THE STATE OF SOUTH CAROLINA
In The Court of Appeals

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SC Court of Appeals

APPEAL FROM NEWBERRY COUNTY
Court of Common Pleas

Donald B. Hocker, Circuit Court Judge

Appellate Case No. 2016-001773

West/Hobby, LLC,..... Respondent,

v.

County of Newberry, ... Appellant.

RECORD ON APPEAL
(Volume II of III)

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Lexington, South Carolina
July 20, 2017

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Consultants, Inc.
engineering & hydrogeology

January 15, 1997

Mr. Edward F. Lominack, Jr.
Newberry County Administration
PO Box 156
Newberry, South Carolina 29108

RE: Newberry County Landfill, DWP-117
Interim Methane Gas Monitoring Results
C&L Consultants, Inc. Job No. 8078

Dear Mr. Lominack,

C&L Consultants, Inc. conducted the referenced monitoring on January 10, 1997, as you authorized in our telephone conversation of January 6, 1997. A total of 20 measurements for %LEL (percent lower explosive limit) were taken in the structures and around the boundary of the landfill and recorded. All readings were less than action limits (25% LEL in structures and 100% LEL at the perimeter) as set forth in R. 61-107.258.23. Field data sheets that include respective sampling point and methane gas readings are enclosed for your records.

The interim monitoring was conducted in lieu of (but in general accordance with) the Methane Gas Monitoring Plan (MGMP) originally submitted to SCDHEC in August, 1996 (revised November, 1996). Although the MGMP has not been approved by SCDHEC as of this date, we believe that this interim methane gas monitoring provides adequate protection of human health and the environment, pending SCDHEC approval of the MGMP and the installation of gas monitoring wells around the landfill.

If you have any questions or if we can be of any additional service, please don't hesitate to call us. C&L Consultants, Inc. appreciates the opportunity to be of service to you and Newberry County.

Respectfully Submitted,
C&L Consultants, Inc.

Randall H. NeSmith

Randall H. NeSmith, PG
Senior Hydrogeologist

cc: Ms Jane Mundell, SCDHEC-BS&HWM w/encls
Mr. Ken Acker, SCDHEC-BS&HWM w/encls

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County 0470

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Landfill (117) Date: 1/10/97 Time (24-hr): 1300

Monitoring Point ID: Triangle Gun Club - Club House* Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Lt. Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Sub-Floor

(B) Interior Floor Level

(C)

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): A: 0%LEL
B: 1%LEL

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL--specify): A: 0% LEL Sampler's Signature: Randall K. Nesmith
B: 1% LEL

* Club House is constructed off-grade.

County 0471

0480

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Co. LF (117) Date: 1/10/97 Time (24-hr): 1310

Monitoring Point ID: Well House Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Lt Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Floor below pressure tank

(B)

(C)

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): 0 % LEL

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL-specify): 0% LEL Sampler's Signature: Randall M. NeSmith

County 0472

0481

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Co. LF (117) Date: 1/10/97 Time (24-hr): 1315

Monitoring Point ID: Maintenance Bldg Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Lt Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Interior slab corner

(B) Interior bathroom

(C) Exterior bathroom

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): A: 0% LEL
B: 4% LEL
C: 1% LEL

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL--specify): A: 0% LEL Sampler's Signature: Randall H. NeSmith
B: 4% LEL
C: 1% LEL

County 0473

0482

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Co. LF (117) Date: 1/10/97 Time (24-hr): 1330

Monitoring Point ID: Trap House Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Lt. Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Floor below trap

(B)

(C)

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): 0 % LEL

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL--specify): 0% LEL Sampler's Signature:

County 0474

0483

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Co. LF (117) Date: 1/10/97 Time (24-hr): 1345

Monitoring Point ID: Skeet Houses Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Lt Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Skeet House 1 Floor (D) Skeet House 4 Floor

(B) Skeet House 2 Floor (E) Skeet House 5 Floor

(C) Skeet House 3 Floor (F) Skeet House 6 Floor

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): A) 0% LEL D) 1% LEL
B) 0% LEL E) 0% LEL
C) 0% LEL F) 0% LEL

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL--specify): A) 0%LEL D) 1%LEL Sampler's Signature: Randall M. NeSmith
B) 0%LEL E) 0%LEL
C) 0%LEL F) 0%LEL

County 0475

0484

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry Co. LF (117) Date: 1/10/97 Time (24-hr): 1430

Monitoring Point ID: Landfill Perimeter Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: 7 JAN 97 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, warm, Lt. Breeze

Ambient Barometric Pressure (if known): unk

Monitoring Point Description: (A) Adjacent MW-1 (D) Adjacent MW-6 (G) Culvert in Access Rd. to Westside
(B) Adjacent MW-2 (E) Adjacent MW-7
(C) Adjacent MW-4 (F) Culvert in Access Road to Westside

General Soil Moisture Conditions: Wet (Damp) Dry

Initial Methane Concentration (ppm, percent, or %LEL-specify): A) 0% LEL D) 0% LEL G) 0% LEL
B) 0% LEL E) 0% LEL
C) 0% LEL F) 0% LEL

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): N/A

Methane Concentration (ppm, percent, or %LEL-specify): A) 0% LEL E) 0% LEL Sampler's Signature: Randall K. NeSmith
B) 0% LEL F) 0% LEL
C) 0% LEL G) 0% LEL
D) 0% LEL

County 0476

0485

Consultants, Inc.
engineering & hydrogeology

May 2, 1997

Mr. Edward F. Lominack, Jr., Administrator
Newberry County
P.O. Box 156
Newberry, South Carolina 2929108

Re: Gas Monitoring Well Installation
Newberry County Landfill (DWP-117)
C&L Consultants, Inc., Job# 8078

Dear Mr. Lominack:

In accordance with your authorization, C & L Consultants, Inc. completed installation of seven gas monitoring wells around the perimeter of the Newberry County Landfill on April 25, 1997. The wells were located and constructed in accordance with the SCDHEC-approved Gas Monitoring Plan for the referenced facility. A well location map, boring logs and construction details for the gas monitoring wells are enclosed. We have also provided these documents to SCDHEC, under separate cover.

I am planning to perform the first quarterly monitoring of these wells next week (May 5-9).

Should you have any questions regarding this letter or the gas monitoring well installation, please do not hesitate to call. C&L Consultants appreciate the opportunity to be of service to you and Newberry County.

Respectfully Submitted,
C&L Consultants, Inc.

Randall H. NeSmith

Randall H. NeSmith
Senior Hydrogeologist

encls

cc: Rick Maxheimer, JKB&B
Mark Gilbert, CAL

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County 0375

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Consultants, Inc.
engineering & hydrogeology

May 12, 1997

Mr. Edward F. Lominack, Jr.
Newberry County Administration
PO Box 156
Newberry, South Carolina 29108

RE: Newberry County Landfill, DWP-117
First (Quarterly) Methane Gas Monitoring Results
C&L Consultants, Inc. Job No. 8078

Dear Mr. Lominack,

C&L Consultants, Inc. conducted the referenced monitoring on May 8, 1997. A total of 24 measurements for %LEL (percent lower explosive limit) were taken from the gas monitoring wells and in the structures on the landfill and recorded. All readings were less than action limits (25% LEL in structures and 100% LEL at the perimeter) as set forth in R. 61-107.258.23. Field data sheets that include respective sampling point and methane gas readings are enclosed for your records.

The methane gas monitoring was conducted in accordance with the SCDHEC-approved Methane Gas Monitoring Plan (MGMP)

If you have any questions or if we can be of any additional service, please don't hesitate to call us. C&L Consultants, Inc. appreciates the opportunity to be of service to you and Newberry County.

Respectfully Submitted,
C&L Consultants, Inc.

Randall H. NeSmith
Senior Hydrogeologist

cc: Ms Jane Mundell, SCDHEC-BL&WM



County 0361

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C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1110

Monitoring Point ID: GMW-1 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow:

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): (A)0.23 ft^3 (B) 0.22 ft^3

O2 Concentration (%): (A) 14.9 (B) 15.2

Methane Concentration (ppm, percent, or %LEL--specify): (A) 47%LEL (B) 23%LEL Sampler's Signature: Randall H. NeSmith

County 0383

0488

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1130

Monitoring Point ID: GMW-2 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): (A) 0.12 ft^3 (B) 0.20 ft^3

O2 Concentration (%): (A) 14.7 (B) 19.1

Methane Concentration (ppm, percent, or %LEL--specify): (A) 63%LEL (B) 22%LEL Sampler's Signature: Randall H. NeSmith

County 0364

0489

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1225

Monitoring Point ID: GMW-3 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): (A) 0.23 ft^3 (B) 0.20 ft^3

O2 Concentration (%): (A) 16.2 (B) 16.8

Methane Concentration (ppm, percent, or %LEL--specify): (A) 62%LEL (B) 44%LEL Sampler's Signature: Randall H. NeSmith

County 0385

0490

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1210

Monitoring Point ID: GMW-4 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead

(B)

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): 0.26 ft^3

O2 Concentration (%): 12.4

Methane Concentration (ppm, percent, or %LEL--specify): 29%LEL Sampler's Signature: Randall H. NeSmith

County 0366

0491

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1155

Monitoring Point ID: GMW-5 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): (A) 0.16 ft^3 (B) 0.23 ft

O2 Concentration (%): (A) 14.6 (B) 13.5

Methane Concentration (ppm, percent, or %LEL--specify): (A) 59%LEL (B) 61%LEL Sampler's Signature: Randall H. NeSmith

County 0367

0492

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1145

Monitoring Point ID: GMW-6 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): (A) 0.16 ft^3 (B) 0.22 ft^3

O2 Concentration (%): (A) 16.2 (B) 17.3

Methane Concentration (ppm, percent, or %LEL--specify): (A) 64%LEL (B) 50%LEL Sampler's Signature: Randall H. NeSmith

County 0368

0493

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1100

Monitoring Point ID: GMW-7 Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Wellhead-Shallow

(B) Wellhead-Deep

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): (A) 0.16 ft^3 (B) 0.22 ft^3

O2 Concentration (%): (A) 13.6 (B) 13.8

Methane Concentration (ppm, percent, or %LEL--specify): (A) 58%LEL (B) 59%LEL Sampler's Signature: Randall H. NeSmith

County 0369

0494

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 0900

Monitoring Point ID: Triangle Gun Club-Clubhouse Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Sub-floor

(B)

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

O2 Concentration (%): 20.9

Methane Concentration (ppm, percent, or %LEL--specify): 0%LEL Sampler's Signature: Randall H. NeSmith

County 0370

0495

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 0905

Monitoring Point ID: Well house Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Floor below pressure tank

(B)

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

O2 Concentration (%): 20.9

Methane Concentration (ppm, percent, or %LEL--specify): 0%LEL Sampler's Signature: Randall H. NeSmith

County 0371

0496

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 0910

Monitoring Point ID: Maintenance Building Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Interior slab corner

(B) Exterior bathroom

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

O2 Concentration (%): 20.9

Methane Concentration (ppm, percent, or %LEL--specify): (A) 0%LEL (B) 2%LEL Sampler's Signature: Randall R. NeSmith

County 0372

0497

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 0940

Monitoring Point ID: Trap House Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) Floor below trap

(B)

(C)

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume ($ft^3 = 3 \times 3.1416 \times r^2 \times L$: where r = well radius in feet, L = length of sample interval): N/A

O2 Concentration (%): 20.9

Methane Concentration (ppm, percent, or %LEL--specify): 2%LEL Sampler's Signature: Randall H. NeSmith

County 0373

0498

C&L CONSULTANTS, INCORPORATED
METHANE GAS MONITORING
Field Data Sheet

Sampler's Name: R. NeSmith

Facility Name (DWP-#): Newberry LF (117) Date: May 8, 1997 Time (24-hr): 1000

Monitoring Point ID: Skeet Houses Sampling Method/Equipment Type: Aim 2600A %LEL/O2

Equipment Calibration Date: March 18, 1997 Sampling Tube Lot# and Expiration Date: N/A

Weather Conditions: Sunny, Warm, Light Breeze

Ambient Barometric Pressure (if known): 410.33 "H2O

Monitoring Point Description: (A) SH-1 Floor (D) SH-4 Floor

(B) SH-2 Floor (E) SH-5 Floor

(C) SH-3 Floor (F) SH-6 Floor

General Soil Moisture Conditions: Wet Damp Dry

Purge Volume (ft^3 = 3 x 3.1416 x r^2 x L: where r = well radius in feet, L = length of sample interval): N/A

O2 Concentration (%): 20.9

Methane Concentration (ppm, percent, or %LEL--specify): (A) 0%LEL (B) 0%LEL (C) 1%LEL (D) 0%LEL (E) 1% LEL (F) 0%LEL

Sampler's Signature: Randall H. NeSmith

0499

County 0374

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FEB 18 1998
HYDROGEOLOGY

1997 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

February 16, 1998

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

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Appendix I--Groundwater Analyses (June 23, 1997 and December 15-16, 1997)

Appendix II--Statistical Analysis

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 1997 Annual Groundwater Monitoring Report for the Newberry County Landfill. The annual report addresses the following six topics:

A. Primary activities in 1997 relative to landfill monitoring and compliance;
B. Groundwater analytical findings/results from the June and December, 1997 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data; and,
F. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

Refer to Figure 1 indicating the landfill site location.

1.1 Summary of activities for 1997

During 1997, activities at the Newberry County landfill by the County Administration of significant mention, are listed as follows:

a. Gas Monitoring Wells were installed and quarterly methane gas well monitoring and reporting initiated at the landfill;
b. Groundwater sampling events for 1997, in accordance with Regulation R.61-71.258.61(3), were June and December, 1997.

2.0 GROUNDWATER ANALYTICAL DATA

Groundwater quality data was obtained from the seven (7) groundwater monitoring stations for the monitoring events on June 23, 1997 and December 15-16, 1997. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during each monitoring event and recorded on the field data sheets. Wells were sampled and laboratory analyzed in accordance with the approved Sampling and Analysis Plan for metals and organic compounds and as requested by SCDHEC officials by letter dated November 18, 1997 (Appendix II sampling of MW-3, MW-4, and MW-7 on December 16, 1997). Complete copies of the laboratory reports, field data sheets and chain of custody forms are located in Appendix I. Tables 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL).

Table 1- 1997 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/23/97)	CONCENTRATION (mg/l) (12/15-16/97)	MCL/ [SMCL](mg/l)
MW-1 (back-ground)	Barium	0.5	0.9	2.00
	Beryllium	0.006*	0.004	0.004
	Cadmium	0.001	--	0.005
	Chromium	--	0.16*	0.100
	Copper	--	0.07	1.3
	Lead	0.033*	0.025*	0.015
	Zinc	0.19	0.25	[5.0]
MW-2		DRY WELL, NO SAMPLE		
MW-3	Mercury	0.00055	--	0.002
	Barium	0.5	--	2.00
	Beryllium	0.009*	0.007*	0.004
	Cadmium	0.004	--	0.005
	Chromium	--	0.15*	0.10
	Lead	0.022*	0.014	0.015
	Antimony	0.3*	--	0.006
	Zinc	0.18	0.20	[5.0]
	Sulfide	NT	0.2	NE
	Chloroethane	--	0.012	NE
	Propionitrile	NT	0.0053	NE
	Methylene Chloride	0.0364*	0.0334*	0.005
	1,1-Dichloroethane	0.0210	0.0269	NE
	Trichloroethene	--	0.0087*	0.005
	Tetrachloroethene	0.0077*	0.008*	0.005
MW-4	Barium	0.6	0.2	2.00
	Beryllium	0.005*	--	0.004
	Cadmium	0.001	--	0.005
	Lead	0.017*	--	0.015
	Zinc	0.25	0.08	[5.0]
	Sulfide	NT	0.2	NE
	Chloroethane	0.0834	0.0898	NE
	Methylene Chloride	0.862*	0.822*	0.005
	1,1-Dichloroethane	0.342	0.390	NE
	Trichloroethene	--	0.0116*	0.005
	Tetrachloroethene	--	0.0071*	0.005
	Benzene	0.0168*	0.0192*	0.005
	Ethylbenzene	0.0054	--	0.700
	Xylenes, total	0.0305	0.0309	10.0
	cis-1,2-Dichloroethene	0.0216	0.020	0.07
	1,3-Dichlorobenzene	0.0065	0.0076	0.6
	1,2-Dichlorobenzene	0.0062	0.0083	0.6
	1,4-Dichlorobenzene	0.007	0.0082	0.075
	Vinyl Chloride	--	0.0054*	0.002
	Toluene	0.0052	--	1.0
	Methyl Chloride	0.0057	--	NE

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/23/97)	(12/15-16/97)	MCL/ [SMCL](mg/l)
MW-5	Barium	0.3	--	2.00
	Beryllium	0.002	--	0.004
	Cadmium	0.001	--	0.005
	Lead	0.015	0.005	0.015
	Zinc	0.11	0.10	[5.0]
MW-6	Barium	0.4	0.2	2.00
	Beryllium	0.004	0.002	0.004
	Cadmium	0.003	--	0.005
	Chromium	--	0.10	0.10
	Lead	0.015	0.006	0.015
	Zinc	0.15	0.15	[5.0]
	Methylene Chloride	--	0.0074*	0.005
MW-7	Barium	0.6	0.5	2.00
	Beryllium	0.010*	0.002	0.004
	Cadmium	0.001	--	0.005
	Chromium	--	0.08	0.100
	Mercury	0.00643*	--	0.002
	Lead	0.034*	0.012	0.015
	Zinc	0.31	0.06	[5.0]
	Sulfide	--	0.6	NE
	Chloroethane	0.0304	0.0325	NE
	cis-1,2-Dichloroethene	0.0069	0.0064	0.070
	Methylene Chloride	0.0107*	0.0131*	0.005
	Vinyl Chloride	0.0036*	0.0037*	0.002
	Benzene	0.0064*	0.0066*	0.005

* - Exceeds MCL (maximum concentration limit for drinking water): N/E - MCL not established: -- - Not reported: NT - Not Tested

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of seven (7) monitoring wells. One monitoring well (MW-1) is located hydraulically upgradient of the subject site and six (6) monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7) are located hydraulically downgradient and side gradient of the landfill foot print. These wells, with the exception of MW-3 and MW-5, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards.

3.1 Monitoring Well Construction Details

Monitoring well construction data for the seven well system is summarized in Table 2.

Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B. Monitoring well MW-2, constructed 4/17/95 (by Law Engineering & Environmental Services, Law report dated March 28, 1996) has been reported as dry during each sampling event following construction of the station. According to the reported geologist's boring log and well construction details, the recorded depth to groundwater at the other six stations (approx. 25 ft below ground surface) and comparison of the location of MW-2, relative to site potentiometric maps for events 3/96 and 9/96, monitoring well MW-2 (49.5 ft deep) should be sufficiently deep to provide groundwater for sampling purposes.

Monitoring wells MW-3 and MW-5 pre-date the other five wells and are the remaining portion of the original groundwater monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size. However, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
MW-2	4/17/95	49.5	34.5-49.5	495.01	496.64	495.39
MW-3	unkown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unkown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figures 2 and 3) for each of the two 1997 (and previous) groundwater elevation monitoring events indicates the background monitoring well appears properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of six (6) groundwater monitoring wells; MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 1997 reporting period groundwater elevation data and the constructed potentiometric maps (Figures 2 and 3) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation, with the exception of MW-2, is generally suitable for providing representative groundwater quality samples from the upper-most aquifer. MW-2, installed on 4/17/95 to a depth of 49.5 ft, has consistently produced insufficient groundwater volume for monitoring purposes.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey.

4.2 Groundwater Flow Direction

Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the two 1997 groundwater monitoring events, are provided as Figures 2 and 3. The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.3 Groundwater Flow Rate

The calculated flow rate (velocity) of horizontal groundwater flow in the shallow saturated zone, as determined using the estimated hydraulic conductivity "K" for silty sand (as indicated in the monitoring well boring log records) and the horizontal hydraulic gradient of 0.03 ft/ft (determined from the potentiometric maps, see Figures 2 and 3), is expressed as $V = Ki$:

where: $K = 1 \times 10^{-4}$ cm/sec for silty sand (Fetter, 1980 and other texts); and,
i = horizontal hydraulic gradient = 0.03 ft/ft

$V = 0.0001$ cm/sec x 0.03 ft/ft

$= 3 \times 10^{-6}$ cm/sec or 0.26 cm/day or 95 cm/year or 3 ft/year.

Note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow (from Point A to Point B) range of 2.5 ft/yr to 3.5 ft/yr.

TABLE 3
GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/97	Water Elevation 12/97
MW-1	30.0	15-30	498.86	500.51	476.31	473.81
MW-2	49.5	34.5-49.5	495.01	496.65	DRY	DRY
MW-3	34.1	UK	452.33	453.92	426.72	425.52
MW-4	30.0	15-30	437.08	439.18	411.58	410.28
MW-5	31.0	UK	418.39	420.12	401.02	400.22
MW-6	25.0	10-25	438.76	440.51	421.46	419.96
MW-7	29.5	14.5-29.5	454.04	455.77	426.97	426.27

Note: TOC=Top of Casing; UK = unkown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 1997 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. The statistical analysis indicated that the only inorganic constituent of concern at the Newberry County Landfill for 1997 is mercury; however, mercury was reported in groundwater samples from MW-3 for the June 23, 1997 sampling event only. The laboratory reported concentration of 0.00055 mg/l is significantly below the established MCL of 0.002 mg/l. No other inorganic constituent was determined statistically to be indicative of significant contamination. Refer to Table 1 for detected constituents and Appendix II for the statistical print-out with referenced inorganic analytes of statistical importance flagged.

6.0 FINDINGS

a. The direction of groundwater flow at the landfill is toward the east-south east.
b. The rate of groundwater flow in the shallow saturated zone is in the range of 2.5 to 3.5 ft/year.

c. The monitoring wells are appropriately located for early warning and detection purposes.

d. Monitoring well MW-2 has remained dry for every sampling events since construction of the well.

e. All sampled monitoring wells, MW-1 (background) through MW-7, (during one or more sampling events) contained one or more metallic analytes at or above the established drinking water concentration limit.

f. Detectable concentrations of organic constituents were laboratory reported at all wells with the exception of MW-1, MW-2 (dry), and MW-5 during 1997. Concentrations of organics, as reported by the laboratory are summarized in Table 1.

i. Laboratory detection of organics in groundwater samples from monitoring wells MW-3, MW-4, and MW-7 provides the only consecutive laboratory measurement of organic constituents exceeding an established drinking water concentration limit.

j. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.

7.0 CONCLUSIONS

7.1 Groundwater Quality

Groundwater at MW-3, MW-4, and MW-7 has been verified, through Attachment II sampling on December 16, 1997, to contain concentrations of various organic constituents. Groundwater analyses at MW-3, MW-4 and MW-7 location indicates a minimum two event occurrence of organic constituents at or above established drinking water limits for various organics.

Inorganic constituents (various metallic ions) occur in each of the sampled wells, potentially the result of clay minerals contained in turbid groundwater samples analyzed by the laboratory. Well clean-out and redevelopment may substantially reduce influence from the clay sediment on metallic ion concentrations in the groundwater samples.

7.2 Technical Sufficiency of the Groundwater Monitoring Network

The six downgradient monitoring wells appear sufficient number and horizontally positioned to provide accurate groundwater quality data; however, MW-2 does not yield sufficient groundwater for sampling and is unusable for groundwater sampling purposes. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units. Monitoring well MW-2 should be evaluated for potential up-grade, replacement, or removed from the monitoring network.

7.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 2.5 to 3.5 ft/yr.

8.0 RECOMMENDATIONS

From evaluation of the 1997 groundwater sampling data it is our professional recommendation that:

a. A Groundwater Assessment Plan, as requested by SCDHEC letter dated November 18, 1997, be prepared for SCDHEC authorization; and,

b. The monitoring wells continue to be sampled on a semi-annual basis with reporting in accordance with permit conditions.

ACKNOWLEDGEMENT

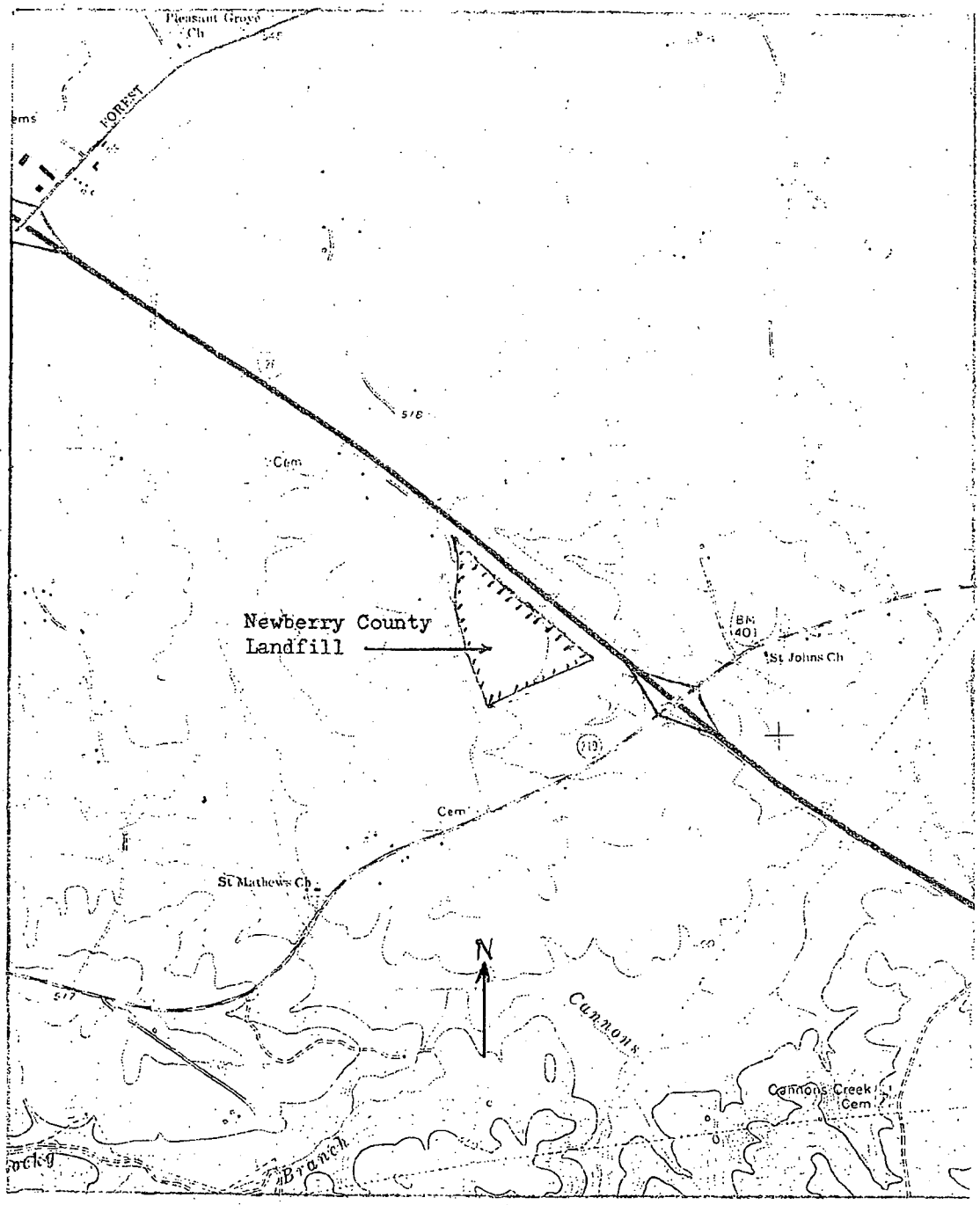
C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.

Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772

CLYDE M. LIVINGSTON, JR. REGISTERED No. 772 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

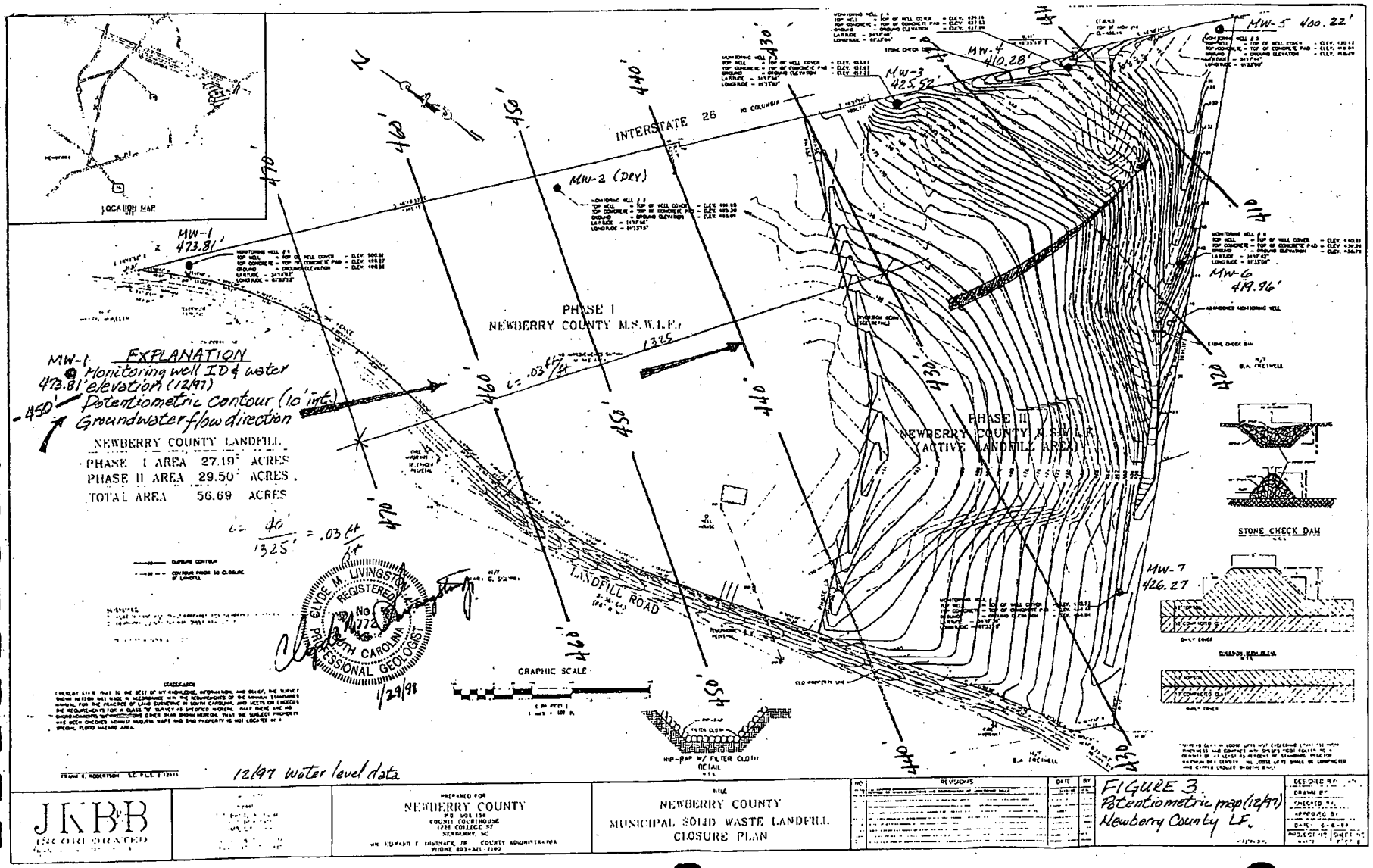
FIGURES



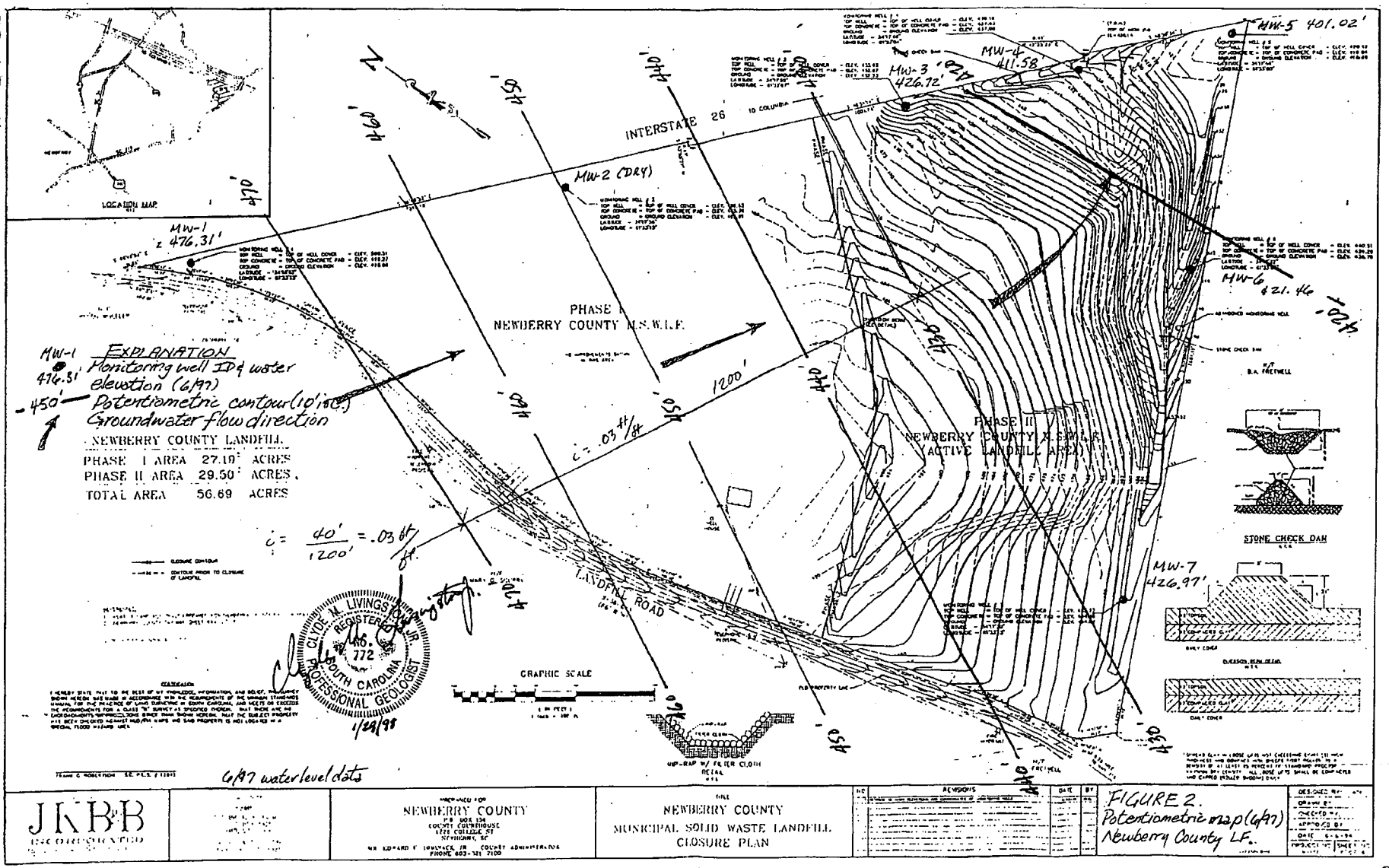
scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&I Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1. Location map, Newberry County landfill.


INTERSTATE 26
PHASE I
NEWBERRY COUNTY M.S.W.L.F.
PHASE II
NEWBERRY COUNTY M.S.W.L.F.
(ACTIVE LANDFILL AREA)
LANDFILL ROAD
MW-1
473.81'
MW-2 (DRY)
MW-3
425.52'
MW-4
410.28'
MW-5 400.22'
MW-6
419.96'
MW-7
426.27
EXPLANATION
Monitoring well ID & water elevation (12/97)
Potentiometric contour (10' int.)
Groundwater flow direction
NEWBERRY COUNTY LANDFILL
PHASE I AREA 27.19 ACRES
PHASE II AREA 29.50 ACRES
TOTAL AREA 56.69 ACRES
i = 40'/1325' = .03 ft/ft
i = .03 ft/ft
1325'
CLYDE M. LIVINGSTON REGISTERED No. 1772 SOUTH CAROLINA PROFESSIONAL GEOLOGIST
1/29/98
GRAPHIC SCALE
STONE CHECK DAM
MW-RAP w/ FILTER CLOTH DETAIL
12/97 water level data
JKBB
RECORD CREATED
PREPARED FOR
NEWBERRY COUNTY
P.O. BOX 156
COUNTY COURTHOUSE
1226 COLLEGE ST.
NEWBERRY, SC
TITLE
NEWBERRY COUNTY
MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN
REVISIONS
FIGURE 3.
Potentiometric map (12/97)
Newberry County LF.

0512


LOCATION MAP
INTERSTATE 26
MW-1
476.31'
MW-2 (DRY)
MW-3
426.72'
MW-4
411.58
MW-5 401.02'
MW-6
421.46
MW-7
426.97'
PHASE I
NEWBERRY COUNTY M.S.W.L.F.
PHASE II
NEWBERRY COUNTY M.S.W.L.F.
(ACTIVE LANDFILL AREA)
B.A. FRETWELL
STONE CHECK DAM
LANDFILL ROAD
MW-1 476.31' -450'
EXPLANATION
Monitoring well ID & water elevation (6/97)
Potentiometric contour (10' incr.)
Groundwater flow direction
NEWBERRY COUNTY LANDFILL
PHASE I AREA 27.19 ACRES
PHASE II AREA 29.50 ACRES
TOTAL AREA 56.69 ACRES
i = 40'/1200' = .03 ft/ft.
i = .03 ft/ft
1200'
CLOSURE CONTOUR
CONTOUR PRIOR TO CLOSURE OF LANDFILL
GRAPHIC SCALE
CLYDE N. LIVINGSTON, JR.
REGISTERED
NO. 772
SOUTH CAROLINA
PROFESSIONAL GEOLOGIST
1/29/98
6/97 water level data
JKBB ENVIRONMENTAL INC.
NEWBERRY COUNTY
NEWBERRY COUNTY
MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN
REVISIONS
FIGURE 2.
Potentiometric map (6/97)
Newberry County LF.

0513

MAR 5 1999

1998 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

March 2, 1999

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

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FIGURES

1. Site location map
2. June, 1998 potentiometric map
4. December, 1998 potentiometric map

APPENDICES

Appendix I--Groundwater Analyses (June 29-30, 1998 and December 21-22, 1998)

Appendix II--Statistical Analysis

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 1998 Annual Groundwater Monitoring Report for the Newberry County Landfill. The annual report addresses the following six topics:

A. Primary activities in 1998 relative to landfill monitoring and compliance;
B. Groundwater analytical findings/results from the June and December, 1998 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data; and,
F. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

Refer to Figure 1 indicating the landfill site location.

1.1 Summary of activities for 1998

During 1998, activities at the Newberry County landfill by the County Administration of significant mention, are listed as follows:

a. Groundwater sampling events for 1998, in accordance with Regulation R.61-71.258.61(3) and permit requirements, were June and December, 1998;
b. Methane gas monitoring was conducted quarterly (March, June, September, December) during 1998; and,
c. A Groundwater Assessment was planned (Plan dated February 25, 1998), approved (by SCDHEC letter dated May 5, 1998), and completed (Report dated October 6, 1998) in the vicinities of MW-3/MW-4, and MW-7.

1.2 Groundwater Assessment Summary

The following conclusions were derived from the collected data physical and chemical and findings of the Groundwater Assessment:

1. The groundwater at the Newberry County Landfill has been altered to a minimal degree by the constituents methylene chloride and vinyl chloride on the I-26 side of the landfill up to the property line. The alteration of water quality is primarily in the shallow water-bearing sediments on the east-southeast side of the landfill. This water flows toward the south-southeast at a rate of 4 to 5 ft/year (V_s = 18 to 26 ft/yr).
2. The deeper drinking water aquifer (bedrock) is recharged by the shallow zone in areas where open fractures are present and has been marginally altered (in a worst-case situation) by the constituent methylene chloride; laboratory reported to be present at a concentration of .068 mg/l (MCL = .005 mg/l) at a depth of 30 ft. into the rock aquifer. Groundwater in the bedrock aquifer flows toward the northeast (under I-26)

as controlled by the fracture system and ultimately discharges into surface water (unnamed tributary to Cannons Creek).

3. Sampling and analysis of the identified potential receptors within 0.25 mile radius of the subject area (off site surface water and on-site/off-site bedrock aquifer wells) indicates that the groundwater at the Newberry County landfill has no laboratory detectable influence on the receptors from the CoCs (methylene chloride, vinyl chloride, trichloroethene, tetrachloroethene, benzene).

Recommendations provided for SCDHEC consideration as protective of the public health and environment according to site geology and hydrogeology were:

1. Continue the routine post-closure groundwater monitoring as scheduled with the addition of TW-1, TW-6, a surface water sampling location at RS-4, and the off-site water supply well at the Cockrell residence. By this recommendation 3 additional monitoring stations would be added to the post-closure monitoring program to monitor the nearby downgradient surface water as it exits the landfill site, the deep groundwater in a downgradient location within the bedrock fracture system on-site and the nearest off-site (bedrock) water well used for drinking purposes.

2. Decommission (abandon) monitoring wells TW-2,3,4,5 and MW-2. Establish TW-1 (constructed to permanent specifications) as replacement for the existing and non-functional MW-2. By this recommendation four temporary assessment wells and one nonfunctional well would be removed according to environmental standards so as to eliminate unnecessary potential point sources of groundwater alteration.

3. Include the additional monitoring data in the annual groundwater quality monitoring report with the data already subject to evaluation as defined in the Sampling and Assessment Plan.

No specific response addressing the Groundwater Assessment recommendations has been received from SCDHEC officials to date.

2.0 GROUNDWATER ANALYTICAL DATA

Groundwater quality data was obtained from the seven (7) groundwater monitoring stations for the monitoring events on June 29-30, 1998 and December 21-22, 1998. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during each monitoring event and recorded on the field data sheets. Wells were sampled and laboratory analyzed in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. Complete copies of the laboratory reports, field data sheets and chain of custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL).

Table 1- 1998 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/29-30/98)	(12/21-22/98)	Annual Average	MCL/ [SMCL](mg/l)
MW-1 (back-ground)	Barium	0.9	0.4	0.65	2.00
	Beryllium	0.010*	0.003	0.0065*	0.004
	Copper	ND	0.06	0.055	1.3
	Lead	0.056*	0.023*	0.0395*	0.015
	Nickel	0.08	ND	0.065	0.10
	Zinc	0.19	0.10	0.145	[5.0]
MW-2		DRY WELL, NO SAMPLE			
MW-3	Mercury	ND	0.00077		0.002
	Barium	0.9	1.3	1.1	2.00
	Beryllium	0.004	0.012*	0.008*	0.004
	Chromium	0.08	0.08	0.08	0.10
	Copper	ND	0.05	0.05	1.3
	Lead	0.040*	0.028*	0.034*	0.015
	Zinc	0.29	0.40	0.345	[5.0]
	Sulfide	1.2	ND	0.65	NE
	Chloroethane	0.007	0.0126	0.0098	NE
	cis-1,2-Dichloroethene	0.0063	0.0064	0.00635	0.07
	Methylene Chloride	0.0243*	0.0212*	0.02275*	0.005
	1,1-Dichloroethane	0.0258	0.0192	0.0225	NE
	Trichloroethene	0.0079*	0.0094*	0.00865*	0.005
	Tetrachloroethene	0.006*	0.0082*	0.0071*	0.005
MW-4	Barium	0.4	1.9	1.15	2.00
	Beryllium	0.003	0.006*	0.0045*	0.004
	Chromium	ND	0.09	0.07	0.10
	Cobalt	0.06	ND	0.055	NE
	Copper	ND	0.06	0.055	1.3
	Lead	0.018*	0.028*	0.023*	0.015
	Mercury	ND	0.00027	0.000235	0.002
	Zinc	0.13	0.47	0.3	[5.0]
	Sulfide	0.4	ND	0.25	NE
	Chloroethane	0.116	0.0538	0.0849	NE
	Methylene Chloride	0.796*	0.580*	0.688*	0.005
	1,1-Dichloroethane	0.323	0.213	0.268	NE
	Trichloroethene	0.0114	0.0110	0.0112*	0.005
	Tetrachloroethene	0.0057*	0.0055*	0.0056*	0.005
	Benzene	0.0187*	0.0153*	0.017*	0.005
	Ethylbenzene	0.0064	0.0099	0.00815	0.700
	Xylenes, total	0.0424	0.0353	0.03885	10.0
	cis-1,2-Dichloroethene	ND	0.0215	0.01325	0.07
	m-Dichlorobenzene	0.006	0.0076	0.0068	0.
	o-Dichlorobenzene	0.0084	0.0118	0.0101	0.
	p-Dichlorobenzene	0.0061	0.0078	0.00695	0.
	Vinyl Chloride	0.0175*	0.0068	0.01215*	0.002
	Toluene	0.0061	ND	0.0055	1.0

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/29-30/98)	(12/21-22/98)	Annual Average	MCL/ [SMCL](mg/l)
MW-5	Barium	0.2	0.2	0.2	2.00
	Beryllium	0.001	ND	0.001	0.004
	Lead	0.014	0.012	0.013	0.015
	Zinc	0.04	0.07	0.055	[5.0]
MW-6	Barium	1.0	0.8	0.9	2.00
	Beryllium	0.007*	0.002	0.0045*	0.004
	Chromium	0.05	ND	0.05	0.10
	Copper	ND	0.05	0.055	1.3
	Lead	0.029*	0.018*	0.0235*	0.015
	Zinc	0.17	0.13	0.15	[5.0]
	Chloroethane	0.0083	0.009	0.00865	
	cis-1,2-Dichloroethene	0.0118	0.0248	0.0183	
MW-7	Barium	0.7	0.2	0.8	2.00
	Beryllium	0.006*	0.002	0.004	0.004
	Chromium	0.06	ND	0.055	0.100
	Mercury	ND	0.00028	0.00024	0.002
	Lead	0.034*	0.009	0.0215*	[illegible]
	Zinc	0.14	0.10	0.12	[illegible]
	Chloroethane	0.0333	0.0173	0.0253	[illegible]
	cis-1,2-Dichloroethene	0.0073	ND	0.00615	[illegible]
	Vinyl Chloride	ND	0.0058*	0.0034*	[illegible]

* - Exceeds MCL (maximum concentration limit for drinking water): N/E - MCL not established: ND - Not Detected: NT - Not Tested

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of seven (7) monitoring wells. One monitoring well (MW-1) is located hydraulically upgradient of the subject site and six (6) monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7) are located hydraulically downgradient and side gradient of the landfill foot print. These wells, with the exception of MW-3 and MW-5, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards.

3.1 Monitoring Well Construction Details

Monitoring well construction data for the seven well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B. Monitoring well MW-2, constructed 4/17/95 (by Law Engineering & Environmental Services, Law report dated March 28, 1996) has been reported as

dry during each sampling event following construction of the station. According to the reported geologist's boring log and well construction details, the recorded depth to groundwater at the other six stations (approx. 25 ft below ground surface) and comparison of the location of MW-2 relative to site potentiometric maps for previous sampling events, monitoring well MW-2 (49.5 ft deep) should be sufficiently deep to provide groundwater for sampling purposes. Monitoring wells MW-3 and MW-5 pre-date the other five wells and are the remaining portion of the original groundwater monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size. However, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
MW-2	4/17/95	49.5	34.5-49.5	495.01	496.64	495.39
MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figures 2 and 3) for each of the two 1998 (and previous) groundwater elevation monitoring events indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of six (6) groundwater monitoring wells (excluding the 1998

assessment wells); MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 1998 reporting period groundwater elevation data and the constructed potentiometric maps (Figures 2 and 3) indicates that the downgradient system wells appear minimally sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site. Implementation of the 1998 groundwater assessment recommendations would greatly enhance the utility and effectiveness of the monitoring network.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation, with the exception of MW-2, is generally suitable for providing representative groundwater quality samples from the upper-most aquifer. MW-2, installed on 4/17/95 to a depth of 49.5 ft, has consistently produced insufficient groundwater volume for monitoring purposes. The 1996 and 1997 Annual Groundwater Monitoring Reports suggested that MW-2 be replaced. The 1998 assessment recommended this well be abandoned and replaced in the monitoring network by TW-1.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the two 1998 groundwater monitoring events, are provided as Figures 2 and 3. The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the actual rate of movement of fluid particles through porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$:
where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = horizontal hydraulic gradient = 0.03 ft/ft; and, n_e = effective porosity = 0.22.
$V_s = 2 \times 10^{-5}$ cm/sec or 1.7 cm/day or 619 cm/yr or 20 ft/yr.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow (Point A to Point B) range of 16 ft/yr to 24 ft/yr.

TABLE 3
1998 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/98	Water Elevation 12/98
MW-1	30.0	15-30	498.86	500.51	477.31	474.51
MW-2	49.5	34.5-49.5	495.01	496.65	DRY	DRY
MW-3	34.1	UK	452.33	453.92	427.42	425.82
MW-4	30.0	15-30	437.08	439.18	412.58	410.28
MW-5	31.0	UK	418.39	420.12	401.52	399.42
MW-6	25.0	10-25	438.76	440.51	424.21	422.01
MW-7	29.5	14.5-29.5	454.04	455.77	428.97	426.47

Note: TOC=Top of Casing: UK = unknown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 1998 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. The statistical analysis indicated that the only inorganic constituent of statistical importance (flagged) at the Newberry County Landfill for 1998 is mercury. The reported trace occurrences of mercury at MW-3 (0.00077 mg/l), MW-4 (0.00028 mg/l), and MW-7 (0.00027 mg/l) are all significantly less than the established drinking water limit (MCL = 0.002 mg/l). It has also been determined through consultation with the analytical laboratory that inter-element interference from chlorides and sulfides can result in the reporting of artificially elevated concentrations of mercury and, potentially, other metallic analytes. No other inorganic constituent was determined to be of statistical significance. Refer to Table 1 for detected constituents and Appendix II for the statistical print-out with referenced inorganic analytes of statistical importance flagged.

6.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 1998 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-south east.

b. The rate of groundwater flow in the shallow saturated zone is in the range of 16 to 24 ft/year.

c. The monitoring wells are appropriately located for early warning and detection

purposes.

d. Monitoring well MW-2 has remained dry for every sampling events since construction of the well.

e. All monitoring wells except MW-2 (dry) and MW-5 contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events.

f. Detectable concentrations of organic constituents were laboratory reported at all wells with the exception of MW-1, MW-2 (dry), and MW-5 during 1998. Concentrations of organics, as reported by the laboratory are summarized in Table 1.

g. Laboratory detection of organics in groundwater samples from monitoring wells MW-3, MW-4, and MW-7 provides the only consecutive laboratory measurement of organic constituents exceeding an established drinking water concentration limit.

h. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.

7.0 CONCLUSIONS

7.1 Groundwater Quality

Groundwater quality at MW-3, MW-4, and MW-7 has been impacted by various organic constituents. Groundwater analyses at MW-3, MW-4 and MW-7 locations indicates a minimum two event occurrence of organic constituents at or above established drinking water limits for various organics.

Inorganic constituents (various metallic ions) occur in each of the sampled wells, potentially the result of clay minerals contained in turbid groundwater samples analyzed by the laboratory. Well clean-out and redevelopment may substantially reduce influence from the clay sediment on metallic ion concentrations in the groundwater samples. Interferences in the laboratory analysis process from chlorides and/or sulfides may also artificially elevate reported metallic analytes concentrations.

7.2 Technical Sufficiency of the Groundwater Monitoring Network

The six downgradient monitoring wells appear sufficient number and horizontally positioned to provide accurate groundwater quality data; however, MW-2 does not yield sufficient groundwater for sampling and is unusable for groundwater sampling purposes. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units.

Monitoring well MW-2 should be replaced by TW-1, removed from the monitoring network, and properly abandoned.

7.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 16 to 24 ft/yr, as seepage velocity.

8.0 RECOMMENDATIONS

From evaluation of the 1998 groundwater sampling data (including the 1998 groundwater quality assessment) our professional recommendations are:

1. Continue the routine post-closure groundwater monitoring as scheduled with the addition of TW-1, TW-6, surface water sampling location at RS-4, and the off-site private water supply well. By this recommendation 3 additional monitoring stations will be added to the post-closure monitoring program to monitor the nearby downgradient surface water as it exits the landfill site, the deep groundwater in a downgradient location within the bedrock fracture system on-site and the nearest off-site (bedrock) water well used for drinking purposes.

2. Decommission (abandon) assessment monitoring wells TW-2,3,4,5 and MW-2. Recognize TW-1 (constructed to permanent specifications) as replacement for the existing and non-functional MW-2. By this recommendation 4-assessment wells and 1-nonfunctional well will be removed according to environmental standards so as to eliminate unnecessary potential point sources of groundwater alteration.

3. Include the additional monitoring data in the annual groundwater quality monitoring report with the data already subject to evaluation as defined in the Sampling and Assessment Plan.

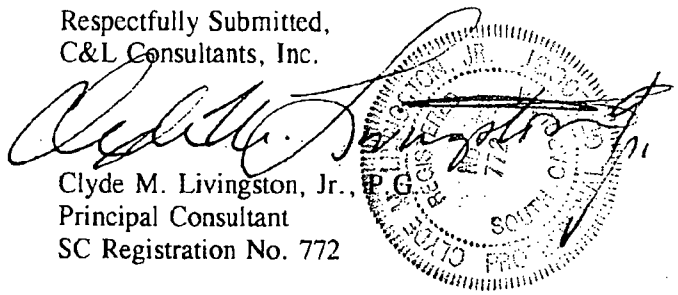
4. Clean-out (develop) all monitoring wells to reduce sample turbidity.

5. Notify the analytical laboratory of potential inter-elemental interferences so that any corrective procedures necessary to minimize interference can be implemented.

ACKNOWLEDGEMENT

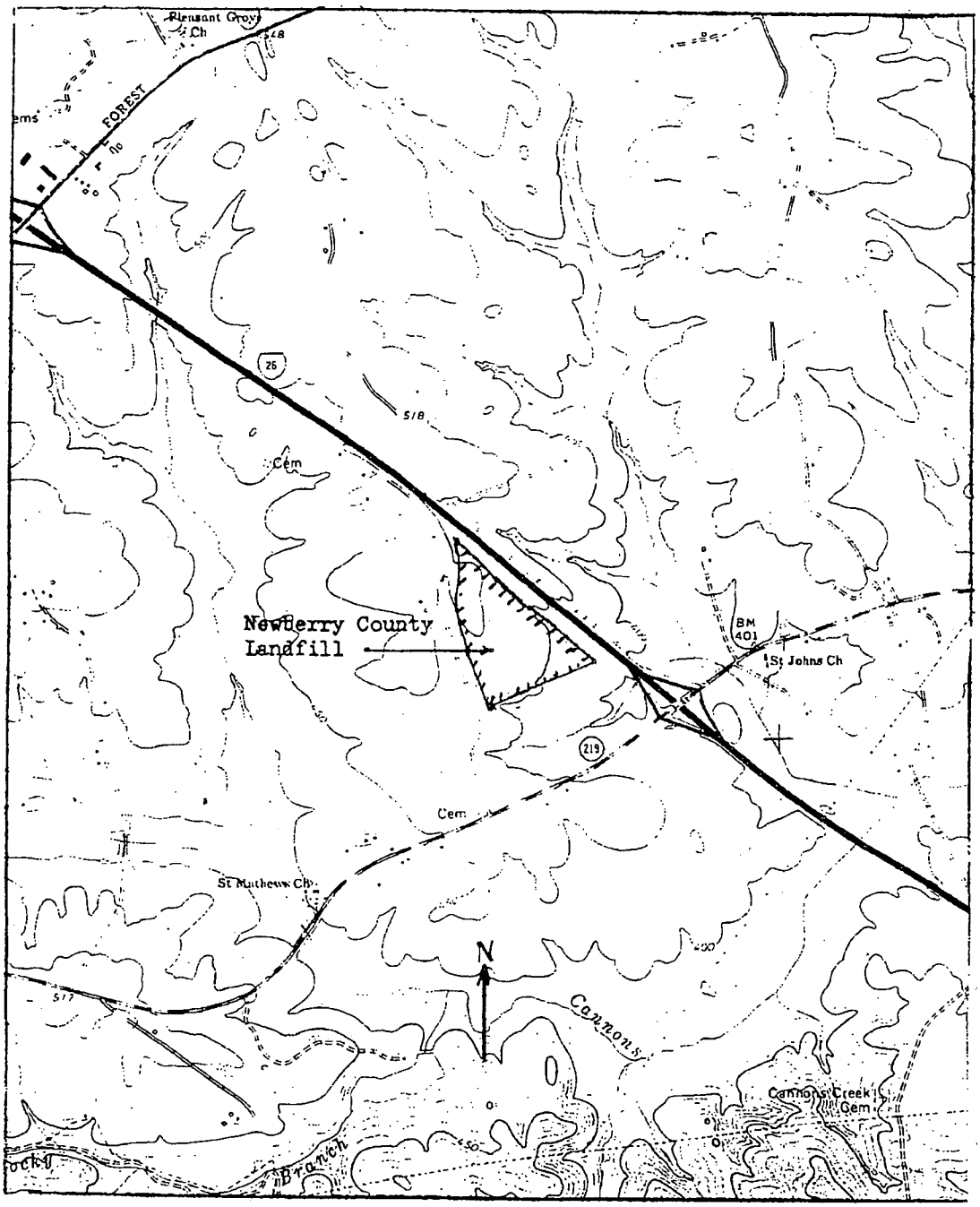
C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.



Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772

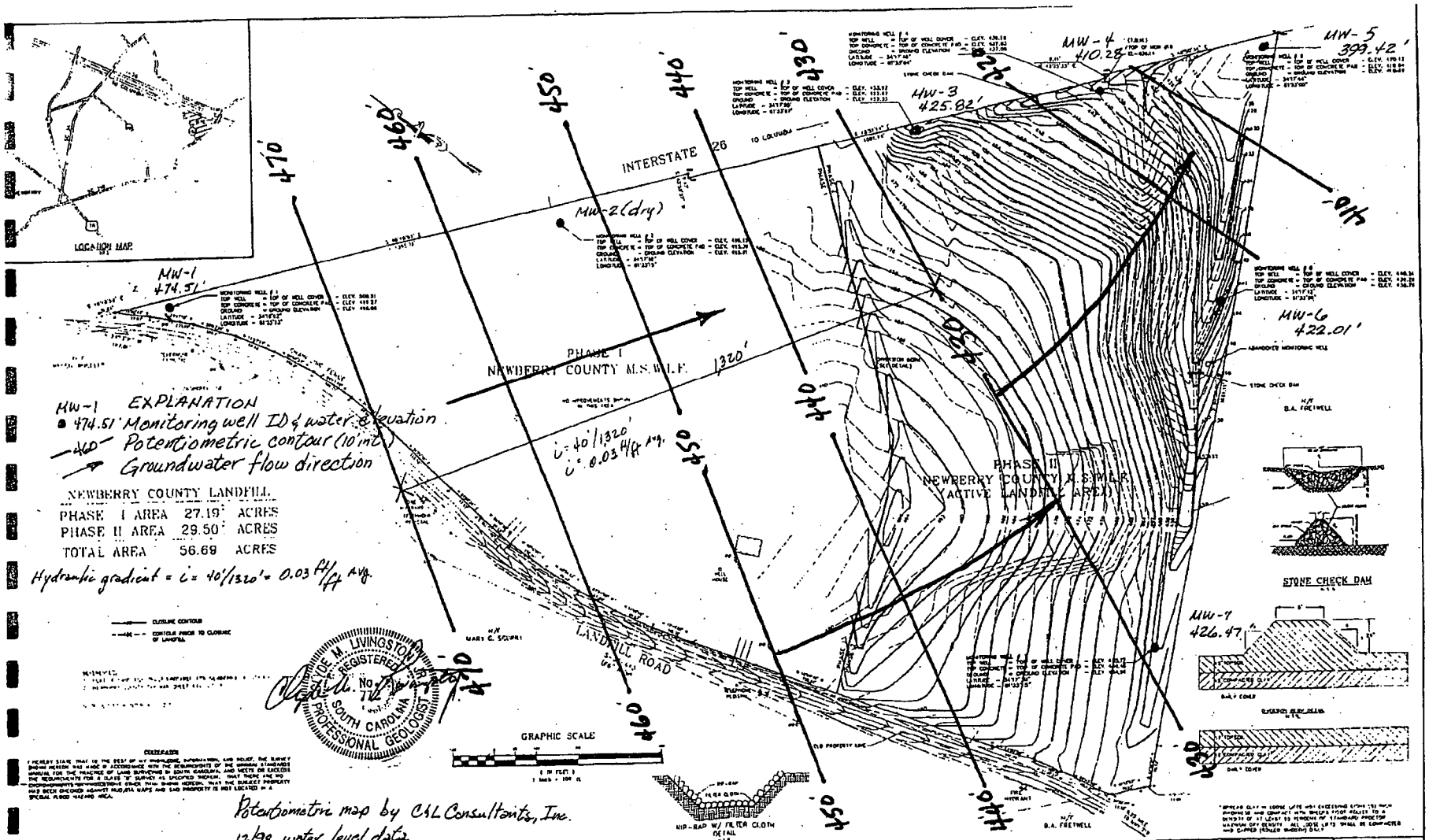
FIGURES



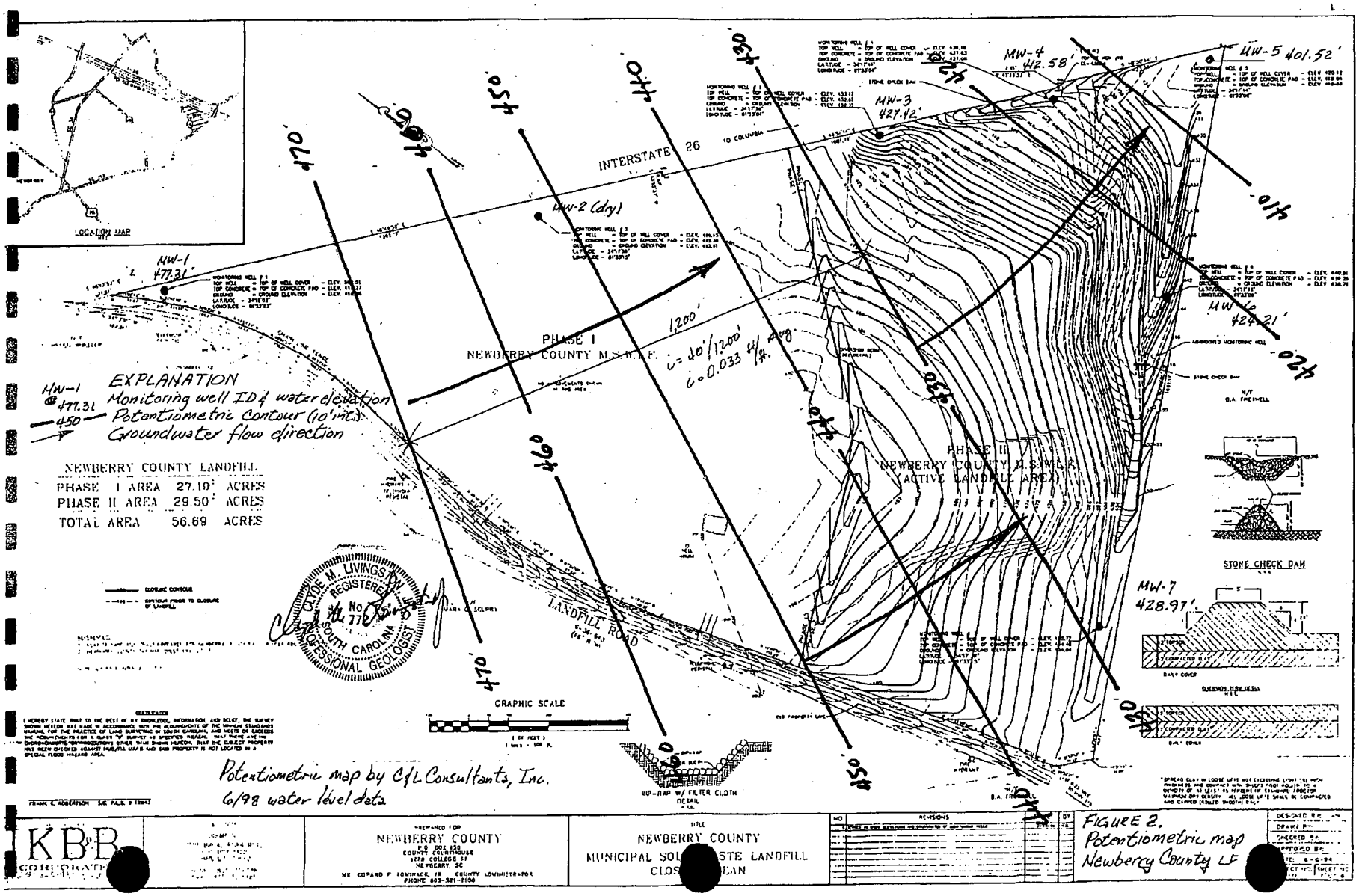
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* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&I Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1. Location map, Newberry County landfill.


LOCATION MAP
INTERSTATE 26
MW-1
474.51'
MW-2(dry)
MW-3
425.82'
MW-4
410.28'
MW-5
399.42'
MW-6
422.01'
MW-7
426.47'
PHASE I
NEWBERRY COUNTY M.S.W.L.F.
1,320'
PHASE II
NEWBERRY COUNTY M.S.W.L.F.
(ACTIVE LANDFILL AREA)
LANDFILL ROAD
STONE CHECK DAM
MW-1 EXPLANATION
474.51' Monitoring well ID & water elevation
Potentiometric contour (10' int.)
Groundwater flow direction
NEWBERRY COUNTY LANDFILL
PHASE I AREA 27.19 ACRES
PHASE II AREA 29.50 ACRES
TOTAL AREA 56.69 ACRES
Hydraulic gradient = i = 40'/1320' = 0.03 ft/ft Avg.
i = 40'/1320'
i = 0.03 ft/ft Avg.
GRAPHIC SCALE
JESSE M. LIVINGSTON
No. 1248
SOUTH CAROLINA
PROFESSIONAL GEOLOGIST
Potentiometric map by C&L Consultants, Inc.
12/98 water level data
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PHONE 803-321-2100
NEWBERRY COUNTY
MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN
REVISIONS
Figure 3.
Potentiometric map
Newberry County LF

0528



Potentiometric map by C/L Consultants, Inc.
6/98 water level data

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TITLE
NEWBERRY COUNTY
MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN

REVISIONS

Figure 2.
Potentiometric map
Newberry County LF

0529

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1999 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

February 22, 2000

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

ALL-STATE LEGAL®
PLAINTIFF'S EXHIBIT
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FIGURES

1. Site location map
2. June 17-18, 1999 potentiometric map
4. December 16-17, 1999 potentiometric map

APPENDICES

Appendix I--Groundwater Analyses (June 17-18, 1999 and December 16-17, 1999)
Appendix II--Statistical Analysis Input Data (diskette)
Appendix III--Methane Gas Monitoring Data (diskette)

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 1999 Annual Groundwater Monitoring Report for the Newberry County Landfill. Refer to Figure 1 indicating the landfill site location. The annual report addresses the following six topics:

A. Primary activities in 1999 relative to landfill monitoring and compliance;
B. Groundwater analytical findings/results from the June and December, 1999 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data;
F. Evaluation of Methane Gas Monitoring; and,
G. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

1.1 Summary of activities for 1999

During 1999, activities at the Newberry County landfill by the County Administration of significant mention, are listed as follows:

a. Groundwater sampling events for 1999, in accordance with Regulation R.61-71.258.61(3) and permit requirements, were June and December, 1999;
b. Methane gas monitoring was conducted quarterly (March, June, September, December) during 1999;
c. A Phase II Groundwater Assessment (USGS Polyethylene Diffusion Method-Poly Bag Study) was planned (Plan dated 10/11/99), approved (by SCDHEC letter dated 11/8/99), and initiated;
d. Four additional monitoring stations were added to the post-closure monitoring program to monitor the nearby downgradient surface water as it exits the landfill site, the deep groundwater in a downgradient location within the bedrock fracture system on-site and the nearest off-site (bedrock) water well used for drinking purposes. The monitoring wells added to the post-closure monitoring program are designated as MW-2R (formerly TW-1), MW-8 (formerly TW-6), a surface water sampling location at SW-1 (formerly RS-4), and the off-site water supply well at the Cockrell residence;
e. MW-2 was properly abandoned by a South Carolina-licensed well driller; and,
f. All monitoring wells were developed by air-surging and evacuation.

2.0 GROUNDWATER ANALYTICAL DATA

Water quality data was obtained from five of the eight (8) groundwater monitoring stations for both sampling events in 1999. Monitoring well MW-2 yielded insufficient water for

sampling in June, 1999 and was abandoned. Monitoring well MW-7 yielded insufficient water for sampling in December, 1999. Monitoring wells MW-2R and MW-8, the nearby water supply well (Cockrell well), and the surface water monitoring station were authorized and added to the monitoring network after the June, 1999 sampling event. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during each monitoring event and recorded on the field data sheets. Wells were sampled and laboratory analyzed by Columbia Analytical Laboratories, reportedly in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. The annual groundwater quality evaluation is based upon groundwater analytical and field data furnished to C&L Consultants, Inc. by Columbia Analytical Laboratories. Complete copies of the laboratory reports, field data sheets and chain of custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL).

Table 1- 1999 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/17-18/99)	CONCENTRATION (mg/l) (12/16-17/99)	MCL/ [SMCL](mg/l)
MW-1 (back-ground)	Barium	0.262	1.01	2
	Beryllium	0.001	0.006*	0.004
	Cadmium	ND	0.003	0.005
	Cobalt	ND	0.022	NE
	Copper	ND	0.034	1.3
	Mercury	ND	0.0001	0.002
	Lead	0.009	0.053*	0.015
	Vanadium	ND	0.068	NE
	Zinc	0.032	0.205	[5]
MW-2		Dry	Abandoned	
MW-2R	Barium	NT	8.72*	2
	Beryllium	NT	0.031*	0.004
	Cadmium	NT	0.027*	0.005
	Cobalt	NT	0.182	NE
	Copper	NT	0.027	1.3
	Mercury	NT	0.0123*	0.002
	Lead	NT	0.394*	0.015
	Vanadium	NT	0.480	NE
	Zinc	NT	1.48	[5]
	Carbon Disulfide	NT	0.0744	NE
	Chloroethane	NT	0.0093	NE
	Acetone	NT	0.0692	NE
	4-Methyl-2-Pentanone	NT	0.0077	NE
	cis-1,2-Dichloroethene	NT	0.038	0.07
	Xylenes, total	NT	0.0214	10
	Methylene Chloride	NT	0.137*	0.005
	1,4-Dichlorobenzene	NT	0.0078	0.075

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/29-30/98)	CONCENTRATION (mg/l) (12/21-22/98)	MCL/ [SMCL](mg/l)
MW-2R cont.	1,1-Dichloroethane	NT	0.0116	NE
	Trichloroethene	NT	0.0091*	0.005
	Benzene	NT	0.0092*	0.005
MW-3	Barium	0.955	0.883	2
	Beryllium	0.008*	0.006*	0.004
	Cadmium	0.006*	0.001	0.005
	Cobalt	0.028	ND	NE
	Copper	ND	0.012	1.3
	Mercury	0.00089	ND	0.002
	Lead	0.053*	0.009	0.015
	Vanadium	0.115	0.024	NE
	Zinc	0.450	0.146	[5]
	Methyl Chloride	ND	0.006	NE
	Dichlorodifluoromethane	ND/T	0.0081	NE
	cis-1,2-Dichloroethene	0.0069	0.0081	0.07
	Methylene Chloride	0.0253*	0.0223*	0.005
	1,1-Dichloroethane	0.0222	0.0198	NE
	Trichloroethene	0.0107*	ND	0.005
	Tetrachloroethene	0.0099*	0.0118*	0.005
MW-4	Barium	0.397	1.04	2
	Cadmium	0.001	0.005	0.005
	Cobalt	0.014	0.037	NE
	Lead	ND	0.028*	0.015
	Mercury	ND	0.00254*	0.002
	Vanadium	0.014	0.082	NE
	Zinc	0.094	0.354	[5]
	Chloroethane	0.043	0.0267	NE
	Trichlorofluoromethane	0.180	ND	NE
	Acetone	0.0956	ND	NE
	Methylene Chloride	0.331*	0.183*	0.005
	1,1-Dichloroethane	0.154	0.0672	NE
	Trichloroethene	0.0091*	ND	0.005
	Tetrachloroethene	0.0052*	ND	0.005
	Benzene	0.013*	0.0085*	0.005
	Ethylbenzene	0.0069	ND	0.700
	Xylenes, total	0.0429	0.0208	10.0
	cis-1,2-Dichloroethene	0.0168	0.0076	0.07
	1,3-Dichlorobenzene	0.0073	ND	0.6
	1,2-Dichlorobenzene	0.011	0.0071	0.6
	Vinyl Chloride	0.0027*	ND	0.002
MW-5	Barium	0.531	3.40*	2.00
	Beryllium	ND	0.006*	0.004
	Cadmium	0.006*	0.024*	0.005
	Cobalt	0.018	0.135	NE
	Chromium	0.011	0.061	0.1

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/29-30/98)	CONCENTRATION (mg/l) (12/21-22/98)	MCL/ [SMCL](mg/l)
MW-5	Copper	0.032	0.076	1.3
cont.	Mercury	ND	0.00277*	0.002
	Lead	0.039*	0.210*	0.015
	Antimony	ND	0.006	0.006
	Vanadium	0.046	0.318	NE
	Zinc	0.276	1.54	[5]
MW-6	Barium	0.617	1.34	2
	Beryllium	0.001	ND	0.004
	Cadmium	0.001	0.007*	0.005
	Cobalt	0.011	0.038	NE
	Mercury	0.00132	ND	0.002
	Lead	0.015	0.045*	0.015
	Vanadium	0.028	0.101	NE
	Zinc	0.145	0.459	[5]
	Chloroethane	0.0127	0.015	NE
	Methylene Chloride	ND	0.0099*	0.005
	cis-1,2-Dichloroethene	0.030	ND	0.07
	Benzene	ND	0.006*	0.005
MW-7	Barium	0.540	Dry	2
	Beryllium	0.002		0.004
	Cadmium	0.001		0.005
	Chromium	ND		0.100
	Mercury	0.00169		0.002
	Lead	0.017*		0.015
	Vanadium	0.019		NE
	Zinc	0.115		[5]
	Chloroethane	0.0185		NE
	cis-1,2-Dichloroethene	0.0052		0.070
	Vinyl Chloride	0.0033*		0.002
	Benzene	0.0066*		0.005
MW-8	Barium	NT	0.188	2
	Mercury	NT	0.00183	0.002
	Thallium	NT	0.003*	0.002
	Zinc	NT	0.028	[5]
	Methylene Chloride	NT	0.034*	0.005
	1,1-Dichloroethane	NT	0.0232	NE
Cockrell Well	Barium	NT	0.029	2
	Copper	NT	0.024	1.3
SW-1	Barium	NT	0.071	2
Field Blank	Acetone	0.0851		NE

* - Exceeds MCL (maximum concentration limit for drinking water): N/E - MCL not established: ND - Not Detected: NT - Not Tested

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of (8) monitoring wells. One monitoring well (MW-1) is located hydraulically upgradient of the subject site and six (6) monitoring wells (MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8) are located hydraulically downgradient and side gradient of the landfill foot print. Four wells, MW-1, MW-4, MW-6, and MW-7, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards. Two monitoring wells, MW-2R (formerly TW-1, replaced MW-2, now abandoned) and MW-8 (formerly TW-6, deep well installed to monitor water quality in the bedrock aquifer) were installed during 1998 as part of a groundwater assessment.

3.1 Monitoring Well Construction Details

Monitoring well construction data for the eight- well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B. Monitoring wells MW-3 and MW-5 pre-date the other six wells and are the remaining portion of the original groundwater monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size. However, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
MW-2R	7/16/98	31.5	26.5-31.5	--	460.21	456.78
MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48
MW-8	7/16/98	68	58-68	--	443.39	440.47

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figures 2 and 3) for each of the two 1999 (and previous) groundwater elevation monitoring events indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of seven (7) groundwater monitoring wells (excluding the 1998 assessment wells); MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 1999 groundwater elevation data and the constructed potentiometric maps (Figures 2 and 3) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation is generally suitable for providing representative groundwater quality samples from the upper-most aquifer.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the two 1999 groundwater monitoring events, are provided as Figures 2 and 3. The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the calculated rate of movement of fluid particles through

porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$: where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = horizontal hydraulic gradient = 0.03 ft/ft; and, n_e = effective porosity = 0.22.

$V_s = 2 \times 10^{-5}$ cm/sec or 1.7 cm/day or 619 cm/yr or 20 ft/yr towards the east-southeast.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow range of 16 ft/yr to 24 ft/yr to the east-southeast.

TABLE 3
1999 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/99	Water Elevation 12/99
MW-1	30.0	15-30	498.86	500.51	473.61	471.81
MW-2R	31.5	26.5-31.5	456.78	460.21	--	426.31
MW-3	34.1	UK	452.33	453.92	425.02	424.02
MW-4	30.0	15-30	437.08	439.18	410.38	408.98
MW-5	31.0	UK	418.39	420.12	399.82	397.42
MW-6	25.0	10-25	438.76	440.51	421.61	423.71
MW-7	29.5	14.5-29.5	454.04	455.77	425.97	<424.54
MW-8	68.0	58-68	440.47	443.39	--	408.29

Note: TOC=Top of Casing; UK = unknown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 1999 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. Please note that MW-2R and MW-8 are not included in this statistical analysis due to insufficient sampling events. The statistical analysis indicated that the only inorganic constituent of statistical importance (flagged) at the Newberry County Landfill for 1999 is mercury at monitoring well MW-3. The reported trace occurrences of mercury at MW-3 (0.00089 mg/l) is significantly less than the established drinking water limit (MCL = 0.002 mg/l). No other inorganic constituent was determined to be of statistical significance. Refer to Table 1 for detected constituents and Appendix II for the statistical analysis input data.

6.0 METHANE GAS MONITORING

Methane gas monitoring was conducted quarterly (March, June, September, December) during 1999. No detected concentrations of methane gas exceeded action levels during 1999; Refer to Appendix III for methane monitoring data.

7.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 1999 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-south east.

b. The rate of groundwater flow in the shallow saturated zone is in the range of 16 to 24 ft/year.

c. The monitoring wells are appropriately located for early warning and detection purposes.

d. Monitoring well MW-7 yielded insufficient water for sampling for the 2nd-half 1999 (December) sampling event.

e. All monitoring wells, including the background well (MW-1) contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events.

f. Detectable concentrations of organic constituents were laboratory reported at all wells with the exception of MW-1 and MW-5 during 1999. Concentrations of organics, as reported by the laboratory are summarized in Table 1.

g. No constituents were detected in water samples from either the Cockrell drinking water well or the surface water sampling point at concentrations that exceeded established MCLs.

h. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.

8.0 CONCLUSIONS

8.1 Groundwater Quality

Groundwater quality at the Newberry County landfill has been altered by various organic constituents. The inorganic constituent mercury at MW-3 was statistically indicated to be significant evidence of contamination; however, the laboratory reported

concentration of 0.00089 mg/l (1st-half sampling event only) is significantly less than the MCL of 0.002 mg/l).

8.2 Technical Sufficiency of the Groundwater Monitoring Network

The seven downgradient monitoring wells appear sufficient number and horizontally positioned to provide accurate groundwater quality data. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units.

8.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 16 to 24 ft/yr, as seepage velocity.

9.0 RECOMMENDATIONS

From evaluation of the 1999 groundwater sampling data our professional recommendations are:

1. Decommission (abandon) assessment monitoring wells TW-2,3,4, and TW-5.

2. Evaluate the data from the on-going Phase II Groundwater Assessment (Polyethylene Diffusion Study) prior to initiating any additional testing or assessment.

ACKNOWLEDGEMENT

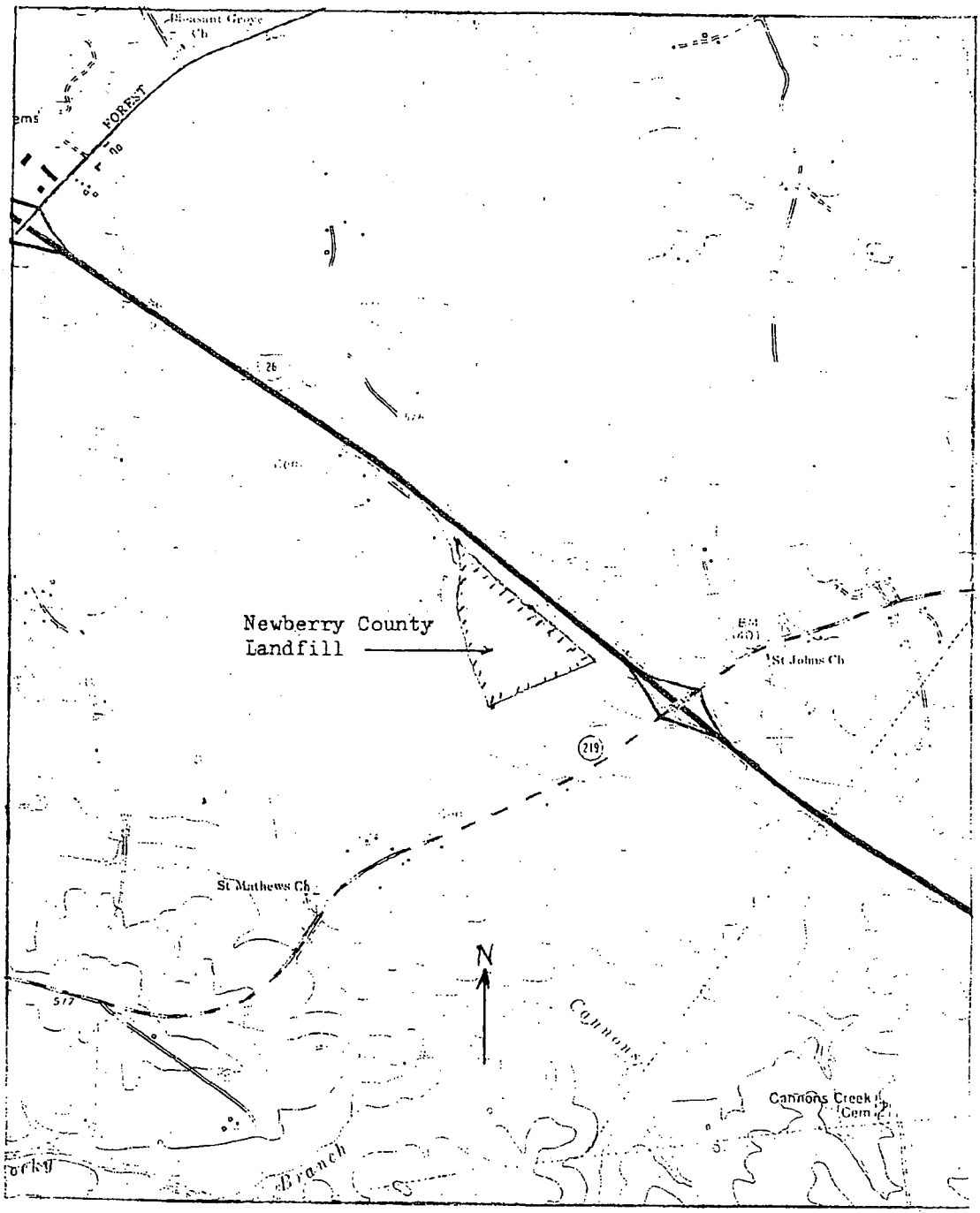
C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.



Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772

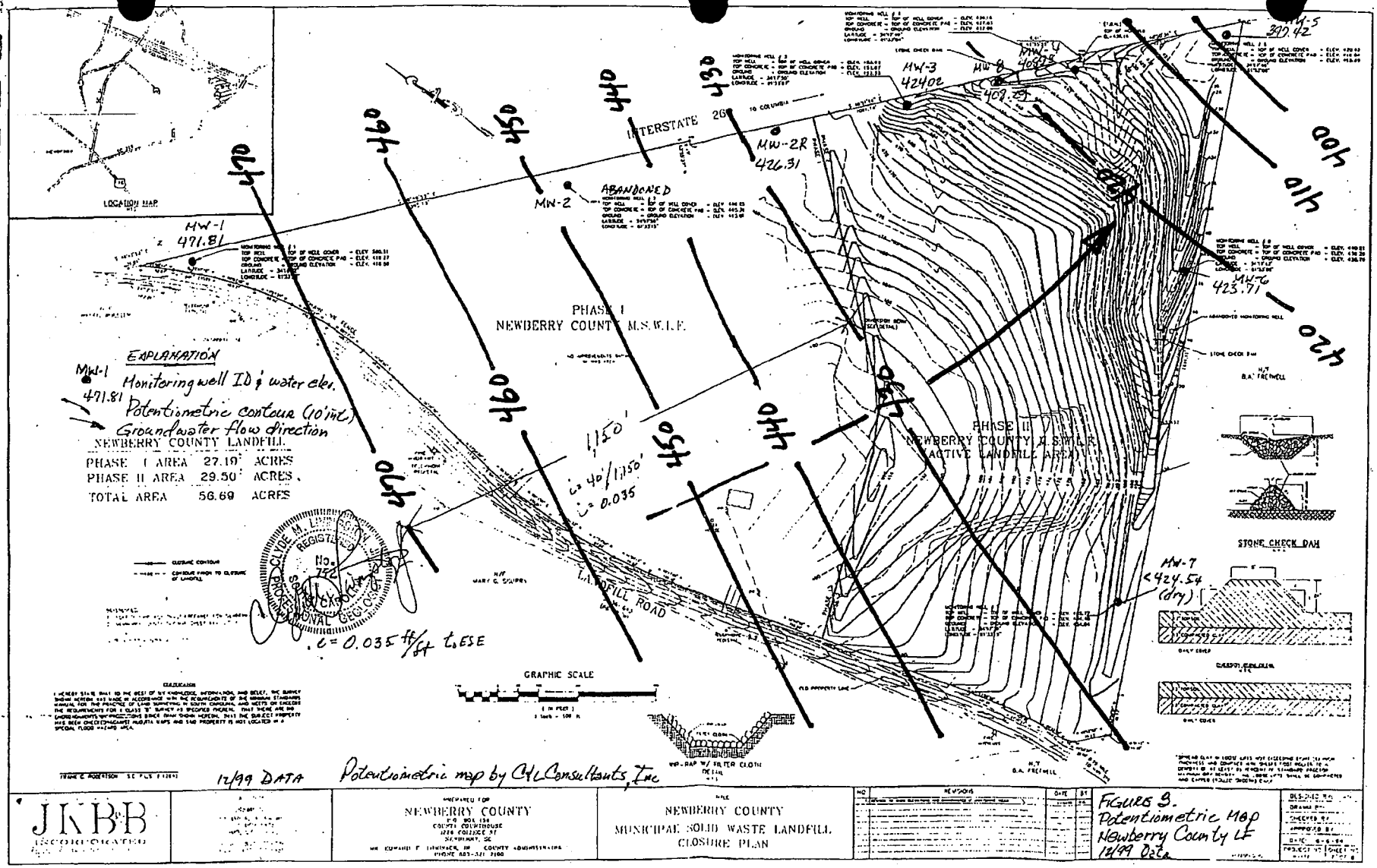
FIGURES

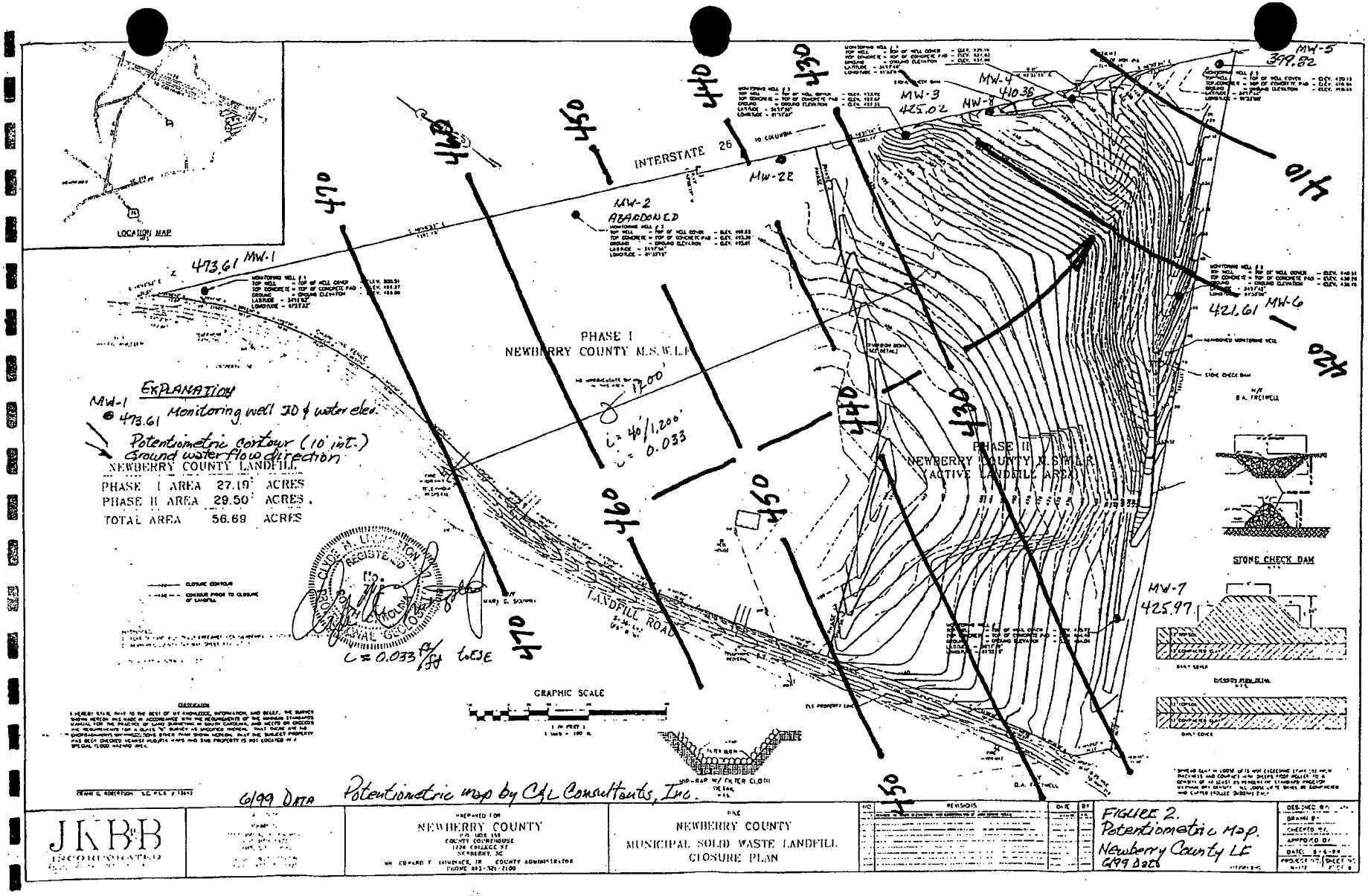


scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&L Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1. Location map, Newberry County landfill.


LOCATION MAP
INTERSTATE 26
MW-1
471.81
MW-2
ABANDONED
MW-2R
426.31
MW-3
424.02
MW-4
409.25
MW-5
397.42
MW-6
423.71
MW-7
<424.54
(dry)
PHASE I
NEWBERRY COUNTY M.S.W.L.F.
PHASE II
NEWBERRY COUNTY M.S.W.L.F.
(ACTIVE LANDFILL AREA)
EXPLANATION
MW-1
471.81
Monitoring well ID & water elev.
Potentiometric contour (10'int.)
Groundwater flow direction
NEWBERRY COUNTY LANDFILL
PHASE I AREA 27.19 ACRES
PHASE II AREA 29.50 ACRES
TOTAL AREA 56.69 ACRES
1,150'
i = 40'/1150'
i = 0.035
i = 0.035 ft/ft toESE
LANDFILL ROAD
STONE CHECK DAM
GRAPHIC SCALE
12/99 DATA
Potentiometric map by CHLConsultants, Inc
JKBB
NEWBERRY COUNTY
NEWBERRY COUNTY
MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN
FIGURE 3.
Potentiometric Map
Newberry County LF
12/99 Data


LOCATION MAP
INTERSTATE 26
MW-1
473.61
MW-2
ABANDONED
MW-22
MW-3
425.02
MW-4
410.38
MW-5
399.82
MW-6
421.61
MW-7
425.97
PHASE I
NEWBERRY COUNTY M.S.W.L.F.
PHASE II
NEWBERRY COUNTY M.S.W.L.F.
(ACTIVE LANDFILL AREA)
EXPLANATION
MW-1 ● 473.61 Monitoring well ID & water elev.
Potentiometric contour (10' int.)
Ground water flow direction
NEWBERRY COUNTY LANDFILL
PHASE I AREA 27.19 ACRES
PHASE II AREA 29.50 ACRES
TOTAL AREA 56.69 ACRES
i = 40'/1,200' = 0.033
i = 0.033 ft/ft WEST
LANDFILL ROAD
STONE CHECK DAM
GRAPHIC SCALE
6/99 DATA
Potentiometric map by CGL Consultants, Inc.
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MUNICIPAL SOLID WASTE LANDFILL
CLOSURE PLAN
REVISIONS
FIGURE 2.
Potentiometric Map.
Newberry County LF
6/99 Data

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2000 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

March 21, 2001

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

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Newberry County Landfill, 2000 Annual Groundwater Monitoring Report

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FIGURES

1. Site location map
2. June, 2000 potentiometric map
3. December, 2000 potentiometric map

APPENDICES

Appendix I--Groundwater Analyses (June, 2000 and December, 2000)
Appendix II--Statistical Analysis Input Data
Appendix III--Methane Gas Monitoring Data

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 2000 Annual Groundwater Monitoring Report for the Newberry County Landfill. Refer to Figure 1 indicating the landfill site location. The annual report addresses the following six topics:

A. Primary activities in 2000 relative to landfill monitoring and compliance;
B. Groundwater analytical results/findings from the June and December, 2000 groundwater sampling events. Note, due to the number of dry wells reported for the December, 2000 sampling event, selected wells were sampled/ resampled in February, 2001;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data;
F. Evaluation of Methane Gas Monitoring; and,
G. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

1.1 Summary of activities for 2000

During 2000, activities at the Newberry County landfill by the County Administration of significant mention, are listed as follows:

a. Groundwater sampling events for 2000, in accordance with Regulation R.61-71.258.61(3) and permit requirements, were June and December, 2000 (due to the number of dry wells reported for the December, 2000 sampling event, selected wells were sampled/resampled in February, 2001); and,
b. Methane gas monitoring was conducted quarterly (March, June, September, December) during 2000;
c. An off-site groundwater assessment plan was prepared, submitted, and SCDHEC-approved. Implementation of the off-site assessment is awaiting landowner permission for well installation.

2.0 GROUNDWATER ANALYTICAL DATA

Water quality data was obtained from five of the eight (8) groundwater monitoring stations for both sampling events in 2000. Monitoring well MW-7 yielded insufficient water for sampling in all 2000 sampling events, including the subsequent resampling in February, 2001. MW-1, MW-4, and SW-1 (surface water) yielded insufficient water for sampling in the December, 2000/February, 2001 sampling event. In addition, MW-2R yielded insufficient water for sampling in the June, 2000 sampling event and for volatile organic sample collection in the December, 2000/February, 2001 sampling event. The off-site private well (Cockrell well) was sampled in both the June and December, 2000 sampling events. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during each monitoring event and recorded on the field data sheets. Wells were

sampled and laboratory analyzed by Columbia Analytical Laboratories, reportedly in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. The annual groundwater quality evaluation is based upon groundwater analytical and field data furnished to C&L Consultants, Inc. by Columbia Analytical Laboratories. Complete copies of the laboratory reports, field data sheets and chain-of-custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL). Refer to figures 2 and 3 for sample point locations.

Table 1- 2000 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/26-27/00)	(12/15-27/00)	(2/7/01)	MCL/ [SMCL](mg/l)
MW-1	Silver	0.010	DRY	DRY	0.1
(back-	Barium	0.596	NS	NS	2
ground)	Beryllium	0.006*	NS	NS	0.004
	Cadmium	0.004	NS	NS	0.005
	Copper	0.014	NS	NS	1.3
	Lead	0.027*	NS	NS	0.015
	Vanadium	0.019	NS	NS	NE
	Zinc	0.249	NS	NS	[5]
MW-2R	Silver	DRY	0.024	DRY	0.1
	Barium	NS	0.860	NS	2
	Beryllium	NS	0.001	NS	0.004
	Cadmium	NS	0.001	NS	0.005
	Copper	NS	0.023	NS	1.3
	Lead	NS	0.082*	NS	0.015
	Antimony	NS	0.006	NS	0.006
	Vanadium	NS	0.016	NS	NE
	Zinc	NS	0.092	NS	[5]
	(INSUFFICIENT WATER AFTER 24 HRS FOR VOLATILE ORGANIC SAMPLES)				
MW-3	Barium	1.97	1.63	NS	2
	Beryllium	0.014*	0.014*	NS	0.004
	Cadmium	0.013*	0.009*	NS	0.005
	Cobalt	0.043	0.048	NS	NE
	Copper	0.012	0.013	NS	1.3
	Mercury	0.00112	0.00289*	NS	0.002
	Lead	0.075*	0.078*	NS	0.015
	Antimony	ND	0.008*	NS	0.006
	Vanadium	0.127	0.170	NS	NE
	Zinc	0.710	0.659	NS	[5]
	Dichlorodifluoromethane	ND	0.0064	NS	NE
	Chloroethane	0.0082	0.0074	NS	NE
	cis-1,2-Dichloroethene	0.0158	0.0188	NS	0.07
	Methylene Chloride	0.0229*	0.0176*	NS	0.005

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/26-27/00)	(12/15-27/00)	(2/7/01)	MCL/ [SMCL](mg/l)
MW-3 cont	1,1-Dichloroethane	0.0215	0.0199	NS	NE
	Trichloroethene	0.0138*	0.0135*	NS	0.005
	Tetrachloroethene	0.0154*	0.0145*	NS	0.005
MW-4	Silver	0.010	DRY	DRY	0.1
	Barium	0.756	NS	NS	2
	Beryllium	0.002	NS	NS	0.004
	Cadmium	0.005	NS	NS	0.005
	Cobalt	0.023	NS	NS	NE
	Lead	0.016*	NS	NS	0.015
	Vanadium	0.029	NS	NS	NE
	Zinc	0.342	NS	NS	[5]
	Chloroethane	0.0077	NS	NS	NE
	Methylene Chloride	0.0345*	NS	NS	0.005
	1,1-Dichloroethane	0.0394	NS	NS	NE
	Xylenes, total	0.007	NS	NS	10.0
MW-5	Barium	1.63	NS	0.206	2.00
	Beryllium	0.009*	NS	ND	0.004
	Cadmium	0.004	NS	0.001	0.005
	Cobalt	0.018	NS	ND	NE
	Chromium	0.012	NS	ND	0.1
	Copper	0.021	NS	ND	1.3
	Lead	0.043*	NS	ND	0.015
	Vanadium	0.056	NS	ND	NE
	Zinc	0.306	NS	0.046	[5]
MW-6	Barium	1.41	0.657	NS	2
	Beryllium	0.011*	ND	NS	0.004
	Cadmium	0.004	0.002	NS	0.005
	Cobalt	0.023	0.013	NS	NE
	Copper	0.013	ND	NS	1.3
	Mercury	ND	0.00083	NS	0.002
	Lead	0.032*	0.019*	NS	0.015
	Antimony	ND	0.007*	NS	0.006
	Vanadium	0.075	0.041	NS	NE
	Zinc	0.363	0.195	NS	[5]
	Chloroethane	0.0119	0.0093	NS	NE
	cis-1,2-Dichloroethene	0.027	ND	NS	0.07
	Benzene	0.0059*	ND	NS	0.005
MW-7		DRY	DRY	DRY	
MW-8	Silver	0.012	0.023	ND	0.1
	Barium	0.191	0.123	0.115	2
	Beryllium	0.004	ND	ND	0.004
	Cadmium	0.002	ND	ND	0.005

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (6/26-27/00)	(12/15-27/00)	(2/7/01)	MCL/ [SMCL](mg/l)
MW-8	Mercury	ND	0.00157	0.00040	0.002
cont	Selenium	0.026	ND	ND	0.05
	Thallium	0.002	0.007*	ND	0.002
	Zinc	0.206	0.017	ND	[5]
	cis-1,2-Dichloroethene	ND	0.0052	ND	0.070
	Methylene Chloride	0.0169*	0.0214*	0.0195*	0.005
	1,1-Dichloroethane	0.0178	0.0164	0.0157	NE
TW-2	Barium	NS	3.22	NS	2
	Beryllium	NS	0.021*	NS	0.004
	Cadmium	NS	0.018*	NS	0.005
	Cobalt	NS	0.055	NS	NE
	Copper	NS	0.045	NS	1.3
	Mercury	NS	0.00027	NS	0.002
	Lead	NS	0.176*	NS	0.015
	Antimony	NS	0.006	NS	0.006
	Vanadium	NS	0.153	NS	NE
	Zinc	NS	0.843	NS	[5]
	cis-1,2-Dichloroethene	NS	0.0067	NS	0.070
	1,1-Dichloroethane	NS	0.0196	NS	NE
Cockrell Well	Silver	0.012	0.021	NS	0.1
	Barium	0.054	0.035	NS	2
	Beryllium	0.004	ND	NS	0.004
	Cadmium	0.002	ND	NS	0.005
	Copper	0.023	0.066	NS	1.3
	Selenium	0.024	ND	NS	0.05
	Thallium	0.001	0.004*	NS	0.002
	Zinc	ND	0.039	NS	[5]
SW-1	Arsenic	0.012	DRY	DRY	0.05
	Barium	0.105	NS	NS	2
	Beryllium	0.002	NS	NS	0.004
	Cadmium	0.001	NS	NS	0.005
	Copper	0.024	NS	NS	1.3
	Zinc	0.086	NS	NS	[5]
Field Blank	Acetone	0.144	0.304	ND	NE

* - Exceeds MCL (drinking water standard): NE - not established: ND - Not Detected: NT - Not Tested: NS - Not Sampled

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of eight (8) monitoring wells and two (2) additional sampling points; the Cockrell private well and a surfacewater monitoring point

(SW-1). One (1) monitoring well (MW-1) is located hydraulically upgradient of the subject site and seven (7) monitoring wells (MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8) are located hydraulically downgradient and sidegradient of the landfill foot-print. Four wells, MW-1, MW-4, MW-6, and MW-7, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards. Two monitoring wells, MW-2R (formerly TW-1, replaced MW-2, now abandoned) and MW-8 (formerly TW-6, deep well installed to monitor water quality in the bedrock aquifer) were installed during 1998 as part of a groundwater assessment and subsequently added to the monitoring network.

3.1 Monitoring Well Construction Details

Available monitoring well construction data for the eight-well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B. Monitoring wells MW-3 and MW-5 pre-date the other six wells and are the remaining portion of the original groundwater monitoring network. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size. However, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
MW-2R	7/16/98	31.5	26.5-31.5	--	460.21	456.78
MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48
MW-8	7/16/98	68	58-68	--	443.39	440.47

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figures 2 and 3) for each of the two 2000 (and previous) groundwater elevation monitoring events indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of seven (7) groundwater monitoring wells (excluding the 1998 assessment wells); MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 2000 groundwater elevation data and the constructed potentiometric maps (Figures 2 and 3) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation is generally suitable for providing representative groundwater quality samples from the upper-most aquifer during periods of normal precipitation. Some degradation of surface pads around the older wells has been reported.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the two scheduled 2000 groundwater monitoring events, are provided as Figures 2 and 3. The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the calculated rate of movement of fluid particles through porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$: where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = average horizontal hydraulic gradient = 0.0275 ft/ft; and, n_e = effective porosity = 0.22.

V_s = 19.5 ft/yr towards the east-southeast.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow range of 16 ft/yr to 24 ft/yr to the east-southeast.

TABLE 3
2000 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/00	Water Elevation 12/00
MW-1	30.0	15-30	498.86	500.51	471.41	470.01
MW-2R	31.5	26.5-31.5	456.78	460.21	425.81	425.41
MW-3	34.1	UK	452.33	453.92	423.62	422.82
MW-4	30.0	15-30	437.08	439.18	409.08	408.18
MW-5	31.0	UK	418.39	420.12	398.72	398.39
MW-6	25.0	10-25	438.76	440.51	419.91	418.81
MW-7	29.5	14.5-29.5	454.04	455.77	DRY	425.57
MW-8	68.0	58-68	440.47	443.39	408.39	407.39

Note: TOC=Top of Casing; UK = unknown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 2000 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. The statistical analysis indicated that the two inorganic constituents of statistical importance (flagged) at the Newberry County Landfill for 2000 are mercury at monitoring well MW-3 and thallium at monitoring well MW-8. The reported trace occurrences of mercury at MW-3 were 0.00112 mg/l in the June, 2000 sampling event and 0.00289 mg/l in the December, 2000 sampling event (MCL = 0.002 mg/l).The reported trace occurrences of thallium at MW-8 were 0.002 mg/l in the June, 2000 sampling event and 0.007 mg/l in the December, 2000 sampling event (MCL = 0.002 mg/l). Thallium was

below the analytical detection limit at MW-8 in the February, 2001 sampling event. No other inorganic constituent was determined to be of statistical significance. Refer to Table 1 for detected constituents and Appendix II for the statistical analysis input data.

6.0 METHANE GAS MONITORING

Methane gas monitoring was conducted quarterly (March, June, September, December) during 2000. No detected concentrations of methane gas exceeded action levels during 2000; Refer to Appendix III for methane monitoring data (included in this report as requested by SCDHEC officials).

7.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 2000 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-southeast.

b. The rate of groundwater flow, as seepage velocity, in the shallow saturated zone is in the range of 16 to 24 ft/year.

c. Drought conditions extending through 2000 had and impact on water availability at several monitoring stations, including SW-1.

d. The monitoring wells are appropriately located for early warning and detection purposes.

e. All sampled monitoring wells, including the background well (MW-1) contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events. Note: MW-7 yielded insufficient water for sampling for both 2000 sampling events and the additional sampling in February, 2001.

f. Detectable concentrations of organic constituents were laboratory reported at all sampled wells with the exception of MW-1 and MW-5 during 2000. Note: MW-2R and MW-7 yielded insufficient water for organic sampling for both 2000 sampling events and the additional sampling in February, 2001.

g. Thallium was detected in the December, 2000 water samples from the Cockrell drinking water well at a concentration of 0.004 mg/l and MW-8 at a concentration of 0.007 mg/l (MCL = 0.002 mg/l). Thallium was below the laboratory detection limit in the additional sampling of MW-8 in February, 2001.

h. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.

i. All methane gas monitoring were within regulatory standards.

8.0 CONCLUSIONS

8.1 Groundwater Quality

Groundwater quality at the Newberry County landfill has been altered by various organic constituents. The inorganic constituent mercury at MW-3 was statistically indicated to be significant evidence of contamination; however, the laboratory reported concentration of 0.00112 mg/l (1st-half sampling event) is significantly less than the MCL of 0.002 mg/l and the laboratory reported concentration of 0.00289 mg/l (2nd-half sampling event) is only slightly above the MCL. The inorganic constituent thallium at MW-8 was statistically indicated to be significant evidence of contamination; however, the laboratory reported concentration of 0.002 mg/l (1st-half sampling event) is at the MCL of 0.002 mg/l and the laboratory reported concentration of 0.007 mg/l (2nd-half sampling event) is only slightly above the MCL. Thallium was below the laboratory detection limit in the additional sampling of MW-8 in February, 2001. Thallium was also reported in the Cockrell well above the MCL in the December, 2000 sampling event.

8.2 Technical Sufficiency of the Groundwater Monitoring Network

The seven downgradient monitoring wells appear sufficient number and horizontally positioned to provide accurate groundwater quality data. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units.

8.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 16 to 24 ft/yr, as seepage velocity. Lower than normal rainfall for 2000 caused several monitoring stations to yield insufficient water for sampling.

9.0 RECOMMENDATIONS

From evaluation of the 2000 groundwater sampling data our professional recommendations

are:

1. Immediately resample the Cockrell irrigation well for thallium; and,

2. Decommission (abandon) or sample assessment monitoring wells TW-2, TW-3, TW-4, and TW-5.

3. Continue routine post-closure sampling as scheduled and approved.

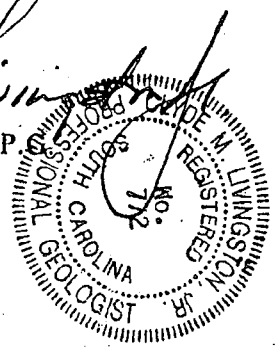
4. Implement the approved off-site groundwater assessment when site access and funding are available.

ACKNOWLEDGEMENT

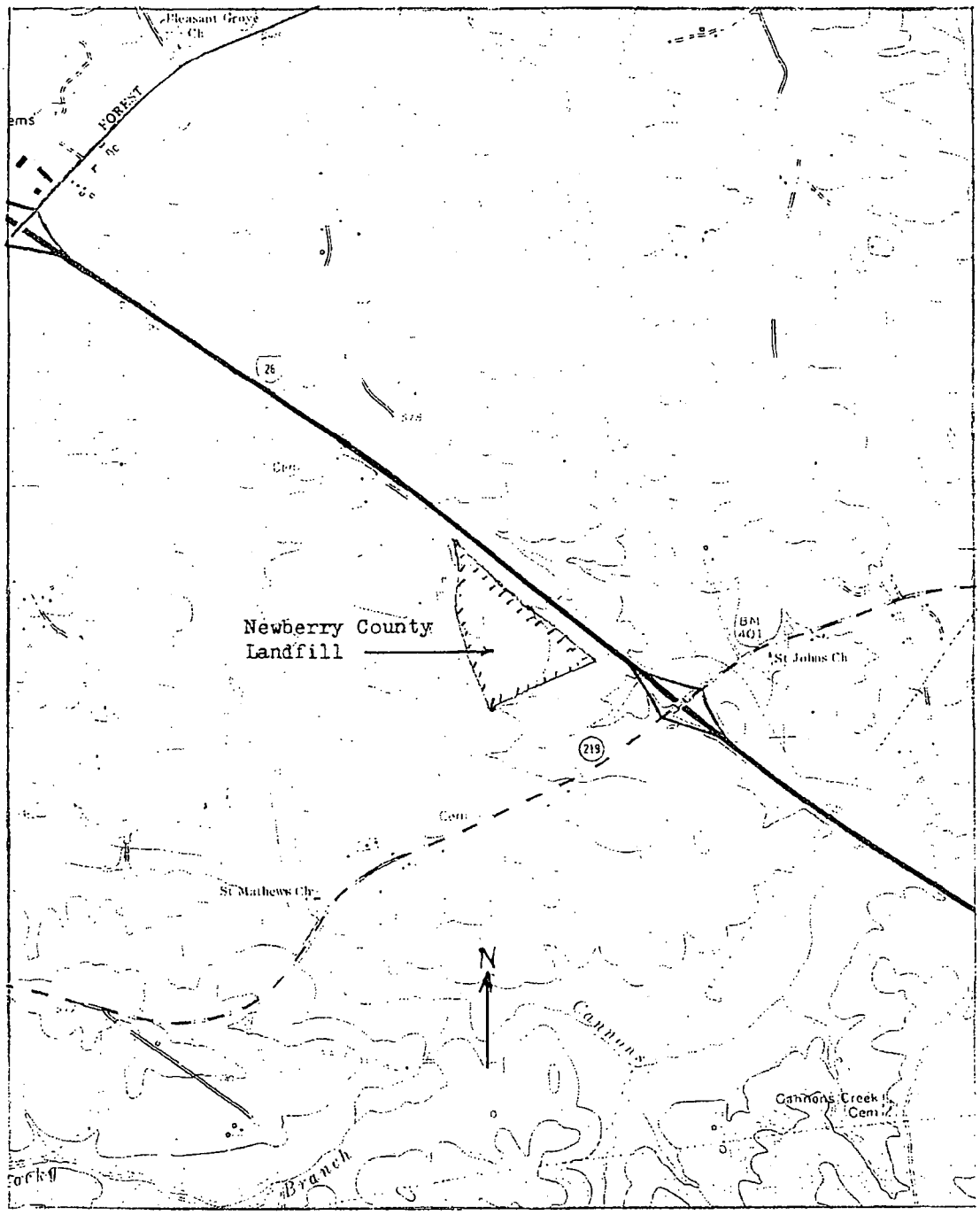
C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.

Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772



FIGURES



scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&L Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1. Location map, Newberry County landfill.

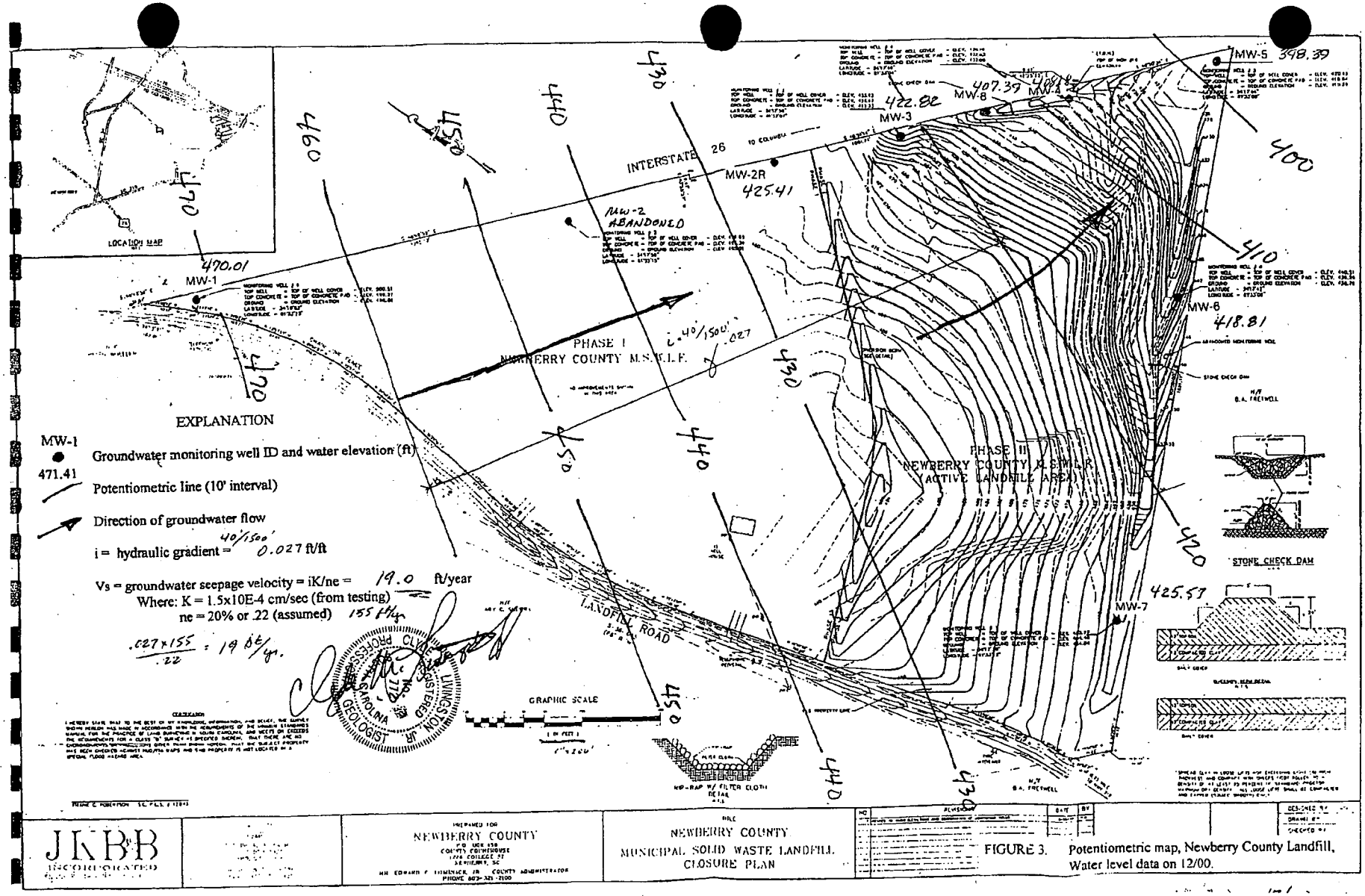


FIGURE 3. Potentiometric map, Newberry County Landfill, Water level data on 12/00.

