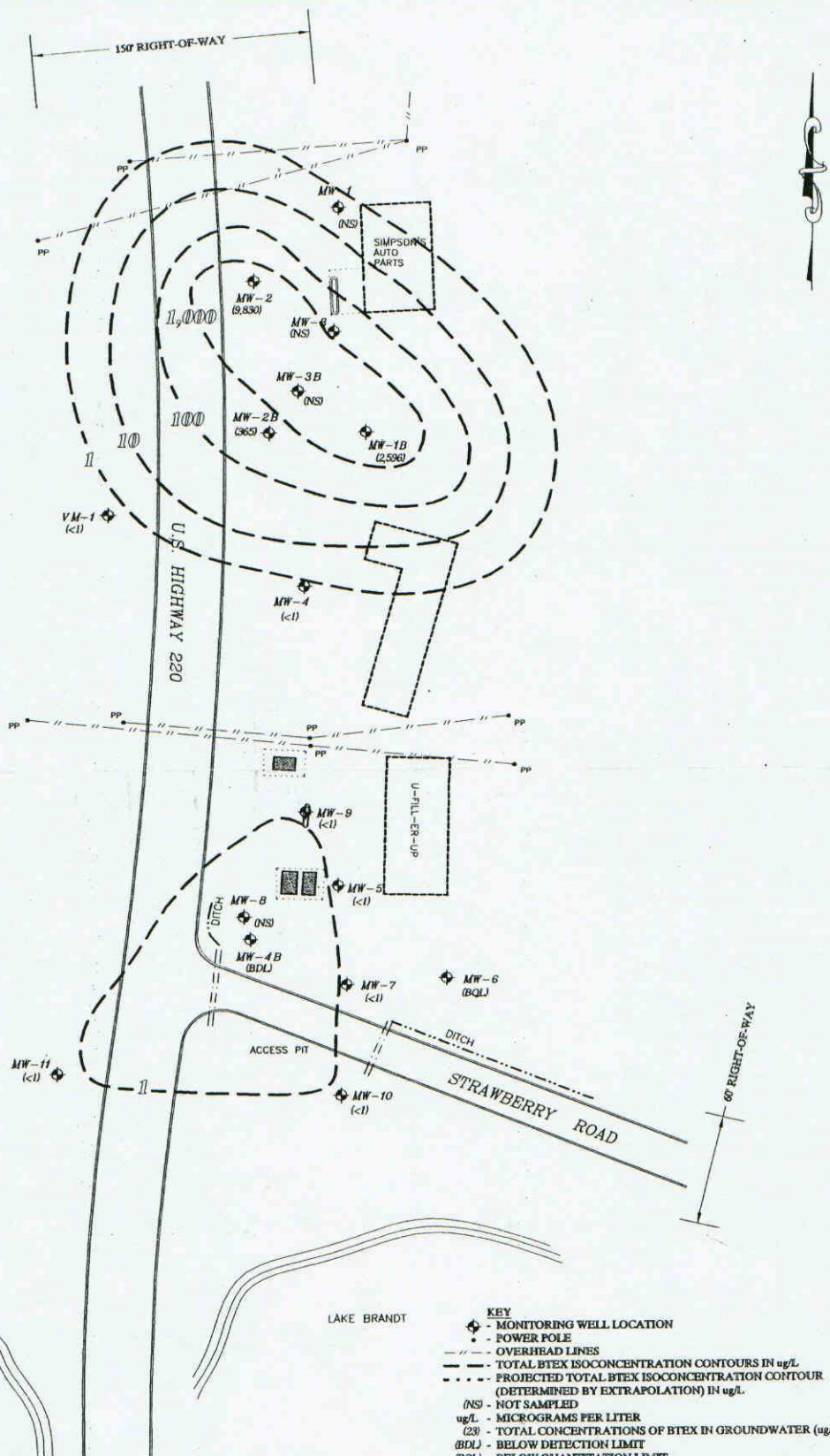
BENZENE ISOCONCENTRATION CONTOUR MAP (01/31/02) STRAWBERRY ROAD SITE GREENSBORO, NORTH CAROLINA		
SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: JHK
JOB NO. 1584-98-131	DATE: FEBRUARY, 2002	FIGURE NO. 3

150' RIGHT-OF-WAY



Scale
1" = 60'