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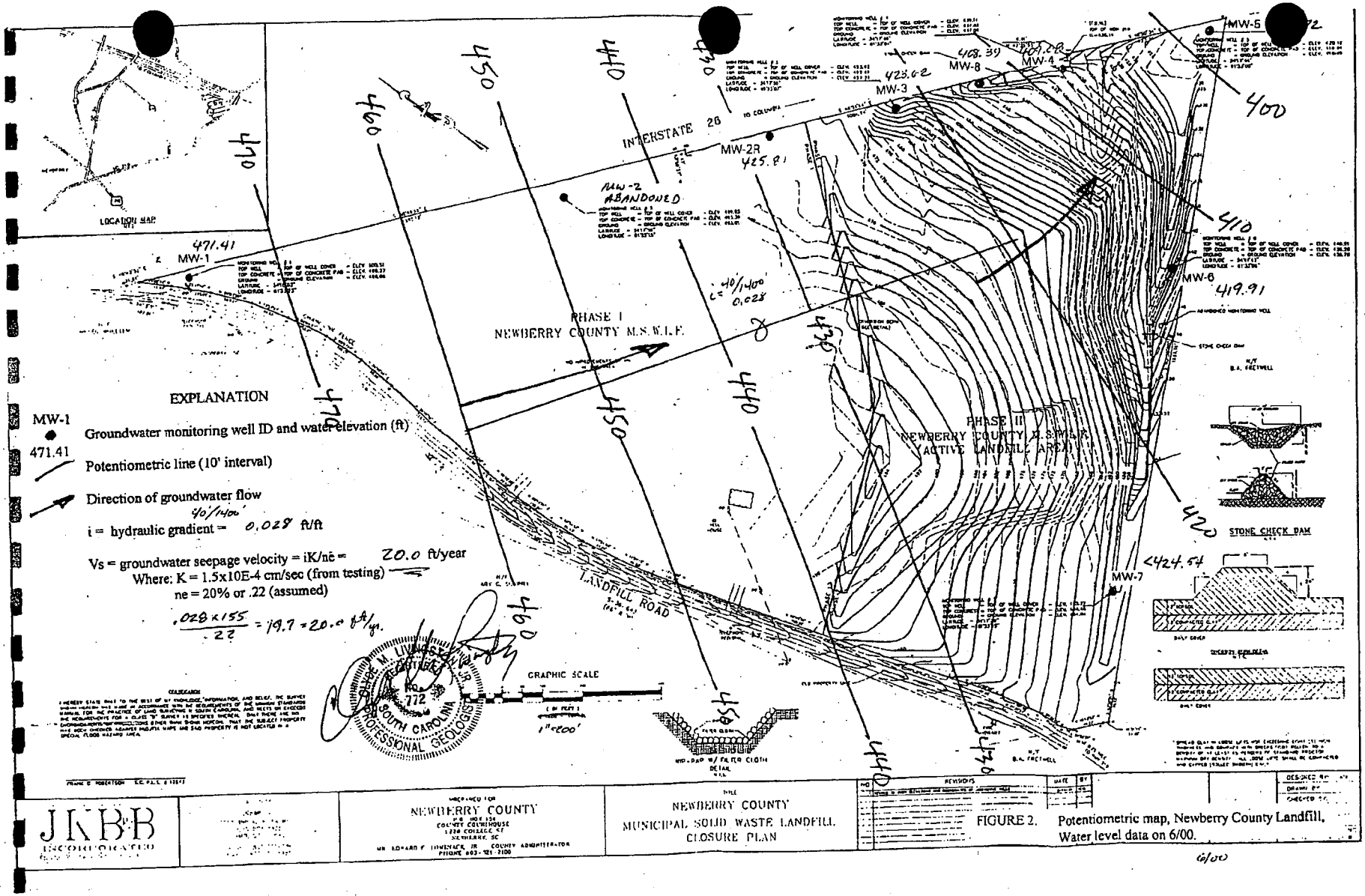


FIGURE 2. Potentiometric map, Newberry County Landfill, Water level data on 6/00.

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File 2

6/00

2001 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

January 31, 2002

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

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PLAINTIFF'S EXHIBIT
16-I

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continuation

APPENDICES

Appendix I--Groundwater Analyses (February, 2001 and December, 2001)
Appendix II--Statistical Analysis
Appendix III--Methane Gas Monitoring Data

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 2001 Annual Groundwater Monitoring Report for the Newberry County Landfill. Refer to Figure 1 indicating the landfill site location. The annual report addresses the following six topics:

A. Primary activities in 2001 relative to landfill monitoring and compliance;
B. Groundwater analytical results/findings from the February and December, 2001 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data;
F. Evaluation of Methane Gas Monitoring; and,
G. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

1.1 Summary of activities for 2001

During 2001, activities at the Newberry County landfill by the County Administration of significant mention, are listed as follows:

a. Groundwater sampling events for 2001, as conducted by Columbia Analytical Laboratories, were February (abbreviated sampling) and December, 2001; and,
b. Methane gas monitoring was conducted quarterly (March, June, September, December) during 2001.

2.0 GROUNDWATER ANALYTICAL DATA

Water quality data was obtained from two (2) of the eight (8) groundwater monitoring stations for the February, 2001 sampling event. Water quality data was obtained from four (4) of the eight (8) groundwater monitoring stations for the December, 2001 sampling event. Monitoring wells, MW-1, MW-2R, MW-4, and MW-7 reportedly yielded insufficient water for sampling in the December, 2001 sampling event. SW-1 (surface water) also reportedly yielded insufficient water for sampling in the December, 2001 sampling event. The off-site out-of-service private well (Cockrell well) was sampled in the December, 2001 sampling event. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during the December, 2001 monitoring event and recorded on the field data sheets. Wells were sampled and laboratory analyzed by Columbia Analytical Laboratories, reportedly in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. The annual groundwater quality evaluation is based upon groundwater analytical and field data furnished to C&L Consultants, Inc. by Columbia Analytical Laboratories. Complete copies of the laboratory reports, field data sheets and chain-of-custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested

maximum contaminant level (SMCL). Refer to Figure 2 for sample point locations.

Table 1- 2001 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/L) (02/07/01)	(12/6/01)	MCL/ SMCL(mg/L)
MW-1 (back-ground)		NS	DRY	
MW-2R		NS	DRY	
MW-3	Barium	NS	0.711	2
	Beryllium	NS	0.001	0.004
	Cobalt	NS	0.016	NE
	Mercury	NS	0.00042	0.002
	Nickel	NS	0.024	0.10
	Lead	NS	0.014	0.015
	Thallium	NS	0.063*	0.002
	Vanadium	NS	0.057	NE
	Zinc	NS	0.220	[5]
	Chloroethane	NS	0.0088	NE
	cis-1,2-Dichloroethene	NS	0.0279	0.07
	Methylene Chloride	NS	0.0057*	0.005
	1,1-Dichloroethane	NS	0.019	NE
	Trichloroethene	NS	0.0126*	0.005
	Tetrachloroethene	NS	0.0152*	0.005
MW-4		NS	DRY	
MW-5	Barium	0.206	0.779	2.00
	Cadmium	0.001	ND	0.005
	Cobalt	ND	0.034	NE
	Chromium	ND	0.018	0.1
	Copper	ND	0.013	1.3
	Nickel	ND	0.039	0.10
	Lead	ND	0.038*	0.015
	Vanadium	ND	0.073	NE
	Zinc	0.046	0.360	[5]
MW-6	Barium	NS	0.511	2
	Mercury	NS	0.00029	0.002
	Nickel	NS	0.022	0.10
	Vanadium	NS	0.024	NE
	Zinc	NS	0.132	[5]
	Chloroethane	NS	0.0065	NE
	cis-1,2-Dichloroethene	NS	0.0226	0.07

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (02/07/01)	(12/6/01)	MCL/ [SMCL](mg/l)
MW-7		NS	DRY	
MW-8	Barium	0.115	0.124	2
	Mercury	0.00040	ND	0.002
	Nickel	ND	0.015	0.10
	Thallium	ND	0.094*	0.002
	cis-1,2-Dichloroethene	ND	0.0072	0.070
	Methylene Chloride	0.0195*	0.0059*	0.005
	1,1-Dichloroethane	0.0157	0.0152	NE
Cockrell Well	Barium	NS	0.040	2
	Copper	NS	0.510	1.3
	Nickel	NS	0.016	0.10
	Lead	NS	0.048*	0.015
	Zinc	NS	0.213	[5]
SW-1		NS	DRY	

* - Exceeds MCL (drinking water standard): NS - not sampled: NE - not established: ND - Not Detected.

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of eight (8) monitoring wells and two (2) additional sampling points; the Cockrell private well and a surfacewater monitoring point (SW-1). One (1) monitoring well (MW-1) is located hydraulically upgradient of the subject site and seven (7) monitoring wells (MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8) are located hydraulically downgradient and sidegradient of the landfill foot-print. Four wells, MW-1, MW-4, MW-6, and MW-7, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards. Two monitoring wells, MW-2R (formerly TW-1, replaced MW-2, now abandoned) and MW-8 (formerly TW-6, deep well installed to monitor water quality in the bedrock aquifer) were installed during 1998 as part of a groundwater assessment and subsequently added to the monitoring network.

3.1 Monitoring Well Construction Details

Available monitoring well construction data for the eight-well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B, as revised. Monitoring wells MW-3 and MW-5 pre-date the other six wells and are the remaining portion of the original groundwater

monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size for MW-3 and MW-5; however, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
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MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48
MW-8	7/16/98	68	58-68	--	443.39	440.47

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figure 2) for the 2001 (and previous) groundwater elevation monitoring event indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of seven (7) groundwater monitoring wells (excluding the 1998 assessment wells); MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8. The downgradient monitoring wells appear located in sufficient number and

location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 2001 groundwater elevation data and the constructed potentiometric map (Figure 2) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation is generally suitable for providing representative groundwater quality samples from the upper-most aquifer during periods of normal precipitation. Some degradation of surface pads around the older wells has been reported.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. A potentiometric map representing the shallow aquifer flow regime, constructed from data recorded from the 2001 groundwater monitoring event, is provided as Figure 2. The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the calculated rate of movement of fluid particles through porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$:

where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = horizontal hydraulic gradient = 0.027 ft/ft; and, n_e = effective porosity = 0.22.

V_s = 19 ft/yr towards the east-southeast.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow range of 15 ft/yr to 23 ft/yr to the east-southeast.

TABLE 3
2001 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 2/01	Water Elevation 12/01
MW-1	30.0	15-30	498.86	500.51	NM	469.61
MW-2R	31.5	26.5-31.5	456.78	460.21	NM	DRY
MW-3	34.1	UK	452.33	453.92	NM	421.31
MW-4	30.0	15-30	437.08	439.18	NM	407.98
MW-5	31.0	UK	418.39	420.12	398.39	396.87
MW-6	25.0	10-25	438.76	440.51	NM	417.41
MW-7	29.5	14.5-29.5	454.04	455.77	NM	DRY
MW-8	68.0	58-68	440.47	443.39	406.48	407.04

Note: TOC=Top of Casing; NM = Not Measured; UK = UnKnown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 2001 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. The statistical analysis indicated that the two inorganic constituents of statistical importance (flagged) at the Newberry County Landfill for 2001 are mercury at monitoring well MW-3 and thallium at monitoring well MW-8. The reported trace occurrences of mercury at MW-3 was 0.00042 mg/l in the December, 2001 sampling event (MCL = 0.002 mg/l).The laboratory reported concentrations of thallium at MW-8 were ND (not detected-below laboratory detection limits) in the February, 2001 sampling event and 0.094 mg/l in the December, 2001 sampling event (MCL = 0.002 mg/l). No other inorganic constituent was determined to be of statistical significance. Refer to Table 1 for detected constituents and Appendix II for the statistical analysis printout.

6.0 METHANE GAS MONITORING

Methane gas monitoring was conducted quarterly (March, June, September, December) during 2001. No detected concentrations of methane gas exceeded action levels during 2001; Refer to Appendix III for methane monitoring data (included in this report as requested by SCDHEC officials).

7.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 2001 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-southeast.
b. The rate of groundwater flow, as seepage velocity, in the shallow saturated zone is in the range of 15 to 23 ft/year.
c. Drought conditions extending through 2001 had an impact on water availability at several monitoring stations, including SW-1.
d. The monitoring wells are appropriately located for early warning and detection purposes.
e. All sampled monitoring wells, with the exception of MW-6, contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events.
f. Detectable concentrations of organic constituents were laboratory reported at all sampled wells, with the exception of the Cockrell out-of-service water supply well and MW-5, during 2001.
g. Thallium was detected in the December, 2001 water samples from MW-3 at a concentration of 0.063 mg/l, and MW-8 at a concentration of 0.094 mg/l (MCL = 0.002 mg/l).
h. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.
i. All methane gas monitoring indicated compliance with regulatory standards.

8.0 CONCLUSIONS

8.1 Groundwater Quality

Groundwater quality at the Newberry County landfill has been altered by various organic constituents. The inorganic constituent mercury at MW-3 was statistically indicated to be significant evidence of contamination; however, the laboratory reported concentration of 0.00042 mg/l is significantly less than the MCL of 0.002 mg/l. The inorganic constituent thallium at MW-8 for the December, 2001 sampling event was statistically indicated to be significant evidence of contamination; however, thallium was below detection limits in the February, 2001 sampling event. Historically, laboratory reported concentrations of both mercury and thallium have both been sporadic.

8.2 Technical Sufficiency of the Groundwater Monitoring Network

The seven downgradient monitoring wells appear sufficient number and horizontally positioned to provide accurate groundwater quality data. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units.

8.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 15 to 23 ft/yr, as seepage velocity. Lower than normal rainfall for 2001 caused several monitoring stations to yield insufficient water for sampling.

8.4 Methane monitoring

Methane monitoring indicated compliance with regulatory standards.

9.0 RECOMMENDATIONS

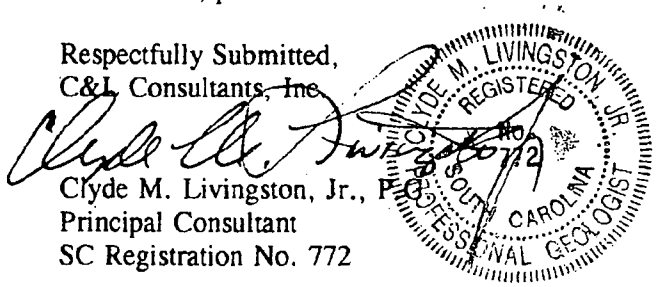
From evaluation of the 2001 groundwater sampling data our professional recommendations are:

1. Decommission (abandon) or sample assessment monitoring wells TW-2, TW-3, TW-4, and TW-5; and,
2. Continue routine post-closure sampling as scheduled and approved.

ACKNOWLEDGEMENT

C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.



Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772

FIGURES

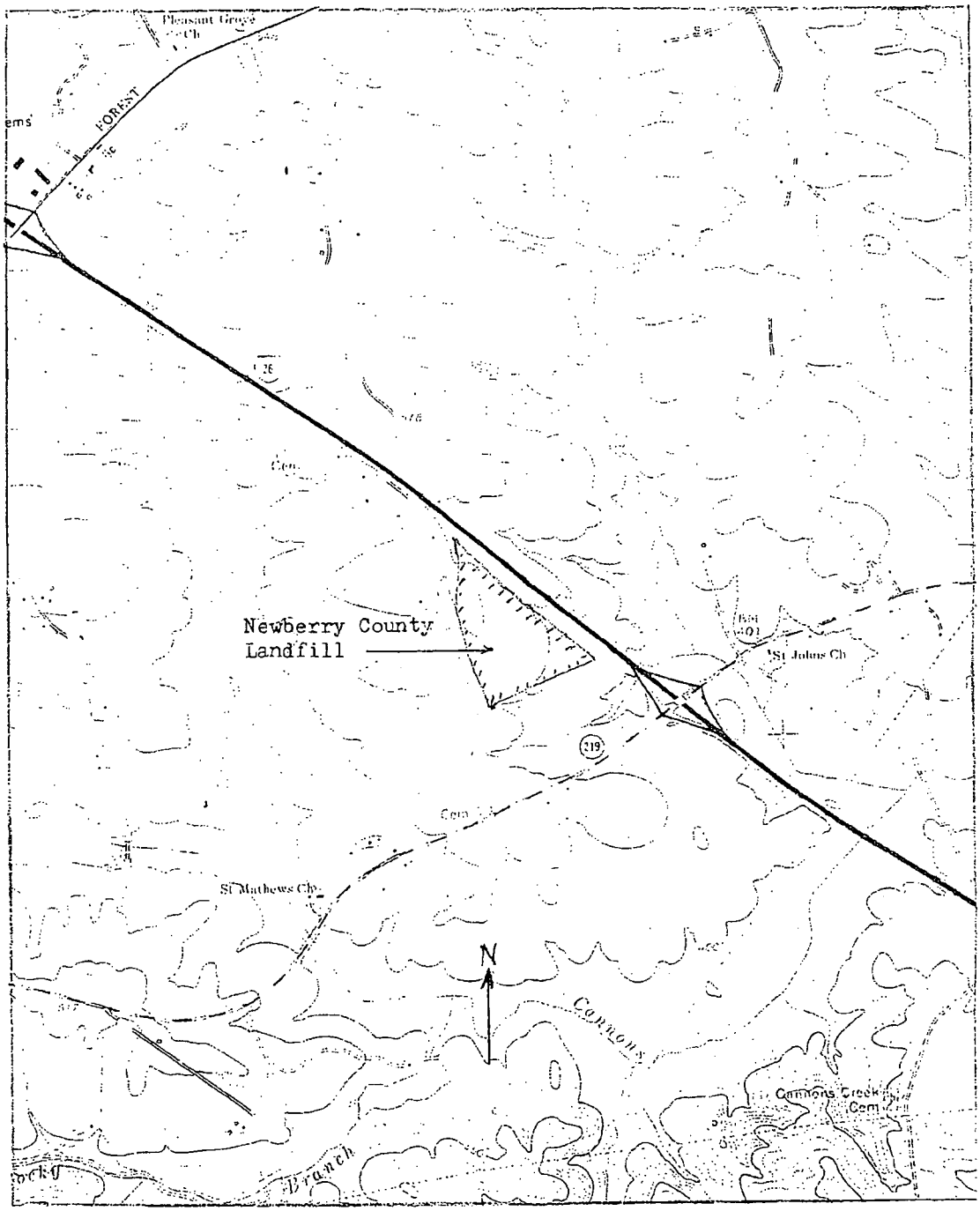
APPENDICES

APPENDIX I
Groundwater Analyses

APPENDIX II
Statistical Analysis

APPENDIX III
Methane Gas Monitoring Data

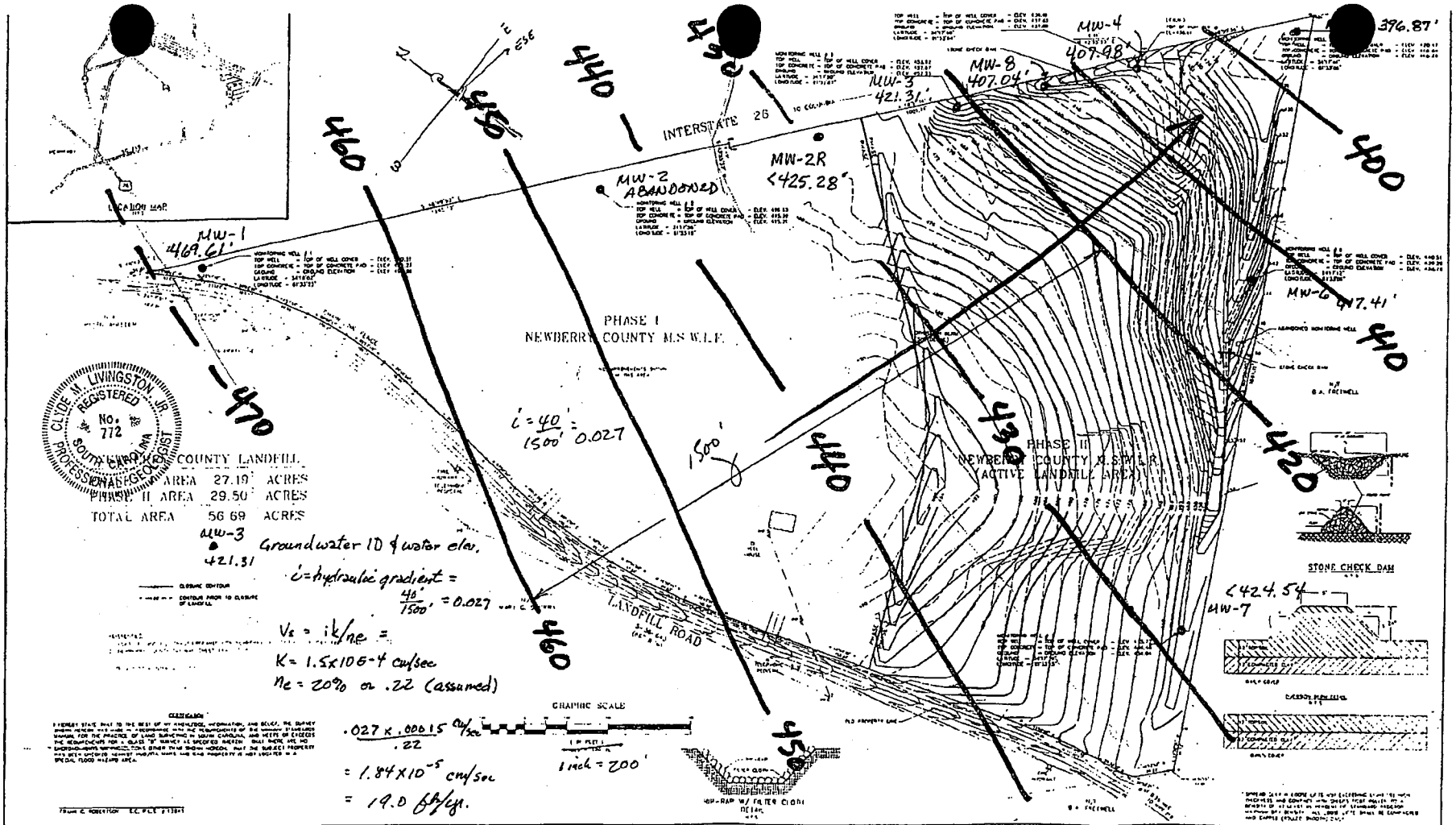
FIGURES



scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96	Figure 1. Location map, Newberry County landfill.
C&L Consultants, Inc. P.O. Box 50307 Columbia, SC 29250		



JKBB INCORPORATED		PREPARED FOR NEWBERRY COUNTY P.O. BOX 416 COUNTY COURTHOUSE 1026 COLLEGE ST NEWBERRY, SC MR. EDWARD F. LIMBACKER, JR. COUNTY ADMINISTRATOR PHONE 803-321-2100	TITLE NEWBERRY COUNTY MUNICIPAL SOLID WASTE LANDFILL CLOSURE PLAN	REVISIONS NO. / DATE / BY

Figure 2. Potentiometric map, Newberry County Landfil
Water level data from 12/2001.

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HYDROGEOLOGY

2002 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

February 14, 2003

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
P.O. Box 50307
Columbia, SC 29250
C&L Job no. 8078

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1. Site location map
2. June 27, 2002 potentiometric map
3. December 23, 2002 potentiometric map

APPENDICES

Appendix I--Groundwater Analyses (June 27, 2002 and December 23, 2002)
Appendix II--Statistical Analysis
Appendix III--Methane Gas Monitoring Data

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 2002 Annual Groundwater Monitoring Report for the Newberry County Landfill. Refer to Figure 1 indicating the landfill site location. The annual report addresses the following six topics:

A. Primary activities in 2002 relative to landfill monitoring and compliance;
B. Groundwater analytical results/findings from the June and December, 2002 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data;
F. Evaluation of Methane Gas Monitoring; and,
G. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

1.1 Summary of activities for 2002

Activities of significant mention by the County Administration during 2002 at the Newberry County landfill are listed as follows:

a. Groundwater sampling events for 2002, as conducted by Columbia Analytical Laboratories, were June 27 and December 23, 2002; and,
b. Methane gas monitoring was conducted quarterly (March, June, September, December) during 2002.

2.0 GROUNDWATER ANALYTICAL DATA

Water quality data was obtained from four (4) of the eight (8) groundwater monitoring stations for both 2002 sampling events. Monitoring wells, MW-1, MW-2R, MW-4, and MW-7 reportedly yielded insufficient water for sampling in both 2002 sampling events. SW-1 (surface water) also reportedly yielded insufficient water for sampling in the June 27, 2002 sampling event. The off-site out-of-service private well (Cockrell well) was sampled in both 2002 sampling events. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during both 2002 monitoring events and recorded on field data sheets. Wells were sampled and laboratory analyzed by Columbia Analytical Laboratories, reportedly in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. The annual groundwater quality evaluation is based upon groundwater analytical and field data furnished to C&L Consultants, Inc. by Columbia Analytical Laboratories. Complete copies of the laboratory reports, field data sheets and chain-of-custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL). Refer to Figure 2 for sample point locations.

Table 1- 2002 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/02)	(12/23/02)	MCL/ [SMCL](mg/l)
MW-1 (back-ground)		DRY	DRY	
MW-2R		DRY	DRY	
MW-3	Barium	1.71	0.630	2
	Beryllium	0.012*	0.002	0.004
	Cadmium	0.011*	0.002	0.005
	Cobalt	0.050	ND	NE
	Copper	0.012	0.012	1.3
	Mercury	NT	ND	0.002
	Lead	0.073*	ND	0.015
	Thallium	ND	0.003*	0.002
	Vanadium	0.180	ND	NE
	Zinc	0.781	0.112	[5]
	cis-1,2-Dichloroethene	0,0397	0.0473	0.07
	Total Xylenes	ND	0.00259	10
	Methylene Chloride	0.0267*	ND	0.005
	1,1-Dichloroethene	ND	0.00171	0.007
	1,1-Dichloroethane	0.0218	0.0216	NE
	Trichloroethene	0.0144*	0.0124*	0.005
	Tetrachloroethene	0.0156*	0.0207*	0.005
	Benzene	ND	0.0082*	0.005
MW-4		DRY	DRY	
MW-5	Barium	0.943	0.139	2.00
	Beryllium	0.001	ND	0.004
	Cadmium	0.006*	0.001	0.005
	Cobalt	0.034	ND	NE
	Chromium	0.018	ND	0.1
	Copper	0.034	ND	1.3
	Lead	0.066*	ND	0.015
	Vanadium	0.081	ND	NE
	Zinc	0.481	0.019	[5]
MW-6	Barium	0.044	0.288	2
	Cadmium	ND	0.006*	0.005
	Mercury	NT	ND	0.002
	Copper	2.06*	ND	1.3
	Thallium	ND	0.001	0.002
	Zinc	0.643	0.042	[5]
	Methyl chloride	ND	0.00778	NE
	Chloroethane	0.0091	0.00802	NE
	cis-1,2-Dichloroethene	0.0338	0.0283	0.07
	Vinyl chloride	ND	0.00138	0.002

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/02)	(12/23/02)	MCL/ [SMCL](mg/l)
MW-6	1,1-Dichloroethane	ND	0.00208	NE
cont	Benzene	ND	0.00416	0.005
MW-7		DRY	DRY	
MW-8	Barium	0.077	0.107	2
	Cadmium	0.001	0.013*	0.005
	Copper	0.035	0.014	1.3
	Mercury	NT	ND	0.002
	Lead	0.011	ND	0.015
	Zinc	0.180	0.051	[5]
	cis-1,2-Dichloroethene	ND	0.00145	0.070
	1,1-Dichloroethane	0.0068	0.00469	NE
Cockrell Well	Barium	0.239	0.036	2
	Cadmium	0.002	ND	0.005
	Copper	0.011	0.800	1.3
	Lead	0.110*	0.018*	0.015
	Thallium	ND	0.001	0.002
	Zinc	0.078	0.419	[5]
SW-1	Barium	DRY	0.059	2

* - Exceeds MCL (drinking water standard): NT - not tested: NE - not established: ND - Not Detected.

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of eight (8) monitoring wells and two (2) additional sampling points; the Cockrell private well and a surfacewater monitoring point (SW-1). One (1) monitoring well (MW-1) is located hydraulically upgradient of the subject site and seven (7) monitoring wells (MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8) are located hydraulically downgradient and sidegradient of the landfill foot-print. Four wells, MW-1, MW-4, MW-6, and MW-7, were constructed in 1995 as new wells to upgrade the post-closure monitoring program. Monitoring wells MW-3 and MW-5 (potentially pre-well construction standards of R. 61-71.11) were upgraded in 1995 by Law Engineering & Environmental so as to comply with monitoring well construction and installation standards. Two monitoring wells, MW-2R (formerly TW-1, replaced MW-2, now abandoned) and MW-8 (formerly TW-6, deep well installed to monitor water quality in the bedrock aquifer) were installed during 1998 as part of a groundwater assessment and subsequently added to the monitoring network.

3.1 Monitoring Well Construction Details

Available monitoring well construction data for the eight-well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B, as revised. Monitoring wells MW-3 and MW-5 pre-date the other six wells and are the remaining portion of the original groundwater monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size for MW-3 and MW-5; however, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	4/13/95	30	15-30	498.86	500.51	499.27
MW-2R	7/16/98	31.5	26.5-31.5	--	460.21	456.78
MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	4/12/95	30	15-30	437.08	439.18	437.83
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	4/12/95	29.5	14.5-29.5	454.04	455.73	454.48
MW-8	7/16/98	68	58-68	--	443.39	440.47

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figure 2) for the 2002 (and previous) groundwater elevation monitoring events indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of seven (7) groundwater monitoring wells (excluding the 1998 assessment wells); MW-2R, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 2002 groundwater elevation data and the constructed potentiometric maps (Figures 2 & 3) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each groundwater monitoring installation is generally suitable for providing representative groundwater quality samples from the upper-most aquifer during periods of normal precipitation. Some degradation of surface pads around the older wells has been reported.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the 2002 groundwater monitoring events, are provided as Figure 2 (6/02) and Figure 3 (12/02). The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the calculated rate of movement of fluid particles through porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$:

where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = horizontal hydraulic gradient = 0.03 ft/ft; and, n_e = effective porosity = 0.22.

V_s = 21 ft/yr towards the east-southeast.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow range of 17 ft/yr to 25 ft/yr to the east-southeast.

TABLE 3
2002 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/02	Water Elevation 12/02
MW-1	30.0	15-30	498.86	500.51	469.51	469.51
MW-2R	31.5	26.5-31.5	456.78	460.21	DRY	DRY
MW-3	34.1	UK	452.33	453.92	420.92	420.76
MW-4	30.0	15-30	437.08	439.18	404.08	408.03
MW-5	31.0	UK	418.39	420.12	398.32	400.02
MW-6	25.0	10-25	438.76	440.51	417.41	417.41
MW-7	29.5	14.5-29.5	454.04	455.77	DRY	DRY
MW-8	68.0	58-68	440.47	443.39	407.39	407.59

Note: TOC=Top of Casing: NM = Not Measured: UK = UnKnown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 2002 and previous sampling events were statistically evaluated in accordance with the SCDHEC-approved Statistical Analysis Plan, EPA - GRITS/STAT. The statistical analysis (Wilcoxson Rank Sum Test statistical method) indicated that the three inorganic constituents of statistical importance (flagged) at the Newberry County Landfill for 2002 are cadmium at MW-5, mercury at monitoring well MW-3 and MW-8, and thallium at monitoring well MW-8. The reported cadmium concentrations exceeded the MCL (0.005 mg/l) for the June 27, 2002 sampling event (0.011 mg/l) but was significantly less than the MCL for the December 23, 2002 sampling event (0.002 mg/l). Mercury was not reported at MW-3 or MW-8 in the 2002 sampling events. Thallium was not reported at MW-8 in the 2002 sampling events. No other inorganic constituent was determined to be of statistical significance. Refer to Table 1 for detected constituents and Appendix II for the statistical analysis printout.

6.0 METHANE GAS MONITORING

Methane gas monitoring was conducted quarterly (March, June, September, December) during 2002. No detected concentrations of methane gas exceeded action levels during 2002. Refer to Appendix III for methane monitoring data (included in this report as requested by SCDHEC officials).

7.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 2002 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-southeast.
b. The rate of groundwater flow, as seepage velocity, in the shallow saturated zone is in the range of 17 to 25 ft/year.
c. Drought conditions extending through 2002 had an impact on water availability at several monitoring stations, including SW-1.
d. The monitoring wells are appropriately located for early warning and detection purposes.
e. All sampled monitoring wells contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events.
f. Detectable concentrations of organic constituents were laboratory reported at all sampled wells, with the exception of the Cockrell out-of-service water supply well and MW-5, during 2002.
g. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.
h. All methane gas monitoring indicated compliance with regulatory standards.

8.0 CONCLUSIONS

8.1 Groundwater Quality

Groundwater quality at the Newberry County landfill has been altered by various organic constituents. The inorganic constituent cadmium at MW-5 was statistically indicated to be significant evidence of contamination; however, cadmium was detected at all sampled monitoring wells during the 2002 sampling period. In addition, laboratory reported concentrations at MW-3 fluctuated from above the MCL (0.011 mg/l, 6/02) to below the MCL (0.002 mg/l, 12/02). The inorganic constituent mercury at MW-3 and MW-8 was statistically indicated to be significant evidence of contamination; however, mercury was below detection limits (0.0002 mg/l) at both wells during the 2002 sampling period. The inorganic constituent thallium at MW-8 was statistically indicated to be significant evidence of contamination; however, thallium was below detection limits in both 2002 sampling events. Historically, laboratory reported concentrations of cadmium, mercury and thallium are sporadic in occurrence at all monitoring stations.

8.2 Technical Sufficiency of the Groundwater Monitoring Network

The seven downgradient monitoring wells appear sufficient in number and horizontally positioned to provide accurate groundwater quality data. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates

the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units; however, repeated reported dryness and inability to sample may compromise the validity of statistical analyses.

8.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 17 to 25 ft/yr, as seepage velocity. Lower than normal rainfall for 2002 caused several monitoring stations to yield insufficient water for sampling.

8.4 Methane monitoring

Methane monitoring indicated compliance with regulatory standards.

9.0 RECOMMENDATIONS

From evaluation of the 2002 groundwater sampling data our professional recommendations are:

1. Decommission (abandon) or sample assessment monitoring wells TW-2, TW-3, TW-4, and TW-5;
2. Continue routine post-closure sampling as scheduled and approved; and,
3. Evaluate water levels at MW-1 over the next sampling period to determine if replacement by a deeper background well is warranted for sampling and statistical analysis purposes.

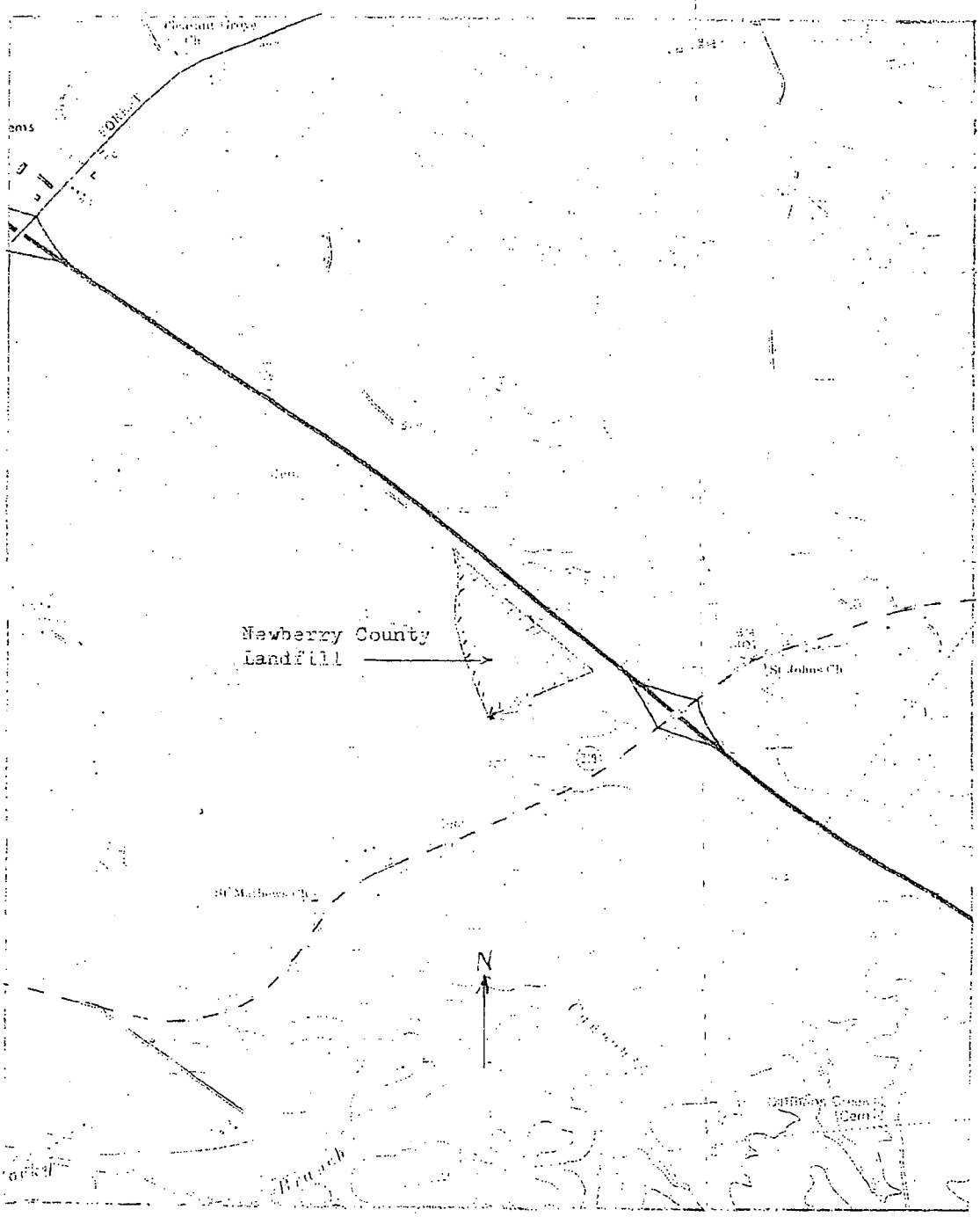
ACKNOWLEDGEMENT

C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.

Clyde M. Livingston, Jr., P.G.
Principal Consultant
SC Registration No. 772

FIGURES



Scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&L Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1, Location map, Newberry County landfill.

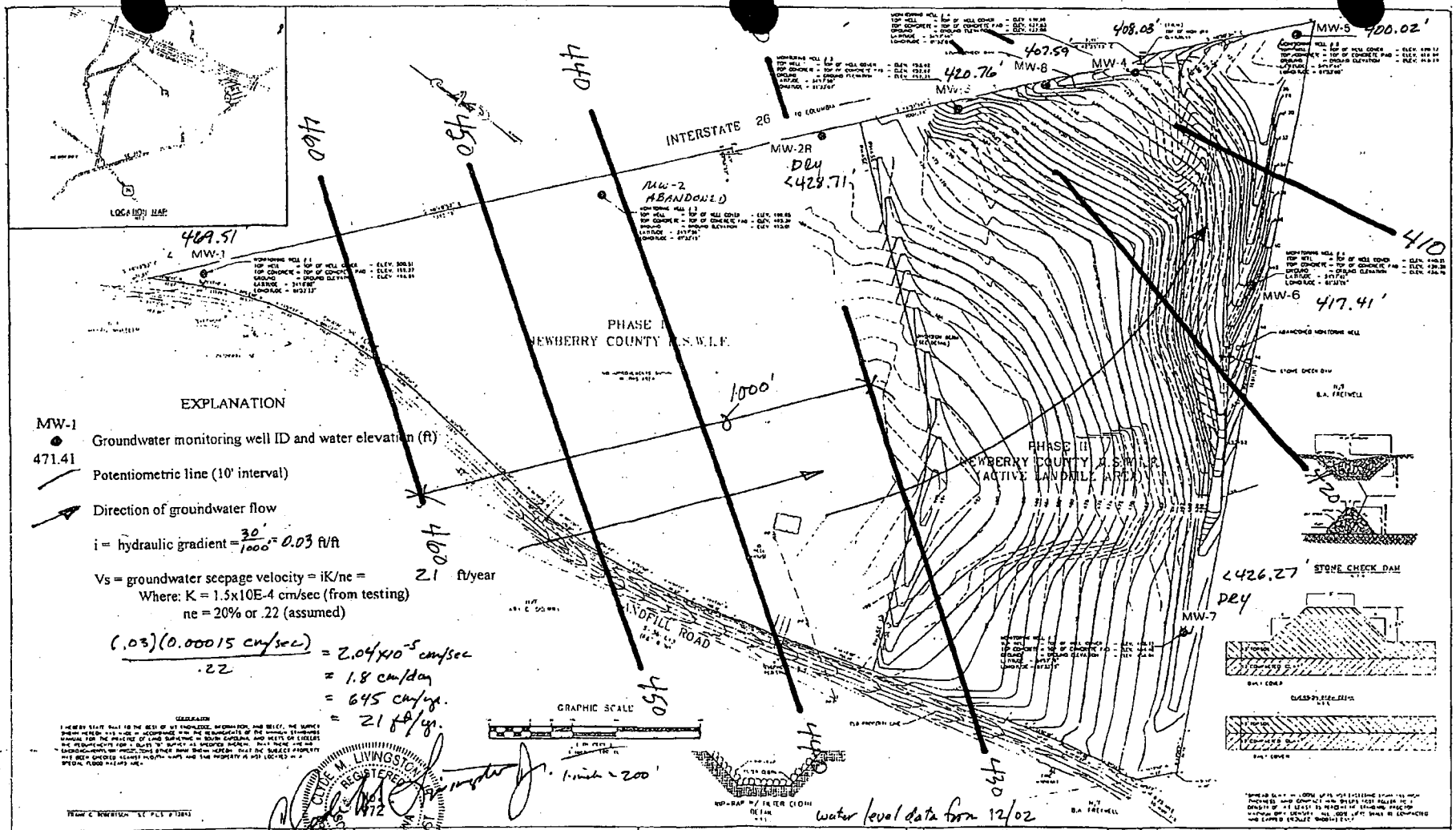


Figure 3. Potentiometric map, Newberry County Landfill December 2002 water level data.

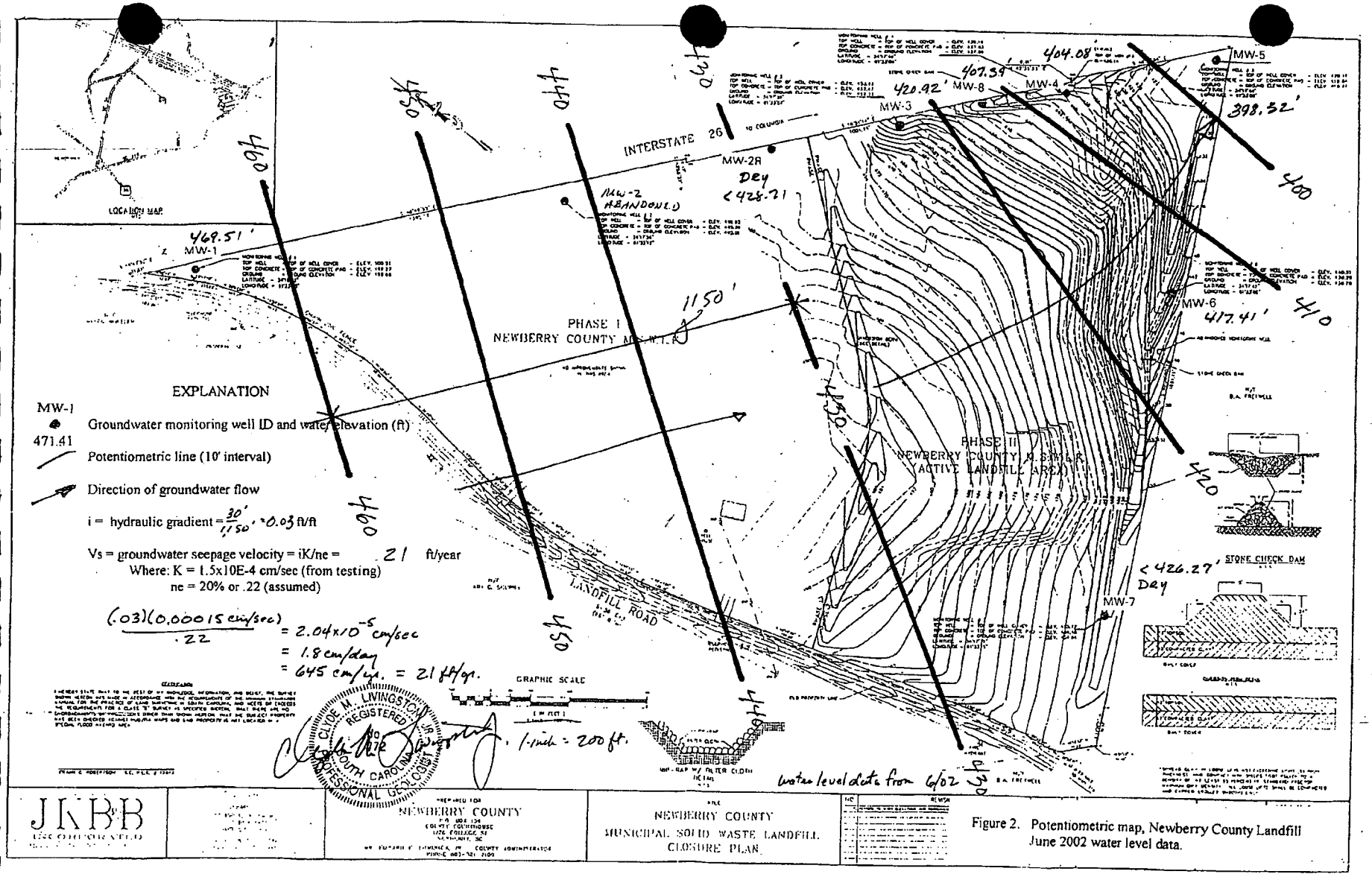


Figure 2. Potentiometric map, Newberry County Landfill
June 2002 water level data.

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HYDROGEOLOGY

2003 - ANNUAL

GROUNDWATER MONITORING REPORT

NEWBERRY COUNTY LANDFILL
(DWP-117)

February 9, 2004

Prepared for:

Newberry County,
South Carolina

Prepared by:

C&L Consultants, Incorporated
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Appendix I--Groundwater Analyses (June 27, 2003 and December 23, 2003)
Appendix II--Statistical Analysis
Appendix III--Methane Gas Monitoring Data
Appendix IV--Monitoring Well Replacement Report

1.0 INTRODUCTION

On behalf of Newberry County, C&L Consultants, Inc. has prepared the following 2003 Annual Groundwater Monitoring Report for the Newberry County Landfill. Refer to Figure 1 indicating the landfill site location. The annual report addresses the following six topics:

A. Primary activities in 2003 relative to landfill monitoring and compliance;
B. Groundwater analytical results/findings from the June and December, 2003 groundwater sampling events;
C. Evaluation of the technical sufficiency of the monitoring well network;
D. Evaluation of the hydrogeology (groundwater elevations, groundwater flow direction and rate of flow);
E. Statistical evaluation of the laboratory analytical data;
F. Evaluation of Methane Gas Monitoring; and,
G. Conclusions and recommendations as appear technically appropriate from evaluation of the available chemical and physical site data.

1.1 Summary of activities for 2003

Activities of significant mention by the County Administration during 2003 at the Newberry County landfill are listed as follows:

a. Groundwater sampling events for 2003, as conducted by Data Resources, Inc., were June 27 and December 23, 2003;
b. Four groundwater monitoring wells (MW-1, MW-2R, MW-4, MW-7) were abandoned and replaced (by MW-1R, MW-2RR, MW-4R, MW-7R, respectively) due to insufficient water volumes for sampling over time;
c. Wellheads at three monitoring wells (MW-3, MW-5, MW-6) were upgraded to meet current well construction standards;
d. Four assessment wells (TW-2, TW-3, TW-4, TW-5) installed as part of the 1998 groundwater assessment in the areas of MW3/MW-4 and MW-7 were abandoned (Note: Well Replacement Report included as Appendix IV); and,
e. Routine methane gas monitoring was conducted quarterly (March, June, September, December) during 2003. An additional resampling for confirmation purposes was also conducted in March 2003.

2.0 GROUNDWATER ANALYTICAL DATA

Water quality data was obtained from eight (8) groundwater monitoring stations and the surfacewater sampling point for both 2003 sampling events. Monitoring wells, MW-1, MW-2R, MW-3, MW-4, MW-5, MW-6, and MW-7 were sampled in the June 27, 2003 sampling event and monitoring wells, MW-1R, MW-2RR, MW-3, MW-4R, MW-5, MW-6, and MW-7R were sampled in the December 23, 2003 sampling event. The off-site out-of-service

private well (Cockrell well) was sampled in the December 23, 2003 sampling event only due to lack of power and access in the June 27, 2003 sampling event. Field measurements for well depth, groundwater elevation, pH and specific conductivity, were measured during both 2003 monitoring events and recorded on field data sheets. Wells were sampled and laboratory analyzed by Data Resources, Inc. (formerly Columbia Analytical Laboratories), reportedly in accordance with the approved Sampling and Analysis Plan for metals and organic compounds. The annual groundwater quality evaluation is based upon groundwater analytical and field data furnished to C&L Consultants, Inc. by Data Resources, Inc. Complete copies of the laboratory reports, field data sheets and chain-of-custody forms are located in Appendix I. Table 1 is a summary of laboratory detected analytes by sample date, location, concentration and regulatory established drinking water quality limits as maximum contaminant level (MCL) and regulatory suggested maximum contaminant level (SMCL). Refer to Figure 2 for sample point locations.

Table 1-2003 Detected Constituents
Newberry Co. Landfill

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/03)	(12/23/03)	MCL/ [SMCL](mg/l)
MW-1	Barium	0.172	Abandoned	2
(back-ground)	Beryllium	0.001	9/24/03	0.004
	Cadmium	0.001		0.005
	Lead	0.009		0.015
	Selenium	0.016		0.050
	Zinc	0.015		[5]
MW-1R	Barium	Installed	0.377	2
(back-ground)	Copper	9/16/03	0.011	1.3
	Zinc		0.017	[5]
MW-2R	Arsenic	0.010	Abandoned	0.050
	Barium	0.724	9/24/03	2
	Beryllium	0.001		0.004
	Cadmium	0.068*		0.005
	Cobalt	0.073		NE
	Chromium	0.155*		0.100
	Lead	0.247*		0.015
	Chloroethane	0.0049		NE
	cis-1,2-dichloroethene	0.0443		0.070
	1,4-dichlorobenzene	0.0115		0.075
	Vinyl Chloride	0.0019		0.002
	1,1-dichloroethane	0.0021		NE
	Chlorobenzene	0.0019		0.100
	Benzene	0.0017		0.005
MW-2RR	Barium	Installed	2.27*	2
	Cobalt	9/15/03	0.016	NE
	Copper		0.013	1.3

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/03)	(12/23/03)	MCL/ [SMCL](mg/l)
MW-2RR cont.	Zinc		0.076	[5]
	Ethylene dibromide		0.00014*	0.00005
	Chloroethane		0.0018	NE
	cis-1,2-dichloroethene		0.0799*	0.070
	1,3-dichlorobenzene		0.0101	0.600
	Vinyl Chloride		0.0017	0.002
	1,1-dichloroethane		0.0289	NE
	Chlorobenzene		0.0019	0.100
	Benzene		0.0110*	0.005
	Bromochloromethane		0.0037	NE
	Methylene chloride		0.141*	0.005
	Xylene, total		0.0118	10.0
	Tetrachloroethene		0.0152*	0.005
	Trichloroethene		0.0192*	0.005
MW-3	Barium	0.501	0.875	2
	Cadmium	0.002	ND	0.005
	Copper	0.016	0.028	1.3
	Mercury	ND	0.0003	0.002
	Lead	ND	0.016*	0.015
	Vanadium	ND	0.012	NE
	Zinc	0.102	0.121	[5]
	cis-1,2-Dichloroethene	ND	0.0842*	0.07
	Xylenes, total	0.0055	0.00431	10
	Methylene Chloride	0.0376*	ND	0.005
	1,4-dichlorobenzene	0.0121	0.00908	0.075
	1,1-dichloroethene	ND	0.00144	0.007
	1,1-dichloroethane	0.0283	0.0260	NE
	1,2-dichloroethane	0.001	0.00187	0.005
	Trichloroethene	0.0149*	0.0160*	0.005
	Tetrachloroethene	0.0238*	0.0249*	0.005
	Toluene	ND	0.00342	1.0
	Chlorobenzene	0.0021	0.00228	0.100
	Benzene	0.0154*	0.0146*	0.005
	Dichlorodifluoro-methane	ND	0.00615	NE
	Vinyl chloride	ND	0.00108	0.002
MW-4	Barium	0.347	Abandoned	2
	Beryllium	0.001	9/24/03	0.004
	Cadmium	0.008*		0.005
	Copper	0.015		1.3
	Selenium	0.013		0.050
	Zinc	0.040		[5]
	Chloroethane	0.0058		NE
	cis-1,2-dichloroethene	0.048		0.070
	Total xylenes	0.0034		10.0

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/03)	(12/23/03)	MCL/ [SMCL](mg/l)
MW-4 cont.	Methylene chloride	0.0208*		0.005
	1,4-dichlorobenzene	0.0078		0.075
	1,1-dichloroethane	0.0188		NE
	Trichloroethene	0.0104*		0.005
	Tetrachloroethene	0.0174*		0.005
	Chlorobenzene	0.0013		0.100
	Benzene	0.0094*		0.005
MW-4R	Barium	Installed	0.136	2
	Copper	9/16/03	0.015	1.3
	Thallium		0.006*	0.002
	Zinc		0.013	[5]
	1,1,1-Trichloroethane		0.0023	0.200
	Chloroethane		0.0018	NE
	cis-1,2-dichloroethene		0.0023	0.07
	Methylene chloride		0.0076*	0.005
	1,1-Dichloroethane		0.0389	NE
	1,1-Dichloroethene		0.0121*	0.007
	Trichloroethene		0.0015	0.005
MW-5	Barium	0.208	0.912	2.00
	Cadmium	0.004	0.027*	0.005
	Copper	0.012	0.027	1.3
	Lead	0.012	0.020*	0.015
	Selenium	0.042	ND	0.050
	Zinc	0.028	0.119	[5]
	Chloroethane	0.0055	ND	NE
	cis-1,2-dichloroethene	0.0437	ND	0.070
	Total xylenes	0.0021	ND	10.0
	Methylene chloride	0.019*	ND	0.005
	1,1-dichloroethane	0.0179	ND	NE
	Trichloroethene	0.0098*	ND	0.005
	Tetrachloroethene	0.016*	ND	0.005
	Chlorobenzene	0.0011	ND	0.100
	Benzene	0.0088*	ND	0.005
MW-6	Barium	0.214	0.306	2
	Cadmium	0.006*	0.013*	0.005
	Copper	0.011	0.010	1.3
	Lead	0.012	ND	0.015
	Zinc	0.046	0.114	[5]
	Methylene chloride	ND	0.0036	0.005
	Chloroethane	0.0068	0.0081	NE
	cis-1,2-dichloroethene	0.0277	0.0241	0.07
	1,4-dichlorobenzene	0.0086	ND	0.075
	1,3-dichlorobenzene	ND	0.0093	0.600
	Vinyl chloride	0.0011	ND	0.002

Table 1- cont.

LOCATION	CONSTITUENT	CONCENTRATION (mg/l) (06/27/03)	CONCENTRATION (mg/l) (12/23/03)	MCL/ [SMCL](mg/l)
MW-6 cont.	1,1-Dichloroethane	0.0022	0.0018	NE
	Chlorobenzene	0.0014	0.0018	0.100
	Benzene	0.0039	0.0050	0.005
	Trichloroethene	ND	0.0011	0.005
MW-7	Barium	0.209	Abandoned	2
	Cadmium	0.011*	9/24/03	0.005
	Copper	0.019		1.3
	Selenium	0.025		0.050
	Zinc	0.047		[5]
	Methyl chloride	0.0066		NE
	Chloroethane	0.0025		NE
	Chloroform	1.3*		0.100
	Vinyl Chloride	0.002		0.002
	Benzene	0.0029		0.005
MW-7R	Barium	Installed	0.458	2
	Chloroethane	9/16/03	0.0040	NE
	cis-1,2-dichloroethene		0.0031	0.070
	Methylene chloride		0.0080*	0.005
	Vinyl Chloride		0.0012	0.002
	1,1-dichloroethane		0.0030	NE
	Benzene		0.0023	0.005
MW-8	Barium	0.100	0.136	2
	Zinc	0.016	0.056	[5]
	cis-1,2-Dichloroethene	0.0072	0.0093	0.070
	1,1-Dichloroethane	0.0109	0.0109	NE
	Benzene	ND	0.0010	0.005
	Chloroethane	ND	0.0012	NE
	Methylene chloride	ND	0.0117*	0.005
	Trichloroethene	0.0025	0.0035	0.005
	Tetrachloroethene	0.0023	0.0033	0.005
Cockrell Well	Barium	NS	0.040	2
	Copper	OUT-OF-SERVICE	0.203	1.3
	Lead	NO POWER	0.011	0.015
	Zinc		0.085	[5]
SW-1	Barium	0.013	0.060	2
	Cadmium	0.001	ND	0.005
	Copper	0.012	0.016	1.3
	Selenium	0.018	ND	0.050
Field Blank	Chloroform	ND	0.0027	0.100
Trip Blank	Chloroform	ND	0.0046	0.100

* - Exceeds MCL (drinking water standard): NT - not tested: NE - not established: ND - Not Detected.

3.0 TECHNICAL SUFFICIENCY OF MONITORING WELL NETWORK

The current monitoring well network consists of eight (8) monitoring wells and two (2) additional sampling points; the Cockrell private well and a surfacewater monitoring point (SW-1). One (1) monitoring well (MW-1R) is located hydraulically upgradient of the subject site and seven (7) monitoring wells (MW-2RR, MW-3, MW-4R, MW-5, MW-6, MW-7R, and MW-8) are located hydraulically downgradient and sidegradient of the landfill foot-print. Four wells, MW-1R, MW-2RR, MW-4R, and MW-7R, were constructed in 2003 as replacement wells. Monitoring wells MW-3, MW-5, and MW-6 were upgraded in 2003 by C&L Consultants, Inc. so as to comply with current monitoring well construction and installation standards. MW-8 (formerly TW-6, deep well installed to monitor water quality in the bedrock aquifer) was installed during 1998 as part of a groundwater assessment and subsequently added to the monitoring network.

3.1 Monitoring Well Construction Details

Available monitoring well construction data for the eight-well system is summarized in Table 2. Elevations for ground surface and top of PVC well casing are as specified on the site survey by JKB&B, as revised. Monitoring wells MW-3 and MW-5 pre-date the other six wells and are the remaining portion of the original groundwater monitoring net-work. Extensive review of available documents does not indicate specific construction details, ie. grouting, coupling materials, screened intervals, pack material or slot size for MW-3 and MW-5; however, the screened intervals can be physically determined, if necessary.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well ID	Date Constructed	Total Depth Drilled (ft.)	Screen Interval (ft. bgs)	Ground Elevation*	Top of Casing Elevation	Cement Pad Elevation
MW-1	Abandoned 9/24/03					
MW-1R	9/16/03	63	45-60	501.22	504.92	501.72
MW-2R	Abandoned 9/24/03					
MW-2RR	9/15/03	63	45-60	457.24	459.82	457.74
MW-3	unknown	34.1	UK	452.33	453.92	452.67
MW-4	Abandoned 9/24/03					
MW-4R	9/16/03	63	45-60	438.50	441.55	439.00
MW-5	unknown	31.0	UK	418.39	420.12	418.84
MW-6	4/12/95	25	10-25	438.76	440.55	439.26
MW-7	Abandoned 9/24/03					
MW-7R	9/16/03	63	45-60	454.21	457.34	454.71
MW-8	7/16/98	68	58-68	--	443.39	440.47

* - Elevation datum Mean Sea Level from JKB&B well elevation survey 6/6/94 as revised 3/14/96

3.2 Well Locations and Positions

3.2.1 Up Gradient Monitoring Well

The Newberry County Landfill currently has one background monitoring well located hydraulically upgradient of the subject site. Review of groundwater elevation data (Table 3) and the groundwater flow regime (Figure 2) for the 2003 (and previous) groundwater elevation monitoring events indicates the background monitoring well is properly located in a position to monitor upgradient groundwater quality. Upgradient well MW-1 was replaced with a deeper monitoring well (MW-1R, same location as MW-1) in order to assure sufficient groundwater for sampling purposes for all future sampling events.

3.2.2 Down Gradient Compliance Monitoring Wells

The Newberry County Landfill has a downgradient monitoring well network consisting of seven (7) groundwater monitoring wells; MW-2RR, MW-3, MW-4R, MW-5, MW-6, MW-7R, and MW-8. The downgradient monitoring wells appear located in sufficient number and location across and around the landfill footprint to provide a reliable groundwater quality detection monitoring system. Review of the 2003 groundwater elevation data and the constructed potentiometric maps (Figures 2 & 3) indicates that the downgradient system wells appear sufficient in number and positions to monitor the shallow saturated zone by intercepting groundwater passing laterally below and through the landfill site.

3.3 Condition of Monitoring Wells

Evaluation of the physical condition of the monitoring wells indicates that each existing groundwater monitoring installation is suitable for providing representative groundwater quality samples from the upper-most aquifer during periods of normal precipitation. Surface pads and locking covers on compliance wells MW-3, MW-5 and MW-6 were upgraded to current well standards.

4.0 HYDROGEOLOGIC EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevations as measured for the subject monitoring period are listed in Table 3 below. All elevations have been referenced to the JKB&B survey. Potentiometric maps representing the shallow aquifer flow regime, constructed from data recorded from the 2003 groundwater monitoring events, are provided as Figure 2 (6/03) and Figure 3 (12/03). The direction of shallow groundwater flow at the landfill site is indicated to be consistently toward the east-southeast.

4.2 Groundwater Flow Rate

Seepage velocity (V_s), the calculated rate of movement of fluid particles through porous media (neglecting the sinuosity of flow paths), is calculated as $V_s = Ki/n_e$:

where : $K = 1.5 \times 10^{-4}$ cm/sec (average from assessment testing); i = horizontal hydraulic gradient = 0.023 ft/ft; and, n_e = effective porosity = 0.22.

V_s = 493 cm/yr. = 16 ft/yr towards the east-southeast.

Please note: Because of the assumptions integrated into the calculations, it is more prudent to state the rate of groundwater flow as a range of +/- 20% the calculated flow rate; which, produces a horizontal groundwater flow range of 13 ft/yr to 19 ft/yr to the east-southeast.

TABLE 3
2003 GROUNDWATER ELEVATIONS

Well ID	Total Depth (ft.bgs)	Screen Interval (ft. bgs)	Ground Elevation	TOC Elevation	Water Elevation 6/03	Water Elevation 12/03
MW-1	30	15-30	498.86	500.51	473.39	abandoned
MW-1R	60	45-60	501.22	504.92	--	469.42
MW-2R	31.5	26.5-31.5	456.78	460.21	426.06	abandoned
MW-2RR	60	45-60	457.24	459.82	--	425.02
MW-3	34	UK	452.33	453.92	423.40	420.72
MW-4	30	15-30	437.08	439.18	408.31	abandoned
MW-4R	60	45-600	438.50	441.55	--	409.55
MW-5	31	UK	418.39	420.12	401.97	396.62
MW-6	25	10-25	438.76	440.51	420.55	416.41
MW-7	29.5	14.5-29.5	454.04	455.77	425.68	abandoned
MW-7R	60	45-60	454.21	457.34	--	422.14
MW-8	68	58-68	440.47	443.39	410.24	408.64

Note: TOC=Top of Casing: NM = Not Measured: UK = UnKnown

5.0 STATISTICAL ANALYSIS

Results of groundwater sampling and laboratory analysis for 2003 and previous sampling events (dating from 1999) were statistically evaluated. Previously, the SCDHEC-approved Statistical Analysis Plan (11/01/96), using the EPA - GRITS/STAT program was utilized for statistical analysis of the inorganic analytical groundwater data. The Wilcoxson Rank Sum Test statistical method was specified. For the 2003 data, a far advanced computer program providing graphical presentation with color enhancement was employed (2003 vs 1992). The new computer program is distributed by Starpoint Software, ChemPoint, version 4.2 for data management, and ChemStat, version 5.0 for statistical analysis. For the new program, 4 sets of sampling events were entered for analysis. Numerous statistical methods of data evaluation were run and the best suited for data presentation and understanding was determined to be the Non-parametric slippage test provided in the U.S. Navy 1999 Guidance Document. This test determines if the compliance point measurements are statistically elevated compared to the statistical background. The test is performed at the 95% confidence level. The test is particularly suitable in the case of a large percentage of non-detects as occurs at monitoring wells. The evaluation print-out is particularly favorable to reviewer

evaluation in that the evaluation sheet provides the reader with the specific information necessary to determine the statistical significance of the last sampling event in comparison to previous events. In addition, a simple time-concentration graph of individual detected parameters by sample station and concentration is provided. No inorganic parameters were indicated by the statistical analysis to be of statistical significance at the Newberry County Landfill for the 2003 monitoring period. Refer to Table 1 for detected constituents and Appendix II for the statistical analysis printouts.

6.0 METHANE GAS MONITORING

Routine methane gas monitoring was conducted quarterly (March, June, September, and December) during 2003. All landfill structure readings were less than the regulatory action limit (25% LEL) during the 2003 monitoring period. Concentrations of methane gas exceeded the regulatory action level (100% LEL) at five monitoring locations (GMW-3, GMW-4, GMW-5, GMW-6, and GMW-7) in the first-quarter (March 18, 2003) monitoring event. In response, SCDHEC was notified and a resampling for confirmation of gas concentrations was conducted March 27, 2003. Methane gas concentrations declined significantly in subsequent monitoring events and were again below the action level in the fourth-quarter (December, 2003) monitoring event. Refer to Appendix III for methane monitoring data (included in this report as requested by SCDHEC officials).

7.0 FINDINGS

The findings, derived from evaluation of the data collected as part the 2003 groundwater monitoring program, are as follows:

a. The direction of groundwater flow at the landfill is toward the east-southeast.
b. The rate of groundwater flow, as seepage velocity, in the shallow saturated zone is in the range of 13 to 19 ft/year.
d. The monitoring wells are appropriately located for early warning and detection purposes.
e. Monitoring wells MW-2R/2RR, MW-3, MW-4/4R, MW-5, MW-6, and MW-7 contained one or more metallic analytes at or above the established drinking water concentration limit during one or more sampling events; however, no metallic analytes were determined to be of statistical significance.
f. Detectable concentrations of organic constituents were laboratory reported at all sampled wells, with the exception of MW-1/1R and the Cockrell out-of-service water supply well, during 2003.
g. Data validation indicates the questionable reliability of conclusions derived from the laboratory-reported concentrations, i.e., trip and field blanks compromised, reported time of analyses all the same, comparison of historic presence/absence of analytes and respective concentrations, etc.

h. Monitoring wells MW-3 and MW-5 are part of the initial monitoring program and complete well construction details are unavailable for these wells.

i. Fourth-quarter, 2003 methane gas monitoring indicated compliance with regulatory standards.

8.0 CONCLUSIONS

8.1 Groundwater Quality

8.1.1 Metals

Groundwater quality at the Newberry County landfill has been altered by various organic constituents and may contain metallic analytes above established drinking water concentration limits; however, no metallic analytes were determined to be of statistical significance. Historically, laboratory reported concentrations of metals are sporadic in occurrence and concentrations fluctuate widely at all monitoring stations.

8.1.2 Organics

Organic constituent concentrations, as reported, are below established laboratory Practical Quantification Limits in many cases. All organic concentrations exceeding the applicable Maximum Contaminant Level for drinking water are flagged (Table 1).

8.2 Technical Sufficiency of the Groundwater Monitoring Network

The seven downgradient monitoring wells appear sufficient in number and horizontally positioned to provide accurate groundwater quality data. Review of the groundwater elevation data and the groundwater flow regime for each monitoring event indicates the background monitoring well appears properly located at a position hydraulically upgradient from the landfill units.

8.3 Hydrogeology

The general direction of groundwater flow over the reporting period has been consistently to the east-southeast at a horizontal flow rate of 13 to 19 ft/yr, as seepage velocity.

8.4 Methane monitoring

Fourth-quarter, 2003 methane monitoring indicated compliance with regulatory standards.

9.0 RECOMMENDATIONS

From evaluation of the 2003 groundwater sampling data our professional recommendations are:

1. Resample all downgradient compliance wells for volatile organic compounds for purposes of confirmation; and,

2. Continue routine methane monitoring as scheduled and approved.

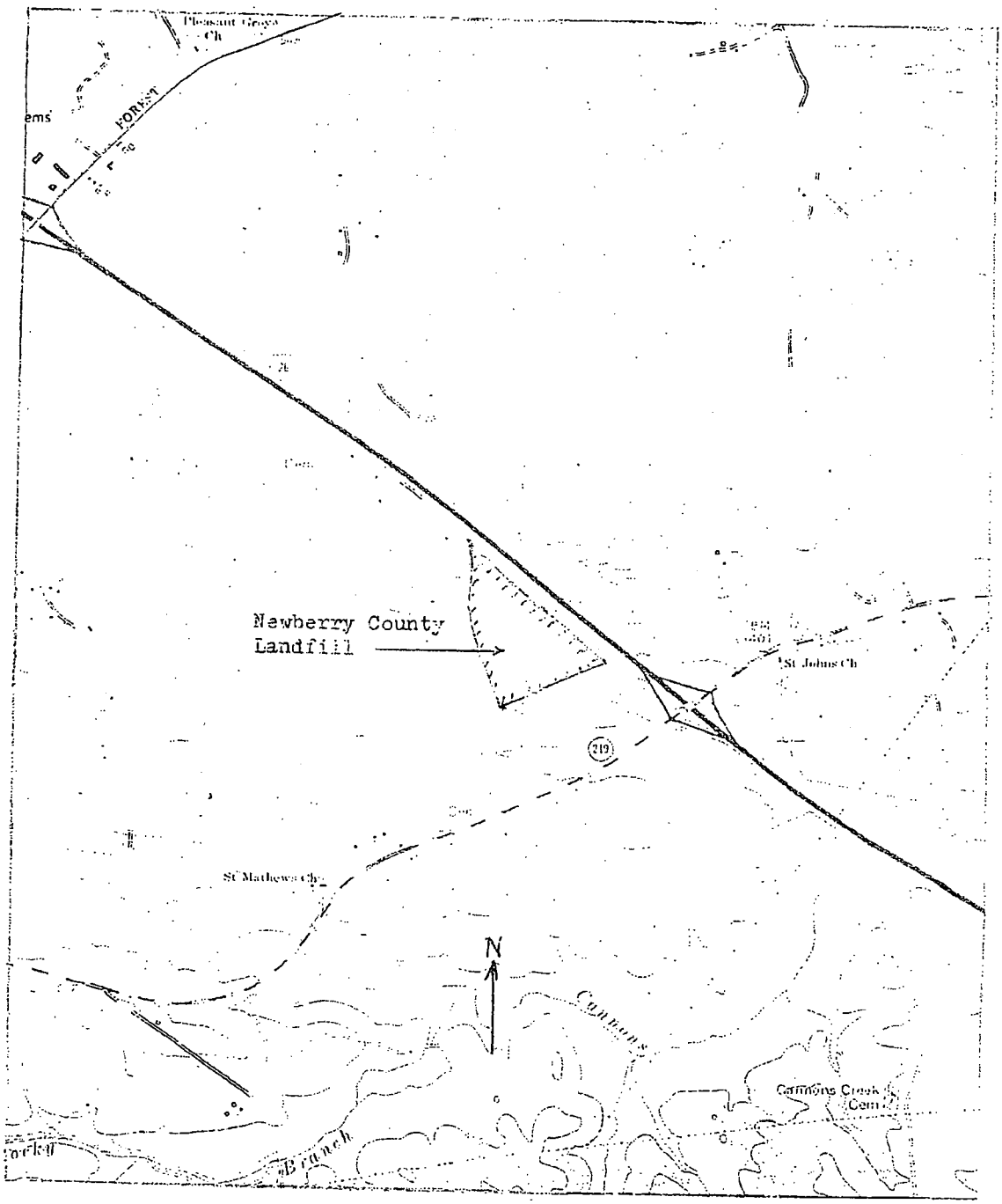
ACKNOWLEDGEMENT

C&L Consultants, Inc. appreciates the opportunity to provide professional environmental services to the Newberry County Administration on this project. If you have any questions concerning this report or if we may be of additional assistance, please contact me.

Respectfully Submitted,
C&L Consultants, Inc.

Clyde M. Livingston, Jr., P.G.
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FIGURES



scale = 1 : 24,000

* Adapted from USGS, Newberry East, 7.5 min. quad.

Drawn by: CML	Date: 12/10/96
C&L Consultants, Inc. P.O. Box 50307 Columbia, SC 29250	Figure 1. Location map, Newberry County landfill.

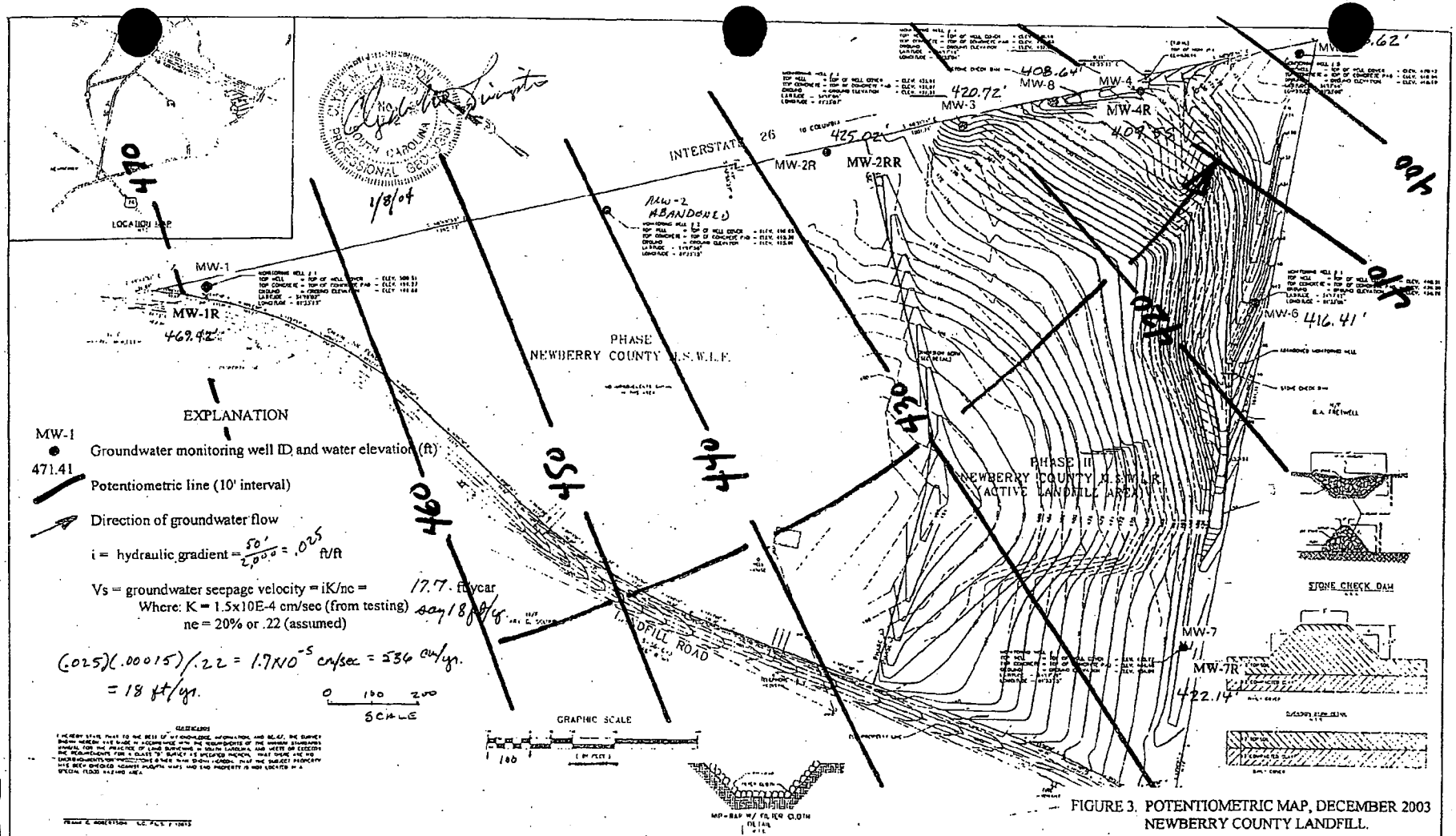


FIGURE 3. POTENTIOMETRIC MAP, DECEMBER 2003
NEWBERRY COUNTY LANDFILL.

JKBB ENGINEERS + PLANNERS		PREPARED FOR NEWBERRY COUNTY P.O. DRAWER 156 COUNTY COURTHOUSE 1200 COLLEGE ST NEWBERRY, SC PHONE 803-321-2100	TITLE NEWBERRY COUNTY MUNICIPAL SOLID WASTE LANDFILL CLOSURE PLAN	NO. REVISIONS DATE BY	Water Elevation 12/03

0610

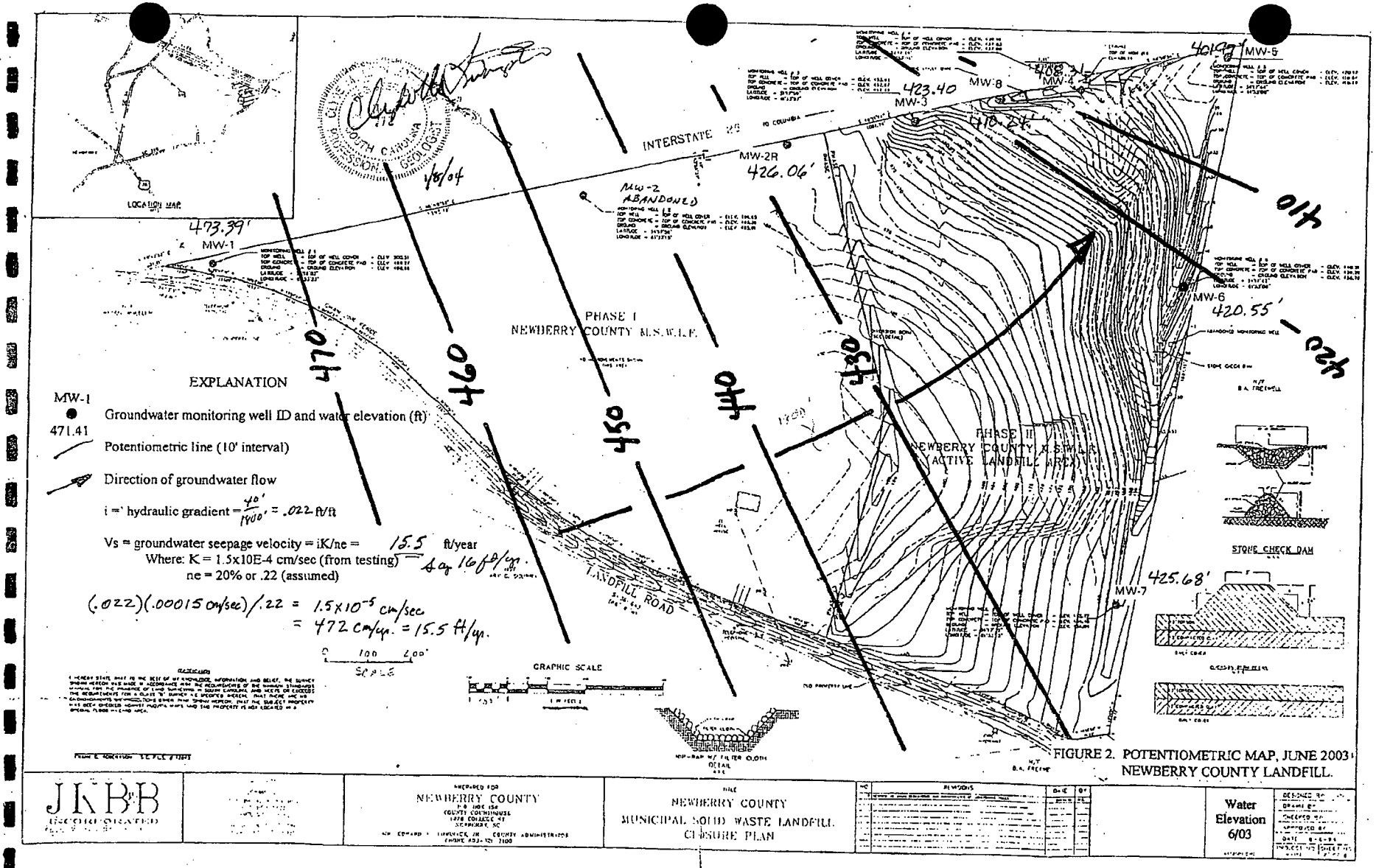


FIGURE 2. POTENTIOMETRIC MAP, JUNE 2003
NEWBERRY COUNTY LANDFILL.

0611

2004 ANNUAL GROUNDWATER MONITORING REPORT FOR THE NEWBERRY COUNTY LANDFILL

Prepared for:

Newberry County

January 2005

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(803) 254-4400 ▯ FAX (803) 935-0799

MAILING: P.O. BOX 1116
COLUMBIA, S.C. 29202-1116

2038 95

JAN - 31 2005

HYDROGEOLOGY

Date: January 27, 2005

Project: Newberry County LF
2004 Annual Groundwater Monitoring Report
File No.: 04463

To: Melanie Deblossio, Hydrogeologist
Division of Hydrogeology, SCDHEC
2600 Bull Street
Columbia, SC 29201

GENTLEMEN:

WE ARE SENDING YOU: X Attached ▯ Under separate cover via regular mail the following items:
▯ Shop Drawings ▯ Prints ▯ Plans ▯ Descriptive Data X Report

COPIES	SOURCE	DESCRIPTION	CODE
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5. Submit specific item
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Remarks:

cc: Leonard Sossomann, Newberry County
Ron Lilly, Newberry County

B.P. BARBER & ASSOCIATES, INC.
BY: Mike Alvarez

2004 ANNUAL GROUNDWATER MONITORING REPORT
FOR THE
NEWBERRY COUNTY LANDFILL

JAN 24 2005
HYDROGEOLOGY

Prepared For:

Newberry County

Post Office Box 156

Newberry, South Carolina 29108

Prepared By:

B.P. Barber & Associates, Inc.

Post Office Box 1116

Columbia, South Carolina 29202-1116

Project No. 04463

January 2005

bpb

1/27/5

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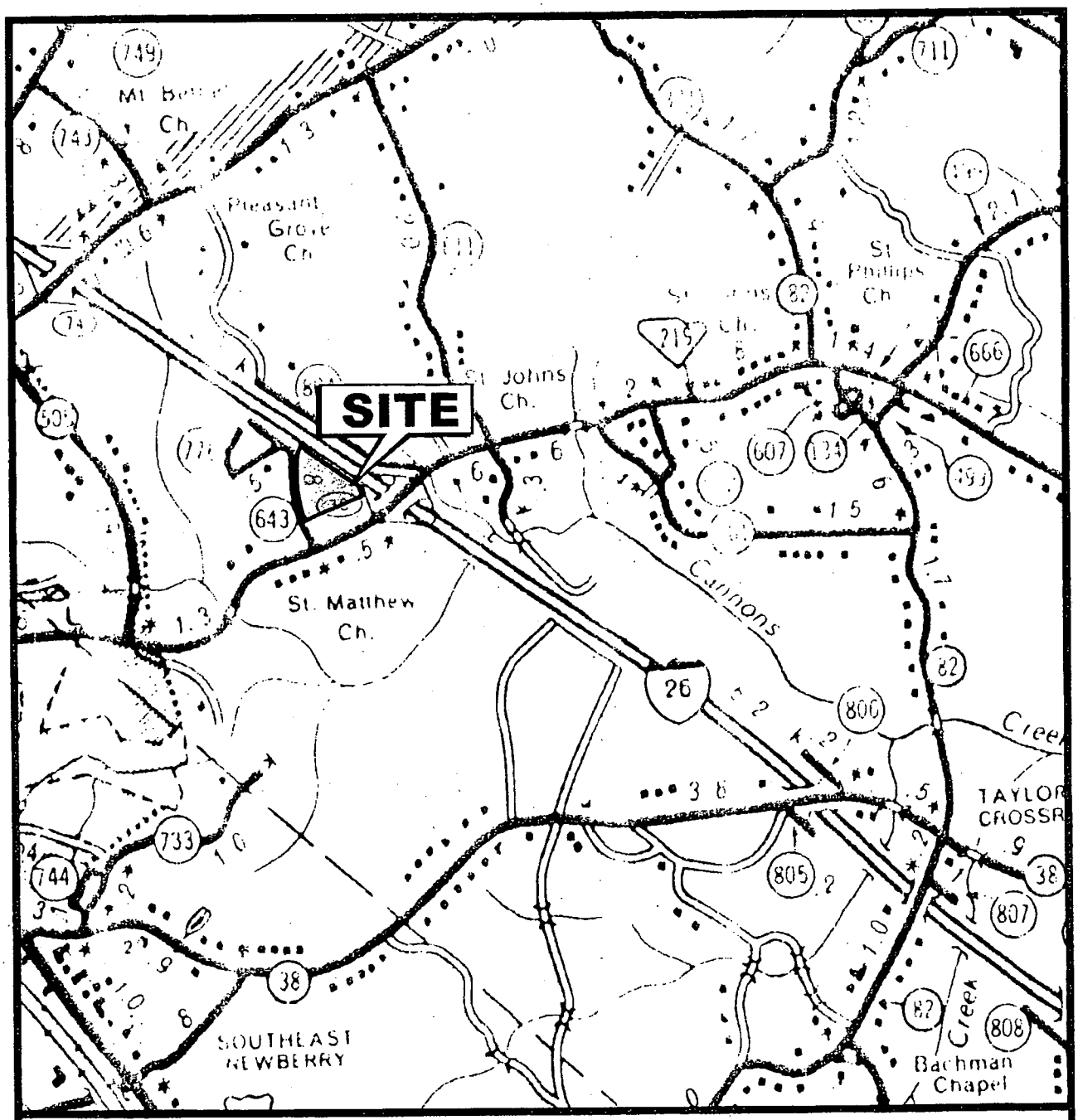
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APPENDIX A Chemistry Laboratory Reports and Field Data Forms

1.0 INTRODUCTION

Project Title:	2004 Annual Groundwater Monitoring Report for the Newberry County Landfill
Owner:	Newberry County Post Office Box 156 Newberry, SC 29108
Owner's Representative:	Leonard Sossamon, County Administrator Ron Lilly, Public Works Director
Consulting Engineers:	B. P. Barber & Associates, Inc. Post Office Box 1116 Columbia, SC 29202-1116
Consultants Representatives:	John Culbreath, P.E., Design Associate Michael E. Glowacz, P.G., Hydrogeologist

The Newberry County Landfill is between Interstate Highway 26 (I-26), Cockerll Road, and South Carolina State Highway 219 (Exhibit Aand Exhibit B) approximately two (2) miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. The County stopped accepting Municipal Solid Waste (MSW) at the 56.6-acre facility during December 1993 when the Newberry County Transfer Station began operation. The Newberry County Transfer Station is located approximately 0.1 mile east of I-26 along South Carolina Highway 34. The landfill is currently leased to the Triangle Gun Club and is used for recreational and competitive skeet shooting.



Site Location Map

EXHIBIT A

Newberry County Closed MSW Landfill

INFORMATION TAKEN FROM:

NEWBERRY COUNTY
GENERAL HIGHWAY MAP
DATED 1971

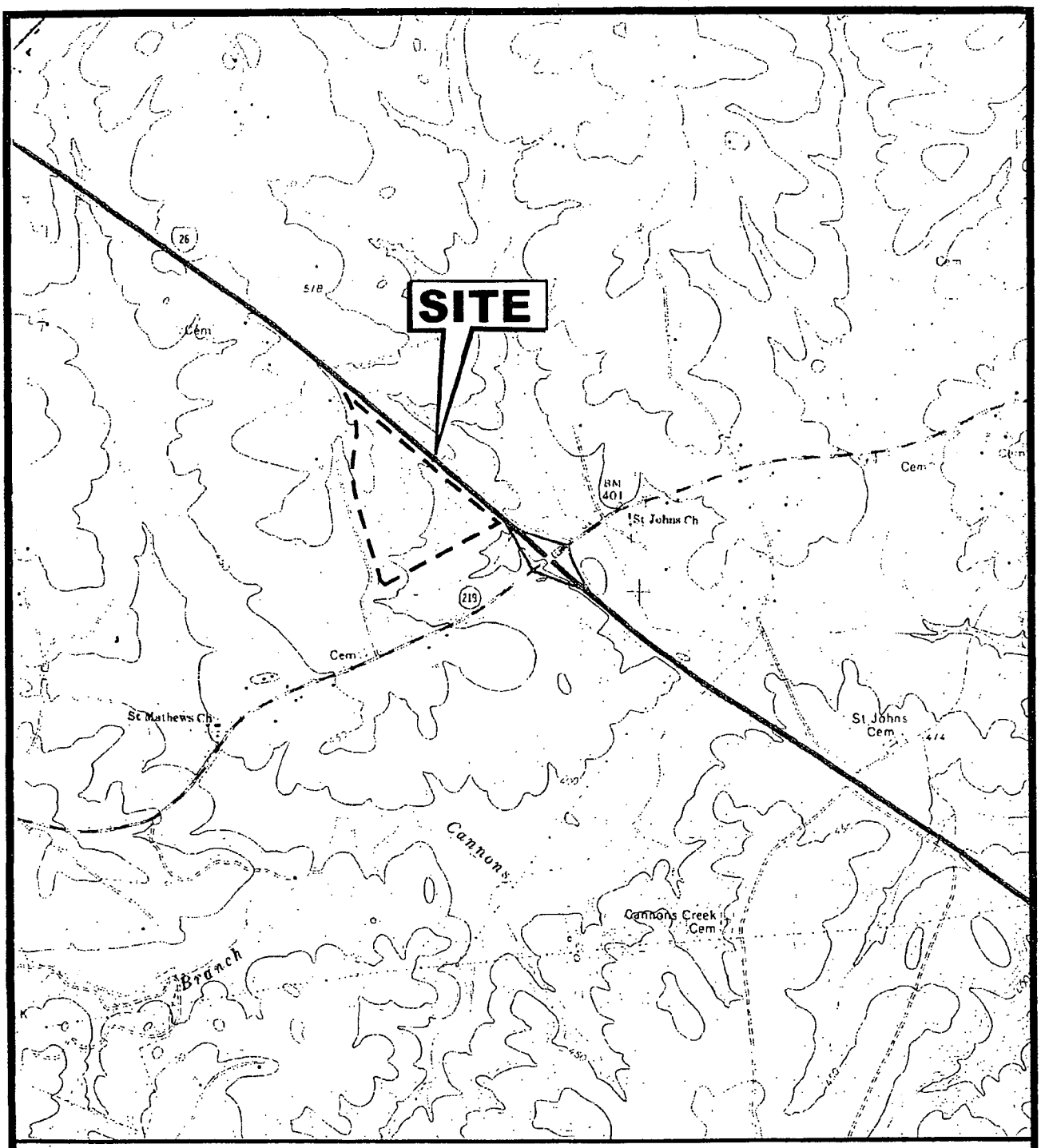
NORTH

GRAPHIC SCALE
SCALE IN MILES
0 .5 1 2

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Topographic Map

Newberry County Landfill

Exhibit B

bpb

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The objectives of the 2004 Annual Groundwater Monitoring Report are to provide a review of the 2004 groundwater chemistry data, a determination of the 2004 groundwater flow rates and directions for each semiannual monitoring event, a comprehensive evaluation of the groundwater monitoring data, and the results of the methane monitoring. This information is provided annually and semiannually in accordance with the South Carolina Department of Health & Environmental Control (SCDHEC) MSW Regulations (*R.170-61.258*).

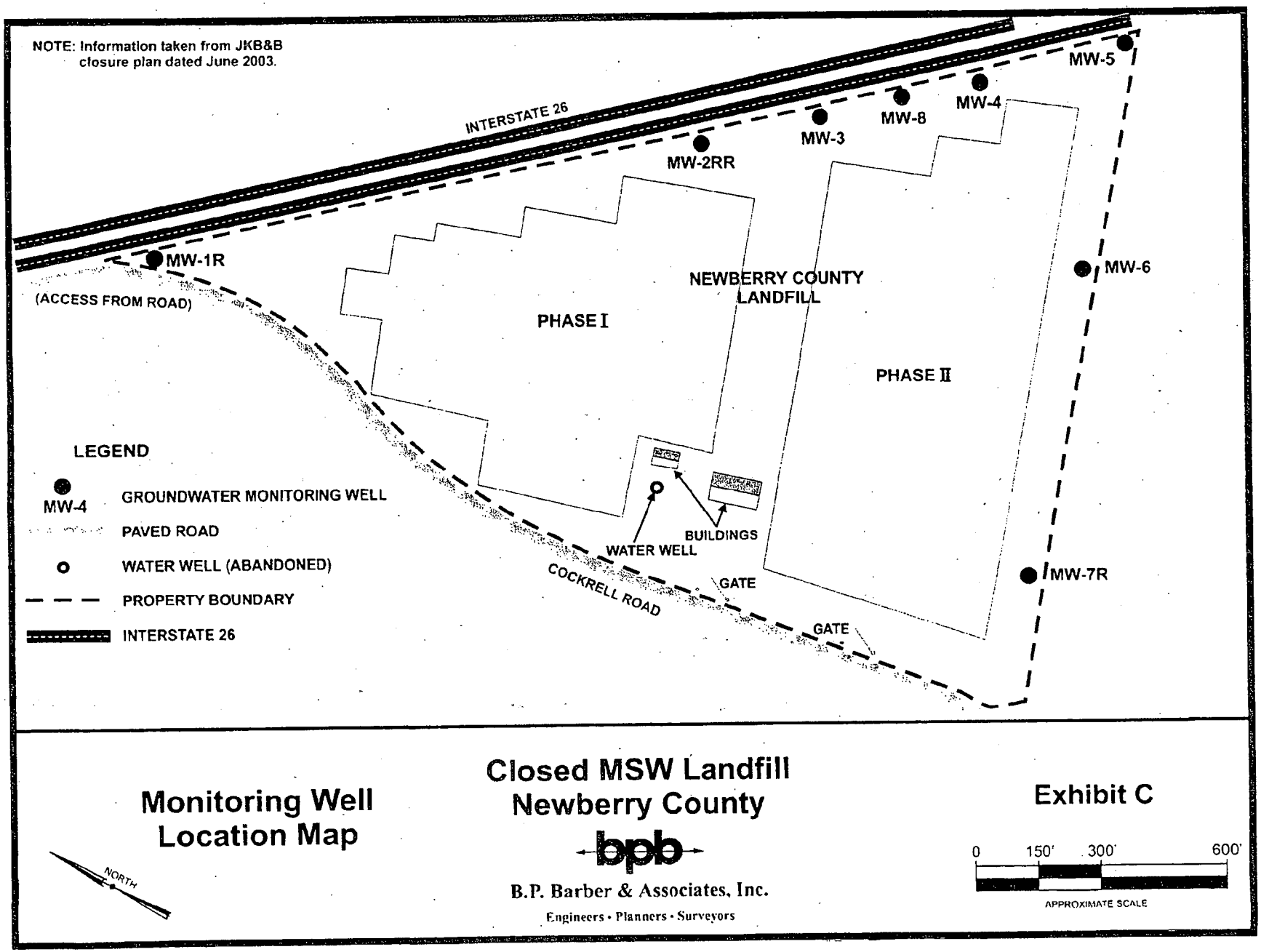
2.0 GROUNDWATER AND METHANE MONITORING PROGRAMS

2.1 Groundwater Sampling and Analysis

The monitoring network for the Newberry County Landfill consists of eight (8) groundwater monitoring wells (MW-1R, MW-2RR, MW-3, MW-4R, MW-5, MW-6, MW-7R, and MW-8) which were monitored for the constituents listed in Appendix I of the MSW Regulations (*R.61-107.258.54.b*) on a semiannual basis. MW-1 is the upgradient well for the facility. The locations of the monitoring wells are illustrated on Exhibit C and the monitoring well construction data are summarized on Table 1.

The groundwater levels were measured and groundwater samples were collected from the eight (8) monitoring wells (MW-1R through MW-8) on June 18, 2004 and November 22, 2004 as the semiannual monitoring events for 2004. C&L Consultants, Inc. (C&L) conducted the June 2004 semiannual sampling event and Data Resources, Inc. analyzed the samples. Shealy Laboratory (Shealy) conducted the November 2004 semiannual sampling event and analyzed the samples. All sampling, analytical tests, and measurement of the depth to groundwater during each of the semiannual sampling events were conducted in accordance with the Groundwater Sampling, Chemical Analysis and Analysis Plan dated January 1996.

Prior to sampling of each monitoring well, three (3) well volumes were removed from each monitoring well using a disposable, dedicated hand-bailer. Following removal of each well volume, pH, temperature, and specific conductance (indicator parameters) were measured. The indicator parameters, water-depth measurements, and other site-specific information were recorded for each well on each Data Information Sheet for Groundwater Sampling, which are provided in Appendix A. The groundwater samples collected from the monitoring wells were analyzed for the list of constituents found in Appendix I of the MSW Regulations (*R.61-107.258.54.b*).


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
MW-4
MW-8
MW-3
MW-2RR
MW-1R
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
MW-7R
WATER WELL
BUILDINGS
GATE
GATE
COCKRELL ROAD
LEGEND
MW-4 GROUNDWATER MONITORING WELL
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
Monitoring Well Location Map
NORTH
Closed MSW Landfill
Newberry County
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B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit C
0
150'
300'
600'
APPROXIMATE SCALE

0622

Table 1 Monitoring Well Construction Information

Location	Depth (ft bls)	Screen Length (ft)
MW-1R	63	15
MW-2RR	63	15
MW-3	34	U
MW-4R	63	15
MW-5	31	U
MW-6	25	15
MW-7R	63	15
MW-8	68	10

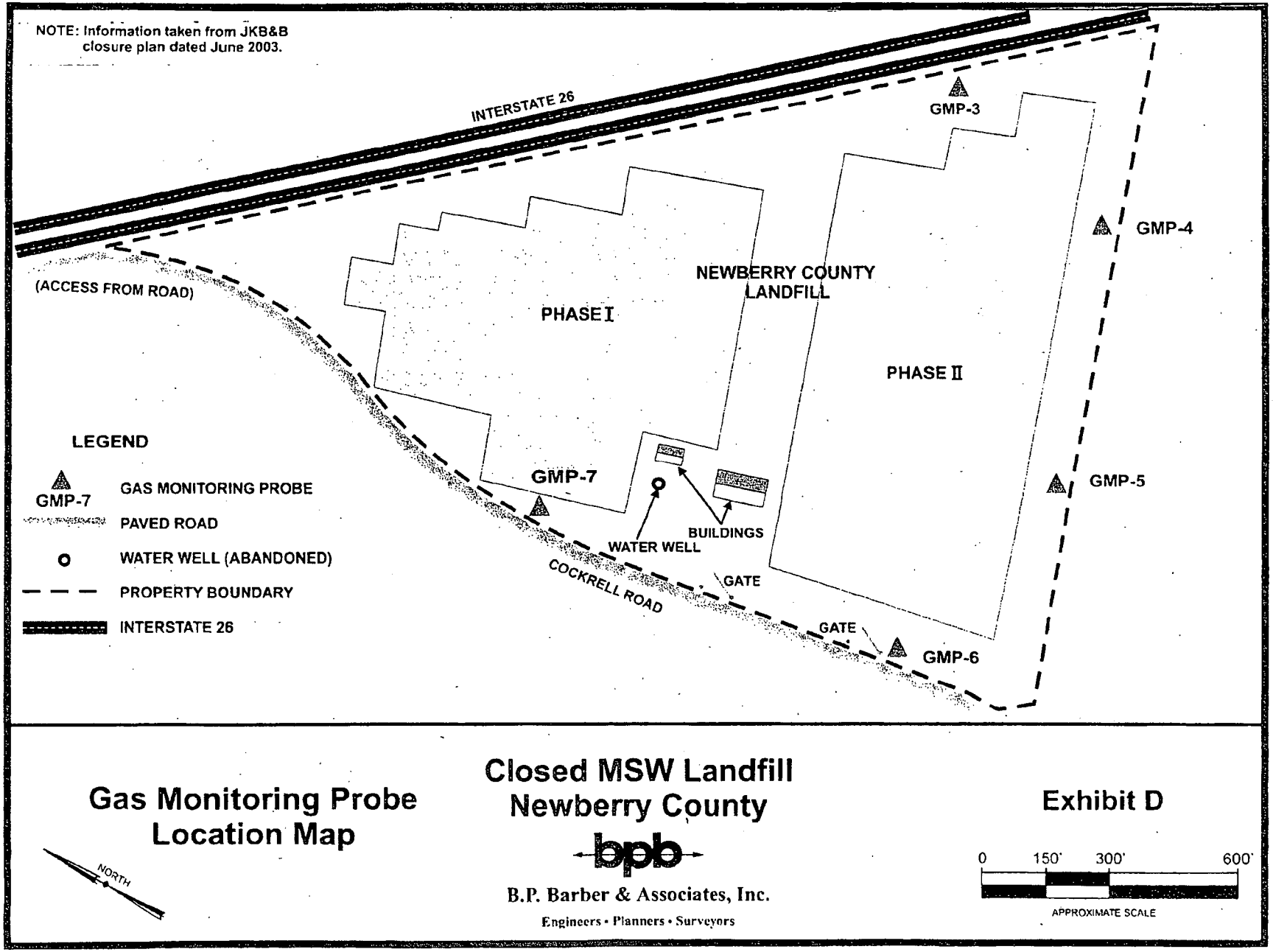
Notes:
U = Unknown
ft bls = feet below land surface
* = Information from C&L Consultants 2003 Annual Groundwater Report dated 2/9/04.

2.2 Surface Water Monitoring and Analysis

Surface water samples were collected from the Commons Creek upstream (S-1) and downstream (S-2) of the landfill on June 18, 2004 and November 22, 2004 during the semiannual monitoring events for 2004. The upstream sample (S-1) was collected near MW-3 and the downstream sample collected where the creek flows under 219 (S-2). C&L Consultants, Inc. (C&L) conducted the June 2004 semiannual sampling event and Data Resources, Inc. analyzed the samples. Shealy Laboratory (Shealy) conducted the November 2004 semiannual sampling event and analyzed the samples. All sampling and analytical tests during each of the semiannual sampling events were conducted in accordance with the Groundwater Sampling, Chemical Analysis and Analysis Plan dated January 1996.

2.3 Methane Monitoring

Five (5) Gas Monitoring Probes (GMPs) (formerly GMWs) (GMP-3 through GMP-7) located near the east, south, and west property boundaries of the landfill (Exhibit D) are currently monitored on a quarterly basis as a requirement of post-closure monitoring in accordance with MSW Regulations (*R.61-107.258.23 Explosive Gases Control*). Quarterly post-closure methane monitoring has been conducted by B.P. Barber & Associates, Inc. since September 2004. C&L performed the quarterly methane monitoring prior to September 2004. The results of the 2004 methane monitoring results are discussed in detail in Section 6.0 *METHANE MONITORING RESULTS*.


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
GMP-3
GMP-4
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
GMP-5
GMP-7
WATER WELL
BUILDINGS
GATE
COCKRELL ROAD
GATE
GMP-6
LEGEND
GMP-7 GAS MONITORING PROBE
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
Gas Monitoring Probe Location Map
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit D
0 150' 300' 600'
APPROXIMATE SCALE

0625

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 Site Geology and Geomorphology

The site geology consists of metamorphic rocks that are highly chemically weathered forming a saprolitic soil that grades into bedrock. The bedrock beneath the Newberry County Landfill is massive granite that is geologically located in the Charlotte belt of the Piedmont province. The depth of the soil (saprolite) that overlies the bedrock is as shallow as 26 feet as indicated in boring TW-3 conducted by C&L, which is reported in the Groundwater Assessment Report for the Newberry County Landfill dated October 6, 1998, and as deep as 40 feet in TW-1. Fractured granite was observed along Cannons Creek by C&L during their Groundwater Assessment conducted during 1998. The soil in the saprolite unit of the aquifer is red-brown or green-gray silt with coarse sand and quartz fragments.

The landfill is located on the east flank of a north-south trending ridge. The topography in the landfill area is gently rolling. Surface water drainage is primarily toward the southeast into the tributaries of Cannons Creek.

3.2 Hydrogeology

The aquifer beneath the Newberry County Landfill vicinity includes two (2) directly interrelated units, a surficial silt and sand (saprolite) unit that grades into a fractured bedrock unit. The uppermost unit typically is composed largely of granular material where the groundwater moves through interstices between the grains. In the underlying bedrock unit, the groundwater typically moves through cracks and fractures. The fractured bedrock appears to be hydraulically interconnected with the saprolite. The unbroken or dense rock has little porosity resulting in little transmissivity of the groundwater. The secondary interstices are primarily a result of the weathering process and, typically, are closer to the earth's surface. Consequently, potential well yields decrease with increasing depth.

3.3 Groundwater Flow Directions

Using the water-level measurements collected by C&L and Shealy from the monitoring wells during the 2004 semiannual sampling events, the water-level elevations were calculated (Table 2) and a potentiometric map was prepared for each semiannual sampling event. The potentiometric map for the June 2004 and November 2004 semiannual sampling events are included as Exhibit E and Exhibit F, respectively. The groundwater flow direction on each potentiometric map was found to be primarily southeast toward tributaries of Cannons Creek.

Table 2 **Groundwater Elevations**

MONITORING WELL NO.	MEASURING POINT ELEVATION* (ft msl)	JUNE 18, 2004		NOVEMBER 22, 2004	
		DEPTH TO WATER (ft)	WATER-LEVEL ELEVATION (ft msl)	DEPTH TO WATER (ft)	WATER-LEVEL ELEVATION (ft msl)
MW-1R	504.92	31.85	473.07	33.31	471.61
MW-2RR	459.82	35.4	424.42	36.16	423.66
MW-3	453.92	34.6	419.32	35.26	418.66
MW-4R	441.55	32.4	409.15	33.08	408.47
MW-5	420.12	24	396.12	24.4	395.72
MW-6	440.55	24.32	416.23	25.2	415.35
MW-7R	457.34	39	418.34	36.6	420.74
MW-8	443.39	32.25	411.14	36	407.39

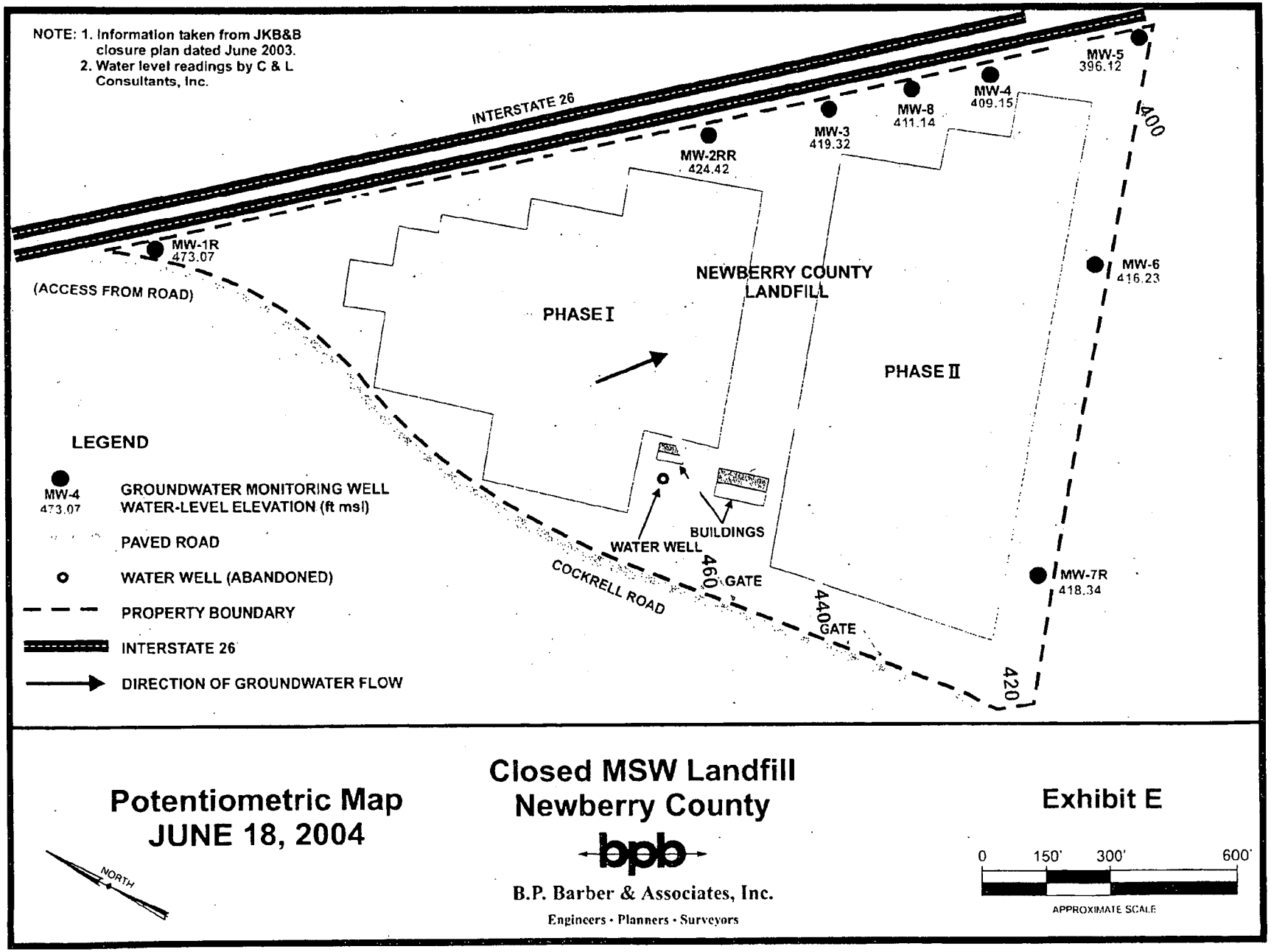
Notes:

msl = mean sea level

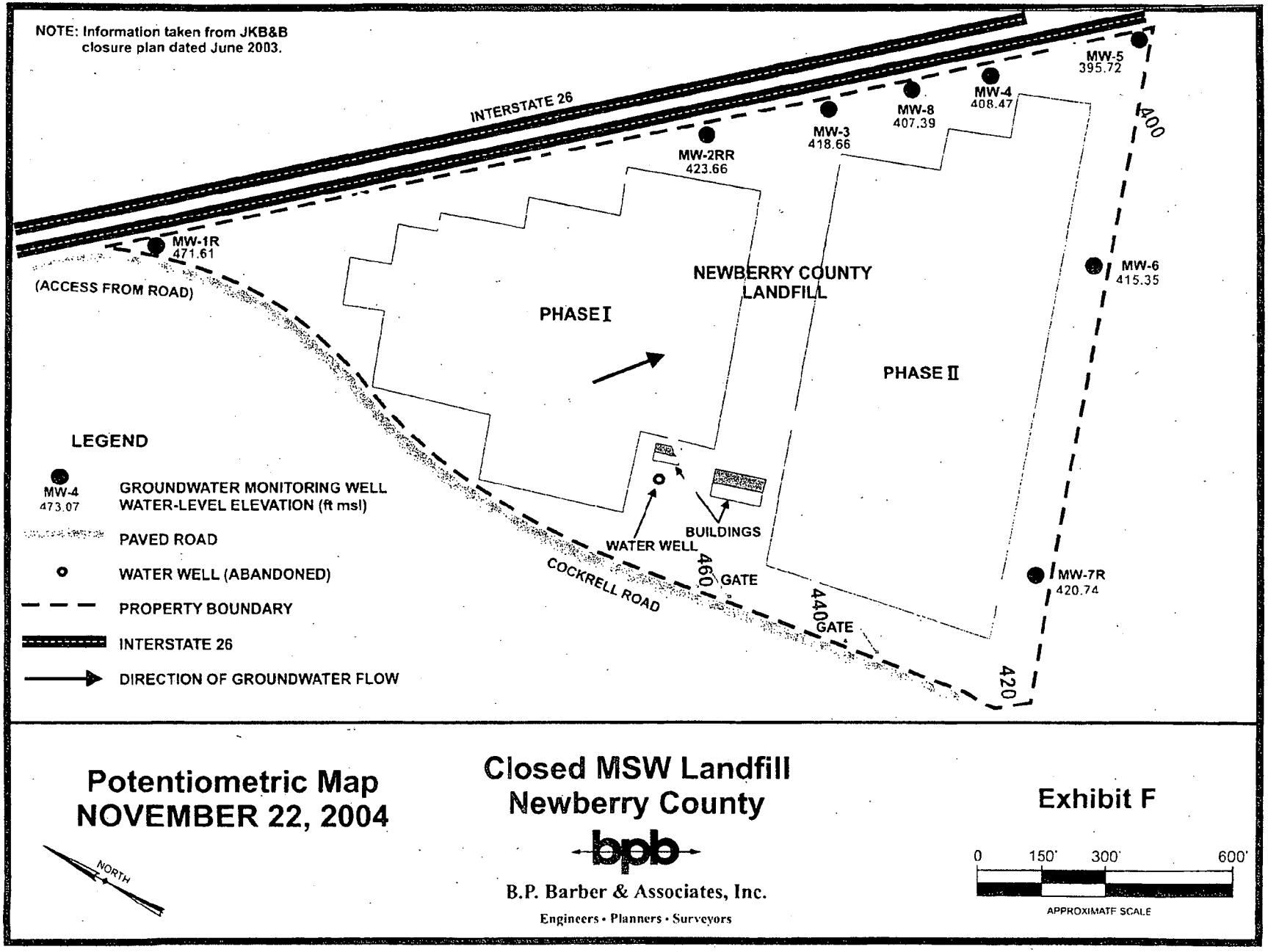
June 2004 sampling event conducted by C&L Consultants, Inc.

November 2004 sampling event conducted by Shealy Laboratory.

* = Elevations from C&L Consultants, Inc. 2003 Annual Groundwater Report dated 2/9/04.


NOTE: 1. Information taken from JKB&B closure plan dated June 2003.
2. Water level readings by C & L Consultants, Inc.
INTERSTATE 26
MW-5
396.12
MW-4
409.15
MW-8
411.14
MW-3
419.32
MW-2RR
424.42
MW-1R
473.07
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
416.23
MW-7R
418.34
400
420
440
460
GATE
GATE
WATER WELL
BUILDINGS
COCKRELL ROAD
LEGEND
MW-4
473.07
GROUNDWATER MONITORING WELL
WATER-LEVEL ELEVATION (ft msl)
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
DIRECTION OF GROUNDWATER FLOW
Potentiometric Map
JUNE 18, 2004
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers · Planners · Surveyors
Exhibit E
0
150'
300'
600'
APPROXIMATE SCALE

0628


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
395.72
MW-4
408.47
MW-8
407.39
MW-3
418.66
MW-2RR
423.66
MW-1R
471.61
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
415.35
MW-7R
420.74
400
420
440
460
GATE
GATE
WATER WELL
BUILDINGS
COCKRELL ROAD
LEGEND
MW-4
473.07
GROUNDWATER MONITORING WELL
WATER-LEVEL ELEVATION (ft msl)
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
DIRECTION OF GROUNDWATER FLOW
Potentiometric Map
NOVEMBER 22, 2004
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit F
0
150'
300'
600'
APPROXIMATE SCALE

0629

3.4 Groundwater Flow Rates

The groundwater flow rate (velocity) was calculated for each 2004 semiannual sampling event. The flow rates were calculated using the following formula:

$$V = (K * i) / n$$

Where:
- V = seepage velocity (feet/sec)
- K = hydraulic conductivity (feet/sec)
- i = hydraulic gradient (dh/dl) (ft/ft)
- dh = difference in hydraulic head between wells (ft)
- dl = distance between wells (feet)
- n = effective porosity (%)

The hydraulic conductivity (K) values used in the velocity calculations are based on slug tests performed by C&L during 1998 and reported in their Groundwater Assessment Report dated October 6, 1998. The hydraulic gradient (i) used in the flow rate calculations was based upon the distance between the upgradient well (MW-1) and downgradient well (MW-5), which is approximately 2,400 feet. The hydraulic gradient was calculated to be 0.032 for the June 2004 event and 0.031 for the November 2004 event. An effective porosity (n) of 30% was estimated based on the boring information obtained from C&L drilling logs dated October 6, 1998, which indicated the soil in the saprolite unit of the aquifer is a red-brown or green-gray silt with coarse sand and quartz fragments.

The groundwater seepage velocity averaged approximately 16 feet per year, which is typical for the soils found at the site. The calculated groundwater flow rates are provided in Table 3.