60' RIGHT-OF-WAY



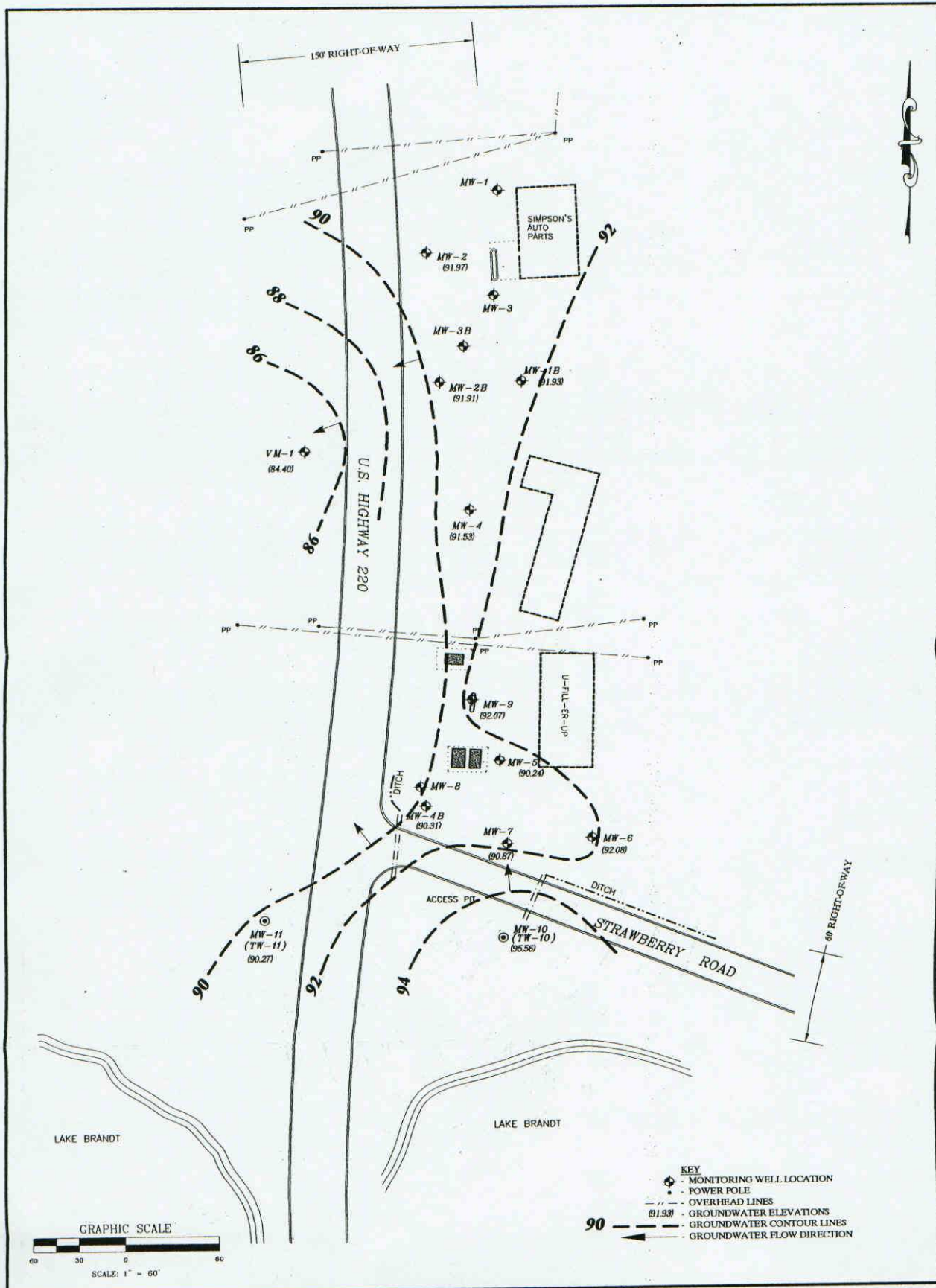
- KEY**
- ◆ - MONITORING WELL LOCATION
 - - POWER POLE
 - - - OVERHEAD LINES
 - TOTAL BTEX ISOCONCENTRATION CONTOURS IN ug/L
 - - - - PROJECTED TOTAL BTEX ISOCONCENTRATION CONTOUR (DETERMINED BY EXTRAPOLATION) IN ug/L
 - (NS) - NOT SAMPLED
 - ug/L - MICROGRAMS PER LITER
 - (23) - TOTAL CONCENTRATIONS OF BTEX IN GROUNDWATER (ug/L)
 - (BDL) - BELOW DETECTION LIMIT
 - (BQL) - BELOW QUANTITATION LIMIT

NOTE: VERTICAL EXTENT MONITOR WELL MW-3B NOT INCLUDED IN CONTOUR DETERMINATION

TOTAL BTEX ISOCONCENTRATION CONTOUR MAP (01/31/02)
 STRAWBERRY ROAD SITE
 GREENSBORO, NORTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: JHK
JOB NO. 1584-98-131	DATE: FEBRUARY, 2002	FIGURE NO. 4





GROUNDWATER ELEVATION CONTOUR MAP (01/31/02)
STRAWBERRY ROAD SITE
GREENSBORO, NORTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: JHK
JOB NO. 1584-98-131	DATE: FEBRUARY, 2002	FIGURE NO. 5