Table 3 Groundwater Velocity Calculations

	K (cm/sec)*	K(ft/day)	I	n	V (ft/day)	V (ft/year)
JUNE 2004						
Average K	0.00015	0.43	0.0321	0.3	0.045	16.6
NOVEMBER 2004						
Average	0.00015	0.43	0.0316	0.3	0.045	16.4

Notes:

V = K(dH/dL) / n where K = hydraulic conductivity, dH/dL = (I) = hydraulic gradient, n = effective porosity

* = K reported by C&L Consultants in Groundwater Assessment Report dated 10/6/98.

June 2004 sampling event conducted by C&L Consultants, Inc.

November 2004 sampling event conducted by Shealy Laboratory.

4.0 STATISTICAL ANALYSIS

After review of the data collected during 2004, a statistical analysis was not conducted. The review indicated that greater concentrations of the inorganic constituents and a higher pH were reported for the June 2004 semiannual sampling event (Table 4) than the November 2004 semiannual sampling event. It was also noted that most of the downgradient wells contained VOCs in excess of the MCLs. Since significant variations were observed between the 2004 sampling events and since most of the monitoring wells were found to contain VOCs in excess of their MCLs, it was decided not to perform the statistical analysis at this time. Following are examples of these discrepancies:

- The average pH in the groundwater samples collected from the monitoring wells was 1.3 units more basic in the June 2004 semiannual sampling event than the November 2004 semiannual sampling event. The average pH reported in the groundwater samples collected from eight (8) monitoring wells during the June 2004 semiannual sampling event was 6.5 units and the average pH for the groundwater samples collected during the November 2004 semiannual sampling event was 5.2 units. Typically, groundwater conditions do not change this rapidly in all of the wells. It has been our experience that pH rarely varies more that 0.2 pH units for sampling event to sampling event. It is speculated that the field pH unit used during the June 2004 semiannual sampling event was not properly calibrated prior to collection of the measurements.

- Cadmium was detected in excess of its method detected limit in six (6) wells and in excess of its MCL in the groundwater samples collected from three (3) of those wells during the June 2004 semiannual sampling event. Cadmium was not detected in excess of its method detection limit and its MCL in any of the groundwater samples collected from the eight (8) monitoring wells during the November 2004 semiannual sampling event. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 semiannual sampling event.

- Chromium, cobalt, selenium, and vanadium were detected in excess of their method detection limit and vanadium was detected in excess of its MCL in the groundwater samples collected during the June 2004 semiannual sampling event. None of these inorganic constituents were detected in excess of their method detection limit in groundwater samples collected during the November 2004 semiannual sampling event. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 semiannual sampling event.

TABLE 4
INORGANIC CONSTITUENTS DETECTED (ug/L)
2004
NEWBERRY COUNTY LANDFILL

Constituent	MCL	MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8
JUNE 2004									
Barium	2,000	910	1250	951	474	626	325	416	141
Cadmium	5		1.4	**6.8**		**13**	**11.4**	1.2	1.2
Chromium	100					32			
Cobalt	70					21			
Copper	1,000	23		15		22			
Lead	15*			13		14	4	2	6
Selenium	50		10						
Vanadium	80	36		**85**		64			
Zinc	5,000	83	75	334		262	130		
pH		6.8	6.1	6.4	6.6	7	6.2	6.5	6.4
Sp. Cond.		50	190	140	150	70	90	160	80
NOVEMBER 2004									
Barium	2,000	480	1200	490	420	130	280	400	160
Cadmium	5								
Chromium	100								
Cobalt	70								
Copper	1,000	8.8		7.4					
Lead	15*	9.7		10					
Selenium	50								
Vanadium	80								
Zinc	5,000	30	60	120			48		
pH		5.5	4.88	5.3	5.8	5.3	4.75	5.3	5.1
Sp. Cond.		60	338	186	331	85	156	285	113

Notes:

bpb

* = action level

ug/L = micrograms per liter

Shaded and bolded concentrations exceed their MCL (Maximum Contaminant Level)

June 2004 sampling event conducted by C&L Consultants, Inc.

November 2004 sampling event conducted by Shealy Laboratory.

- Approximately 40% less inorganic constituents concentrations were reported for the same constituents in the groundwater samples collected from the same eight (8) wells during the November 2004 semiannual sampling event than during the June 2004 semiannual sampling event. The total of the inorganic constituents reported in excess of their method detection limit during the June 2004 semiannual sampling event was 6359 ug/L. The total of the inorganic constituents reported in excess of their method detection limit during the November 2004 semiannual sampling event was 4854 ug/L. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 semiannual sampling event.

- Four (4) inorganic constituent concentrations were reported in excess of their MCLs in the groundwater samples collected from the eight (8) wells during the June 2004 semiannual sampling event. None of the inorganic constituents tested were reported in excess of their MCLs in the groundwater samples collected from the eight (8) wells during the November 2004 semiannual sampling event. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 semiannual sampling event.

Based upon these observations, it is speculated that the inorganic and pH data collected before the November 2004 semiannual sampling event is not reliable for performing statistical comparisons. Also, the groundwater samples collected from six (6) of the seven (7) downgradient monitoring wells contain VOCs in excess of their MCLs. Since most of the monitoring wells are already contaminated and since the objective is to find subtle indications of contamination where not apparent, it does not appear that statistical analysis is necessary at this time.

5.0 FINDINGS

5.1 Inorganic Constituents in Groundwater

A review of the analytical data from the semiannual sampling events indicates concentrations of four (4) inorganic constituents (barium, copper, lead, and zinc) in excess of their method detection limits in the groundwater samples collected during the November 2004 semiannual sampling event from the eight (8) monitoring wells (MW-1R through MW-8). None of these four (4) constituents were detected in excess of its MCL in the groundwater samples collected during the November 2004 semiannual sampling event. The inorganic constituents that were detected in the groundwater samples collected during the 2004 semiannual sampling events are summarized on Table 4. The laboratory analytical report for the November 2004 semiannual sampling event is provided in Appendix A.

5.2 Volatile Organic Compounds (VOCs) in Groundwater

A review of the analytical data from the April and November 2004 semiannual sampling events indicates VOCs were detected in excess of their MCLs in the groundwater samples collected from six (6) of the eight (8) monitoring wells. VOCs were not detected in excess of their method detection limits in the groundwater samples collected from MW-1R (the upgradient well) and MW-5. The analytical results from the June 2004 and the November 2004 semiannual sampling events are summarized on Table 5. The laboratory analytical report for the November 2004 semiannual sampling event is provided in Appendix A.

TABLE 5
VOLATILE ORGANIC COMPOUNDS (VOCs) DETECTED (ug/L)
2004
NEWBERRY COUNTY LANDFILL

Compound	MCL		MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8
JUNE 18, 2004										
Benzene	5		**12**	**9**	4		**6**	3	1
Chlorobenzene	100		2	1					
1,4-Dichlorobenzene	75			4			12		
1,1-Dichloroethane	5		**26**	**15**	**8**		2	3	**14**
1,1-Dichloroethene	7								
Cis-1,2-dichloroethene	70		**89**	49	4		27	3	15
1,2-Dichloropropane	5		**17**						
Methylene chloride	5		**123**	**11**					
Tetrachloroethene	5		**11**	**12**					4
Toluene	1,000			2					
Trichloroethene	5			**8**	1				5
Vinyl chloride	2						1	**3**	
Xylenes	10,000		15	2				1	
Total VOCs		0	295	113	17	0	47	12	40
NOVEMBER 22, 2004										
Benzene	5		**11**	**13**			**6**		
Chlorobenzene	100			9			7		
1,4-Dichlorobenzene	75		12	7			10		
1,1-Dichloroethane	5		**28**	**21**	**70**				**12**
1,1-Dichloroethene	7				**11**				
Cis-1,2-dichloroethene	70		**76**	59	6		22		13
1,2-Dichloropropane	5								
Methylene chloride	5		**210**	**28**	**37**			**8**	**13**
Tetrachloroethene	5		**13**	**28**					**5**
Toluene	1,000		17	15	25				
Trichloroethene	5			**16**					
Vinyl chloride	2								
Xylenes	10,000		14	7					
Total VOCs		0	381	202	149	0	45	8	43

Notes:

ug/L = micrograms per liter (to the nearest ug/L).

bpb

MCL = Maximum Contaminant Level

Shaded and bolded concentrations exceed their MCL (Maximum Contaminant Level).

June 2004 sampling event conducted by C&L Consultants, Inc.

November 2004 sampling event conducted by Shealy Laboratory.

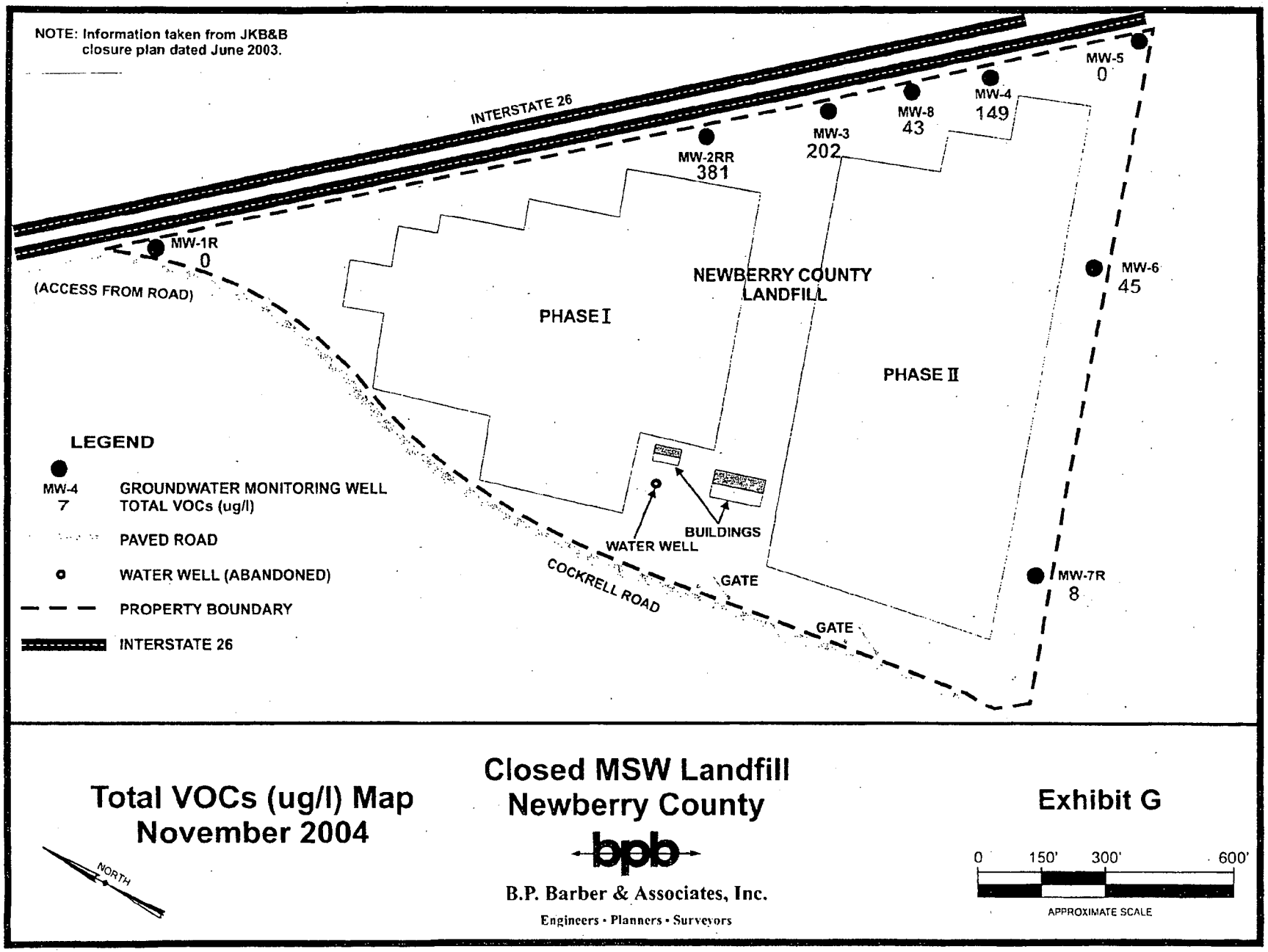
It appears that the groundwater samples collected from MW-2RR contain the greatest Total VOC concentrations (Table 5 and Exhibit G). Total VOCs have increased from 298 ug/L to 381 ug/L from the June 2004 semiannual sampling event to the November 2004 semiannual sampling event in the groundwater samples collected from MW-2RR. The Total VOCs in the groundwater samples collected from MW-3 and MW-4R have increased from 133 ug/L and 17 ug/L, respectively, to 202 ug/L and 149 ug/L, respectively, from the June 2004 semiannual sampling event to the November 2004 semiannual sampling event. The Total VOCs concentrations are similar in the groundwater samples collected from MW-6, MW-7R, and MW-8 during the April and November 2004 semiannual sampling events.

5.3 Inorganic Constituents and VOCs in Surface Water Samples

Surface water samples were collected from the tributaries of Cannons Creek, upstream and downstream of the landfill during the 2004 semiannual sampling events. The two (2) surface water samples were monitored for the constituents listed in Appendix I of the MSW Regulations (*R.61-107.258.54.b*).

Inorganic constituents were not detected in excess of their method detection limits in the two (2) surface water samples with two (2) exceptions. Barium and arsenic were detected in the upstream sample at concentrations of 43 ug/L and 6.1 ug/L, respectively. The MCL for barium in drinking water is 2,000 ug/L and the MCL for arsenic is 10 ug/L. Barium was detected in the sample collected from the downstream sample at a concentration of 60 ug/L.

VOCs were not detected in excess of their method detection limits in the two (2) surface water samples.


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
0
MW-4
149
MW-8
43
MW-3
202
MW-2RR
381
MW-1R
0
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
45
MW-7R
8
WATER WELL
BUILDINGS
COCKRELL ROAD
GATE
GATE
LEGEND
MW-4
7
GROUNDWATER MONITORING WELL
TOTAL VOCs (ug/l)
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
Total VOCs (ug/l) Map
November 2004
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit G
0
150'
300'
600'
APPROXIMATE SCALE

6.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Conclusions

Following are the conclusions reached based upon the groundwater samples collected from the eight (8) monitoring wells during the 2004 semiannual sampling events:

- Four (4) inorganic constituents (barium, copper, lead, and zinc) were reported in excess of their method detection limits in the groundwater samples collected during the November 2004 semiannual sampling event; however, none of these four (4) constituents were detected in excess of their MCLs;

- VOCs were detected in excess of their MCLs in the groundwater samples collected from six (6) of the seven (7) downgradient monitoring wells. VOCs were not detected in excess of their method detection limits in the groundwater samples collected from MW-1R (the upgradient well) and MW-5;

- The groundwater samples collected from MW-2RR, located along the I-26 property boundary, contain the greatest Total VOC concentrations. Total VOCs have increased in the groundwater samples collected from MW-2RR, MW-3, and MW-4R from the June 2004 semiannual sampling event to the November 2004 semiannual sampling event; whereas, the Total VOCs have remained relative constant in the groundwater samples collected from MW-6, MW-7R, and MW-8;

- Statistical analysis does not appear to be necessary at this time due to apparent discrepancies in the pH and inorganic constituent concentrations between the June 2004 and November 2004 semiannual sampling events and since most of the monitoring well samples are contaminated with VOCs;

- Inorganic constituents and VOCs were not detected in excess of their MCLs in either of the surface water samples;

- The groundwater flow direction illustrated on each potentiometric map is primarily southeast toward the tributaries of Cannons Creek;

- The groundwater flow rates averaged approximately 16 feet per year, which is typical for the geological conditions.

6.2 Recommendations

The November 2004 semiannual sampling event was the first sampling event where B.P. Barber & Associates, Inc. managed the quality control of the groundwater sampling and analysis. Since there are major discrepancies between the June and November 2004 analytical data, it is recommended that the results of the next semiannual sampling event be reviewed prior to recommending any further assessment activities. No change in the current groundwater-monitoring program is recommended at this time.

7.0 METHANE MONITORING RESULTS

B. P. Barber & Associates, Inc. began methane gas monitoring on a quarterly basis for the five (5) Gas Monitoring Probes (GMPs) (GMP-3 through GMP-7) in the third quarter of 2004. The methane concentrations were measured using an MDU-420 continuous-reading methane monitor. The Lower Explosive Limit (LEL) for methane, which is 5% in air, was exceeded in the GMPs during the quarterly measurements for 2004.

The quarterly methane monitoring results obtained from the GMPs are provided in Table 6. The quarterly methane readings indicate that the LEL has been exceeded along the east, south, and west landfill property boundaries.

TABLE 6
QUARTERLY GAS MONITORING PROBE READINGS
% METHANE
DECEMBER 2003 THROUGH NOVEMBER 2004
NEWBERRY COUNTY LANDFILL

GMP NO.*	12/4/03	3/25/04	9/20/04	11/22/04
GMP-3	41	58	0	42
GMP-4	50	60	NM	NM
GMP-5	44	75	52	LF
GMP-6	40	68	2	58
GMP-7	38	84	54	42
Club House	0	0	0	0
Shed	0	0	0	0

Notes:

NM = not measured (Could not be located).

bpb

* = To minimize confusion with the Groundwater Monitoring Well designation, GMW has been changed to GMP.

Bolded and shaded readings indicate the Lower Explosive Limit (LEL) for methane, 5% in air, has been exceeded.

LF = Lock frozen (needs to be cut and replaced).

12/03 and 3/04 sampling eventsconducted by C&L Consultants, Inc.

9/04 and 12/04 sampling event conducted by Shealy Laboratory.

2005 ANNUAL GROUNDWATER MONITORING REPORT FOR THE NEWBERRY COUNTY LANDFILL

Prepared for:

Newberry County

April 2006

B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
•
Engineering Excellence Since 1916

ALL-STATE LEGAL®
PLAINTIFF'S EXHIBIT
16-M

B.P. BARBER & ASSOCIATES, INC.
ENGINEERS - PLANNERS - SURVEYORS

101 RESEARCH DRIVE
COLUMBIA, S.C. 29203
(803) 254-4400 ▫ FAX (803) 935-0799

MAILING: P.O. BOX 1116
COLUMBIA, S.C. 29202-1116

11A

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HYDROGEOLOGY

20389

To: Melanie Murphy, Hydrogeologist
Division of Hydrogeology, SCDHEC
2600 Bull Street
Columbia, SC 29201

Date: April 5, 2006

Project: Newberry County LF
2005 Annual Groundwater Monitoring Report
File No.: 04463

GENTLEMEN:

WE ARE SENDING YOU: X Attached ▫ Under separate cover via regular mail the following items:
▫ Shop Drawings ▫ Prints ▫ Plans ▫ Descriptive Data X Report

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THESE ARE TRANSMITTED as indicated below:

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2. Furnish as corrected, forward three (3) corrected copies
3. Rejected
4. Revise and Submit
5. Submit specific item
6. For your information and file

Remarks:

cc: Gene Klugh, Newberry County
Tommy Whitehead, Newberry County

B.P. BARBER & ASSOCIATES, INC.
BY:

Reviewed 4/12/06

11A

20389

2005 ANNUAL GROUNDWATER MONITORING REPORT
FOR THE
NEWBERRY COUNTY LANDFILL

RECEIVED
APR 7 2006
HYDROGEOLOGY

Prepared For:
Newberry County
Post Office Box 156
Newberry, South Carolina 29108

Prepared By:
B.P. Barber & Associates, Inc.
Post Office Box 1116
Columbia, South Carolina 29202-1116

Project No. 04463
April 2006

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Appendix A Chemistry Laboratory Reports and Field Data Forms

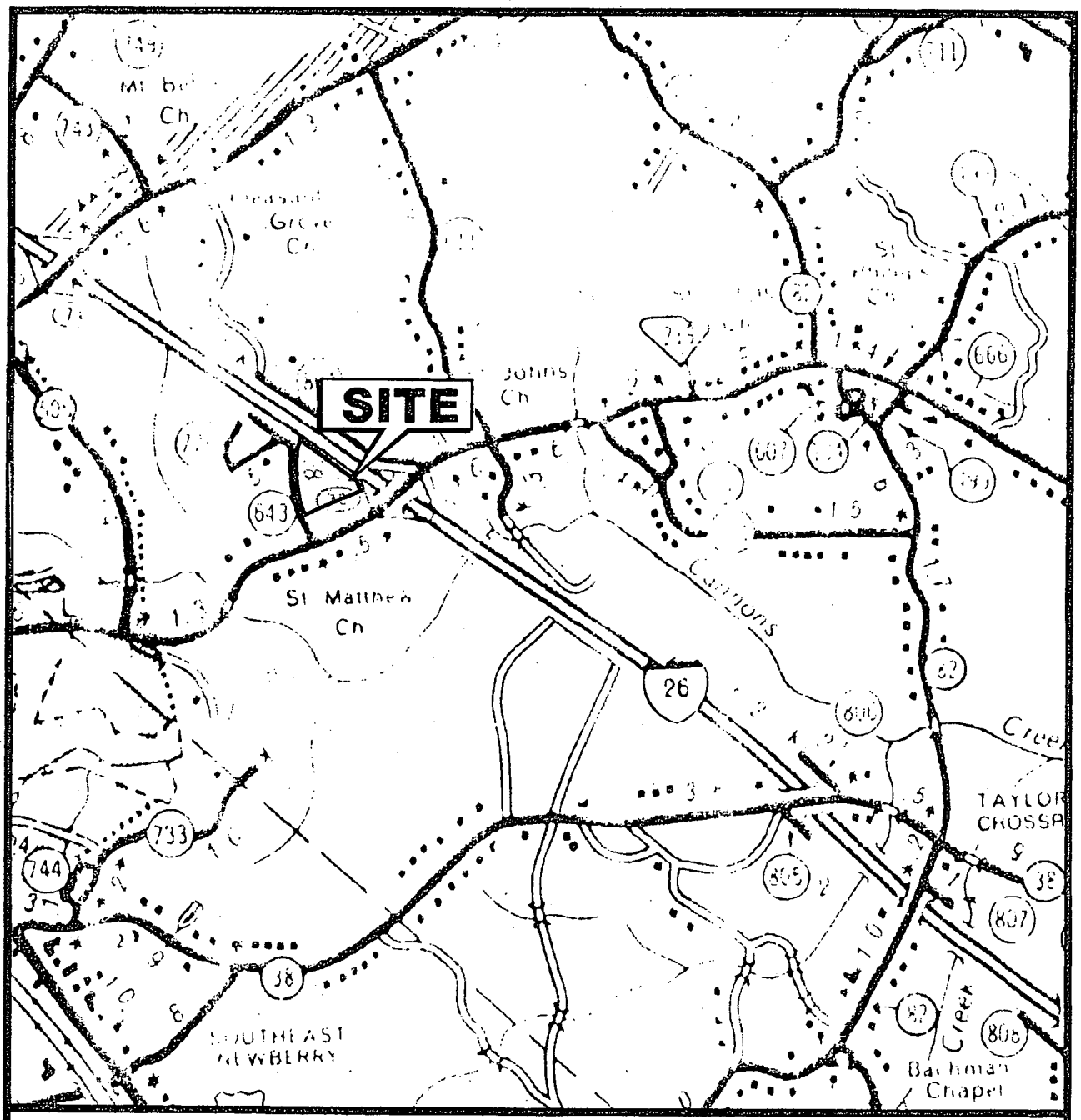
Appendix B Inorganic Constituent Tables

Appendix C Organic Constituent Tables

1.0 INTRODUCTION

Project Title:	2005 Annual Groundwater Monitoring Report for the Newberry County Landfill
Owner:	Newberry County Post Office Box 156 Newberry, SC 29108
Owner's Representative:	Gene Klugh, Interim County Administrator Tommy Whitehead, Public Works Director
Consulting Engineers:	B. P. Barber & Associates, Inc. Post Office Box 1116 Columbia, SC 29202-1116
Consultant's Representatives:	John Culbreath, P.E., Project Engineer II Michael E. Glowacz, P.G., Senior Hydrogeologist

The Newberry County Landfill is located between Interstate Highway 26 (I-26), Cockrell Road, and South Carolina State Highway 219 (Exhibit A and Exhibit B) approximately two (2) miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. The County stopped accepting Municipal Solid Waste (MSW) at the 56.6-acre facility during December 1993 when the Newberry County Transfer Station began operation. The Newberry County Transfer Station is located approximately 0.1 mile east of I-26 along South Carolina Highway 34. The landfill is currently leased to the Triangle Gun Club and is used for recreational and competitive skeet shooting.



Site Location Map

EXHIBIT A

Newberry County Closed MSW Landfill

NORTH

INFORMATION TAKEN FROM:

NEWBERRY COUNTY
GENERAL HIGHWAY MAP
DATED 1971

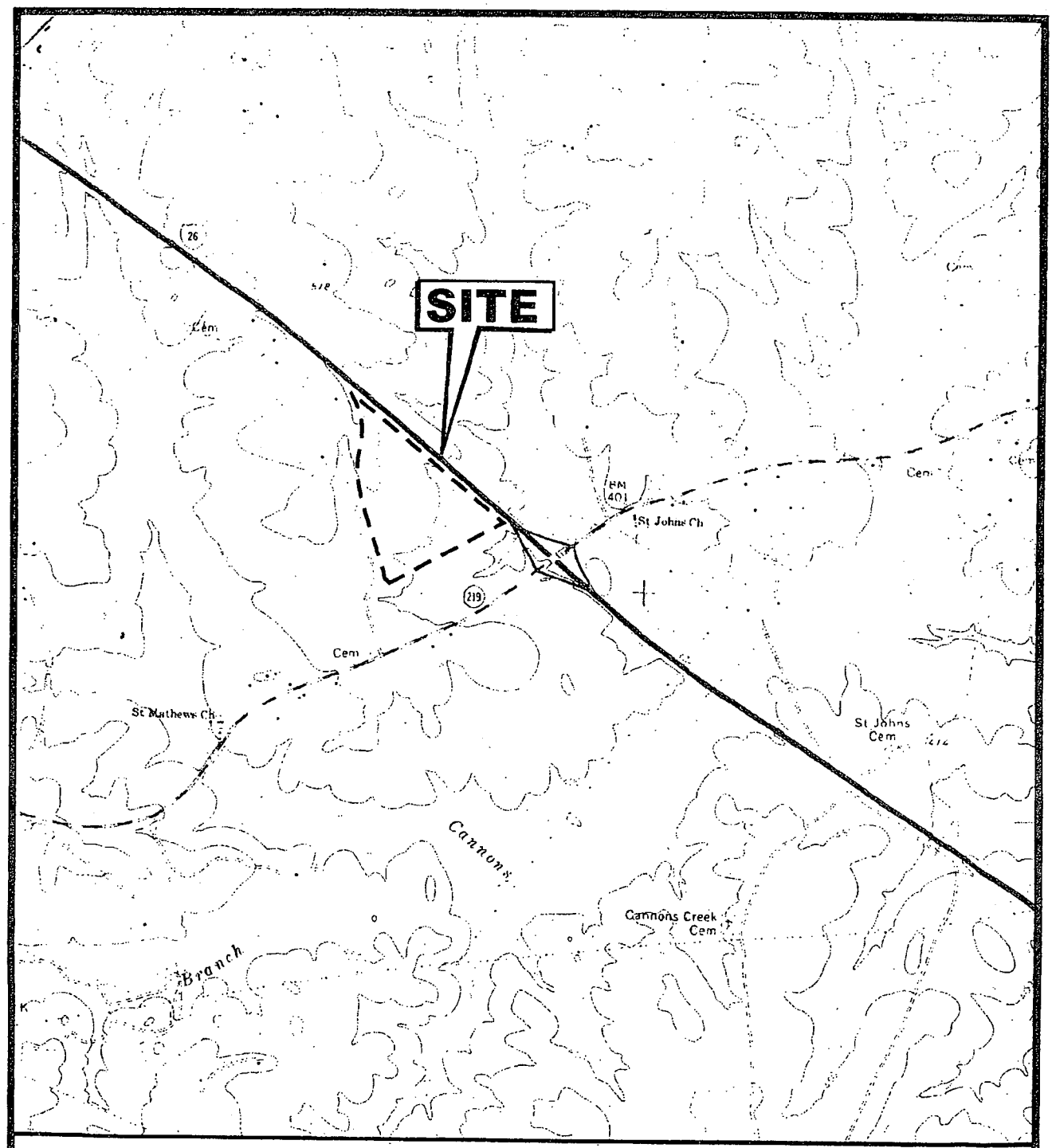
0 5 1 2

GRAPHIC SCALE
SCALE IN MILES

bpb

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Topographic Map

Newberry County Landfill

Exhibit B

INFORMATION TAKEN FROM:

USGS QUAD MAP
NEWBERRY EAST, SC
DATED 1997

bpb

B.P. Barber & Associates, Inc.

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0 1,000' 2,000' 4,000'

SCHEMATIC

The objectives of the 2005 Annual Groundwater Monitoring Report are to provide a review and a comprehensive evaluation of the 2005 groundwater chemistry data. This information is provided annually and semiannually in accordance with the South Carolina Department of Health & Environmental Control (SCDHEC) MSW Regulations (*R.170-61.258*).

2.0 GROUNDWATER AND METHANE MONITORING PROGRAMS

2.1 Groundwater Sampling and Analysis

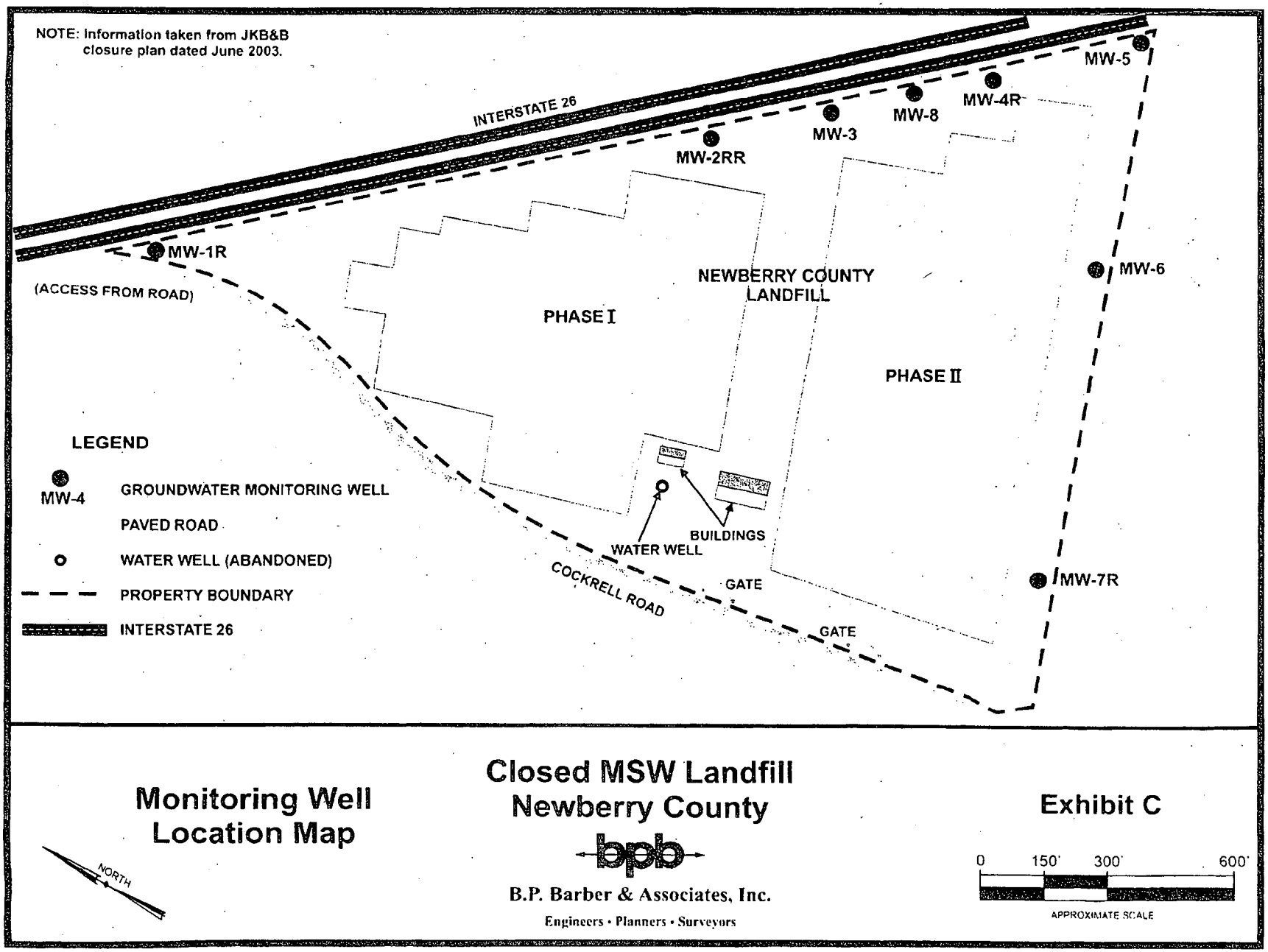
The monitoring network for the Newberry County Landfill currently consists of eight (8) groundwater monitoring wells (MW-1R, MW-2RR, MW-3, MW-4R, MW-5, MW-6, MW-7R, and MW-8) which were monitored for the constituents listed in Appendix I of the MSW Regulation *R.61-107.258.54.b* on a semiannual basis. MW-1 is the upgradient well for the facility. The locations of the monitoring wells are illustrated on Exhibit C and the monitoring well construction data are summarized on Table 1. The laboratory analytical report for the April 2005 semiannual sampling event is provided in Appendix A.

Table 1 Monitoring Well Construction Information

Location	Depth (ft bls)	Screen Length (ft)
MW-1R	63	15
MW-2RR	63	15
MW-3	34	U
MW-4R	63	15
MW-5	31	U
MW-6	25	15
MW-7R	63	15
MW-8	68	10

Notes:
U = Unknown
ft bls = feet below land surface
All information from C&L Consultants 2003 Annual Groundwater Report dated 2/9/04.

Shealy Laboratory (Shealy) measured the groundwater levels and collected groundwater samples from the eight (8) monitoring wells (MW-1R through MW-8) on April 12, 2005 and October 17, 2005 as the semiannual monitoring events for 2005. All sampling, analytical tests, and measurement of the depth to groundwater during the semiannual sampling event were conducted in accordance with the Groundwater Sampling, Chemical Analysis and Analysis Plan dated January 1996.


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
MW-4R
MW-8
MW-3
MW-2RR
MW-1R
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
MW-7R
LEGEND
MW-4 GROUNDWATER MONITORING WELL
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
WATER WELL
BUILDINGS
COCKRELL ROAD
GATE
GATE
Monitoring Well Location Map
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit C
0
150'
300'
600'
APPROXIMATE SCALE

0654

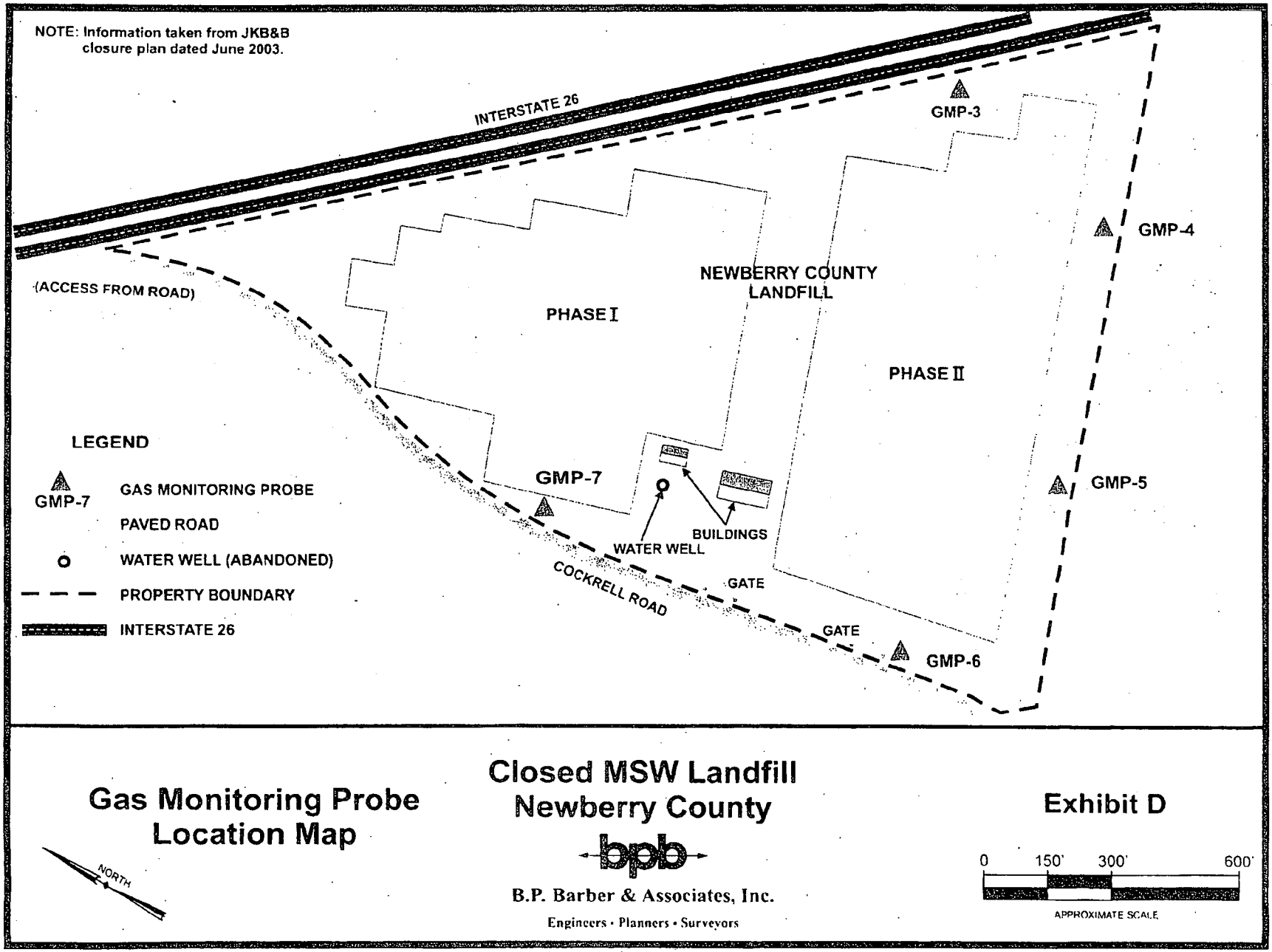
Prior to sampling of each monitoring well, three (3) well volumes were removed from each monitoring well using a disposable, dedicated hand-bailer. Following removal of each well volume, pH, temperature, and specific conductance (indicator parameters) were measured. The indicator parameters, water-depth measurements, and other site-specific information were recorded for each well on each Data Information Sheet for Groundwater Sampling, which are provided in Appendix A.

2.2 Surface Water Monitoring and Analysis

Surface water samples were collected from the Cannons Creek upstream (S-1) and downstream (S-2) of the landfill on April 12, 2005 and October 17, 2005 as the semiannual monitoring events for 2005. The upstream sample (S-1) was collected near MW-3 and the downstream sample was collected where the creek flows under Highway 219 (S-2). Shealy conducted the sampling and analysis for the 2005 semiannual sampling events. All sampling and analytical tests for the 2005 semiannual sampling events were conducted in accordance with the Groundwater Sampling, Chemical Analysis and Analysis Plan dated January 1996 prepared by C&L.

2.3 Methane Monitoring

Five (5) Gas Monitoring Probes (GMPs) (formerly GMWs) (GMP-3 through GMP-7) located near the east, south, and west property boundaries of the landfill are currently monitored on a quarterly basis as a requirement of post-closure monitoring in accordance with MSW Regulation *R.61-107.258.23 Explosive Gases Control.* Quarterly post-closure methane monitoring has been conducted by B.P. Barber & Associates, Inc. since September 2004. C&L performed the quarterly methane monitoring prior to September 2004. The 2004 methane monitoring results were discussed in detail in Section 6.0 *METHANE MONITORING RESULTS* of the 2004 Annual Groundwater Monitoring Report dated January 2005 prepared by B.P. Barber & Associates, Inc. and in the Methane Remediation Plan dated September 2005 prepared by B.P. Barber & Associates, Inc. The results of the 2005 methane monitoring events are discussed in detail in Section 6.0 *METHANE MONITORING RESULTS.*


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
GMP-3
GMP-4
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
GMP-7
GMP-5
BUILDINGS
WATER WELL
COCKRELL ROAD
GATE
GATE
GMP-6
LEGEND
GMP-7 GAS MONITORING PROBE
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
Gas Monitoring Probe Location Map
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
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Exhibit D
0 150' 300' 600'
APPROXIMATE SCALE

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 Site Geology and Geomorphology

The site geology consists of metamorphic rocks that are highly chemically weathered forming a saprolitic soil that grades into bedrock. The bedrock beneath the Newberry County Landfill is massive granite that is geologically classified as part of the Charlotte belt of the Piedmont province of South Carolina. The depth of the soil (saprolite) that overlies the bedrock is as shallow as 26 feet, as indicated in the boring log for TW-3, and as deep as 40 feet in TW-1, according to the Groundwater Assessment Report for the Newberry County Landfill dated October 6, 1998 prepared by C&L. Fractured granite was observed by C&L along Cannons Creek during their Groundwater Assessment conducted during 1998. The soil in the saprolite unit of the aquifer is red-brown or green-gray silt with coarse sand and quartz fragments

The landfill is located on the east flank of a north-south trending ridge. The topography in the landfill area is gently rolling. Surface water drainage is primarily toward the southeast into the tributaries of Cannons Creek.

3.2 Hydrogeology

The aquifer beneath the Newberry County Landfill vicinity includes two (2) directly interconnected units, a surficial silt and sand (saprolite) unit that grades into a fractured bedrock unit. The uppermost unit (saprolite) typically is composed largely of granular material where the groundwater moves through interstices between the grains. In the underlying bedrock unit, the groundwater typically moves through cracks and fractures. Well yields typically decrease with increasing depth below the saprolite/bedrock interface.

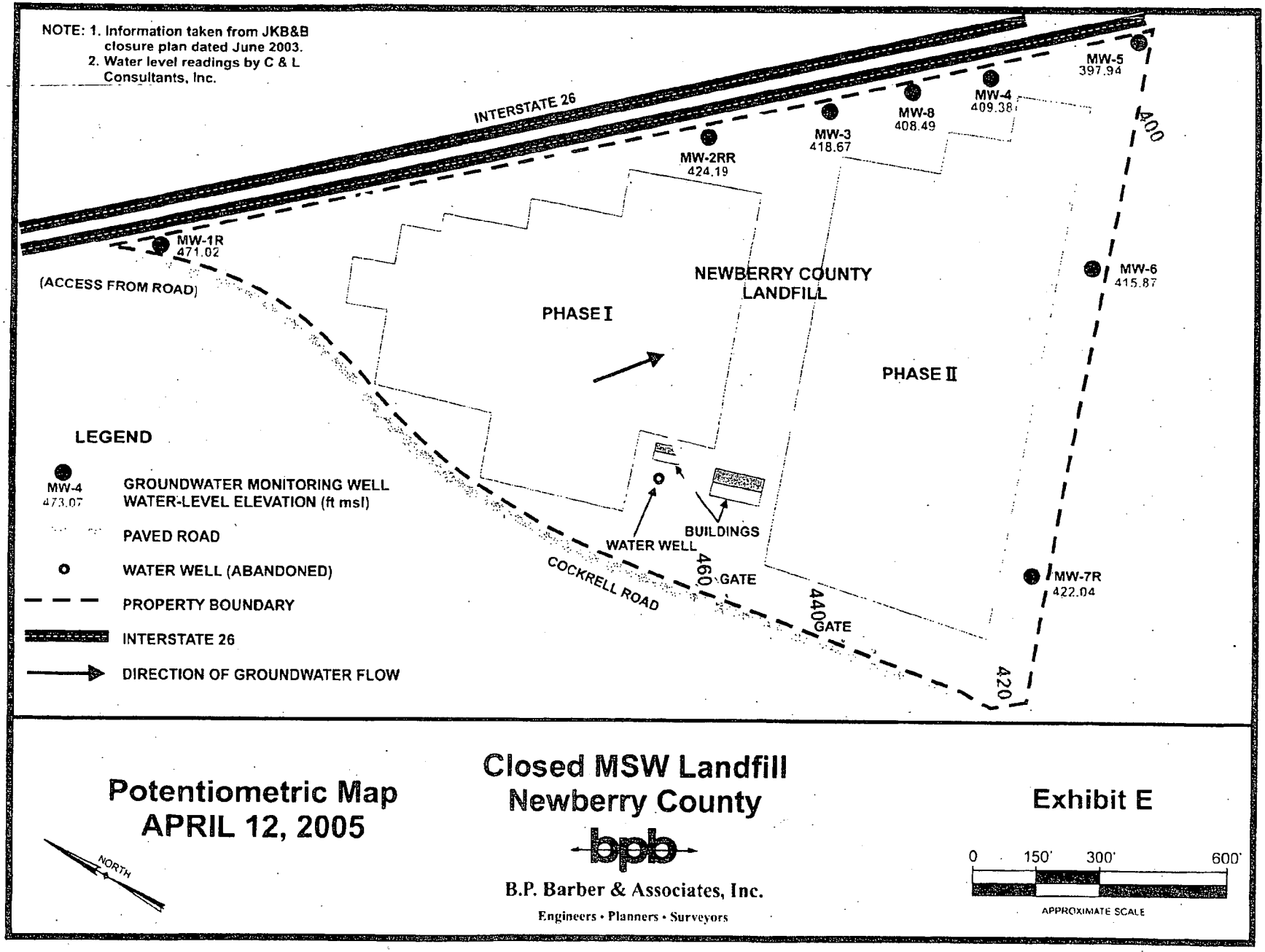
3.3 Groundwater Flow Directions

Using the water-level measurements collected by Shealy from the monitoring wells during the 2005 semiannual sampling events, the water-level elevations were calculated (Table 2) and a potentiometric map was prepared for each semiannual sampling event. The potentiometric map for the April 2005 and October 2005 semiannual sampling events are included as Exhibit E and Exhibit F, respectively. The groundwater flow direction on each potentiometric map was found to be primarily southeast toward tributaries of Cannons Creek.

Table 2 Groundwater Elevations

MONITORING WELL NO.	MEASURING POINT ELEVATION* (ft msl)	APRIL 12, 2005		OCTOBER 17, 2005	
		DEPTH TO WATER (ft)	WATER-LEVEL ELEVATION (ft msl)	DEPTH TO WATER (ft)	WATER-LEVEL ELEVATION (ft msl)
MW-1R	504.92	33.9	471.02	33.07	471.85
MW-2RR	459.82	35.63	424.19	36.51	423.31
MW-3	453.92	35.25	418.67	35.61	418.31
MW-4R	441.55	32.17	409.38	32.76	408.79
MW-5	420.12	22.18	397.94	23.75	396.37
MW-6	440.55	24.68	415.87	25.84	414.71
MW-7R	457.34	35.3	422.04	35.43	421.91
MW-8	443.39	34.9	408.49	35.51	407.88

Notes:
msl = mean sea level
June 2004 sampling event conducted by C&L Consultants, Inc.
November 2004 sampling event conducted by Shealy Laboratory.
* = Elevations from C&L Consultants, Inc. 2003 Annual Groundwater Report dated 2/9/04.



Potentiometric Map
APRIL 12, 2005

Closed MSW Landfill
Newberry County

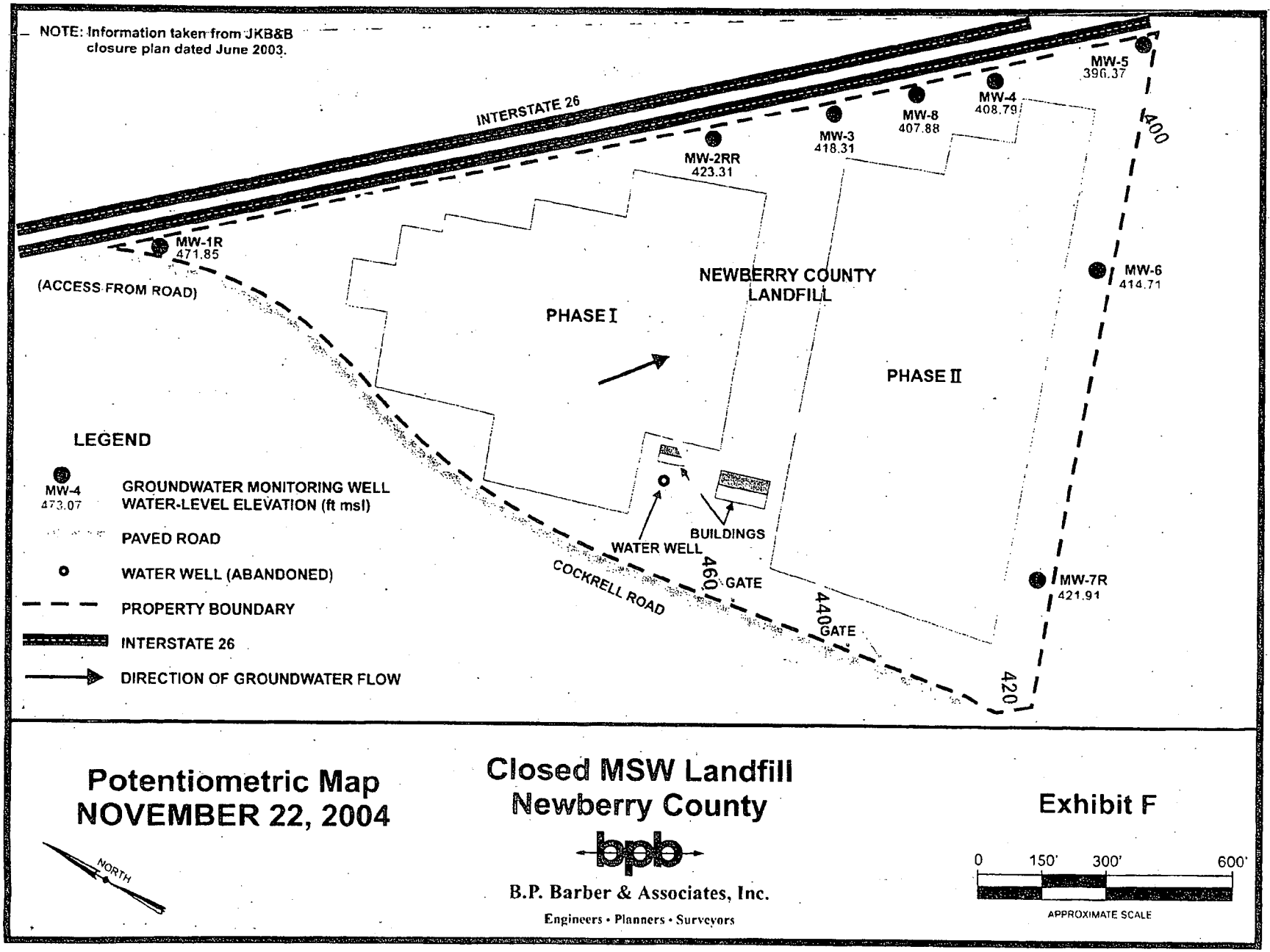
bpb

B.P. Barber & Associates, Inc.

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Exhibit E

0659


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
396.37
MW-4
408.79
MW-8
407.88
MW-3
418.31
MW-2RR
423.31
MW-1R
471.85
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
414.71
MW-7R
421.91
400
420
460
440
GATE
GATE
WATER WELL
BUILDINGS
COCKRELL ROAD
LEGEND
MW-4
473.07
GROUNDWATER MONITORING WELL
WATER-LEVEL ELEVATION (ft msl)
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
DIRECTION OF GROUNDWATER FLOW
Potentiometric Map
NOVEMBER 22, 2004
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
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Exhibit F
0
150'
300'
600'
APPROXIMATE SCALE

0690

3.4 Groundwater Flowrates

The groundwater flowrate (velocity) was calculated for each 2005 semiannual sampling event. The flowrates were calculated using the following formula:

$$V = (K * i) / n$$

Where: V = seepage velocity (feet/sec)
K = hydraulic conductivity (feet/sec)
i = hydraulic gradient (dh/dl) (ft/ft)
dh = difference in hydraulic head between wells (ft)
dl = distance between wells (feet)
n = effective porosity (%)

The hydraulic conductivity (K) values used in the velocity calculations are based on slug tests performed by C&L during 1998 and reported in their Groundwater Assessment Report dated October 6, 1998. The hydraulic gradient (i) used in the flowrate calculations was based upon the distance between the upgradient well (MW-1) and downgradient well (MW-5), which is approximately 2,400 feet. The hydraulic gradient was calculated to be 0.0305 for the April 20054event and 0.0315 for the October 2005 event. An effective porosity (n) of 30% was estimated based on the boring information obtained from C&L drilling logs dated October 6, 1998, which indicated the soil in the saprolite unit of the aquifer is red-brown or green-gray silt with coarse sand and quartz fragments. The groundwater seepage velocity averaged approximately 16 feet per year, which is typical for the soils found at the site. The calculated groundwater flow rates are provided in Table 3.

Table 3 Groundwater Velocity Calculations

	K (cm/sec)*	K(ft/day)	I	n	V (ft/day)	V (ft/year)
APRIL 2005						
Average K	0.00015	0.43	0.0305	0.3	0.043	15.8
OCTOBER 2005						
Average	0.00015	0.43	0.0315	0.3	0.045	16.3

Notes:
V = K(dH/dL) / n where K = hydraulic conductivity, dH/dL = (I) = hydraulic gradient, n = effective porosity
* = K reported by C&L Consultants in Groundwater Assessment Report dated 10/6/98.
June 2004 sampling event conducted by C&L Consultants, Inc.
November 2004 sampling event conducted by Shealy Laboratory.

4.0 STATISTICAL ANALYSIS

After review of the data collected during April 2005, a statistical analysis would not be conducted. The analytical data review indicated that greater concentrations of the inorganic constituents and much higher average pH values were reported by C&L for the June 2004 semiannual sampling event (Appendix B and Table 4) than the November 2004 and April 2005 semiannual sampling events. It was also noted that most of the downgradient wells contained Volatile Organic Compounds (VOCs) in excess of the Maximum Contaminant Levels (MCLs). Since significant groundwater quality variations were observed between the 2004 C&L and the Shealy November 2004 and April 2005 sampling events and since most of the downgradient monitoring wells were found to contain VOCs in excess of their MCLs, it was decided not to perform the statistical analysis at this time to determine if the wells are potentially contaminated. Following are examples of these discrepancies:

- The average pH in the groundwater samples collected from the monitoring wells was 1.3 units more basic in the June 2004 semiannual sampling event than the November 2004 semiannual sampling event. The average pH reported in the groundwater samples collected from eight (8) monitoring wells during the June 2004 semiannual sampling event was 6.5 units and the average pH for the groundwater samples collected during the November 2004 semiannual sampling event was 5.2 units. Typically, groundwater conditions do not change this drastically. It has been our experience that pH rarely varies more that 0.5 pH units from sampling event to sampling event. It is speculated that the field pH unit used during the June 2004 semiannual sampling event was not properly calibrated prior to collection of the measurements.

Table 4 Inorganic Constituents Detected - 2004

Constituent	MCL	MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8
JUNE 2004									
Barium	2,000	910	1250	951	474	626	325	416	141
Cadmium	5		1.4	**6.8**		**13**	**11.4**	1.2	1.2
Chromium	100					32			
Cobalt	70					21			
Copper	1,000	23		15		22			
Lead	15*			13		14	4	2	6
Selenium	50		10						
Vanadium	80	36		**85**		64			
Zinc	5,000	83	75	334		262	130		
Total Inorganics - all wells									6359
pH		6.8	6.1	6.4	6.6	7	6.2	6.5	6.4
Sp. Cond.		50	190	140	150	70	90	160	80
NOVEMBER 2004									
Barium	2,000	480	1200	490	420	130	280	400	160
Cadmium	5								
Chromium	100								
Cobalt	70								
Copper	1,000	8.8		7.4					
Lead	15*	9.7		10					
Selenium	50								
Vanadium	80								
Zinc	5,000	30	60	120			48		
Total Inorganics - all wells									3854
pH		5.5	4.88	5.3	5.8	5.3	4.75	5.3	5.11
Sp. Cond.		60	338	186	331	85	156	285	113

Notes:
* = action level
ug/L = micrograms per liter
Shaded and bolded concentrations exceed their MCL (Maximum Contaminant Level)
June 2004 sampling event conducted by C&L Consultants, Inc
November 2004 sampling event conducted by Shealy Laboratory.

- Cadmium was detected in excess of its method detected limit in the groundwater samples collected from six (6) wells and in excess of its MCL in the groundwater samples collected from three (3) of those wells during the June 2004 semiannual sampling event. Cadmium was not detected in excess of its method detection limit in any of the groundwater samples collected from the eight (8) monitoring wells during the November 2004 and April 2005 semiannual sampling events. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 and April 2005 semiannual sampling events. Typically, the greater the silt content of the groundwater sample, the greater the metals ion concentrations reported.

- Chromium, cobalt, selenium, and vanadium were detected in excess of their method detection limit and vanadium was detected in excess of its MCL in the groundwater samples collected during the June 2004 semiannual sampling event. None of these inorganic constituents were detected in excess of their method detection limit in groundwater samples collected during the November 2004 and April 2005 semiannual sampling events. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 and April 2005 semiannual sampling events.

- Approximately 40% less inorganic constituents were reported in the groundwater samples collected from the same eight (8) wells during the November 2004 and April 2005 semiannual sampling events than during the June 2004 semiannual sampling event. The total of the inorganic constituents reported in excess of their method detection limit during the June 2004 semiannual sampling event was 6359 micrograms per Liter (ug/L). The total of the inorganic constituents reported in excess of their method detection limit during the November 2004 and April 2005 semiannual sampling events was 3854 ug/L and 3633 ug/L, respectively. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 and April 2005 semiannual sampling events.

- Four (4) inorganic constituent concentrations were reported in excess of their MCLs in the groundwater samples collected from the eight (8) wells during the June 2004 semiannual sampling event. None of the inorganic constituents tested were reported in excess of their MCLs in the groundwater samples collected from the eight (8) wells during the November 2004 and April 2005 semiannual sampling events. It is speculated that the samples collected during the June 2004 semiannual sampling event contained more silt than those collected during the November 2004 and April 2005 semiannual sampling events.

Based upon these observations, it is speculated that the inorganic and pH data collected before the November 2004 semiannual sampling event is not reliable for performing statistical comparisons. Also, the groundwater samples collected from six (6) of the seven (7)

downgradient monitoring wells contain VOC's in excess of their MCLs. Since most of the monitoring wells are already contaminated and since the objective of the statistical analysis is to find subtle indications of contamination where not apparent, it does not appear that statistical analysis is necessary at this time. Since it is believed that the first reliable inorganic data was collected during the November 2004 semiannual sampling event and since the results of a minimum of four (4) sampling events are needed for a statistical analysis, the first time the statistical analysis will be provided is after the April 2006 semiannual sampling event.

5.0 FINDINGS

5.1 Inorganic Constituents Detected in Groundwater

5.1.1 April 2005

A review of the analytical data collected from the eight (8) monitoring wells (MW-1R through MW-8) during the April 2005 semiannual sampling event indicates concentrations of two (2) inorganic constituents (barium and zinc) in excess of their method detection limits. Neither of two (2) constituents was detected in excess of its MCL in the groundwater samples collected during the April 2005 semiannual sampling event. The inorganic constituents that were detected in the groundwater samples collected during the 2005 semiannual sampling events are summarized on Table 5, page 18. Tables summarizing the inorganic constituents detected in each monitoring well during the 2005 semiannual sampling events are provided in Appendix B.

Table 5 Inorganic Constituents Detected – 2005

Constituent	MCL	MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8
APRIL 2005									
Barium	2,000	150	1300	410	500	140	270	420	160
Zinc	5,000		52	54	20	41	86		30
pH		6.1	5.38	5.4	6	5.6	5.3	5.8	5.59
Sp. Cond.		58	349	181	354	76	159	289	110
OCTOBER 2005									
Barium	2,000	270	1500	430	530	120	290	460	150
Copper	1,300*	5							
Lead	15*	3.7	7.1						
Zinc	5,000	35	110	90	23	24	77	20	36
pH		6.8	5.57	5.5	6.2	5.7	5.3	6.1	5.66
Sp. Cond.		80	350	190	433	91	175	327	109

Notes:

* = action level

ug/L = micrograms per liter

Shaded and bolded concentrations exceed their MCL (Maximum Contaminant Level).

5.1.2 October 2005

A review of the analytical data collected from the eight (8) monitoring wells (MW-1R through MW-8) during the October 2005 semiannual sampling event indicates concentrations of four (4) inorganic constituents (barium, copper, lead, and zinc) in excess of their method detection limits. None of the constituents were detected in excess of its MCL in the groundwater samples collected during the October 2005 semiannual sampling event. The inorganic constituents that were detected in the groundwater samples collected during the October 2005 semiannual sampling event are summarized on Table 5, page 18. The laboratory analytical report for the October 2005 semiannual sampling event is provided in Appendix A and tables summarizing the inorganic constituents detected in each monitoring well during the 2005 semiannual sampling events are provided in Appendix B.

5.2 Volatile Organic Compounds (VOCs) Detected in Groundwater

5.2.1 April 2005

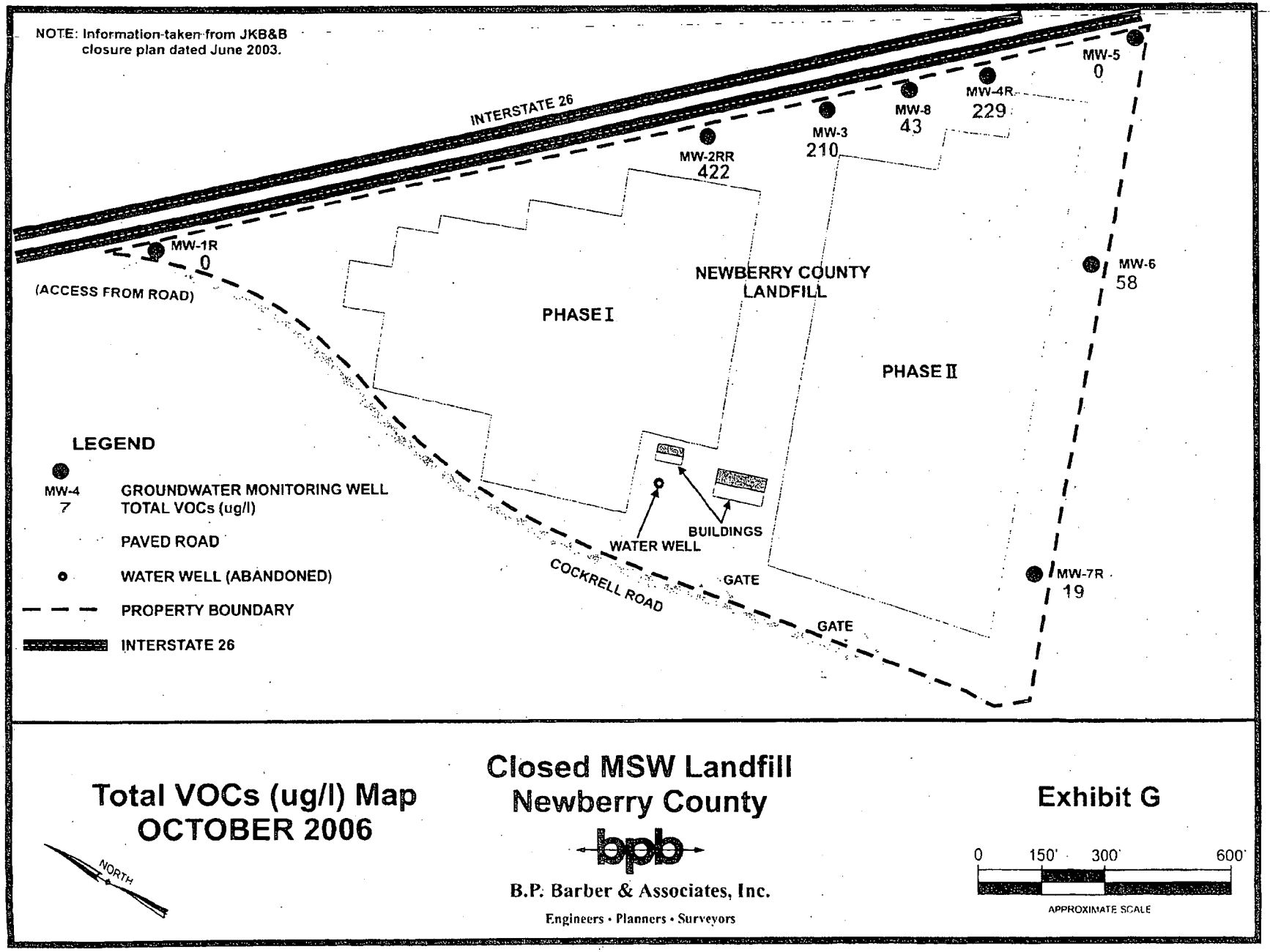
A review of the analytical data from the April 2005 semiannual sampling event indicates VOCs were detected in excess of their MCLs in the groundwater samples collected from six (6) of the eight (8) monitoring wells. VOCs were not detected in excess of their method detection limits in the groundwater samples collected from MW-1R (the upgradient well) and MW-5. The analytical results from the April 2005 semiannual sampling event is summarized on Table 6. Tables summarizing the organic constituents detected in each monitoring well during the 2004 and 2005 semiannual sampling events are provided in Appendix C.

Table 6 Volatile Organic Compounds Detected

Compound	MCL	MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8
APRIL 12, 2005									
Benzene	5		**13**	**11**			8		
2-Butanone	100				12				
Chloroethane	10			10			12	5	
1,4-Dichlorobenzene	75		11	6	7		12		
1,1-Dichloroethane	5		**39**	**24**	**95**				**16**
1,1-Dichloroethene	7				**20**				
Cis-1,2-dichloroethene	70		**110**	75	9		39		19
Methylene chloride*	5		**310**	**36**	**51**		5	**12**	**19**
Tetrachloroethene	5		**11**	**21**					
Toluene	1,000			12	30				
Trichloroethene	5		18	**17**					
Vinyl chloride	2							3	
Xylenes	10,000		13	6					
Total VOCs		0	525	218	224	0	77	20	54
OCTOBER 17, 2005									
Benzene	5		**12**	**12**	6		7		
Chloroethane	10			11	8		8	6	
1,2-Dibromo-3-chloropropane	0.2				**42**				
1,4-Dichlorobenzene	75		13	6			15		
1,1-Dichloroethane	5		**33**	**22**	**86**				11
1,1-Dichloroethene	7				11				
Cis-1,2-dichloroethene	70		**88**	70	10		28		15
Methylene chloride*	5		**230**	**29**	**39**			11	12
Tetrachloroethene	5		**13**	**28**					5.1
Toluene	1,000			9	21				
Trichloroethene	5		**16**	**16**					
Vinyl chloride	2		2					3	
Xylenes	10,000		15	7	7				
Total VOCs		0	422	210	229	0	58	19	43

Notes:
ug/L = micrograms per liter (to the nearest ug/L).
Shaded and bolded concentrations exceed their MCL (Maximum Contaminant Level)
Sampling and analysis conducted by Shealy Laboratory
* = Methylene chloride detected at 6.8 in field blank on April 12,2005

The groundwater samples collected from MW-2RR contain the greatest Total VOC concentrations (Table 6 and Exhibit G). Total VOCs have increased from 298 ug/L to 525 ug/L from the June 2004 semiannual sampling event to the April 2005 semiannual sampling event in the groundwater samples collected from MW-2RR. The Total VOCs in the groundwater samples collected from MW-3 and MW-4R have increased from 133 ug/L and 17 ug/L, respectively, to 218 ug/L and 224 ug/L, respectively, from the June 2004 semiannual sampling event to the April 2005 semiannual sampling event. The Total VOCs concentrations are similar in the groundwater samples collected from MW-6, MW-7R, and MW-8 have increased from 45 ug/L, 8 ug/L, and 43 ug/L, respectively, to 77 ug/L, 20 ug/L, and 54 ug/L, respectively, from the June 2004 semiannual sampling event to the April 2005 semiannual sampling event.


NOTE: Information taken from JKB&B closure plan dated June 2003.
INTERSTATE 26
MW-5
0
MW-4R
229
MW-8
43
MW-3
210
MW-2RR
422
MW-1R
0
(ACCESS FROM ROAD)
NEWBERRY COUNTY LANDFILL
PHASE I
PHASE II
MW-6
58
MW-7R
19
WATER WELL
BUILDINGS
COCKRELL ROAD
GATE
GATE
LEGEND
MW-4
7
GROUNDWATER MONITORING WELL
TOTAL VOCs (ug/l)
PAVED ROAD
WATER WELL (ABANDONED)
PROPERTY BOUNDARY
INTERSTATE 26
Total VOCs (ug/l) Map
OCTOBER 2006
NORTH
Closed MSW Landfill
Newberry County
bpb
B.P. Barber & Associates, Inc.
Engineers • Planners • Surveyors
Exhibit G
0
150'
300'
600'
APPROXIMATE SCALE

0670

5.2.2 October 2005

A review of the analytical data from the October 2005 semiannual sampling event indicates VOCs were detected in excess of their MCLs in the groundwater samples collected from six (6) of the eight (8) monitoring wells. VOCs were not detected in excess of their method detection limits in the groundwater samples collected from MW-1R (the upgradient well) and MW-5. The analytical results from the semiannual sampling events are summarized on Table 6. The laboratory analytical report for the October 2005 semiannual sampling event is provided in Appendix A and tables summarizing the organic constituents detected in each monitoring well during the 2004 and 2005 semiannual sampling events are provided in Appendix C.

The groundwater samples collected from MW-2RR contain the greatest Total VOC concentrations (Table 6 and Exhibit G). Total VOCs have decreased from 525 ug/L to 422 ug/L from the April 2005 semiannual sampling event to the October 2005 semiannual sampling event in the groundwater samples collected from MW-2RR. The Total VOCs in the groundwater samples collected from MW-4R have increased from 224 ug/L to 229 ug/L from the April 2005 semiannual sampling event to the October 2005 semiannual sampling event. The Total VOCs concentrations in the groundwater samples collected from MW-3, MW-6, MW-7R, and MW-8 and have decreased from 218 ug/L, 77 ug/L, 20 ug/L, and 54 ug/L, respectively, to 210 ug/L, 58 ug/L, 19 ug/L, and 43 ug/L, respectively, from the April 2005 semiannual sampling event to the October 2005 semiannual sampling event.

5.3 Inorganic Constituents and VOCs in Surface Water Samples

Surface water samples were collected from the tributaries of Cannons Creek, upstream and downstream of the landfill during the April 2005 and October 2005 semiannual sampling events. The two (2) surface water samples were analyzed for the constituents listed in Appendix I of the MSW Regulation *R.61-107.258.54.b.*

5.3.1 April 2005

Inorganic constituents were not detected in excess of their method detection limits in the two (2) surface water samples with two (2) exceptions. Barium was detected in the upstream sample at a concentration of 51 ug/L. The MCL for barium in drinking water is 2,000 ug/L. Barium and zinc were detected in the downstream sample at concentrations of 76 ug/L and 24 ug/L, respectively. The MCL for zinc is 5,000 ug/L.

VOCs were not detected in excess of their method detection limits in either of the two (2) surface water samples.

5.3.2 October 2005

Inorganic constituents were not detected in excess of their method detection limits in the two (2) surface water samples with three (3) exceptions (barium, cadmium, and zinc). Barium and cadmium were detected in the upstream sample at concentrations of 51 ug/L and 2.2 ug/L, respectively. The MCL for barium in drinking water is 2,000 ug/L and the MCL for cadmium in drinking water is 5 ug/L. Barium and zinc were detected in the downstream sample at concentrations of 76 ug/L and 24 ug/L, respectively. The MCL for zinc is 5,000 ug/L.

VOCs were not detected in excess of their method detection limits in either of the two (2) surface water samples.

6.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Conclusions

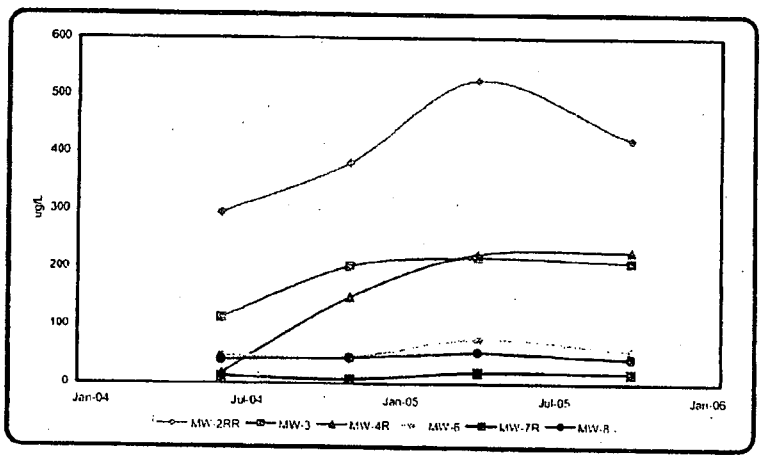
Following are the conclusions reached based upon the groundwater samples collected from the eight (8) monitoring wells during the 2005 semiannual sampling events:

- Four (4) inorganic constituents (barium, copper, lead, and zinc) in excess of their method detection limits. None of the constituents were detected in excess of its MCL;

- VOCs were detected in excess of their MCLs in the groundwater samples collected from six (6) of the seven (7) downgradient monitoring wells. VOCs were not detected in excess of their method detection limits in the groundwater samples collected from MW-1R (the upgradient well) and MW-5;

- The groundwater samples collected from MW-2RR, located along the I-26 property boundary, contained the greatest Total VOC concentrations. Total VOCs have increased only in the groundwater samples collected from MW-4R from the April 2005 semiannual sampling event to the October 2005 semiannual sampling event (Exhibit H);

Exhibit H VOCs Detected in Monitoring Wells – June 2004 through October 2005



- Statistical analysis does not appear to be necessary at this time due to apparent discrepancies in the pH and inorganic constituent concentrations between the June 2004 and most recent (November 2004 and April 2005) semiannual sampling events and since most of the downgradient monitoring well samples are contaminated with VOCs;

- Neither inorganic constituents nor VOCs were detected in excess of their MCLs in either of the surface water samples;

- The groundwater flow direction illustrated on each potentiometric map is primarily southeast toward the tributaries of Cannons Creek at an approximate rate of 16 ft per year.

6.2 Recommendations

Following are the recommendations based upon the results of the 2005 semiannual sampling events.

- Since the County is currently implementing the Groundwater Assessment Plan dated May 2005 prepared by B.P. Barber & Associates, Inc., no change in the current groundwater-monitoring program will be recommended until the results of the Groundwater Assessment are reviewed.

- Since it is believed that the first reliable inorganic data was collected during the November 2004 semiannual sampling event and since the results of a minimum of four (4) sampling events are needed for a statistical analysis, the first time the statistical analysis will be run is after the April 2006 semiannual sampling event.

7.0 METHANE MONITORING RESULTS

B. P. Barber & Associates, Inc. began methane gas monitoring on a quarterly basis for the five (5) Gas Monitoring Probes (GMPs) (GMP-3 through GMP-7) in the third quarter of 2004. The methane concentrations were measured using an MDU-420 continuous-reading methane monitor. The Lower Explosive Limit (LEL) for methane, which is 5% in air, was exceeded in the GMPs during the quarterly measurements for 2004 and 2005. The quarterly methane monitoring results obtained from the GMPs are provided in Table 7.

Since the quarterly methane readings indicated that the LEL has been exceeded along the east, south, and west landfill property boundaries, the Methane Remediation Plan dated September 2005 was prepared by B.P. Barber & Associates, Inc. It was approved in a correspondence dated November 2005 to Mr. Tommy Whitehead of Newberry County. The Plan is currently being implemented.

Table 7 Quarterly Gas Monitoring Probe Readings

GMP NO.*	9/20/04	11/22/04	3/18/05	6/30/05	8/22/05	12/28/05
GMP-3	0	42	50	45	52	46
GMP-4	NM	NM	44	40	49	38
GMP-5	52	LF	64	60	71	60
GMP-6	2	58	54	46	53	44
GMP-7	54	42	52	44	48	40
Club House	0	0	0	0	0	0
Shed	0	0	0	0	0	0

Notes:

NM = not measured (Could not be located).

* = To minimize confusion with the Groundwater Monitoring Well designation (MW), GMW has been changed to GMP.

Bolded and shaded readings indicate the Lower Explosive Limit (LEL) for methane, 5% in air, has been exceeded

LF = Lock frozen (susequently cut and replaced)

METHANE AND GROUNDWATER MONITORING
FOURTH QUARTER - 2007
of
FORMER NEWBERRY COUNTY LANDFILL SITE
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road
Newberry, South Carolina

RECEIVED
JAN 28 2008
HYDROGEOLOGY

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TERRY Project # 2314

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JANUARY 2008

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1.0 EXECUTIVE SUMMARY

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the city of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week (usually on Wednesdays). Two small structures are located on the landfill. A small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

2.0 BACKGROUND

Five (5) gas monitoring points (GMPs) known as GMP-3 through GMP-7 were installed along the boundaries of the former landfill. These points are currently monitored quarterly as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). TERRY Environmental Services, Inc. (TERRY) began the post closure methane monitoring in January 2007. Previous work was performed by B.P. Barber & Associates, Inc. and C&L Consultants, Inc.

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment of 1998. The soil in the saprolite unit of the aquifer is a red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek.

Three (3) additional monitoring wells were installed by another contractor in early 2007. The wells were designated TMW-9, TMW-10 and TMW-11. The locations are shown on Figure 2 Appendix 1 and the construction details are summarized in Table 2, Appendix 2.

3.0 METHANE MONITORING RESULTS

TERRY personnel were on-site Monday, December 31, 2007 to perform the required quarterly methane monitoring of the five (5) GMPs and two (2) structures. The methane concentrations were measured using a Landtec GEM-500 Landfill Gas Monitor. The instrument simultaneously reads percent oxygen, percent carbon dioxide, percent of the lower explosive limit (LEL), percent make up gas and percent methane gas. This is a direct reading instrument that does not need gas correction. Table 1 in Appendix 2 summarizes the readings and copies of the field data collection logs are provided in Appendix 3.

The LEL action level for methane (5% in air) was exceeded in GMP-3, GMP-4, GMP-5, and GMP-6. It was also noted that GMP-3 which normally vents landfill gas under natural conditions, was no longer actively venting. GMP-5 has shown a continual decreasing trend over the course of 2007. With the exception of the reading in June 2007, the methane readings in GMP-7 have remained below the action level of 5% of the LEL. Figure 3, Appendix 1 shows the results of the methane testing. Values in red text exceed the LEL for methane.

The methane venting trench (shown on Figure 2 and Figure 3, Appendix 1) does appear to be having a positive effect on the landfill gas concentrations in some areas (near GMP-5 and GMP-7) but is not capable of reducing the gas concentrations in other areas (near GMP-3, GMP-4 and GMP-6). Additional methane remediation methods should be considered to reduce the landfill gas concentrations at the property boundaries.

4.0 GROUNDWATER MONITORING RESULTS

TERRY personnel were on-site December 31, 2007 to collect groundwater samples from eleven (11) monitoring wells, the out-of-service / abandoned water well on-site and a surface water sample from Cannons Creek.

Prior to sample collection, the depth to water measurement was taken with respect to the top-of-casing elevation. The TOC elevations were provided by previous assessment work performed at the site. This information was used to determine the water table elevation at each sampling point. Copies of the sample collection logs are provided in Appendix 4 showing the depth to water measurements. The data is summarized in Table 2, Appendix 2. The groundwater elevations were entered into a graphical contouring program and used to generate groundwater elevation contours which were subsequently overlaid on a copy of the site plan. The resulting Figure 4 in Appendix 1 shows the contours on the water table surface and direction of groundwater flow. It appears that the groundwater flows toward the north, in the direction of Cannons Creek. The gradient was calculated by dividing the change in elevation by the change in distance between two points located along a line parallel to the direction of groundwater flow. From this, a gradient of 0.05 feet per foot was calculated.

Each of the monitoring wells was purged prior to sample collection so as to collect a representative sample of the groundwater. Copies of the sample collection logs are provided in Appendix 4. Each of the samples was placed immediately in laboratory supplied glassware and shipped to Pace Analytical Services, Inc. (SCDHEC Laboratory certification #99006) for analysis. The samples were analyzed by US EPA Method 8260B for volatile organic compounds. A total of sixty one (61) parameters are included in the analysis. Table 3 in Appendix 2 summarizes the results of the detected compounds only and provides a comparison with previous sample data. A complete copy of the laboratory report is provided in Appendix 5.

Of the compounds detected in the samples, only two (2) exceeded their respective US EPA maximum contaminant level (MCL) for drinking water. Benzene exceeded its MCL of 5 micrograms per liter (µg/L) in MW-5 (7.3 µg/L), MW-6 (7.7 µg/L) and TMW-11 (8.3 µg/L). Methylene chloride exceeded its MCL of 5 µg/L in MW-7R (20.1 µg/L), TMW-9 (43.8 µg/L) and TMW-10 (25 µg/L). The distribution of these compounds is shown on Figure 5 in Appendix 1.

Several compounds that were detected at concentrations above their MCLs during previous sampling events have decreased to levels below their MCLs. These compounds are: 1,1 Dichloroethene, cis-1,2-Dicholoroethene, Tetrachloroethene and Trichloroethene. In addition, the concentration of Benzene in MW-2RR and MW-3 decreased to levels below the MCL.

5.0 ADDITIONAL WORK REQUESTED BY THE SCDHEC

In a letter dated September 24, 2007, the SCDHEC requested the following:

- Installation of at least two (2) additional wells to delineate the extent of the off-site contamination plume. One (1) well should be installed south of TMW-10 and the other northwest of TMW-9. Due to the off-site contaminants being denser than water, these new wells should be screened just above the bedrock.
- The SCDHEC supports the suggestion to install passive and/or active landfill gas vents in order to lower methane levels. In addition to lowering methane levels, this remediation method may help reduce the off-site migration of contaminants by eliminating the landfill gas as a carrier for other contaminants.

The SCDHEC has also requested in previous correspondence that wells TMW-9, TMW-10 and TMW-11 be surveyed as to their location and elevation relative to the existing monitoring well network so that they can be included in future water table flow calculations and maps.

5.1 Additional Methane Remediation - Passive Landfill Gas Vents

Passive landfill gas vents (GVs) would be constructed through the waste by a driller registered in the State of South Carolina and in compliance with the South Carolina Water Well Regulations (R.61-71). Typically, a 36 inch diameter auger bucket is used to construct each borehole through the waste material. The vents are constructed approximately 150 feet apart with 6 inch diameter schedule 40 PVC, flush threaded casing and screen. Each screen is 0.02 inch slot. Following placement of the casing and screen in each boring, a gravel pack of 0.5 inch to 1.5 inch washed aggregate is placed around the screen to 1 foot above the top of the screen. A minimum of 1 foot of bentonite will then be placed on top of the aggregate filter material and hydrated with clean water. A cement pad will then be constructed on top of the bentonite and brought to an elevation equal to the surrounding landfill surface. A "U" shaped joint of 6 inch schedule 40 PVC is then added to the top of the casing a minimum of 4 feet above the surface of the landfill. A description of the typical gas vent construction is provided in Figure 6, Appendix 1.

Once the gas vents are installed, additional gas monitoring points may be installed along the property line in areas that are known to have methane in excess of the LEL. These points are monitored for a period of approximately 6 months on a bi-weekly basis to evaluate the effectiveness of the PGV network. The intensive 6 month evaluation period will enable a proper tracking of the climatic variations over a sustained period, the necessity for more PGVs, and their effectiveness in reducing the overall methane gas concentrations at the property line. After the 6 month evaluation period, the gas monitoring results will be submitted to the SCDHEC as a Landfill Gas Remediation Effectiveness Report. This report will detail the findings and propose any additional remedial activities that may be warranted.

If after the 6 month observation period it is determined that the PGVs are effectively reducing the concentrations of methane to levels below the action limit of 5% LEL, then a return to quarterly methane monitoring will be appropriate. If the data shows that the PGVs are not effective in reducing the concentrations of landfill gas then additional gas remediation (active recovery) will be evaluated.

The installation of the passive gas vents is performed using specialized equipment (36 inch bucket auger) and health and safety procedures and should only be performed by contractors with experience in installing landfill gas vent systems. Methane and other components of landfill gas pose significant health risks as does the handling of the waste generated during the augering process. All vent installation activities should be performed in accordance with all applicable federal, state and local regulations with particular emphasis on health and safety procedures.

5.2 Landfill Gas Vent Installation Technique

A South Carolina Certified Well Driller should oversee the installation of the GVs in accordance with the South Carolina Water Well Standards (R. 61-71). A 36 inch diameter bucket auger well installation system is typically used to construct each boring through the waste material to a depth sufficient to construct the GV, but not penetrating into the native soil beneath the waste. A minimum of 1 foot separation should be maintained between the base of the waste and the base of the GV. GV borings should be terminated a maximum of 20 feet below the landfill surface. It is not anticipated that the water table will be encountered in any of the borings. It is estimated that the depth of waste is approximately 20 feet and the landfill cap is

2 to 5 feet thick. Site conditions will vary and exact measurements should be verified prior to construction of the GV.

Borehole logging for each GV should consist of describing the auger cuttings on a continuous basis. The log should contain information concerning the drilling method, date of installation, sampling locations, material description, location of the GV and lithologic/waste descriptions.

Each GV should be constructed of 6 inch diameter schedule 40 PVC threaded casing and screen. The screen slot site should be 0.020 inches. Prior to the insertion of the screen and casing into the boring, a sufficient volume of washed aggregate should be placed in the base of the boring to ensure a firm footing for the GV and establish unrestricted vertical flow into the screen. Following the placement of the casing and 15 foot screen in each boring, a gravel pack of 0.5 to 1.5 inch washed aggregate should be placed around the screen to an elevation a minimum of 1 foot above the screen. A minimum of 1 foot of bentonite should be placed on top of the aggregate and hydrated with clean water. Cement grout should be placed above the hydrated bentonite and brought level with the surrounding landfill surface. A "U" shaped joint of 6 inch PVC should be affixed to the top of the casing approximately 4 feet above the landfill surface. Each GV should be clearly and neatly labeled using waterproof paint and a stencil. A small diameter sampling port should be installed in the side of each GV approximately 3 feet above the ground to facilitate sample collection and methane monitoring.

Waste derived from the installation of the gas vents should be properly containerized and disposed of at a SCDHEC approved facility. All proper health and safety procedures should be followed when working with waste derived from the installation of the GV borings.

5.3 Phasing of Installation

It is our recommendation that the installation of GVs should be performed in two phases. Initially, 32 vents should be installed around the perimeter of each of the two former cells of the landfill. After monitoring the effectiveness of these GVs in reducing the off-site migration of landfill gas as previously described, the determination should be made for the necessity of additional GVs in the interior of the

landfill cells. The estimated locations of the initial GVs (shown in red) and any possible interior GVs (shown in blue) are provided in Figure 7, Appendix 1.

5.4 Monitoring Well Installation

As per SCDHEC correspondence, two additional monitoring wells should be installed in the locations shown on Figure 8, Appendix 1. Monitoring wells will be completed by a South Carolina licensed well driller, under the supervision of a licensed engineer or geologist. The well installation method shall conform to the South Carolina Water Well Regulations (R.61-71).

Prior to the installation of any new monitoring wells, all downhole equipment should be decontaminated by sandblasting or steam cleaning as necessary to remove any paint, rust, caked on soil or other material. Well construction material (PVC casing and riser) shall be new and sealed in plastic from the manufacturer.

Each well should be installed using the hollow stem auger and/or the air rotary installation method(s). Borehole logging should consist of describing the soil samples on a continuous basis from the cuttings and chips produced by the drill rig. The material should be characterized by an environmental professional qualified to do so. All data collected should be recorded in a field log and presented in boring logs in the final report. Copies of the SCDHEC Water Well Record should also be included in the final report.

As determined by the SCDHEC, each well will be completed at the surface of the bedrock as encountered in each boring. Previous drilling in the area indicated that bedrock exists between 25 to 50 feet from the ground surface. As these wells are not proposed to be installed in the bedrock, it is anticipated that the wells can be installed with a hollow stem auger drill rig.

A 2 inch diameter schedule 40 PVC casing and screen with a 0.010 inch slot should be installed in each boring. A 10 foot length of screen should be used at the base of the well. Following the installation of the casing and screen, a sand pack of FX-50 (or equal) well filter sand should be constructed around the screen extending 1 foot above the top of the screen. A minimum of 1 foot of bentonite should be placed on top of the sand and hydrolyzed with clean water. The remaining annulus should be filled with neat cement grout or a bentonite-grout mix under pressure so as to ensure a complete surface seal.

The wells should be completed at the surface with a 3 foot square concrete pad and "stick up" well vault. The vault shall be of a locking type with the well identification tag clearly affixed to the outside of the well. Well development should be performed upon completion of the well. A minimum of 24 hours after completion of the well construction, development should be performed by repeatedly pumping and surging the well until the purged water reaches its maximum clarity and field measurement parameters (pH, temperature, conductivity) reach a stabilized value. As these wells are not located on the landfill property, the purge water should be containerized and transported to the landfill site where it will be allowed to seep back into the ground within the area of known contamination. Samples should be collected from the well for laboratory analysis during the next regularly scheduled sampling event in June 2008.

The proposed location of the wells is shown on Figure 8 and a typical well construction detail is provided in Figure 9, Appendix 1.

5.5 Monitoring Well Survey

The additional monitoring wells, TMW-9, TMW-10, and TMW-11 should be surveyed as to their location and elevation relative to the existing monitoring well network and landfill features. The location of passive landfill gas vents should also be added to the site maps when completed. The survey should be completed by a South Carolina Registered Land Surveyor and referenced to mean sea level (MSL).

6.0 RECOMMENDATIONS

The methane readings collected during this monitoring event confirm a decreasing trend in GMP-5 and GMP-7; however, methane readings remained above the action level of 5% of the LEL in GMP-3, GMP-4, GMP-5 and GMP-6. It was noted during the December 2007 site visit that GMP-3 is no longer actively venting landfill gas under pressure.

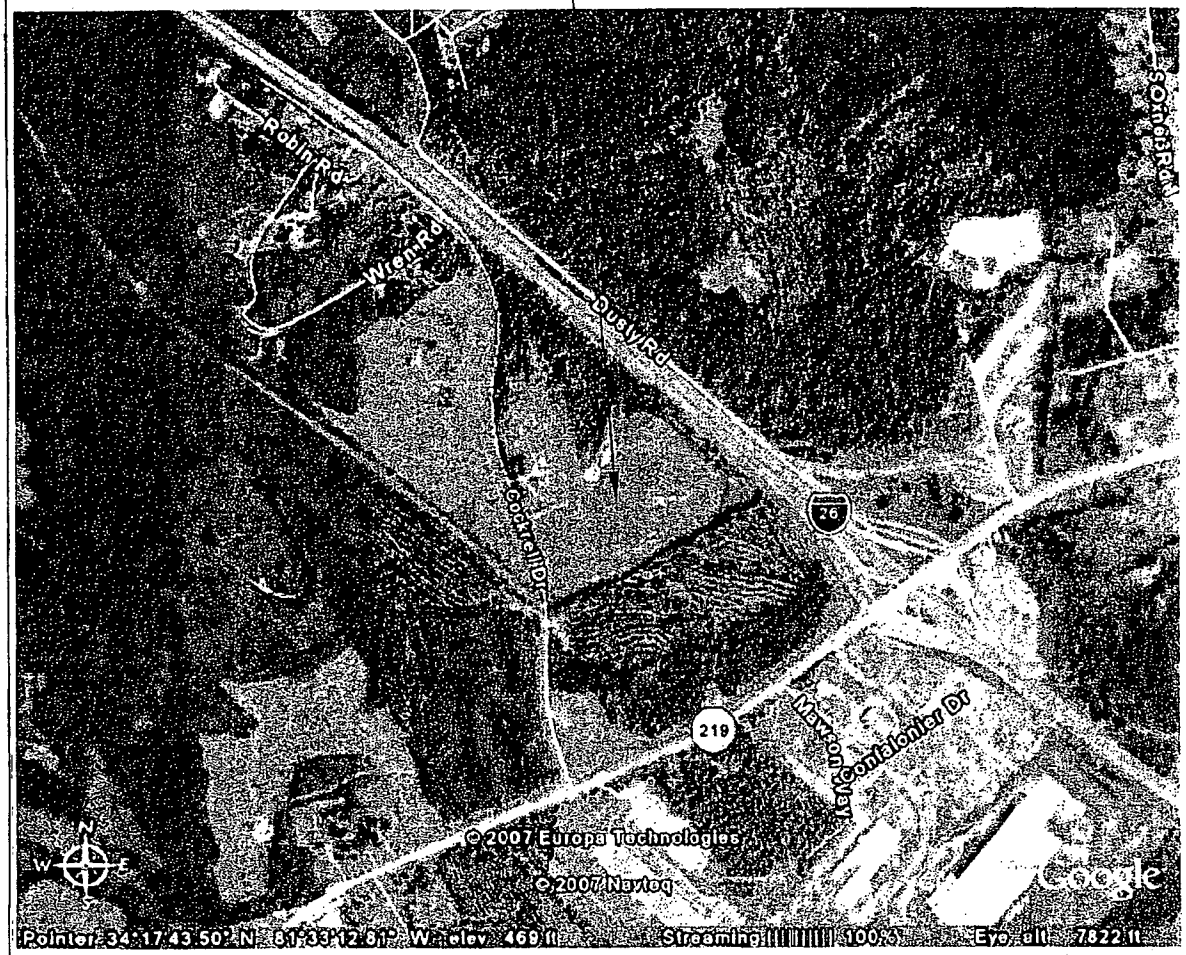
Groundwater analytical results indicate the presence of two (2) volatile organic compounds at concentrations in excess of the US EPA drinking water MCL in on-site monitoring wells. There were no contaminants detected at concentrations in excess of any MCL in the out-of-service well on-site or in the sample collected from Cannons Creek. The concentrations of the two detected compounds were generally les than ten (10) times the MCL and have remained relatively stable as compared to the historical data. This represents a significant reduction in contaminants as compared to the historical data.

The decrease in landfill gas pressure in GMP-3 and decreasing concentrations of landfill gas at GMP-5 are coincident with a significant reduction in groundwater contaminants across the site. It does appear that the landfill gas may be acting as a carrier for other contaminants in the groundwater. Landfill gas mitigation should have a continued beneficial effect on groundwater quality downgradient of the landfill itself.

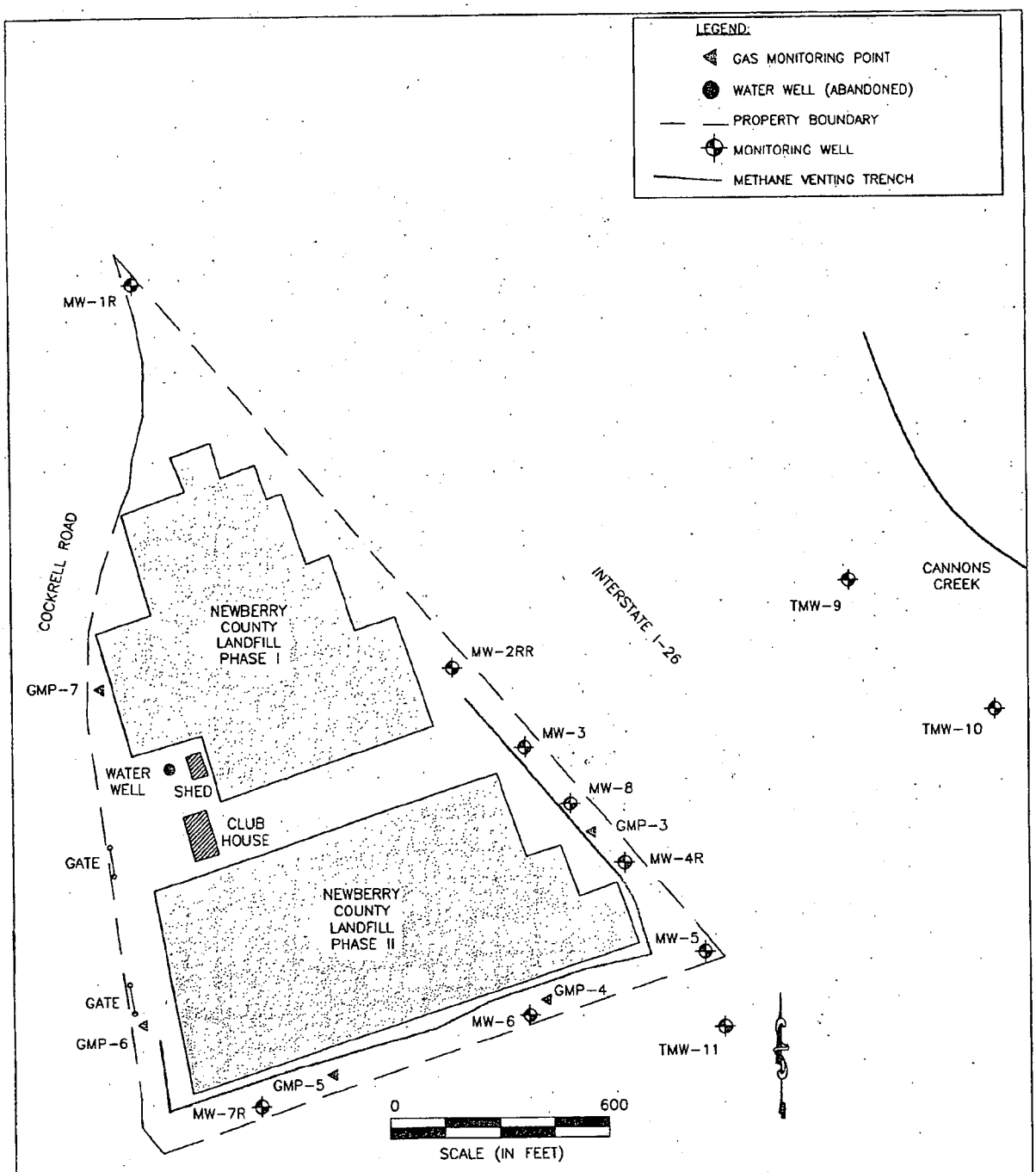
APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road, Newberry, SC



TERRY ENVIRONMENTAL SERVICES — CLIENTS FIRST ALWAYS	**FIGURE 1** **SITE LOCATION** FORMER NEWBERRY COUNTY MSW LANDFILL 432 Cockrell Road Newberry, South Carolina SCDHEC Solid Waste Permit #: DWP-117			
providing our clients with the best services available, actually understanding our clients' objectives, and making that objective our own	SIZE: B	TERRY Project No: 2314	DWG NO.: Figure 1 Site Location.dwg	REV
PO Box 75, Summerville, South Carolina 29484, (843) 873-8291, fax (843) 873-8766	SCALE: NOT TO SCALE		DATE: January 11, 2008	



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FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO.	REV
B	2314	Figure 2 Site Plan.dwg	

SCALE 1 inch = 400 feet

DATE January 11, 2008

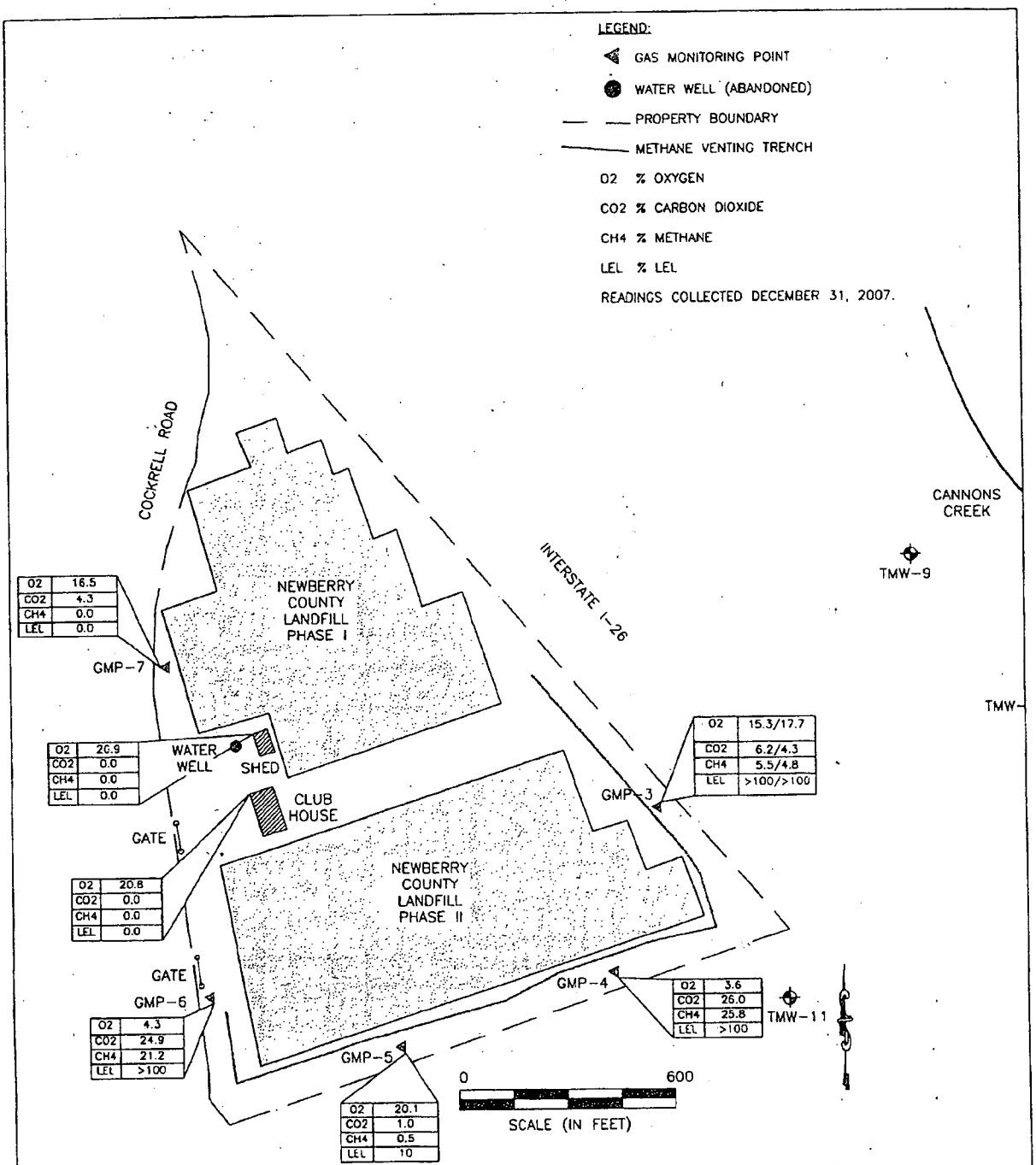


FIGURE 3
METHANE READINGS

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO	REV
B	2314	Figure 3 Methane Readings.dwg	

SCALE 1 inch = 400 feet

DATE: December 31, 2007

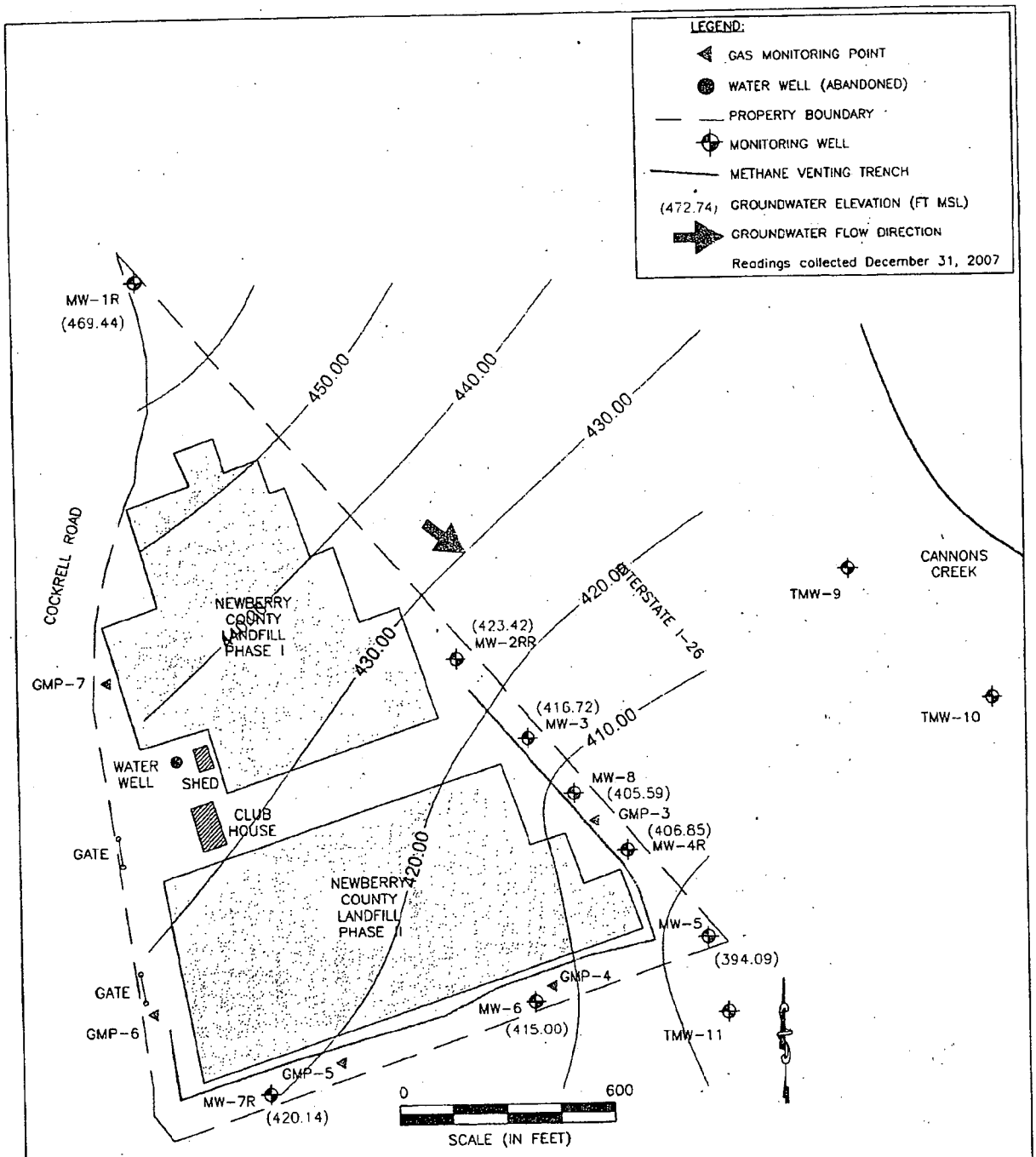


FIGURE 4
WATER TABLE SURFACE MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO.	REV
B	2314	Figure 2 Site Plan.dwg	

SCALE - 1 inch = 400 feet

DATE January 11, 2008

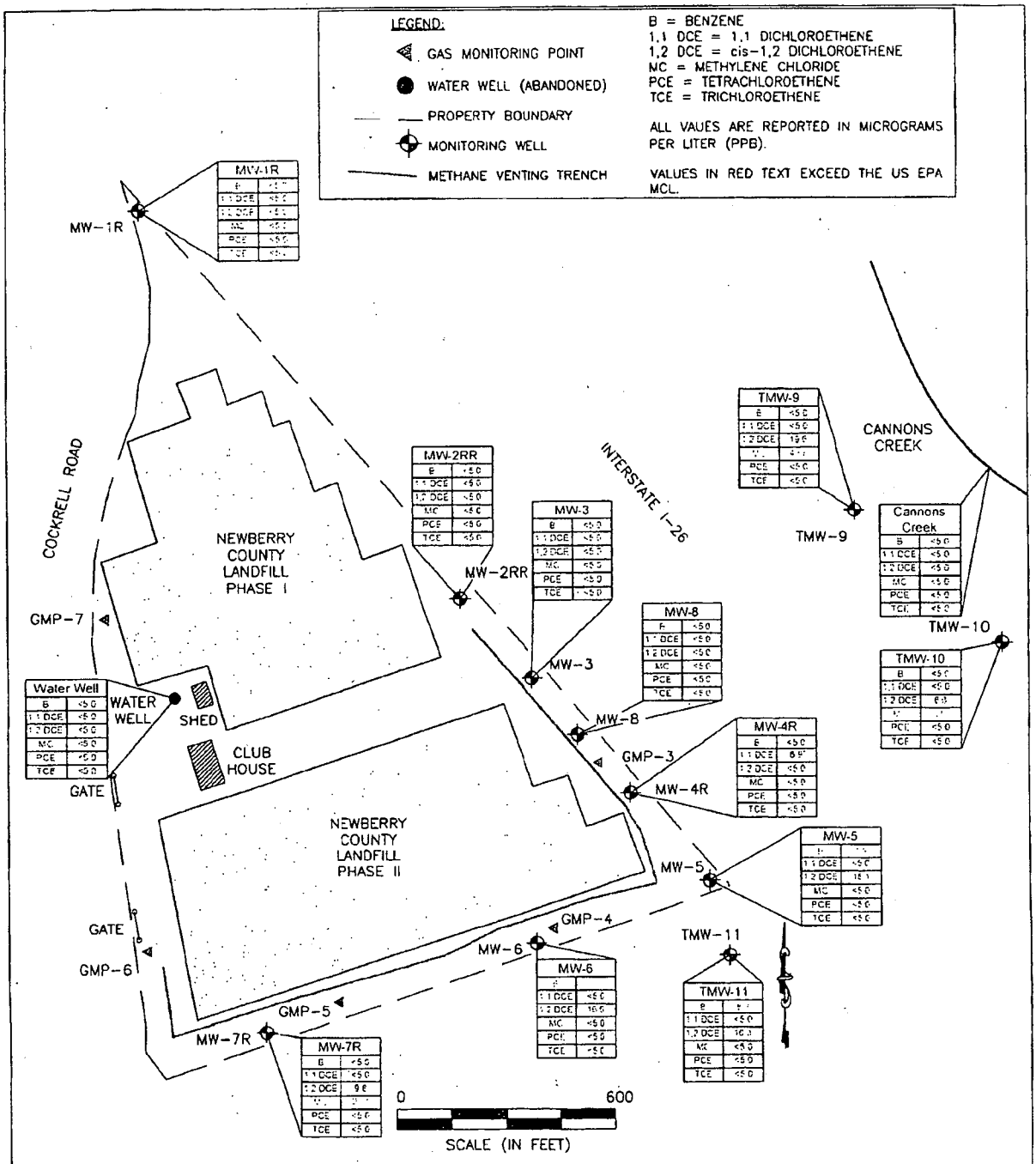


FIGURE 5
DETECTED COMPOUNDS ABOVE MCL

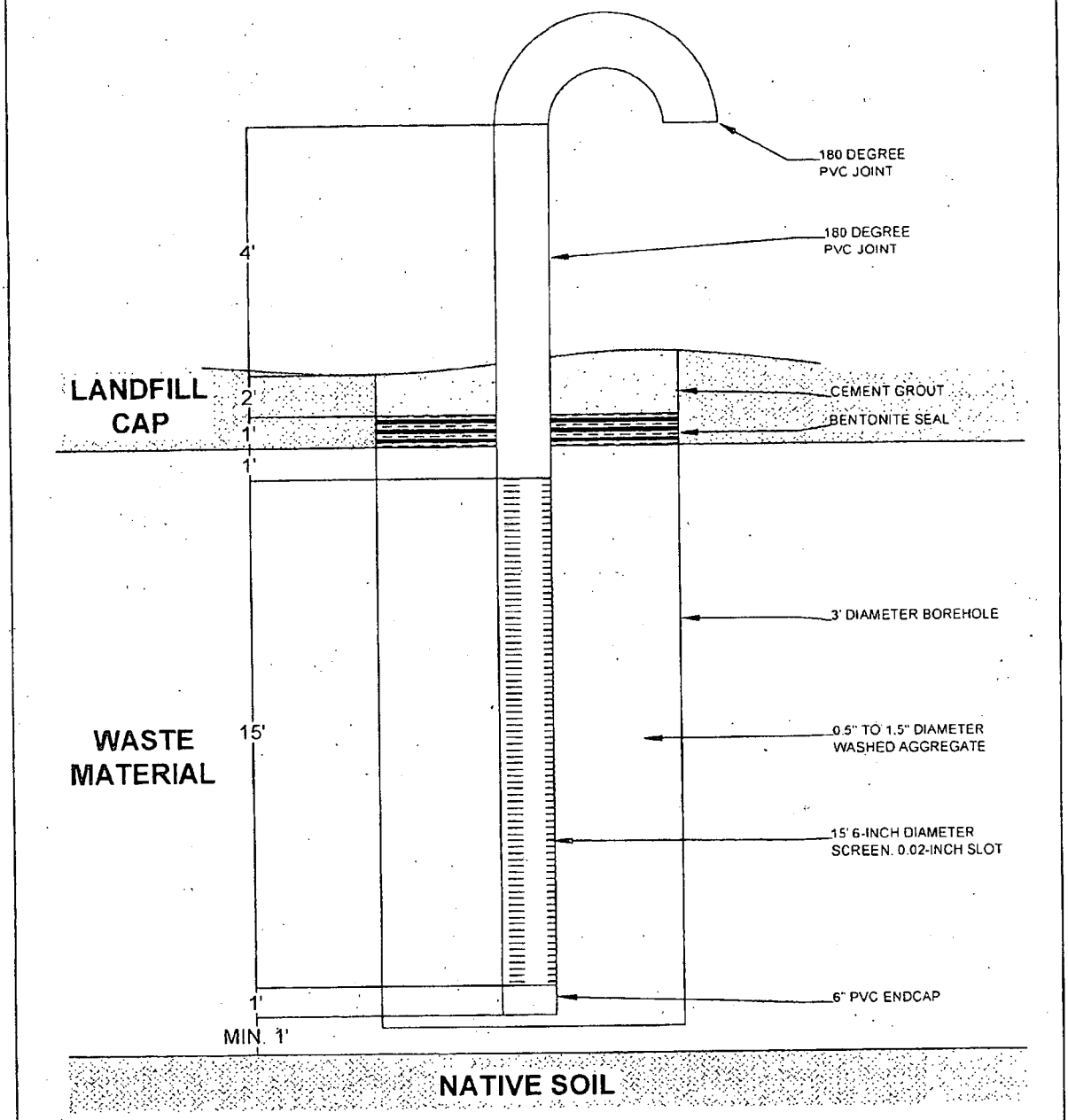
FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO	REV
B	2314	Figure 5 Detected Compounds	

SCALE 1 inch = 400 feet

DATE January 23, 2008



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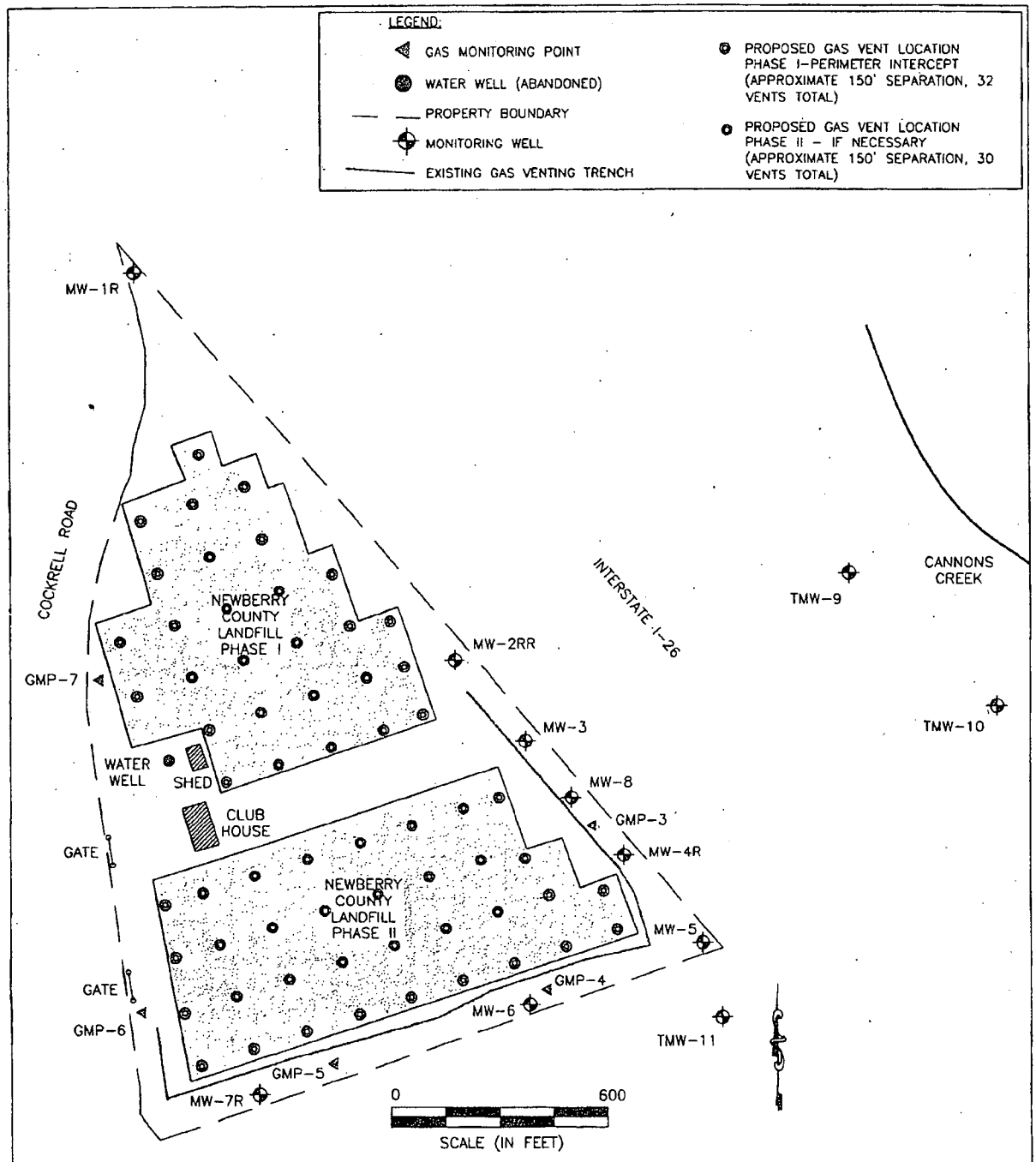
FIGURE 6
METHANE GAS VENT WELL DETAIL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO.	REV
B	2314		

SCALE AS SHOWN

DATE January 10, 2008



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FIGURE 7
PROPOSED METHANE VENT LOCATIONS

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO.	REV
B	2314		

SCALE 1 inch = 400 feet

DATE January 10, 2008

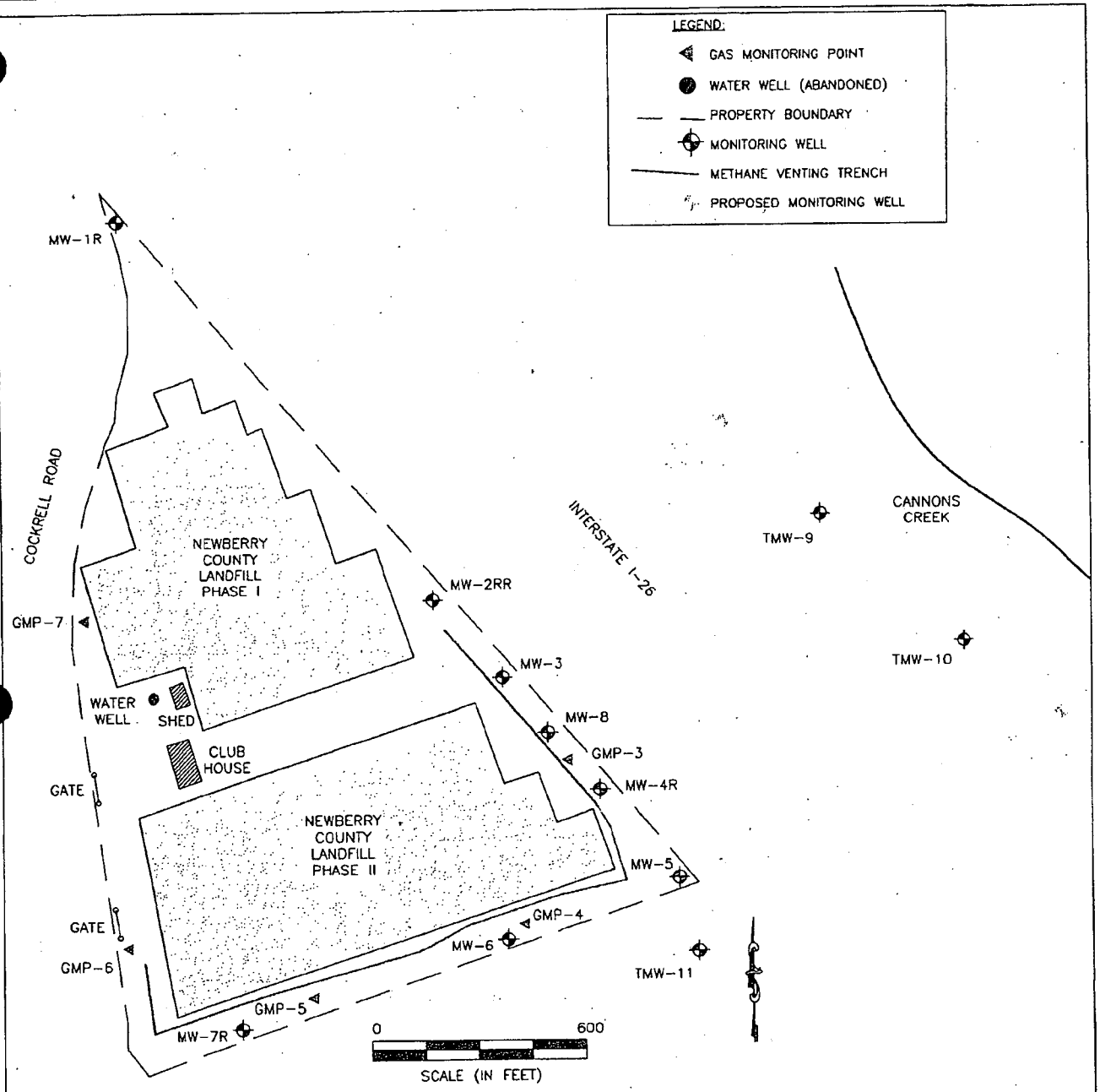


FIGURE 8
PROPOSED MONITORING WELLS

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

TERRY ENVIRONMENTAL SERVICES
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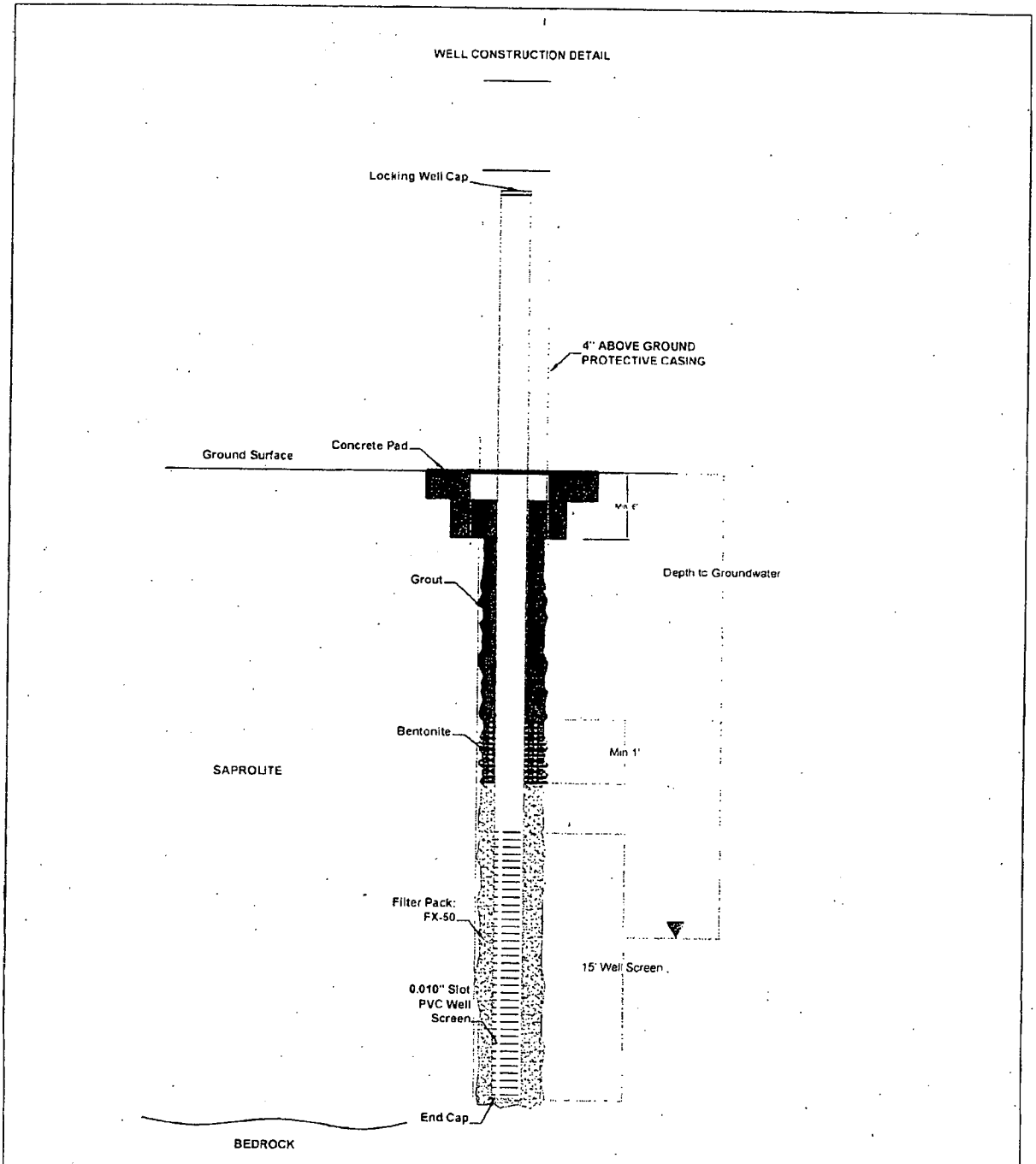
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SIZE	TERRY Project No.	DWG NO	REV
B	2314	Figure 8 Propsed Wells	

SCALE 1 inch = 400 feet

DATE January 23, 2008



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FIGURE 9
MONITORING WELL DETAIL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No.	DWG NO	REV
B	2314	Figure 9 Well Construction Detail	

SCALE: NOT TO SCALE

DATE: December 23, 2008

APPENDIX 2

Tables

TABLE 1
METHANE MONITORING RESULTS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-3	3/20/2007	15.7/16.0	4.9/4.4	>3.0/>3.0	**>43/>43**
	6/8/2007	18.0/17.8	2.3/1.9	3.2/2.4	**62/47**
	9/20/2007	5.9/2.1	23.0/24.0	23.3/19.3	**>100/>100**
	12/31/2007	15.3/17.7	6.2/4.3	5.5/4.8	**>100/>100**
GMP-4	3/20/2007	0.0	>20	5.3	**6.45**
	6/8/2007	0.0	39.9	60.4	**>100**
	9/20/2007	0.2	38.3	36.1	**>100**
	12/31/2007	3.6	26.0	25.8	**>100**
GMP-5	3/20/2007	4.0	17.3	2.8	**32.25**
	6/8/2007	16.5	4.4	4.2	**69**
	9/20/2007	20.3	0.7	0.7	**12**
	12/31/2007	20.1	1.0	0.5	**10**
GMP-6	3/20/2007	0.0	19.4	0.5	**6.02**
	6/8/2007	0.2	35.2	43.3	**>100**
	9/20/2007	0.3	40.5	44.3	**>100**
	12/31/2007	4.3	24.9	21.2	**>100**
GMP-7	3/20/2007	19.3	0.1	0.0	0.0
	6/8/2007	16.3	4.4	0.0	**69**
	9/20/2007	19.6	1.0	0.0	0.0
	12/31/2007	16.5	4.3	0.0	0.0
Club House	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.2	0.0	0.0	0.0
	9/20/2007	20.6	0.0	0.0	0.0
	12/31/2007	20.8	0.0	0.0	0.0
Shed	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.3	0.0	0.0	0.0
	9/20/2007	20.7	0.0	0.0	0.0
	12/31/2007	20.9	0.0	0.0	0.0

Notes:

(1) The monitoring points are labeled "GMW-X" in the field. but are reported as "GMP-X" to avoid confusion with groundwater monitoring wells.

Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

12/31/07 data was collected with a GEM 500 Landfill Gas Monitor calibrated to a methane standard.

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Well I.D.	Date	Total Depth (ft)	Screened Interval (ft)	Top of Casing (ft MSL)	Depth to Water (ft)	Water Table Elevation (ft MSL)
MW-1R	6/22/2007	63	48-63	504.92	32.18	472.74
	12/31/2007				35.48	469.44
MW-2RR	6/22/2007	63	48-63	459.82	36.10	423.72
	12/31/2007				36.40	423.42
MW-3	6/22/2007	34	Unknown	453.92	35.28	418.64
	12/31/2007				37.20	416.72
MW-4R	6/22/2007	63	48-63	441.55	31.68	409.87
	12/31/2007				34.70	406.85
MW-5	6/22/2007	31	Unknown	420.12	23.40	396.72
	12/31/2007				26.03	394.09
MW-6	6/22/2007	25	10-25	440.55	27.22	413.33
	12/31/2007				25.55	415.00
MW-7R	6/22/2007	63	48-63	457.34	35.78	421.56
	12/31/2007				37.20	420.14
MW-8	6/22/2007	68	58-68	443.39	35.50	407.89
	12/31/2007				37.80	405.59
TMW-9	6/22/2007	75	65-75	Unknown	47.35	Unknown
	12/31/2007				47.33	
TMW-10	6/22/2007	45	35-45	Unknown	18.90	Unknown
	12/31/2007				21.10	
TMW-11	6/22/2007	30	20-30	Unknown	26.08	Unknown
	12/31/2007				28.60	

TABLE 3
SUMMARY OF DETECTED COMPOUNDS
Former Newberry County MSW Landfill DWP-117
Cockrell Road, Newberry, South Carolina

	Date	Benzene	Bromodichloromethane	Bromomethane	n-Butylbenzene	Chlorobenzene	Chloroethane	Chloroform	Dibromochloromethane	1,2-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Diethyl Ether (Ethyl Ether)	Isopropylbenzene (Cumene)	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		**5**	**n/a**	**n/a**	**n/a**	**100**	**n/a**	**n/a**	**n/a**	**600**	**75**	**n/a**	**n/a**	**7**	**70**	**n/a**	**n/a**	**5**	**40**	**25**	**5**	**1,000**	**5**	**2**	**10,000**
MW-1R	6/22/2007	<1.0	10	3.3	<1.0	<1.0	<1.0	65	2.8	<1.0	<1.0	<1.0	3.4	<1.0	<1.0	<1.0	<1.0	2.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-2RR	6/22/2007	**15**	<1.0	<1.0	1.2	2.2	8.7	<1.0	<1.0	<1.0	6.8	1.5	27	3.9	**89**	<1.0	1.8	**32**	3.6	1.5	**21**	1.3	**14**	<1.0	2.8
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	12.3	<5.0	<5.0	12.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-3	6/22/2007	**19**	<1.0	<1.0	1.4	2.1	10.0	<1.0	<1.0	<1.0	7.5	1.9	23	3.2	**110**	<1.0	2.1	**34**	3.3	1.7	**27**	1.6	**18**	<1.0	3.3
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	12.8	<5.0	<5.0	11.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-4R	6/22/2007	4.4	<1.0	<1.0	<1.0	4.2	5.8	<1.0	<1.0	2.9	5.0	1.8	70	**9.9**	8.7	<1.0	1.7	**27**	5.1	<1.0	<1.0	2.5	2.3	<1.0	2.2
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	17.8	6.9	<5.0	17.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-5	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**7.3**	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	15.1	61.9	<5.0	<5.0	15.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-6	6/22/2007	**7.6**	<1.0	<1.0	<1.0	<1.0	6.3	<1.0	<1.0	<1.0	8.0	<1.0	<1.0	<1.0	18	<1.0	4.5	<2.0	26	<1.0	<1.0	<1.0	<1.0	1.0	<1.0
	12/31/2007	**7.7**	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	7.8	<5.0	<5.0	<5.0	16.6	67.5	<5.0	<5.0	18.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-7R	6/22/2007	3.2	<1.0	<1.0	<1.0	<1.0	3.6	<1.0	<1.0	<1.0	<1.0	<1.0	2.9	<1.0	5.2	<1.0	<1.0	**12**	3.1	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	9.8	28.4	<5.0	**20.1**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-8	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.3	2.6	<1.0	1.4	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	5.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TWM-9	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.9	2.6	11	<1.0	21	<1.0	<1.0	**56**	1.1	<1.0	3.1	<1.0	4.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	11.1	<5.0	19.6	27.6	<5.0	**43.8**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Aanlysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

TERRY Environmental Services

TABLE 3
SUMMARY OF DETECTED COMPOUNDS
Former Newberry County MSW Landfill DWP-117
Cockrell Road, Newberry, South Carolina

	Date	Benzene	Bromodichloromethane	Bromomethane	n-Butylbenzene	Chlorobenzene	Chloroethane	Chloroform	Dibromochloromethane	1,2-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Diethyl Ether (Ethyl Ether)	Isopropylbenzene (Cumene)	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		**5**	**n/a**	**n/a**	**n/a**	**100**	**n/a**	**n/a**	**n/a**	**600**	**75**	**n/a**	**n/a**	**7**	**70**	**n/a**	**n/a**	**5**	**40**	**25**	**5**	**1,000**	**5**	**2**	**10,000**
TMW-10	6/22/2007	1.3	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	2.8	44	5.3	6.2	<1.0	<1.0	**29**	<1.0	<1.0	2.8	<1.0	4.3	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	39.8	<5.0	6.6	11.6	<5.0	**25**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TMW-11	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**8.3**	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	7.6	<5.0	<5.0	<5.0	16.3	68.4	<5.0	<5.0	17.7	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Water Well	6/22/2007	<1.0	1.4	<1.0	<1.0	<1.0	2.9	8.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/8/2008	<5.0	6.2	<10	<5.0	<5.0	<10	22.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cannons Creek	6/24/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Analysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

TERRY Environmental Services

0704

ANNUAL METHANE AND GROUNDWATER MONITORING REPORT FOR 2008
of
FORMER NEWBERRY COUNTY LANDFILL SITE
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road
Newberry, South Carolina

Prepared for:

Mr. Kyle Nash, Public Works Director
Newberry County
P.O. Box 156
Newberry, South Carolina 29108

Prepared by:

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TERRY Project # 2314

APRIL 2009

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ANNUAL METHANE AND GROUNDWATER MONITORING REPORT FOR 2008
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TERRY Project # 2314

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APRIL 2009

BRYAN P. WILLIAMS REGISTERED No. 2358 PROFESSIONAL GEOLOGIST SOUTH CAROLINA

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1.0 INTRODUCTION

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week (usually on Wednesdays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

2.0 BACKGROUND

Five (5) methane gas monitoring points (GMPs) known as GMP-3 through GMP-7 were installed along the boundaries of the former landfill. These points are currently monitored quarterly as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). TERRY Environmental Services, Inc. (TERRY) began the post closure methane monitoring in January 2007. Previous work was performed by B.P. Barber & Associates, Inc. and C&L Consultants, Inc.

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is a red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek.

Three (3) additional monitoring wells were installed by another contractor in early 2007. The wells were designated TMW-9, TMW-10 and TMW-11. The locations are shown on Figure 2 Appendix 1 and the construction details are summarized in Table 2, Appendix 2.

3.0 METHANE MONITORING RESULTS

TERRY personnel were on-site March 12 and 13, 2009 to perform the required methane monitoring of the five (5) GMPs and two (2) structures. The methane concentrations were measured using a Landtec GEM-2000 Landfill Gas Monitor. The instrument simultaneously reads percent oxygen, percent carbon dioxide, percent of the lower explosive limit (LEL), percent make up gas and percent methane gas. This is a direct reading instrument that does not need gas correction. Table 1 in Appendix 2 summarizes the readings and copies of the field data collection logs are provided in Appendix 3.

The LEL action level for methane (5% in air) was exceeded in GMP-5. It was also noted that GMP-4 could not be located at the time of sample collection. Figure 3, Appendix 1 shows the results of the methane testing. Values in red text exceed the LEL for methane.

The methane venting trench (shown on Figure 2 and Figure 3, Appendix 1) does appear to be having a positive effect on the landfill gas concentrations in some areas (near GMP-3, GMP-6 and GMP-7) but is not capable of reducing the gas concentrations in other areas (near GMP-5). The current round of methane readings indicates a significant reduction in the methane emissions from the landfill as compared to the previous (December 2007) data. Additional methane remediation methods should be considered to reduce the landfill gas concentrations at the property boundaries particularly in the area of GMP-5.

4.0 GROUNDWATER MONITORING RESULTS

TERRY personnel were on-site March 12 and 13. 2009 to collect groundwater samples from eleven (11) monitoring wells, the out-of-service/abandoned water well on-site and a surface water sample from Cannons Creek.

Prior to sample collection, the depth to water measurement was taken with respect to the top-of-casing elevation. The TOC elevations were provided by previous assessment work performed at the site. This information was used to determine the water table elevation at each sampling point. Copies of the sample collection logs are provided in Appendix 4 showing the depth to water measurements. The data is summarized in Table 2, Appendix 2. The groundwater elevations were entered into a graphical contouring program and used to generate groundwater elevation contours which were subsequently overlaid on a copy of the site plan. The resulting Figure 4 in Appendix 1 shows the contours on the water table surface and direction of groundwater flow. It appears that the groundwater flows toward the southeast, in the direction of Cannons Creek. The gradient was calculated by dividing the change in elevation by the change in distance between two points located along a line parallel to the direction of groundwater flow. From this, a gradient of 0.05 feet per foot was calculated.

Each of the monitoring wells was purged prior to sample collection so as to collect a representative sample of the groundwater. Copies of the sample collection logs are provided in Appendix 4. Each of the samples was placed immediately in laboratory supplied glassware and shipped to Access Analytical Services, Inc. (SCDHEC Laboratory certification #73006) for analysis. The samples were analyzed by US EPA Method 8260B for volatile organic compounds. A total of sixty one (61) parameters are included in the analysis. Table 3 in Appendix 2 summarizes the results of the detected compounds only and provides a comparison with previous sample data. A complete copy of the laboratory report is provided in Appendix 5.

Of the compounds detected in the samples, seven (7) compounds were detected at concentrations that exceeded their respective US EPA maximum contaminant level (MCL) for drinking water. A summary of these compounds and the historical data is provided in Table 3. Appendix 2. The distribution of these compounds is shown on Figure 5 in Appendix 1.

5.0 RECOMMENDATIONS

The methane readings collected during this monitoring event confirm a decreasing trend in most gas monitoring points with the exception of GMP-5 which remained above the action level of 5% of the LEL. It was noted during the December 2007 site visit that GMP-3 is no longer actively venting landfill gas under pressure.

Groundwater analytical results indicate the presence of seven (7) volatile organic compounds at concentrations in excess of the US EPA drinking water MCL in on-site monitoring wells. There were no contaminants detected at concentrations in excess of any MCL in the out-of-service well on-site or in the sample collected from Cannons Creek. The concentrations of the two detected compounds were generally les than ten (10) times the MCL and have remained relatively stable as compared to the historical data.

Additional monitoring wells should be installed downgradient of TMW-9 and TMW-10. Additionally, TMW-11 should be replaced. After well installation is complete, all of the monitoring wells should be surveyed so as to determine the location and elevation of each well head. A work plan has previously been submitted to the County and subsequently approved by the SCDHEC for the proposed tasks.

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



FIGURE 1
SITE LOCATION

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO	REV
B	2314	Figure 1 Site Location.dwg	

SCALE: NOT TO SCALE

DATE: April 6, 2009

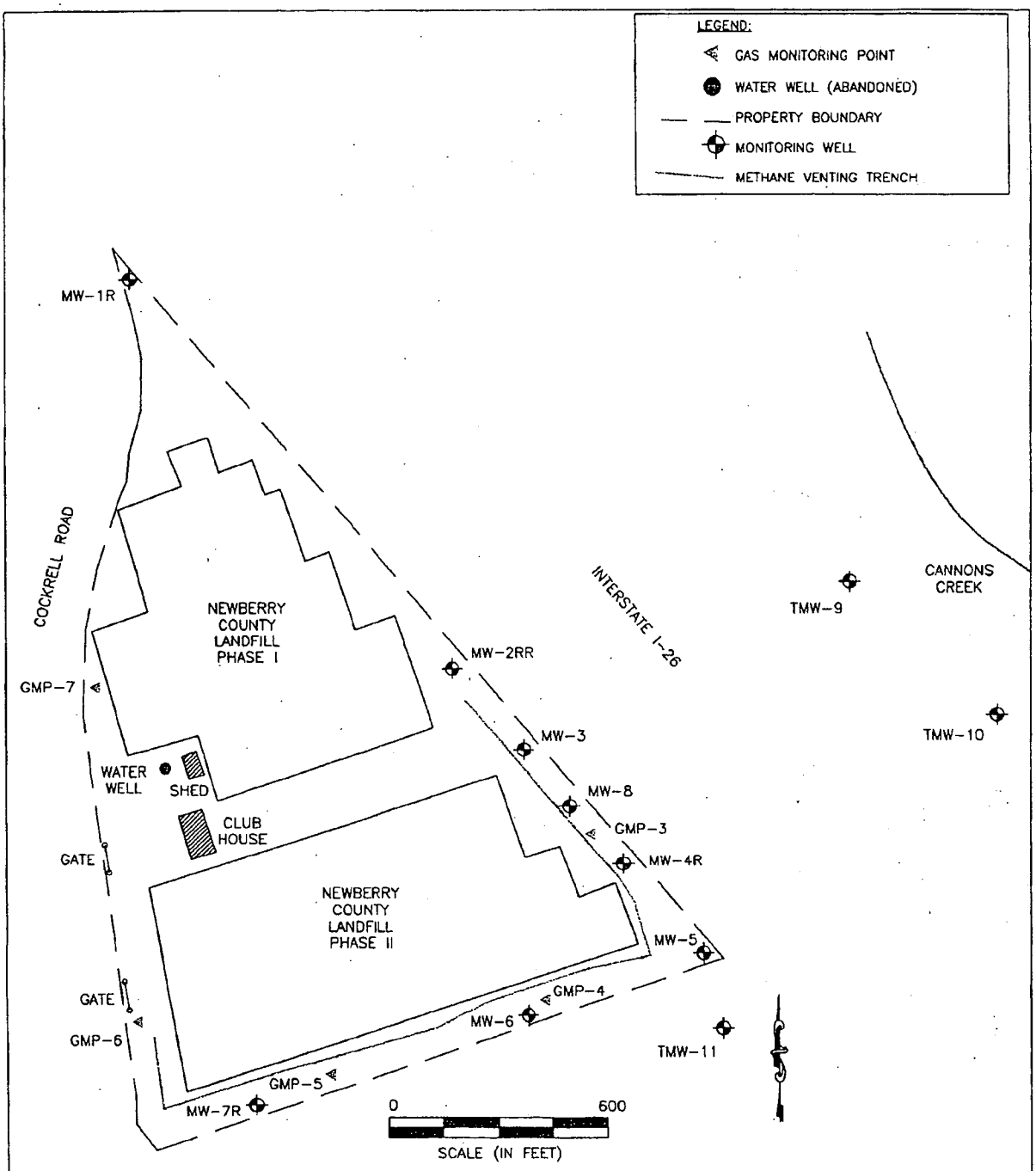


FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO	REV
B	2314	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: April 6, 2009

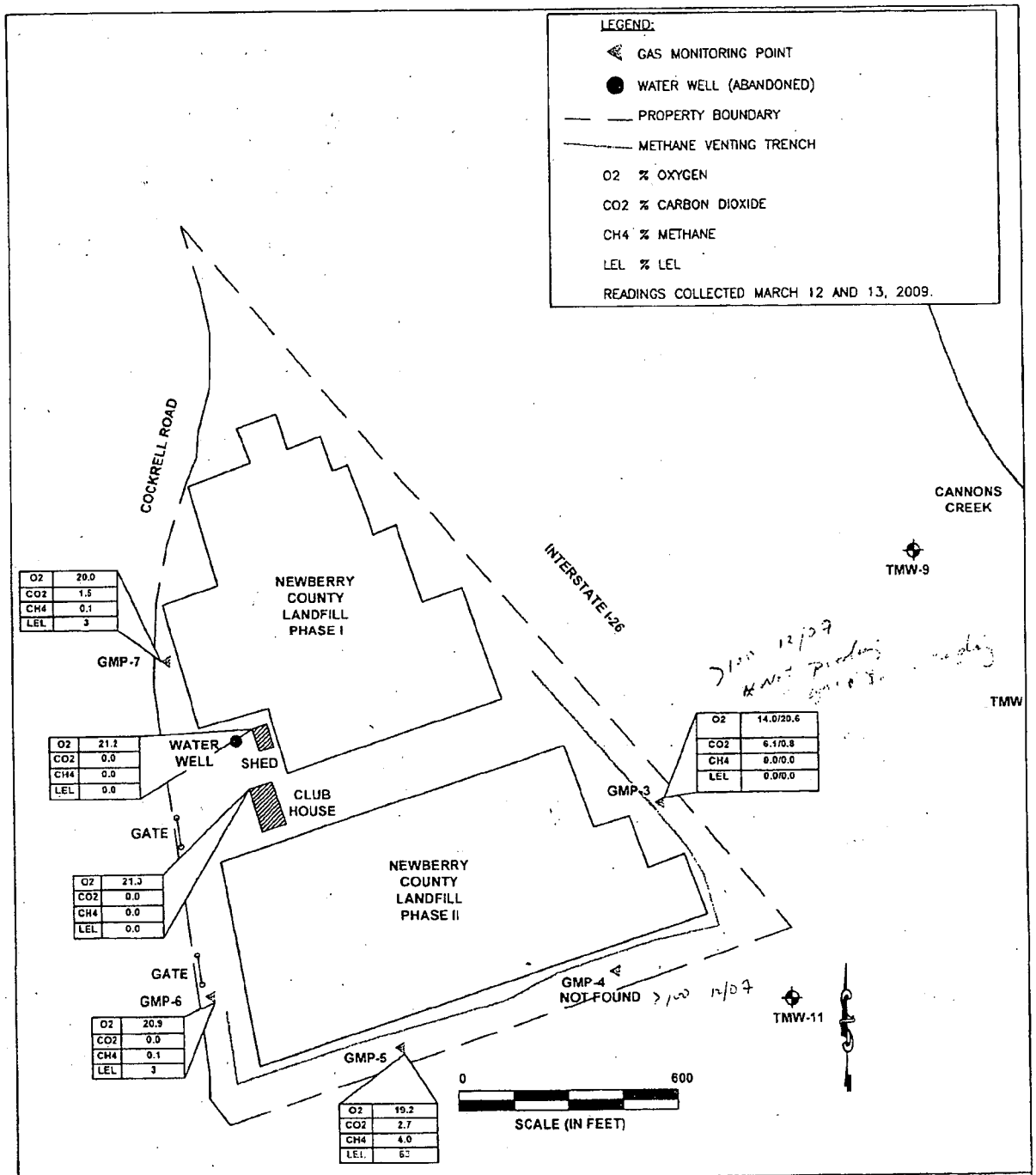


FIGURE 3
METHANE READINGS

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO.	REV
B	2314	Figure 3 Methane Readings.dwg	

SCALE: 1 inch = 400 feet

DATE: April 6, 2009

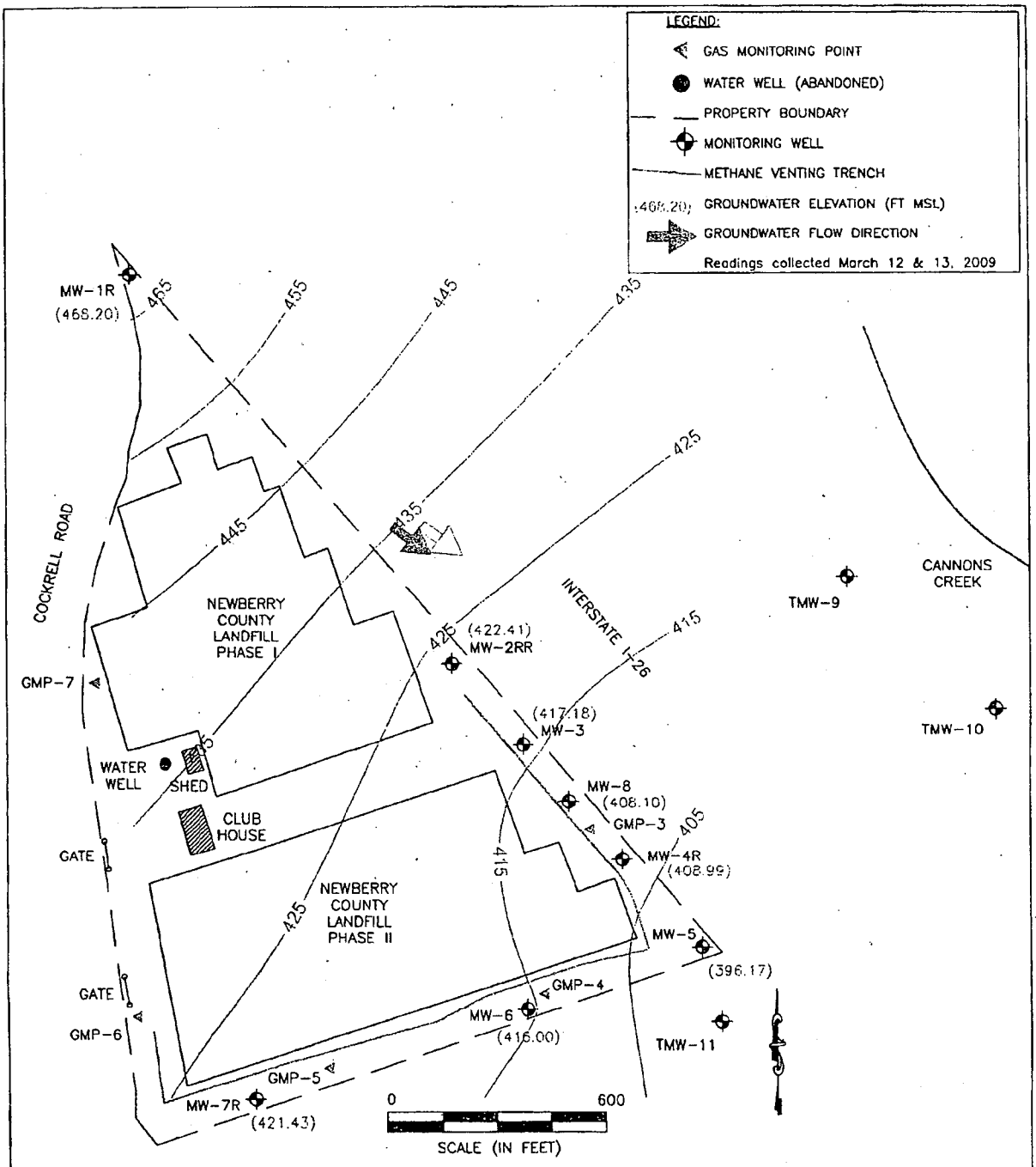


FIGURE 4
PIEZOMETRIC MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO	REV
B	2314	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: April 6, 2009

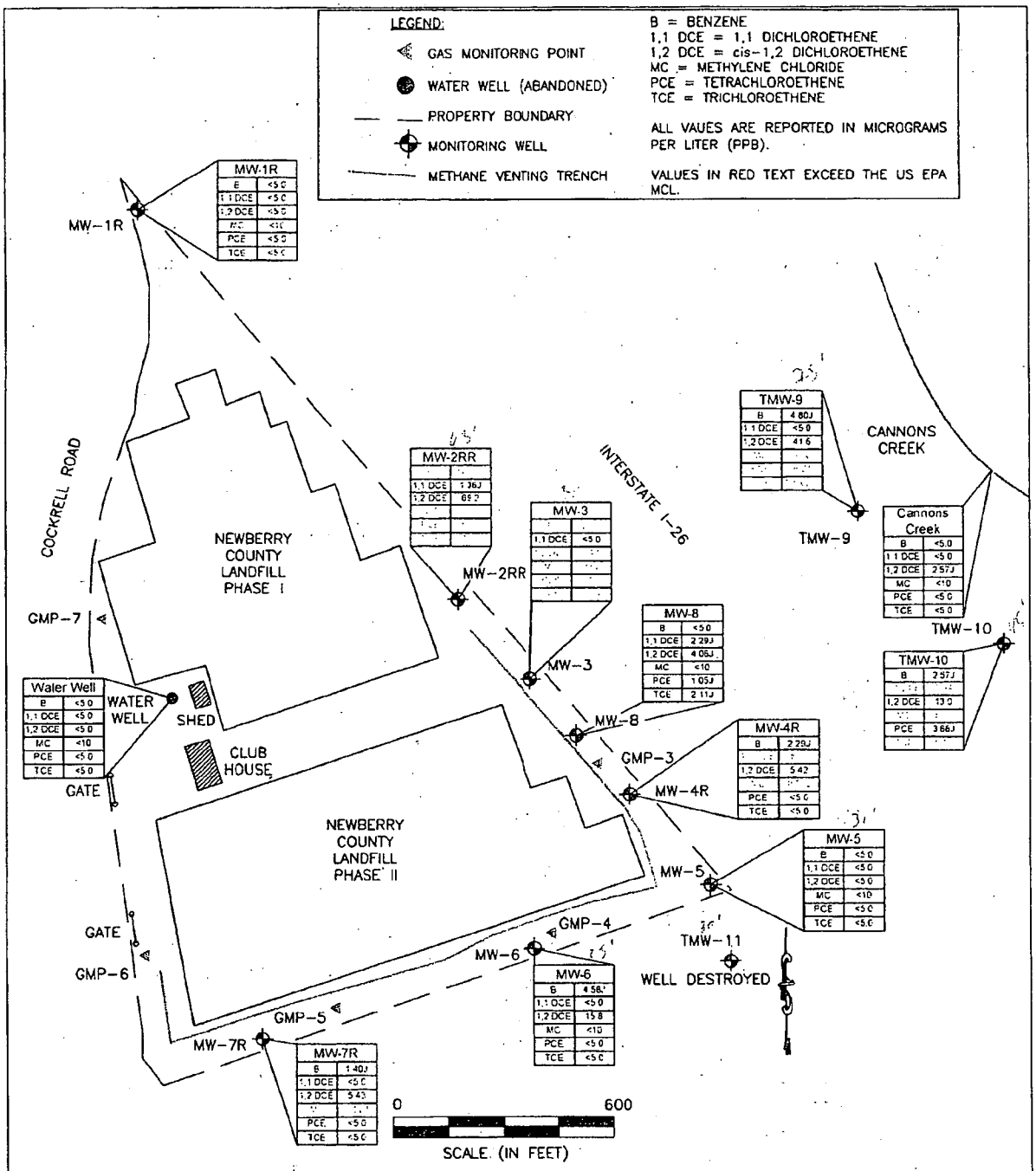


FIGURE 5
ANALYTICAL RESULTS MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO.	REV
B	2314	Figure 5 Detected Compounds	

SCALE. 1 inch = 400 feet

DATE: April 6, 2009

APPENDIX 2

Tables

TABLE 1
METHANE MONITORING RESULTS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-3	3/20/2007	15.7/16.0	4.9/4.4	>3.0/>3.0	**>43/>43**
	6/8/2007	18.0/17.8	2.3/1.9	3.2/2.4	**62/47**
	9/20/2007	5.9/2.1	23.0/24.0	23.3/19.3	**>100/>100**
	12/31/2007	15.3/17.7	6.2/4.3	5.5/4.8	**>100/>100**
	3/12/2009	14.0/20.6	6.1/0.8	0.0/0.0	0.0/0.0
GMP-4	3/20/2007	0.0	>20	5.3	**6.45**
	6/8/2007	0.0	39.9	60.4	**>100**
	9/20/2007	0.2	38.3	36.1	**>100**
	12/31/2007	3.6	26.0	25.8	**>100**
	3/12/2009	Not Found			
GMP-5	3/20/2007	4.0	17.3	2.8	**32.25**
	6/8/2007	16.5	4.4	4.2	**69**
	9/20/2007	20.3	0.7	0.7	**12**
	12/31/2007	20.1	1.0	0.5	**10**
	3/12/2009	19.2	2.7	4.0	**63**
GMP-6	3/20/2007	0.0	19.4	0.5	**6.02**
	6/8/2007	0.2	35.2	43.3	**>100**
	9/20/2007	0.3	40.5	44.3	**>100**
	12/31/2007	4.3	24.9	21.2	**>100**
	3/12/2009	20.9	0.0	0.1	3
GMP-7	3/20/2007	19.3	0.1	0.0	0.0
	6/8/2007	16.3	4.4	0.0	**69**
	9/20/2007	19.6	1.0	0.0	0.0
	12/31/2007	16.5	4.3	0.0	0.0
	3/12/2009	20.0	1.5	0.1	3

TABLE 1
METHANE MONITORING RESULTS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
Club House	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.2	0.0	0.0	0.0
	9/20/2007	20.6	0.0	0.0	0.0
	12/31/2007	20.8	0.0	0.0	0.0
	3/12/2009	21.3	0.0	0.0	0.0
Shed	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.3	0.0	0.0	0.0
	9/20/2007	20.7	0.0	0.0	0.0
	12/31/2007	20.9	0.0	0.0	0.0
	3/12/2009	21.2	0.0	0.0	0.0

Notes:

(1) The monitoring points are labeled "GMW-X" in the field, but are reported as "GMP-X" to avoid confusion with groundwater monitoring wells.

Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

3/12/09 data was collected with a Landtec GEM 2000 Landfill Gas Monitor calibrated to a methane standard.

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Well I.D.	Date	Total Depth (ft)	Screened Interval (ft)	Top of Casing (ft MSL)	Depth to Water (ft)	Water Table Elevation (ft MSL)
MW-1R	6/22/2007	63	48-63	504.92	32.18	472.74
	12/31/2007				35.48	469.44
	3/12/2009				36.72	468.20
MW-2RR	6/22/2007	63	48-63	459.82	36.10	423.72
	12/31/2007				36.40	423.42
	3/13/2009				37.41	422.41
MW-3	6/22/2007	34	Unknown	453.92	35.28	418.64
	12/31/2007				37.20	416.72
	3/13/2009				36.74	417.18
MW-4R	6/22/2007	63	48-63	441.55	31.68	409.87
	12/31/2007				34.70	406.85
	3/13/2009				32.56	408.99
MW-5	6/22/2007	31	Unknown	420.12	23.40	396.72
	12/31/2007				26.03	394.09
	3/12/2009				23.95	396.17
MW-6	6/22/2007	25	10-25	440.55	27.22	413.33
	12/31/2007				25.55	415.00
	3/12/2009				24.55	416.00
MW-7R	6/22/2007	63	48-63	457.34	35.78	421.56
	12/31/2007				37.20	420.14
	3/12/2009				35.91	421.43
MW-8	6/22/2007	68	58-68	443.39	35.50	407.89
	12/31/2007				37.80	405.59
	3/12/2009				35.29	408.10
TMW-9	6/22/2007	75	65-75	Unknown	47.35	Unknown
	12/31/2007				47.33	
	3/13/2009				47.30	

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314

Well I.D.	Date	Total Depth (ft)	Screened Interval (ft)	Top of Casing (ft MSL)	Depth to Water (ft)	Water Table Elevation (ft MSL)
TMW-10	6/22/2007	45	35-45	Unknown	18.90	Unknown
	12/31/2007				21.10	
	3/13/2009				18.75	
TMW-11	6/22/2007	30	20-30	Unknown	26.08	Unknown
	12/31/2007				28.60	
	3/12/2009				CNF	

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS
Former Newberry County MSW Landfill DWP-117
Cockrell Road, Newberry, South Carolina

	Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		**5**	**100**	**600**	**75**	**7**	**70**	**5**	**40**	**25**	**5**	**1,000**	**5**	**2**	**10,000**
MW-1R	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-2RR	6/22/2007	**15**	2.2	<1.0	6.8	3.9	**89**	**32**	3.6	1.5	**21**	1.3	**14**	<1.0	2.8
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	**8.88**	3.22J	<5.0	11.6	1.38J	69.2	**191**	2.40J	<5.0	**6.03**	<5.0	**11.9**	1.73J	5.63
MW-3	6/22/2007	**19**	2.1	<1.0	7.5	3.2	**110**	**34**	3.3	1.7	**27**	1.6	**18**	<1.0	3.3
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	**20.5**	2.74J	<5.0	6.87	<5.0	**142**	**33.2**	4.85J	<5.0	**21.7**	<5.0	**13.5**	**2.23J**	5.65
MW-4R	6/22/2007	4.4	4.2	2.9	5.0	**9.9**	8.7	**27**	5.1	<1.0	<1.0	2.5	2.3	<1.0	2.2
	12/31/2007	<5.0	<5.0	<5.0	<5.0	6.9	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	2.29J	4.02J	1.16J	1.95J	**8.46**	5.42	**8.85J**	3.07J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-5	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**7.3**	<5.0	<5.0	7.0	<5.0	15.1	<5.0	15.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-6	6/22/2007	**7.6**	<1.0	<1.0	8.0	<1.0	18	<2.0	26	<1.0	<1.0	<1.0	<1.0	1.0	<1.0
	12/31/2007	**7.7**	<5.0	<5.0	7.8	<5.0	16.6	<5.0	18.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	4.58J	1.62J	<5.0	8.64	<5.0	15.8	<10.0	20.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-7R	6/22/2007	3.2	<1.0	<1.0	<1.0	<1.0	5.2	**12**	3.1	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	9.8	**20.1**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	1.40J	<5.0	<5.0	<5.0	<5.0	5.43	**9.92J**	3.72J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Aanlysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

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TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS
Former Newberry County MSW Landfill DWP-117
Cockrell Road, Newberry, South Carolina

	Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		**5**	**100**	**600**	**75**	**7**	**70**	**5**	**40**	**25**	**5**	**1,000**	**5**	**2**	**10,000**
MW-8	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<2.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	2.29J	4.08J	<10.0	<5.0	<5.0	1.05J	<5.0	2.11J	<5.0	<5.0
TWM-9	6/22/2007	<1.0	<1.0	<1.0	1.9	<1.0	21	**56**	1.1	<1.0	3.1	<1.0	4.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	19.6	**43.8**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	4.80J	2.94J	<5.0	5.31	<5.0	41.6	**99.0**	<5.0	<5.0	**6.21**	<5.0	**8.62**	<5.0	1.39J
TMW-10	6/22/2007	1.3	<1.0	<1.0	<1.0	5.3	6.2	**29**	<1.0	<1.0	2.8	<1.0	4.3	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	6.6	**25**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	2.57J	<5.0	<5.0	<5.0	**9.94**	13.0	**83.7**	<5.0	<5.0	3.88J	<5.0	**6.19**	<5.0	<5.0
TMW-11	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**8.3**	<5.0	<5.0	7.6	<5.0	16.3	<5.0	17.7	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	Well Destroyed													
Water Well	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/8/2008	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cannons Creek	6/24/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	<5.0	<5.0	<5.0	<5.0	<5.0	2.57J	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Aanlysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

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SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR 2009 of FORMER NEWBERRY COUNTY LANDFILL SITE SCDHEC Solid Waste Permit #: DWP-117 432 Cockrell Road Newberry, South Carolina

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JANUARY 2010

ALL-STATE LEGAL® PLAINTIFF'S EXHIBIT 16-P

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1.0 INTRODUCTION

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week (usually on Wednesdays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is providc in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

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2.0 BACKGROUND

2.1 Groundwater Monitoring Network

The groundwater monitoring network consists of a total of 13 (thirteen) monitoring wells. Monitoring wells designated as TMW-9, TMW-10, TMW-12 and TMW-13 are located on the northeast side of Interstate Highway 26 (I-26). Monitoring wells TMW-12 and TMW-13 were installed in November 2009 in response to a SCDHEC directive dated September 17, 2009. All of the monitoring wells at the site were installed by others.

2.2 Methane Monitoring Network

Six (6) methane gas monitoring points (GMPs) identified as GMP-1 and GMP-3 through GMP-7 were previously installed along the boundaries of the former landfill and serve as the landfill gas monitoring network. Newberry County Public Works has led a contract for the installation of six passive landfill gas vents; however, the passive gas vents had not been installed at the time of the December 3 and 4, 2009 monitoring event. The GMPs are monitored as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). TERRY Environmental Services, Inc. (TERRY) began the post closure methane monitoring in January 2007; however changes in personnel at Newberry County Public Works (responsible entity) resulted in a lapse of contract for monitoring services during calendar year 2008. The locations of monitoring wells and GMPs are shown in Figure 2 and monitoring well construction details are summarized in Table 1.

2.3 Semi-Annual Monitoring Events

TERRY conducted groundwater and methane gas monitoring events December 3 and 4, 2009. TERRY previously conducted the 2008 annual monitoring event during March 2009 (delayed due to above referenced personnel changes) and provided the monitoring data in a report entitled *Annual Methane and Groundwater Monitoring Report for 2008 of Former Newberry County Landfill Site* dated April 2009.

2.4 Site Geology and Hydrogeology

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is a red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek. Groundwater flow within the uppermost aquifer has historically been to the east and northeast with discharge occurring into Cannons Creek.

3.0 GROUNDWATER MONITORING RESULTS

TERRY personnel were on-site December 3 and 4, 2009 to collect groundwater samples from thirteen (13) monitoring wells, a water supply well on-site and a surface water sample from Cannons Creek. However, during the sampling event monitoring wells MW-5 and TMW-11 could not be located, TMW-12 had insufficient volume, and the pump on the water supply well was not operable; therefore these wells were not sampled.

Prior to sample collection, the depth to water measurement was determined relative to the top-of-casing (TOC) elevation. The TOC elevations were provided by previous assessment work performed at the site. This information was used to determine the water table elevation at each sampling point. The depth to water and water-level elevation data are summarized in Table 2, Appendix 2. The groundwater elevations were entered into a graphical contouring program and used to generate groundwater elevation contours which were subsequently overlaid on a copy of the site plan. Figure 3, Appendix I indicates

the piezometric surface and direction of groundwater flow. Groundwater flow is toward the southeast toward Cannons Creek. The gradient was calculated by dividing the change in elevation by the change in distance between two points located along a line parallel to the direction of groundwater flow; a gradient of 0.05 foot per foot was calculated.

Each of the monitoring wells was purged prior to sample collection so as to collect a representative sample of the groundwater. Copies of the sampling logs are provided in Appendix 4. Each of the samples was placed immediately in laboratory supplied glassware and shipped to Access Analytical Services, Inc. (SCDHEC Laboratory certification #73006) for analysis. The samples were analyzed by US EPA Method 8260B for volatile organic compounds. A total of sixty one (61) parameters are included in the analysis.

Twenty-three (23) volatile organic compounds (VOCs) were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only six (6) VOCs were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs). Of those VOCs that equaled or exceeded MCLs, the maximum concentrations per parameter detected were as follows: benzene 18.1 micrograms per liter (µg/L) in MW-3; 1,1-dichloroethene 7.22 µg/L (TMW-10); cis-1,2-dichloroethene 139.0 µg/L (MW-3); tetrachloroethene 19.8 µg/L (MW-3); trichloroethene 12.0 µg/L (MW-3) and vinyl chloride 2.18 µg/L (MW-3). Samples collected from monitoring wells MW-2RR and MW-3 (compliance wells located down-gradient of the southeast corner of the Phase I cell(s)) had both the greatest number of VOCs detected in concentrations above MDL (eighteen and twenty-one respectively) and the greatest number of VOCs exceeding MCL concentrations (four and five respectively).

VOC concentrations exceeding MCL in samples collected from the distal down-gradient wells TMW-9, TMW-10, TMW-12 and TMW-13 (each located east of I-26) were limited to tetrachloroethene (7.45 µg/L) and Trichloroethene (7.93 µg/L) in TMW-9 and 1,1-dichloroethene (7.22 µg/L) and trichloroethene (6.00 µg/L) in TMW-10. The established U.S. EPA MCL is 5.0 µg/L for each of these VOCs. It should be noted that TMW-12 could not be sampled because of an insufficient water volume.

No VOCs were detected in concentrations at or above their respective MDLs in the sample collected from Cannons Creek (SW-1) or in the duplicate sample collected at that location (SW-1 DUP).

Table 3, Appendix 2 summarizes the analytical data from the period June 2007 through March 2009; Table 4 provides data for those compounds detected in concentrations greater than their respective MDLs during the December 2009 monitoring event. Groundwater sampling logs are included as Appendix 4 and a copy of the laboratory data report is provided as Appendix 5.

Of the compounds detected in the samples, five (5) compounds were detected at concentrations that exceeded their respective US EPA maximum contaminant level (MCL) for drinking water. The distribution of VOCs exceeding their respective MCLs during the December 2009 monitoring event is shown in Figure 4, Appendix 1.

4.0 METHANE MONITORING RESULTS

TERRY personnel recorded landfill gas measurements on December 3, 2009 at six (6) GMPs and two (2) structures located at the former landfill. The methane concentrations were measured using a Landtec GEM-2000 Landfill Gas Monitor. The instrument simultaneously determines percent oxygen, percent carbon dioxide, and percent methane gas. Field measurements of percent methane were converted to percent LEL (lower explosive limit). Table 5, Appendix 2 summarizes the landfill gas values recorded during the period March 2007 through March 2009; Table 6 summarizes the landfill gas data recorded during the December 2009 monitoring event. Field data and field data collection logs are provided in Appendix 3.

The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-4 and GMP-5. Figure 5, Appendix 1 shows the results of the methane monitoring; data shown in red exceed the LEL for methane.

Newberry County Public Works is installing a passive landfill gas venting system in the vicinity of GMP 5; however, at the time of the December 2009 monitoring event the passive vent system had not yet been installed.

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



FIGURE 1
SITE LOCATION

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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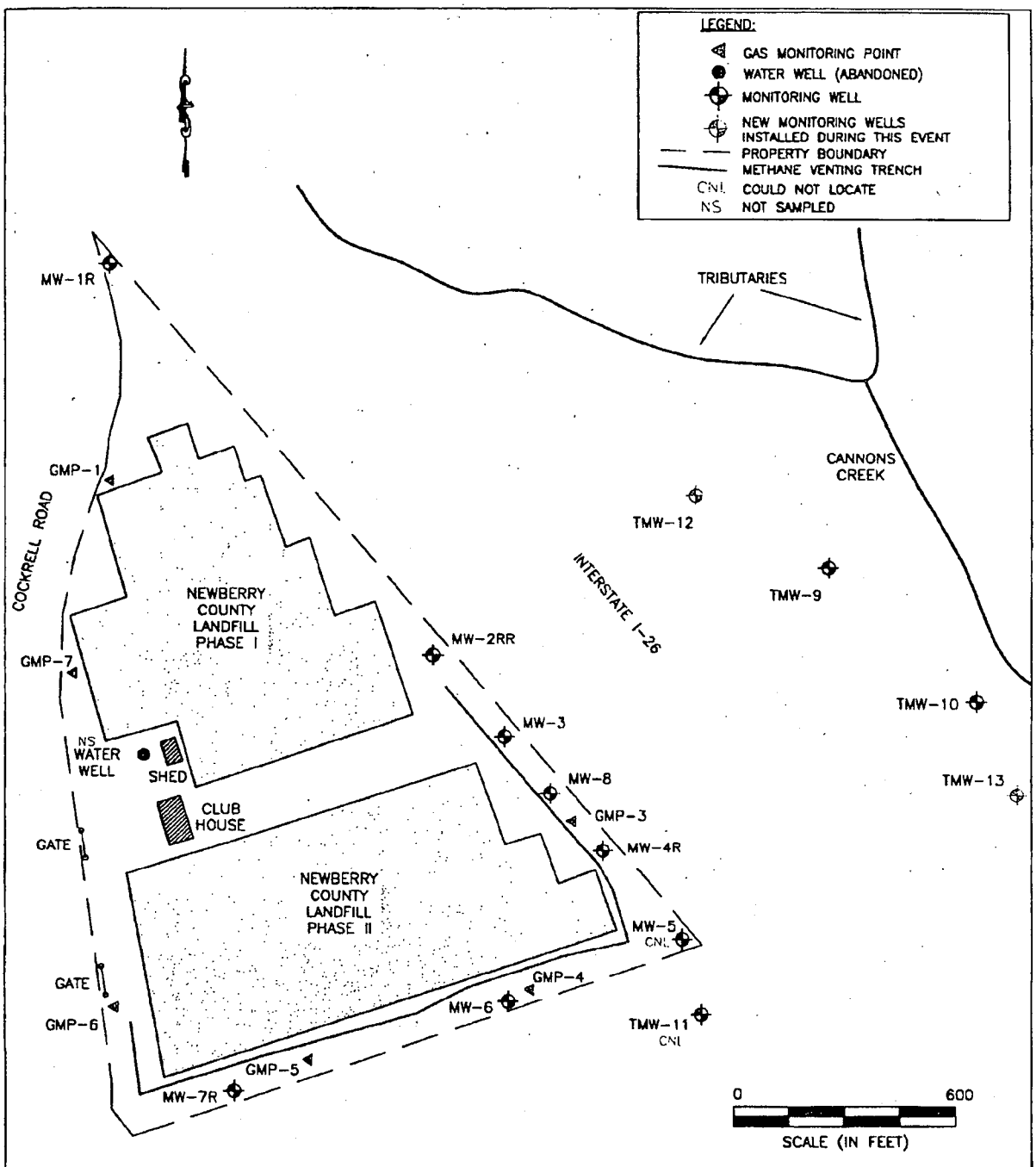
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Summerville, South Carolina 29484
(800) 325-0605 (843)-873-8200 fax (843)-873-8765

SIZE	TERRY Project No	DWG NO.	REV
B	2314 A	Figure 1 Site Location.dwg	

SCALE: NOT TO SCALE

DATE: January, 2010



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FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO	REV
B	2314 A	Figure 2 Site Plan.dwg	

SCALE 1 inch = 400 feet

DATE: January 2010

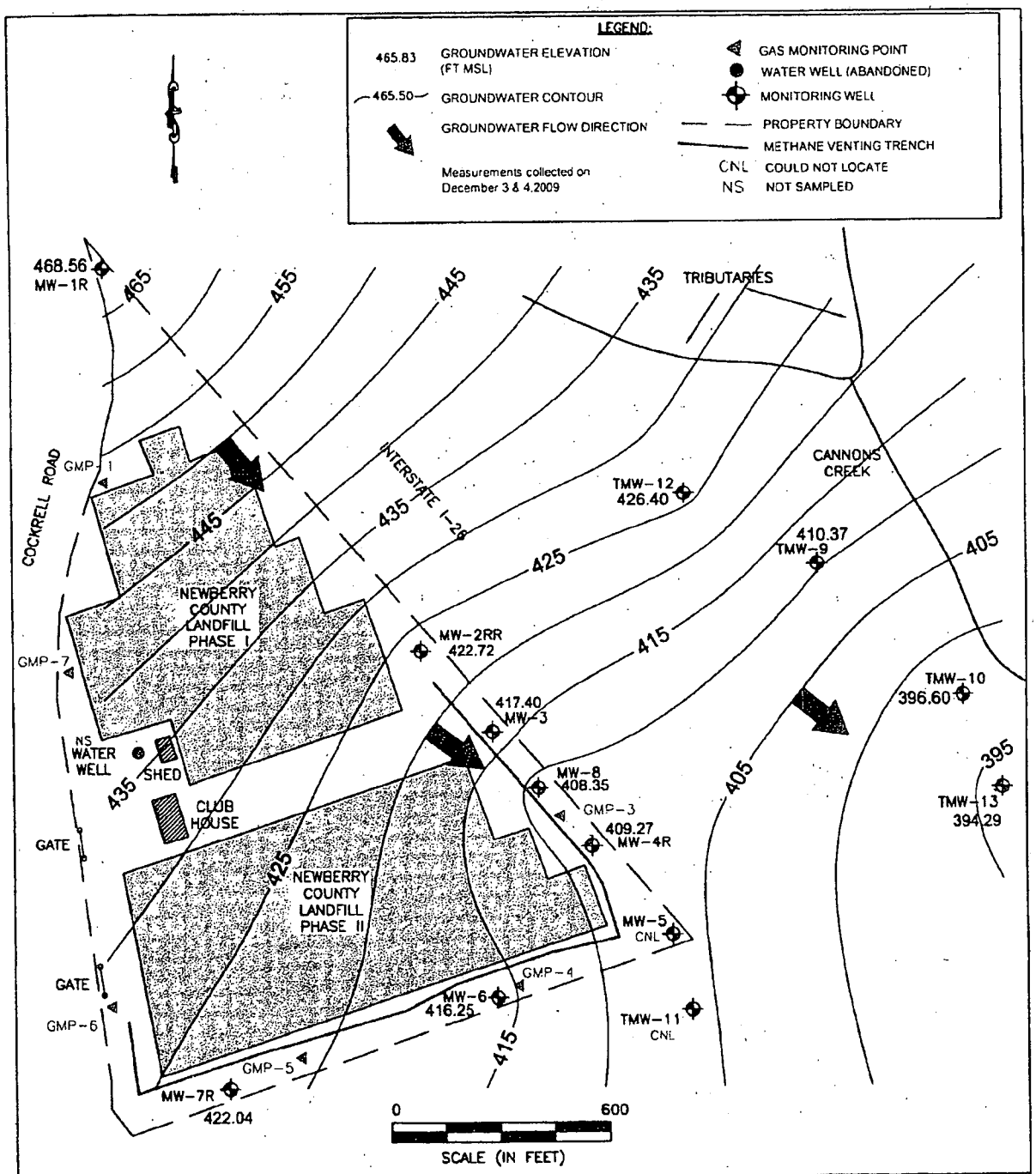


FIGURE 3
PIEZOMETRIC MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO	REV
B	2314 A	Figure 3 Contour Map.dwg	

SCALE 1 inch = 400 feet

DATE. January 2010

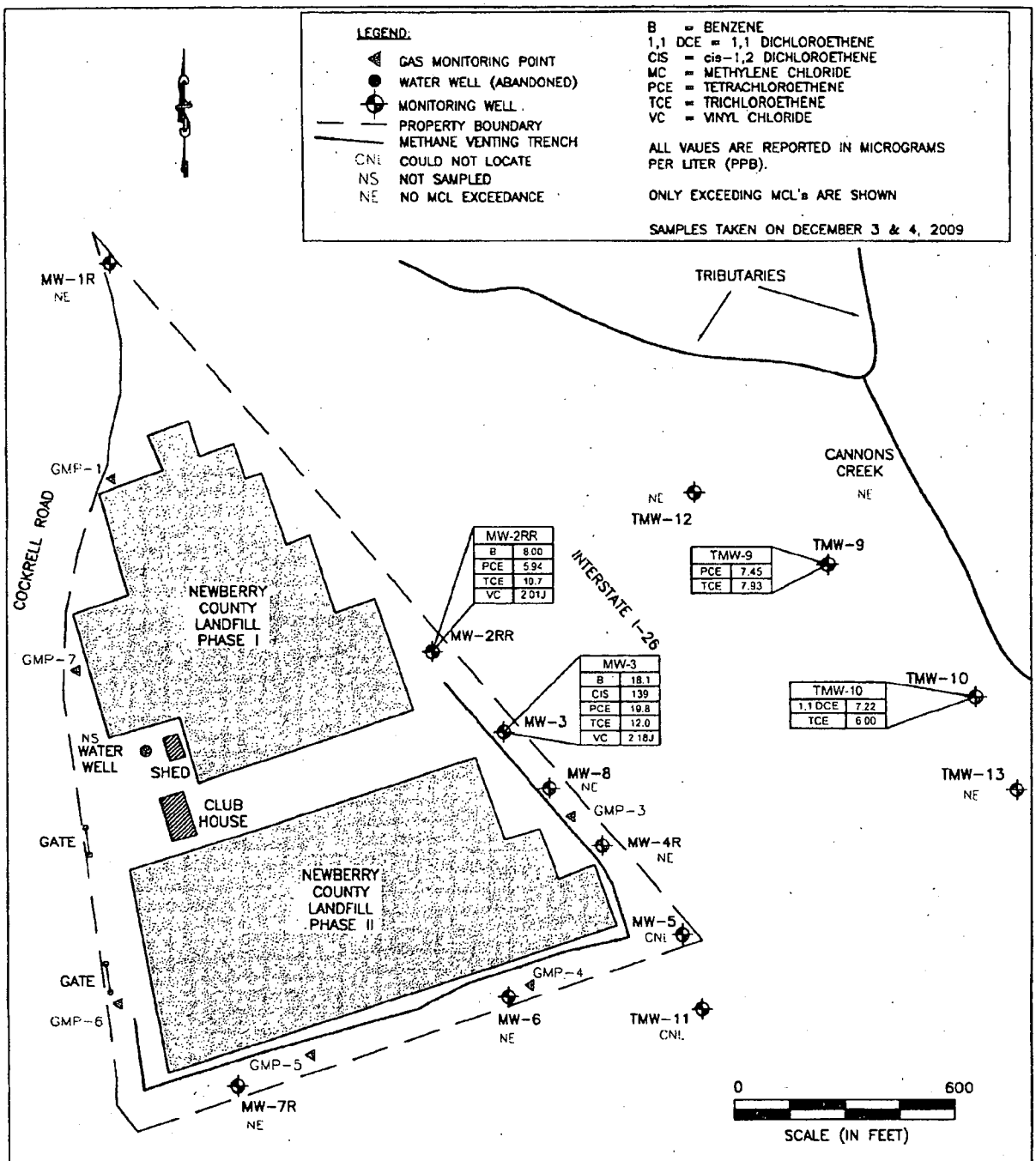


FIGURE 4
Distribution of VOCs Equal to or Exceeding MCL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO.	REV
B	2314 A	Figure 4 VOCs Detected Map.dwg	

SCALE: 1 inch = 400 feet

DATE: January 2010

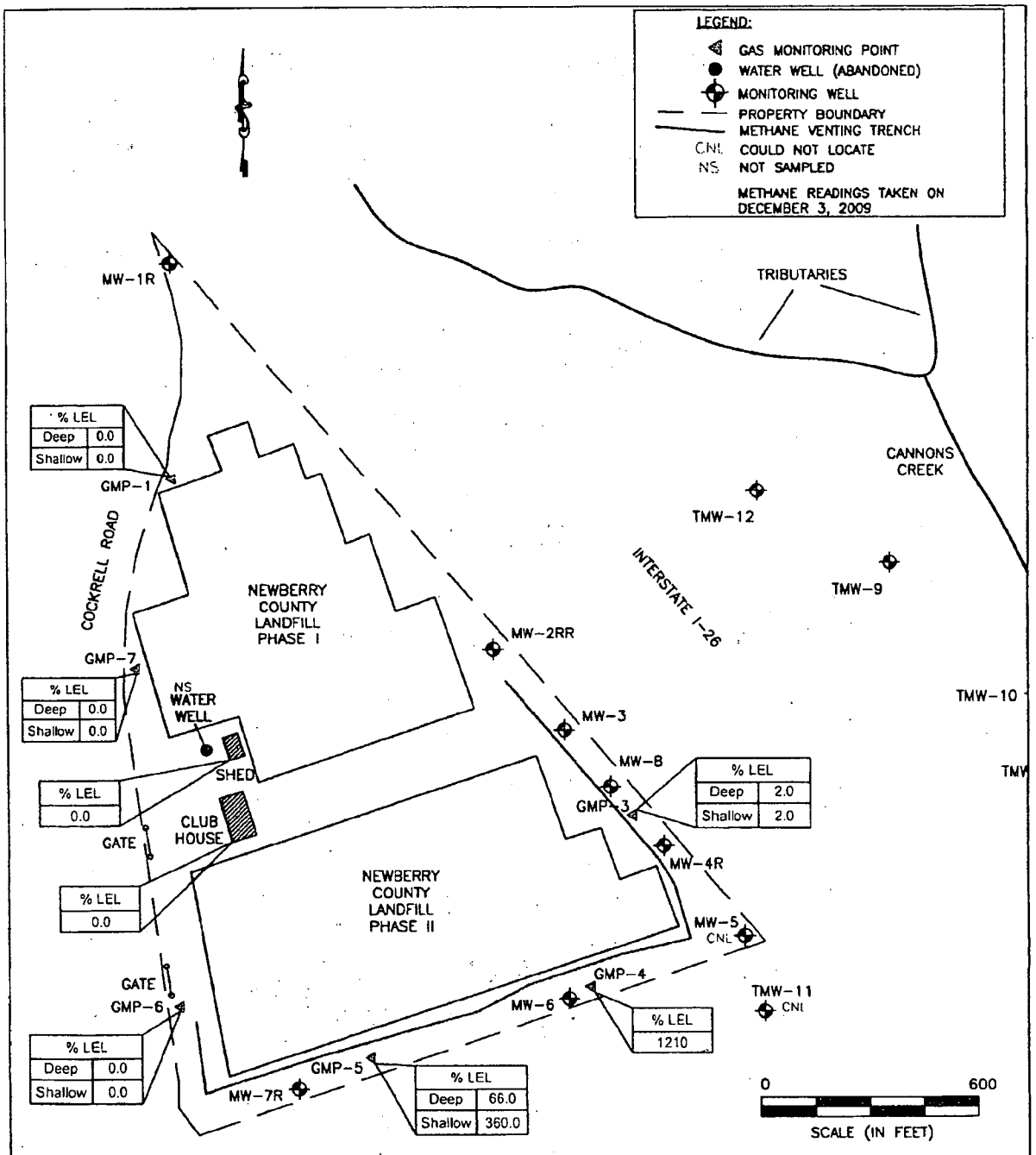


FIGURE 5
METHANE %LEL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No	DWG NO	REV
B	2314 A	Figure 5 Methane LEL Map.dwg	

SCALE: 1 inch = 400 feet

DATE: January 2010

APPENDIX 2

Tables

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Monitoring Well ID	Reported TOC Elevation	Reported Total Depth	Measured Well Depth Dec 3 & 4, 2009	Reported Screened Interval	Reported Latitude	Reported Longitude
MW-1R	504.92	63.0	60.93	48.0 – 63.0	Unknown	Unknown
MW-2RR	459.82	63.0	58.00	48.0 – 63.0	Unknown	Unknown
MW-3	453.92	34.0	38.25	Unknown	34° 17' 50"	81° 33' 07"
MW-4R	441.55	63.0	62.44	48.0 – 63.0	Unknown	Unknown
MW-5	420.12	31.0	Well not located	Unknown	34° 17' 44"	81° 33' 00"
MW-6	440.55	25.0	24.30	10.0 – 25.0	34° 17' 42"	81° 33' 08"
MW-7R	457.34	63.0	62.89	48.0 – 63.0	Unknown	Unknown
MW-8	443.39	68.0	71.85	58.0 – 68.0	Unknown	Unknown
TMW-9	457.58	75.0	74.02	65.0 – 75.0	Unknown	Unknown
TMW-10	415.07	45.0	44.15	35.0 – 45.0	Unknown	Unknown
TMW-11	Unknown	30.0	Well not located	20.0 – 30.0	Unknown	Unknown
TMW-12	468.18	42.6	42.18	22.6 – 42.6	Unknown	Unknown
TMW-13	409.25	44.4	43.71	14.4 – 44.4	Unknown	Unknown

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Monitoring Well ID	Date	Reported TOC Elevation (ft)	Depth to Water (ft)	Water-Level Elevation (ft)	Comment
MW-1R	6/22/2007	504.92	32.18	472.74	
	12/31/2007		35.48	469.44	
	3/12/2009		36.72	468.20	
	12/04/2009		36.36	468.56	
MW-2RR	6/22/2007	459.82	36.10	423.72	
	12/31/2007		36.40	423.42	
	3/12/2009		37.41	422.41	
	12/04/2009		37.10	422.72	
MW-3	6/22/2007	453.92	35.28	418.64	
	12/31/2007		37.20	416.72	
	3/12/2009		36.75	417.18	
	12/04/2009		36.52	417.40	
MW-4R	6/22/2007	441.55	31.68	409.87	
	12/31/2007		34.70	406.85	
	3/12/2009		32.56	408.99	
	12/04/2009		32.28	409.27	
MW-5	6/22/2007	420.12	23.40	396.72	
	12/31/2007		26.03	394.09	
	3/12/2009		23.95	396.17	
	12/04/2009		-	-	Well not located
MW-6	6/22/2007	440.55	27.22	413.33	
	12/31/2007		25.55	415.00	
	3/12/2009		24.55	416.00	
	12/04/2009		24.30	416.25	
MW-7R	6/22/2007	457.34	35.78	421.56	
	12/31/2007		37.20	420.14	
	3/12/2009		35.91	421.43	
	12/04/2009		35.30	422.04	
MW-8	6/22/2007	443.39	35.50	407.89	
	12/31/2007		37.80	405.59	
	3/12/2009		35.29	408.10	
	12/04/2009		35.04	408.35	
TMW-9	6/22/2007	457.58	47.35	410.23	
	12/31/2007		47.33	410.25	
	3/12/2009		47.30	410.27	
	12/03/2009		47.21	410.37	
TMW-10	6/22/2007	415.07	18.90	396.17	
	12/31/2007		21.10	393.97	
	3/12/2009		18.75	396.32	
	12/03/2009		18.47	396.60	
TMW-11	6/22/2007	Unknown	26.08	-	
	12/31/2007		28.60	-	
	3/12/2009		-	-	Well not located
	12/03/2009		-	-	Well not located
TMW-12	12/03/2009	468.18	41.78	426.40	Insufficient volume to sample
TMW-13	12/03/2009	409.25	14.96	394.29	

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS
June 2007 through March 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

	Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		**5**	**100**	**600**	**75**	**7**	**70**	**5**	**40**	**25**	**5**	**1,000**	**5**	**2**	**10,000**
MW-1R	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-2RR	6/22/2007	**15**	2.2	<1.0	6.8	3.9	**89**	**32**	3.6	1.5	**21**	1.3	**14**	<1.0	2.8
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	**8.88**	3.22J	<5.0	11.6	1.38J	69.2	**191**	2.40J	<5.0	**6.03**	<5.0	**11.9**	1.73J	5.63
MW-3	6/22/2007	**19**	2.1	<1.0	7.5	3.2	**110**	**34**	3.3	1.7	**27**	1.6	**18**	<1.0	3.3
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	**20.5**	2.74J	<5.0	6.87	<5.0	**142**	**33.2**	4.85J	<5.0	**21.7**	<5.0	**13.5**	**2.23J**	5.65
MW-4R	6/22/2007	4.4	4.2	2.9	5.0	**9.9**	8.7	**27**	5.1	<1.0	<1.0	2.5	2.3	<1.0	2.2
	12/31/2007	<5.0	<5.0	<5.0	<5.0	6.9	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	2.29J	4.02J	1.16J	1.95J	**8.46**	5.42	**8.85J**	3.07J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-5	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**7.3**	<5.0	<5.0	7.0	<5.0	15.1	<5.0	15.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-6	6/22/2007	**7.6**	<1.0	<1.0	8.0	<1.0	18	<2.0	26	<1.0	<1.0	<1.0	<1.0	1.0	<1.0
	12/31/2007	**7.7**	<5.0	<5.0	7.8	<5.0	16.6	<5.0	18.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	4.58J	1.62J	<5.0	8.64	<5.0	15.8	<10.0	20.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-7R	6/22/2007	3.2	<1.0	<1.0	<1.0	<1.0	5.2	**12**	3.1	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	9.8	**20.1**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	1.40J	<5.0	<5.0	<5.0	<5.0	5.43	**9.92J**	3.72J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Analysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS
June 2007 through March 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

	Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene chloride	Methyl-tert-butyl ether	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	o-Xylene
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		5	100	600	75	7	70	5	40	25	5	1,000	5	2	10,000
MW-8	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<2.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/12/2009	<5.0	<5.0	<5.0	<5.0	2.29J	4.08J	<10.0	<5.0	<5.0	1.05J	<5.0	2.11J	<5.0	<5.0
TWM-9	6/22/2007	<1.0	<1.0	<1.0	1.9	<1.0	21	**56**	1.1	<1.0	3.1	<1.0	4.1	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	19.6	**43.8**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	4.80J	2.94J	<5.0	5.31	<5.0	41.6	**99.0**	<5.0	<5.0	**6.21**	<5.0	**8.62**	<5.0	1.39J
TMW-10	6/22/2007	1.3	<1.0	<1.0	<1.0	5.3	6.2	**29**	<1.0	<1.0	2.8	<1.0	4.3	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	6.6	**25**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	2.57J	<5.0	<5.0	<5.0	**9.94**	13.0	**83.7**	<5.0	<5.0	3.88J	<5.0	**6.19**	<5.0	<5.0
TMW-11	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	**8.3**	<5.0	<5.0	7.6	<5.0	16.3	<5.0	17.7	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	Well Destroyed													
Water Well	6/22/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/8/2008	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cannons Creek	6/24/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/2007	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/13/2009	<5.0	<5.0	<5.0	<5.0	<5.0	2.57J	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
Analysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
December 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Sample ID	Parameter	Result	RDL	MDL	MCL	Units
MW-2RR	1,1-Dichloroethane	22	5.00	0.035	-	µg/L
	1,1-Dichloroethene	1.00J	5.00	0.119	7.0	µg/L
	1,2-Dichloroethane	2.24J	5.00	0.064	5.0	µg/L
	1,2-Dichloroethene (Total)	64.2	10.0	0.198	-	µg/L
	1,4-Dichlorobenzene	17.5	5.00	0.129	-	µg/L
	Benzene	8.00	5.00	0.075	5.0	µg/L
	Chlorobenzene	5.51	5.00	0.072	100.0	µg/L
	Dichlorodifluoromethane	8.40	5.00	0.061	-	µg/L
	Isopropylbenzene (Cumene)	5.97	5.00	0.071	-	µg/L
	Methylene chloride	119	10.0	0.142	-	µg/L
	Tetrachloroethene	5.94	5.00	0.100	5.0	µg/L
	Trichloroethene	10.7	5.00	0.097	5.0	µg/L
	Vinyl chloride	2.01J	5.00	0.077	2.0	µg/L
	Xylene (Total xylene isomers)	18.3	10.0	0.334	10,000	µg/L
	cis-1,2-Dichloroethene	64.2	5.00	0.103	70.0	µg/L
	m,p-Xylene	10.2	5.00	0.243	-	µg/L
	o-Xylene	8.06	5.00	0.103	-	µg/L
	Tertiary-Butyl methyl ether (MTBE)	4.86J	5.00	0.077	-	µg/L
MW-3	1,1-Dichloroethane	14.3	5.00	0.035	-	µg/L
	1,2,4-Trimethylbenzene	4.54J	5.00	0.156	-	µg/L
	1,2-Dichloroethane	1.26J	5.00	0.064	5.00	µg/L
	1,2-Dichloroethene (Total)	139	10.0	0.198	-	µg/L
	1,4-Dichlorobenzene	10.7	5.00	0.129	-	µg/L
	Benzene	18.1	5.00	0.075	5.0	µg/L
	Chlorobenzene	4.44J	5.00	0.072	100.0	µg/L
	Chloroethane	4.80J	5.00	0.140	-	µg/L
	Dichlorodifluoromethane	1.66J	5.00	0.061	-	µg/L
	Eythlbenzene	1.75J	5.00	0.052	700.0	µg/L
	Isopropylbenzene (Cumene)	5.97	5.00	0.071	-	µg/L
	Methylene chloride	26.6	10.0	0.142	-	µg/L
	Tetrachloroethene	19.8	5.00	0.100	5.0	µg/L
	Toluene	3.47J	5.00	0.082	1,000	µg/L
	Trichloroethene	12.0	5.00	0.097	5.0	µg/L
	Vinyl chloride	2.18J	5.00	0.077	2.0	µg/L
	Xylene (Total xylene isomers)	15.3	10.0	0.334	10,000	µg/L
	cis-1,2-Dichloroethene	139	5.00	0.103	70.0	µg/L
	m,p-Xylene	7.33	5.00	0.243	-	µg/L
	o-Xylene	7.98	5.00	0.103	-	µg/L
	Tertiary-Butyl methyl ether (MTBE)	6.64	5.00	0.077	-	µg/L

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
December 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Sample ID	Parameter	Result	RDL	MDL	MCL	Units
MW-4R	1,1-Dichloroethane	19.8	5.00	0.035	-	µg/L
	1,1-Dichloroethene	4.15J	5.00	0.119	7.0	µg/L
	1,2-Dichlorobenzene	2.96J	5.00	0.102	-	µg/L
	1,2-Dichloroethene (Total)	4.34J	10.00	0.198	-	µg/L
	1,3-Dichlorobenzene	0.430J	5.00	0.094	-	µg/L
	1,4-Dichlorobenzene	4.51J	5.00	0.129	-	µg/L
	Benzene	2.19J	5.00	0.075	5.0	µg/L
	Chlorobenzene	7.11	5.00	0.072	100.0	µg/L
	Chloroethane	0.900J	5.00	0.140	-	µg/L
	Dichlorodifluoromethane	0.630J	5.00	0.061	-	µg/L
	Isopropylbenzene (Cumene)	5.53	5.00	0.071	-	µg/L
	Methylene chloride	4.09J	5.00	0.142	-	µg/L
	Napthalene	9.07	5.00	0.101	-	µg/L
	Toluene	1.22J	10.0	0.082	1,000	µg/L
	Trichloroethene	0.863J	5.00	0.097	5.0	µg/L
	Xylene (Total xylene isomers)	5.17J	10.00	0.334	10,000	µg/L
	cis-1,2-Dichloroethene	4.34J	5.00	0.103	70.0	µg/L
	o-Xylene	5.17	5.00	0.103	-	µg/L
	Tertiary-Butyl methyl ether (MTBE)	5.57	5.00	0.077	-	µg/L
MW-6	1,1-Dichloroethane	2.64J	5.00	0.035	-	µg/L
	1,2-Dichloroethene (Total)	11.6	10.00	0.198	-	µg/L
	1,4-Dichlorobenzene	12	5.00	0.129	-	µg/L
	Benzene	4.71J	5.00	0.075	5.0	µg/L
	Chlorobenzene	4.07J	5.00	0.072	100.0	µg/L
	Chloroethane	5.81	5.00	0.140	-	µg/L
	Isopropylbenzene (Cumene)	6.59	5.00	0.071	-	µg/L
	Methylene chloride	1.22J	10.00	0.142	-	µg/L
	Trichloroethene	0.646J	5.00	0.097	5.0	µg/L
	Vinyl chloride	1.55J	5.00	0.077	2.0	µg/L
	cis-1,2-Dichloroethene	11.6	5.00	0.103	70.0	µg/L
	Tertiary-Butyl methyl ether (MTBE)	16	5.00	0.077	-	µg/L
MW-7R	1,1-Dichloroethane	3.72J	5.00	0.035	-	µg/L
	1,2-Dichloroethene (Total)	7.36J	10.00	0.198	-	µg/L
	1,4-Dichlorobenzene	2.32J	5.00	0.129	-	µg/L
	Benzene	1.46J	5.00	0.075	5.0	µg/L
	Chlorobenzene	1.93J	5.00	0.072	100.0	µg/L
	Chloroethane	1.09J	5.00	0.140	-	µg/L
	Methylene chloride	9.41J	5.00	0.142	-	µg/L
	Tetrachloroethene	0.973J	5.00	0.100	5.0	µg/L
	Trichloroethene	0.937J	5.00	0.097	5.0	µg/L
	cis-1,2-Dichloroethene	7.36	5.00	0.103	70.0	µg/L
	Tertiary-Butyl methyl ether (MTBE)	7.41	5.00	0.077	-	µg/L

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
December 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Sample ID	Parameter	Result	RDL	MDL	MCL	Units
MW-8	1,1-Dichloroethane	7.08	5.00	0.035	-	µg/L
	1,1-Dichloroethene	2.23J	5.00	0.119	7.0	µg/L
	1,2-Dichloroethene (Total)	4.18J	10.00	0.198	-	µg/L
	Dichlorodifluoromethane	6.45	5.00	0.061	-	µg/L
	Methylene chloride	1.03J	10.00	0.142	-	µg/L
	Tetrachloroethene	1.75J	5.00	0.100	5.0	µg/L
	Trichloroethene	2.45J	5.00	0.097	5.0	µg/L
	Trichlorofluoromethane	3.22J	5.00	0.072	-	µg/L
	cis-1,2-Dichloroethene	4.18J	5.00	0.103	70.0	µg/L
TMW-9	1,1-Dichloroethane	15.7	5.00	0.035	-	µg/L
	1,1-Dichloroethene	0.924J	5.00	0.119	7.0	µg/L
	1,2-Dichloroethene (Total)	36.1	10.00	0.198	-	µg/L
	1,4-Dichlorobenzene	8.28	5.00	0.129	-	µg/L
	Benzene	3.91J	5.00	0.075	5.0	µg/L
	Chlorobenzene	5.07	5.00	0.072	100.0	µg/L
	Dichlorodifluoromethane	7.35	5.00	0.061	-	µg/L
	Isopropylbenzene (Cumene)	5.17	5.00	0.071	-	µg/L
	Methylene chloride	74.3	10.0	0.142	-	µg/L
	Tetrachloroethene	7.45	5.00	0.100	5.0	µg/L
	Trichloroethene	7.93	5.00	0.097	5.0	µg/L
	Trichlorofluoromethane	1.26J	5.00	0.072	-	µg/L
	Vinyl chloride	1.36J	5.00	0.077	2.0	µg/L
	Xylene (Total xylene isomers)	11.5	10.0	0.334	10,000	µg/L
	cis-1,2-Dichloroethene	36.1	5.00	0.103	70.0	µg/L
	m,p-Xylene	6.57	5.00	0.243	-	µg/L
	o-Xylene	4.90J	5.00	0.103	-	µg/L
TMW-10	1,1-Dichloroethane	50.1	5.00	0.035	-	µg/L
	1,1-Dichloroethene	7.22	5.00	0.119	7.0	µg/L
	1,2-Dichloroethene (Total)	13.9	10.00	0.198	-	µg/L
	1,4-Dichlorobenzene	2.16J	5.00	0.129	-	µg/L
	Benzene	2.32J	5.00	0.075	5.0	µg/L
	Dichlorodifluoromethane	4.27J	5.00	0.061	-	µg/L
	Methylene chloride	64.9	10.00	0.142	-	µg/L
	Tetrachloroethene	4.79J	5.00	0.100	5.0	µg/L
	Trichloroethene	6.00	5.00	0.097	5.0	µg/L
	Trichlorofluoromethane	1.57J	5.00	0.072	-	µg/L
	cis-1,2-Dichloroethene	13.9	5.00	0.103	70.0	µg/L
TMW-13	1,1-Dichloroethane	2.54J	5.00	0.035	-	µg/L

Notes:
MCL = Maximum Contaminant Level as established by U.S. EPA.
MDL = method detection level; the minimum concentration that can be detected but not reliably quantified.
RDL = reporting detection level; the minimum concentration that can be reliably quantified.
Yellow highlighting indicates that the parameter's reported concentration equaled or exceeded its respective MCL value.
J flagged data indicates that the reported concentration is an estimated value.
µg/L = parts per billion.

TABLE 5
METHANE MONITORING RESULTS
March 2007 through March 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-3	3/20/2007	15.7/16.0	4.9/4.4	>3.0/>3.0	**>43/>43**
	6/8/2007	18.0/17.8	2.3/1.9	3.2/2.4	**62/47**
	9/20/2007	5.9/2.1	23.0/24.0	23.3/19.3	**>100/>100**
	12/31/2007	15.3/17.7	6.2/4.3	5.5/4.8	**>100/>100**
	3/12/2009	14.0/20.6	6.1/0.8	0.0/0.0	0.0/0.0
GMP-4	3/20/2007	0.0	>20	5.3	**6.45**
	6/8/2007	0.0	39.9	60.4	**>100**
	9/20/2007	0.2	38.3	36.1	**>100**
	12/31/2007	3.6	26.0	25.8	**>100**
	3/12/2009	Not Found			
GMP-5	3/20/2007	4.0	17.3	2.8	**32.25**
	6/8/2007	16.5	4.4	4.2	**69**
	9/20/2007	20.3	0.7	0.7	**12**
	12/31/2007	20.1	1.0	0.5	**10**
	3/12/2009	19.2	2.7	4.0	**63**
GMP-6	3/20/2007	0.0	19.4	0.5	**6.02**
	6/8/2007	0.2	35.2	43.3	**>100**
	9/20/2007	0.3	40.5	44.3	**>100**
	12/31/2007	4.3	24.9	21.2	**>100**
	3/12/2009	20.9	0.0	0.1	3
GMP-7	3/20/2007	19.3	0.1	0.0	0.0
	6/8/2007	16.3	4.4	0.0	**69**
	9/20/2007	19.6	1.0	0.0	0.0
	12/31/2007	16.5	4.3	0.0	0.0
	3/12/2009	20.0	1.5	0.1	3

TABLE 5
METHANE MONITORING RESULTS
March 2007 through March 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
Club House	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.2	0.0	0.0	0.0
	9/20/2007	20.6	0.0	0.0	0.0
	12/31/2007	20.8	0.0	0.0	0.0
	3/12/2009	21.3	0.0	0.0	0.0
Shed	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.3	0.0	0.0	0.0
	9/20/2007	20.7	0.0	0.0	0.0
	12/31/2007	20.9	0.0	0.0	0.0
	3/12/2009	21.2	0.0	0.0	0.0

Notes:
(1) The monitoring points are labeled "GMW-X" in the field, but are reported as "GMP-X" to avoid confusion with groundwater monitoring wells.
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).
3/12/09 data was collected with a Landtec GEM 2000 Landfill Gas Monitor calibrated to a methane standard.

TABLE 6
METHANE MONITORING RESULTS
December 2009
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314A

Monitoring Point	Date	Time	Approximate Ambient Air Temperature (°F)	Barometric Pressure (inches Hg)	Sampling Point	O_2 (%)	CO_2 (%)	Methane (%)	LEL (%)
GMP – 1	12/03/09	1635	60	29.33	Point A - Deep	20.5	0.5	0.0	0.0
					Point B - Shallow	20.5	0.5	0.0	0.0
GMP – 3	12/03/09	1510	60	29.34	Point A - Deep	21.0	0.1	0.1	2.0
					Point B - Shallow	21.0	0.1	0.0	2.0
GMP – 4	12/03/09	1455	60	29.34	Single Monitoring Point	0.2	39.1	60.5	**1210**
GMP – 5	12/03/09	1440	60	29.33	Point A - Deep	19.2	2.2	3.3	**66.0**
					Point B - Shallow	14.2	13.0	18.8	**360.0**
GMP – 6	12/03/09	1410	60	29.31	Point A - Deep	21.0	0.1	0.0	0.0
					Point B - Shallow	21.1	0.1	0.0	0.0
GMP – 7	12/03/09	1730	60	29.33	Point A - Deep	20.9	0.1	0.0	0.0
					Point B - Shallow	20.9	0.1	0.0	0.0
Club House	12/03/09	1600	60	29.31	Single Monitoring Point	21.0	0.1	0.0	0.0
Shed	12/03/09	1610	60	29.31	Single Monitoring Point	21.1	0.1	0.0	0.0

Notes: Yellow highlighting indicates recorded LEL (Lower Explosion Limit) exceeded 5%.

SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR 2010 of FORMER NEWBERRY COUNTY LANDFILL SITE SCDHEC Solid Waste Permit #: DWP-117 432 Cockrell Road Newberry, South Carolina

Prepared for:

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AUG 3 [illegible]

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VICE PRESIDENT – ASSESSMENT SERVICES

JASON A. TERRY, PG
PRESIDENT

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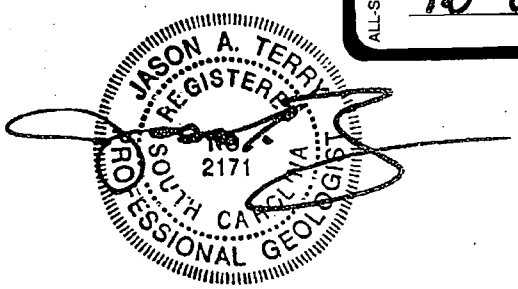


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1.0 INTRODUCTION

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week (usually on Wednesdays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

2.0 BACKGROUND

2.1 Groundwater Monitoring Network

The groundwater monitoring network consists of a total of 13 (thirteen) monitoring wells. Monitoring wells designated as TMW-9, TMW-10, TMW-12 and TMW-13 are located on the northeast side of Interstate Highway 26 (I-26). Monitoring wells TMW-12 and TMW-13 were installed in November 2009 in response to a SCDHEC directive dated September 17, 2009. All of the monitoring wells at the site were installed by others.

2.2 Methane Monitoring Network

Six (6) methane gas monitoring points (GMPs) identified as GMP-1 and GMP-3 through GMP-7 were previously installed along the boundaries of the former landfill and serve as the landfill gas monitoring network. Newberry County Public Works has installed six passive landfill gas vents as previously directed by SCDHEC. The GMPs are monitored as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). The locations of monitoring wells and GMPs are shown in Figure 2 and monitoring well construction details are summarized in Table 1.

2.3 Site Geology and Hydrogeology

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is a red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek. Groundwater flow within the uppermost aquifer has historically been to the east and northeast with discharge occurring into Cannons Creek.

3.0 GROUNDWATER MONITORING RESULTS

TERRY personnel were on-site June 21 and 22, 2010 to collect groundwater samples from thirteen (13) monitoring wells, a water supply well on-site and a surface water sample from Cannons Creek. However, during the sampling event monitoring well TMW-11 could not be accessed due to property issues, TMW-12 had insufficient volume, and the pump on the water supply well was not operable; therefore these wells were not sampled.

Prior to sample collection, the depth to water measurement was determined relative to the top-of-casing (TOC) elevation. The TOC elevations were provided by previous assessment work performed at the site. This information was used to determine the water table elevation at each sampling point. The depth to water and water-level elevation data are summarized in Table 2, Appendix 2. The groundwater elevations were entered into a graphical contouring program and used to generate groundwater elevation contours which were subsequently overlaid on a copy of the site plan. Figure 3, Appendix 1 indicates the piezometric surface and direction of groundwater flow. Groundwater flow is toward the southeast toward Cannons Creek. The gradient was calculated by dividing the change in elevation by the change in distance between two points located along a line parallel to the direction of groundwater flow; a gradient of 0.03 foot per foot was calculated.

Each of the monitoring wells was purged prior to sample collection so as to collect a representative sample of the groundwater. Copies of the sampling logs are provided in Appendix 4. Each of the samples was placed immediately in laboratory supplied glassware and shipped to Access Analytical Services, Inc. (SCDHEC Laboratory certification #73006) for analysis. The samples were analyzed for the Appendix V list of parameters as directed in the SCDHEC correspondence dated April 13, 2010. The only exception to this was that Dioxins was not included in the analyses as per the SCDHEC Project Manager as the likelihood of detection was deemed extremely low based on facility history.

Fifty-five (55) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only nine (9) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's) or Action Levels (AL's).

Table 3, Appendix 2 summarizes the analytical data from the period June 2007 through December 2009; Table 4 provides data for those parameters detected in concentrations greater than their respective MDLs during the June 2010 monitoring event. Groundwater sampling logs are included as Appendix 4 and a copy of the laboratory data report is provided as Appendix 5. The distribution of parameters exceeding their respective MCL/RBSL/AL during the June 2010 monitoring event is shown in Figure 4, Appendix 1.

4.0 METHANE MONITORING RESULTS

TERRY personnel recorded landfill gas measurements on June 22, 2010 at six (6) GMPs and two (2) structures located at the former landfill. The methane concentrations were measured using a Landtec GEM-2000 Landfill Gas Monitor. The instrument simultaneously determines percent oxygen, percent carbon dioxide, and percent methane gas. Field measurements of percent methane were converted to percent LEL (lower explosive limit). Table 5, Appendix 2 summarizes the landfill gas values recorded during the period March 2007 through December 2009; Table 6 summarizes the landfill gas data recorded during the June 2010 monitoring event. Field data and field data collection logs are provided in Appendix 3.

The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3, GMP-4, GMP-5, GMP-6 and GMP-7. Figure 5, Appendix 1 shows the results of the methane monitoring. Newberry County Public Works has installed a passive landfill gas venting system in the vicinity of GMP 5 as directed by SCDHEC.

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



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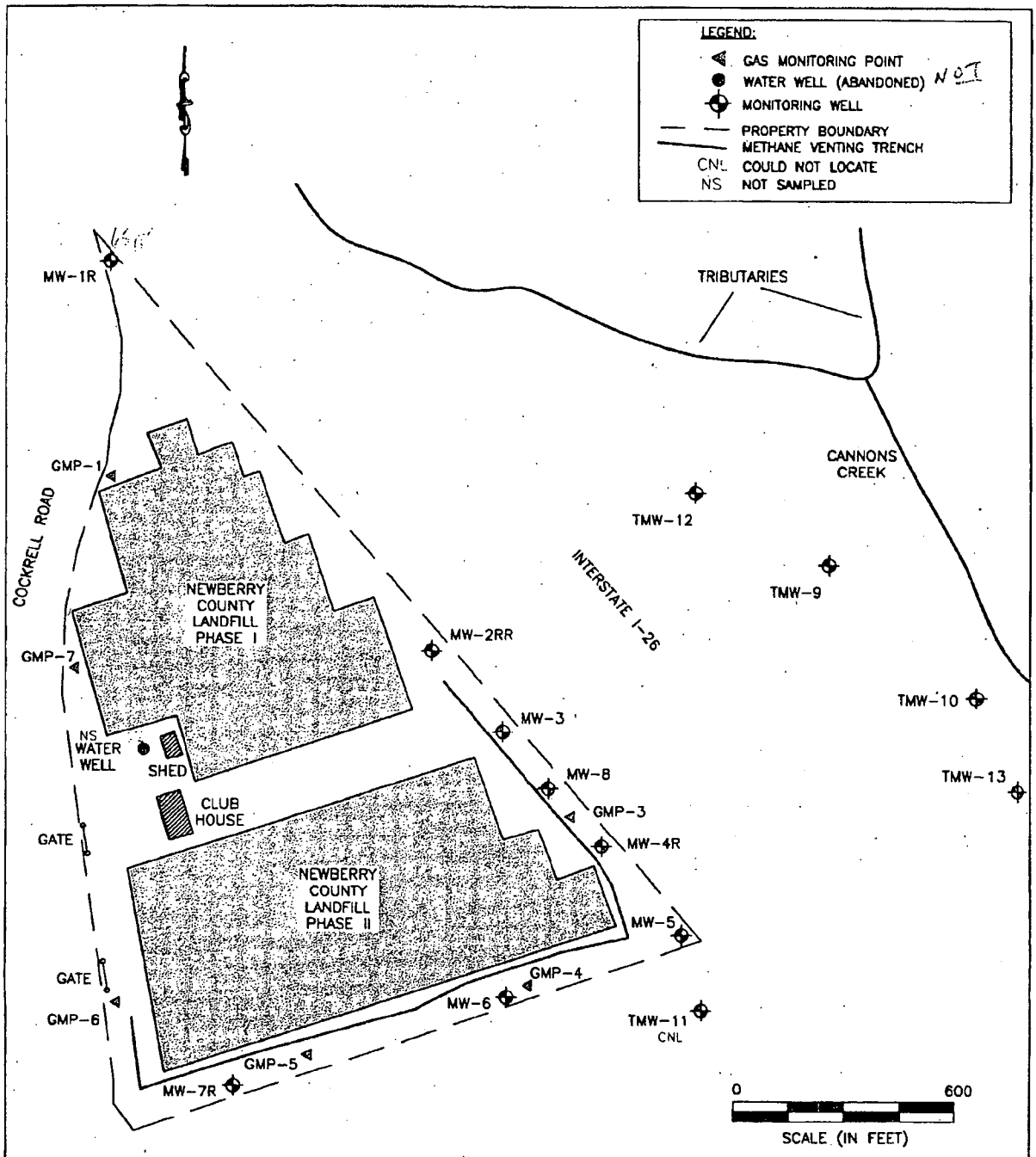
FIGURE 1
SITE LOCATION

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO.	REV
B	2314 B	Figure 1 Site Location.dwg	

SCALE: NOT TO SCALE

DATE: June 2010



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FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO	REV
B	2314 B	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: June 2010

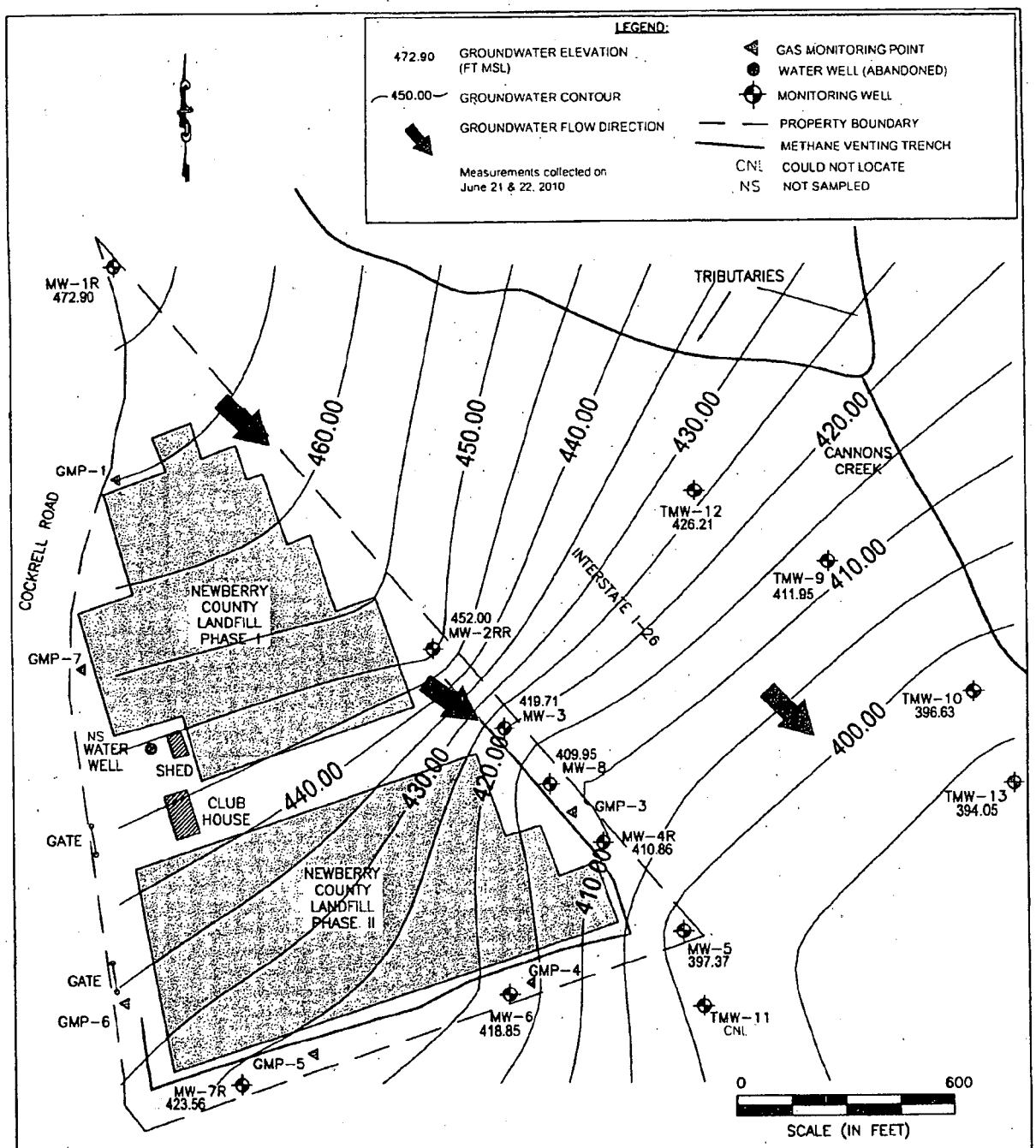


FIGURE 3
PIEZOMETRIC MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
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SIZE	TERRY Project No	DWG NO.	REV
B	2314 B	Figure 2 Site Plan.dwg	

SCALE 1 inch = 400 feet

DATE June 2010

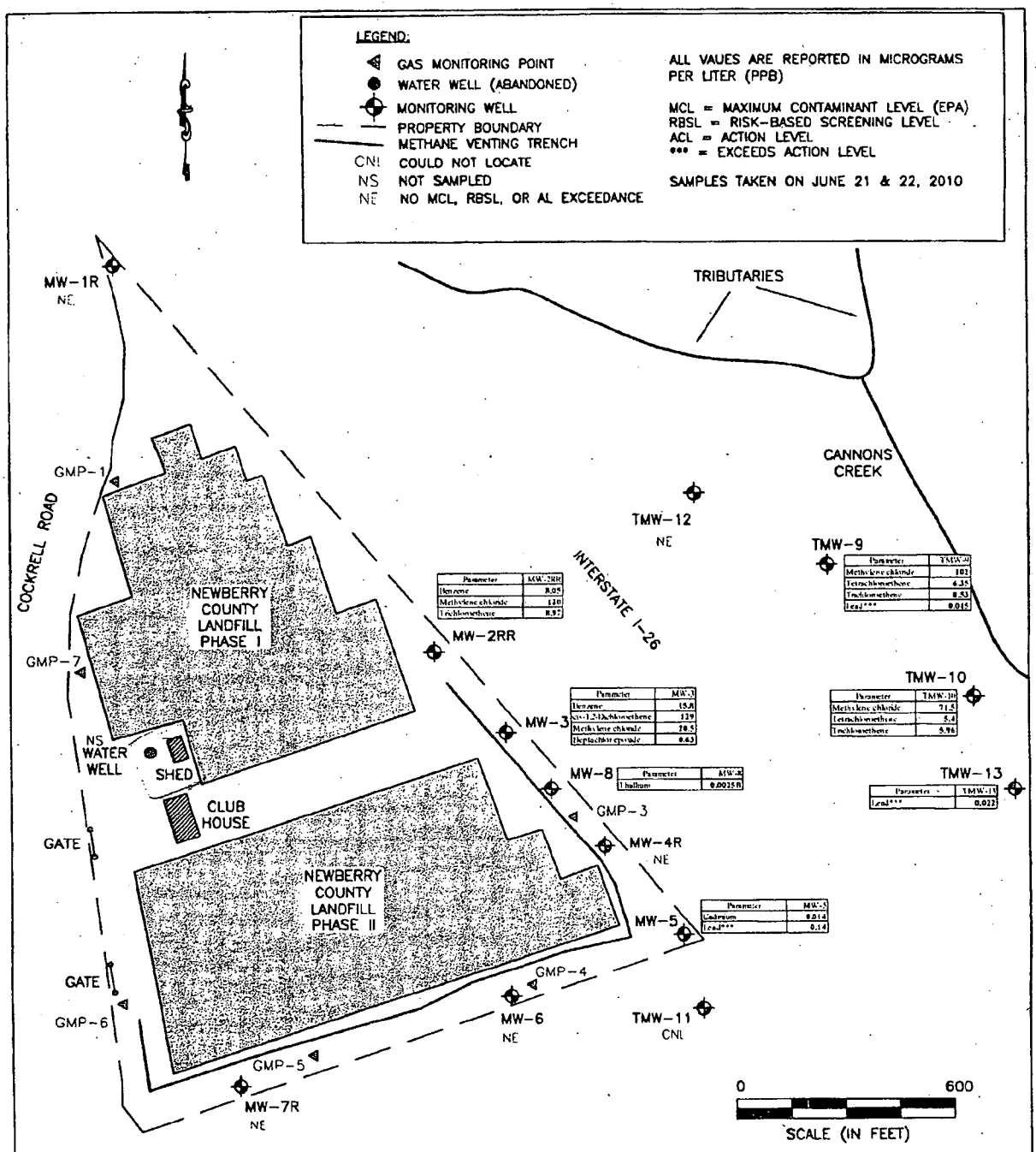


FIGURE 4

Parameters Equal to or Exceeding MCL, RBSL, or AL

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432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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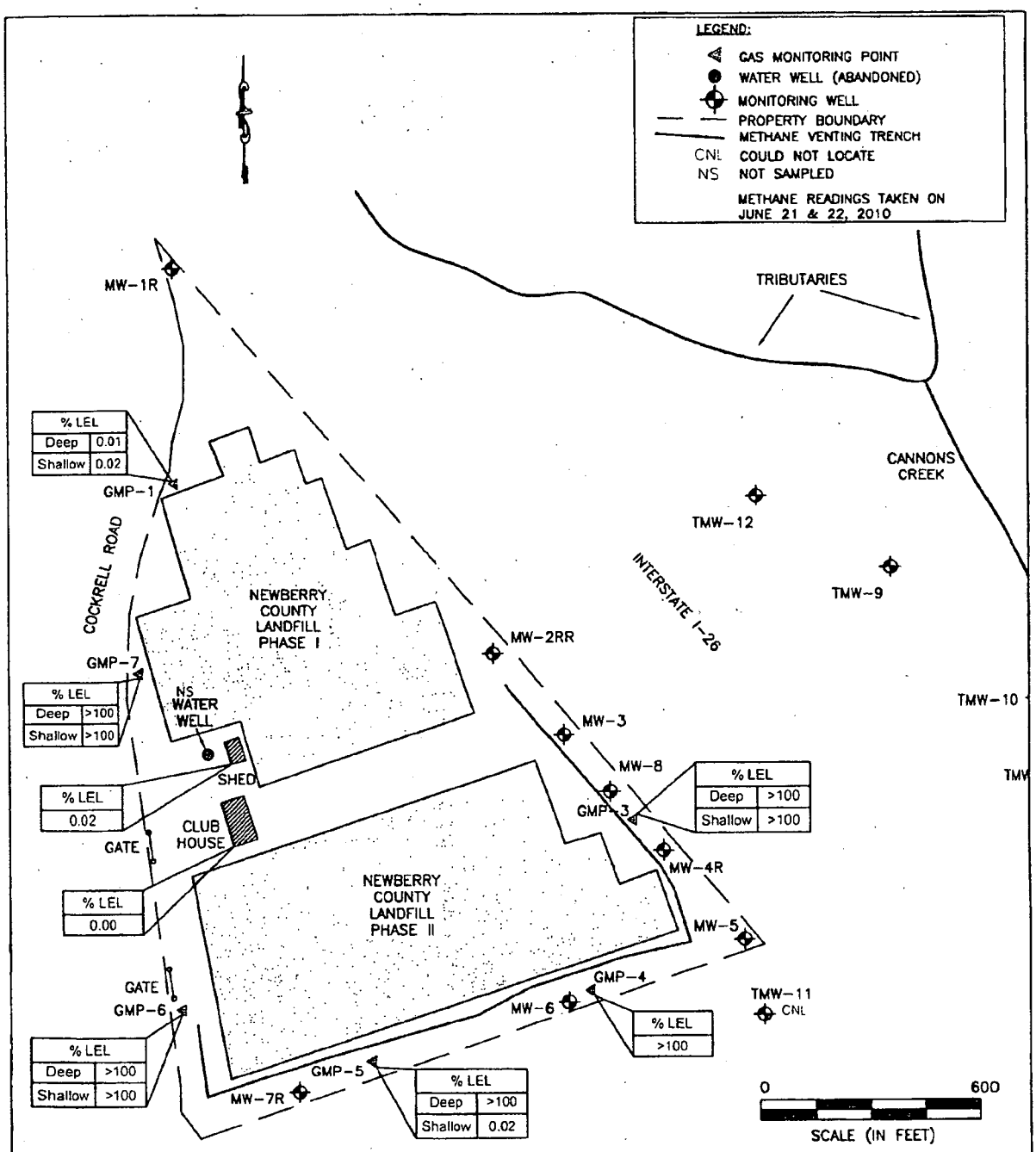
providing our clients with the best services available
actually understanding our clients objectives
and making their objectives our own

PO Box 25
Summerville, South Carolina 29484
(800) 325-0605 (843)-873-8700 fax (843)-873-8765

SIZE	TERRY Project No	DWG NO.	REV
B	2314 B	Figure 4 Analytical Data.dwg	

SCALE. 1 inch = 400 feet

DATE. June 2010



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FIGURE 5
METHANE %LEL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No	DWG NO	REV
B	2314 B	Figure 5 Methane LEL Map.dwg	

SCALE 1 inch = 400 feet

DATE June 2010

APPENDIX 2

Tables

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314B

Monitoring Well ID	Reported TOC Elevation	Reported Total Depth	Measured Well Depth June 21 &22, 2010	Reported Screened Interval	Reported Latitude	Reported Longitude
MW-1R	504.92	63.0	61.00	48.0 - 63.0	Unknown	Unknown
MW-2RR	459.82	63.0	58.00	48.0 - 63.0	Unknown	Unknown
MW-3	453.92	34.0	38.20	Unknown	34° 17' 50"	81° 33' 07"
MW-4R	441.55	63.0	63.20	48.0 - 63.0	Unknown	Unknown
MW-5	420.12	31.0	33.85	Unknown	34° 17' 44"	81° 33' 00"
MW-6	440.55	25.0	27.70	10.0 - 25.0	34° 17' 42"	81° 33' 08"
MW-7R	457.34	63.0	62.90	48.0 - 63.0	Unknown	Unknown
MW-8	443.39	68.0	71.00	58.0 - 68.0	Unknown	Unknown
TMW-9	457.58	75.0	74.85	65.0 - 75.0	Unknown	Unknown
TMW-10	415.07	45.0	44.10	35.0 - 45.0	Unknown	Unknown
TMW-11	Unknown	30.0	Well not located	20.0 - 30.0	Unknown	Unknown
TMW-12	468.18	42.6	42.10	22.6 - 42.6	Unknown	Unknown
TMW-13	409.25	44.4	43.75	14.4 - 44.4	Unknown	Unknown

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314B

Monitoring Well ID	Date	Reported TOC Elevation (ft)	Depth to Water (ft)	Water-Level Elevation (ft)	Comment
MW-1R	6/22/2007	504.92	32.18	472.74	
	12/31/2007		35.48	469.44	
	3/12/2009		36.72	468.20	
	12/04/2009		36.36	468.56	
	6/22/2010		32.02	472.90	
MW-2RR	6/22/2007	459.82	36.10	423.72	
	12/31/2007		36.40	423.42	
	3/12/2009		37.41	422.41	
	12/04/2009		37.10	422.72	
	6/21/2010		34.82	452.00	
MW-3	6/22/2007	453.92	35.28	418.64	
	12/31/2007		37.20	416.72	
	3/12/2009		36.75	417.18	
	12/04/2009		36.52	417.40	
	6/21/2010		34.21	419.71	
MW-4R	6/22/2007	441.55	31.68	409.87	
	12/31/2007		34.70	406.85	
	3/12/2009		32.56	408.99	
	12/04/2009		32.28	409.27	
	6/22/2010		30.69	410.86	
MW-5	6/22/2007	420.12	23.40	396.72	
	12/31/2007		26.03	394.09	
	3/12/2009		23.95	396.17	
	12/04/2009		-	-	Well not located
	6/22/2010		22.75	397.37	
MW-6	6/22/2007	440.55	27.22	413.33	
	12/31/2007		25.55	415.00	
	3/12/2009		24.55	416.00	
	12/04/2009		24.30	416.25	
	6/21/2010		21.70	418.85	
MW-7R	6/22/2007	457.34	35.78	421.56	
	12/31/2007		37.20	420.14	
	3/12/2009		35.91	421.43	
	12/04/2009		35.30	422.04	
	6/22/2010		33.78	423.56	
MW-8	6/22/2007	443.39	35.50	407.89	
	12/31/2007		37.80	405.59	
	3/12/2009		35.29	408.10	
	12/04/2009		35.04	408.35	
	6/21/2010		33.44	409.95	
TMW-9	6/22/2007	457.58	47.35	410.23	
	12/31/2007		47.33	410.25	
	3/12/2009		47.30	410.27	
	12/03/2009		47.21	410.37	
	6/22/2010		45.63	411.95	

TABLE 2
WATER TABLE ELEVATION DATA
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314B

Monitoring Well ID	Date	Reported TOC Elevation (ft)	Depth to Water (ft)	Water-Level Elevation (ft)	Comment
TMW-10	6/22/2007	415.07	18.90	396.17	
	12/31/2007		21.10	393.97	
	3/12/2009		18.75	396.32	
	12/03/2009		18.47	396.60	
	6/22/2010		18.44	396.63	
TMW-11	6/22/2007	Unknown	26.08	-	
	12/31/2007		28.60	-	
	3/12/2009		-	-	Well not located
	12/03/2009		-	-	Well not located
	6/21/2010		-	-	Well not located
TMW-12	12/03/2009	468.18	41.78	426.40	Insufficient volume to sample
	6/22/2010		41.97	426.21	Insufficient volume to sample
TMW-13	12/03/2009	409.25	14.96	394.29	
	6/22/2010		15.20	394.05	

SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL

Cockrell Road, Newberry, South Carolina

Sample ID	Date	Acetone	Acrolein	Acrylonitrile	tert-Amylmethyl ether	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	2-Butanone (MEK)	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	2-Chloroethyl vinyl ether	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	Dibromochloromethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	cis-1,4-Dichloro-2-butene	trans-1,4-Dichloro-2-butene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL						5												100												600	75						7	70			
MW-1R	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	10	<1.0	3.3	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	65	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	3.4	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/12/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
MW-2RR	6/22/07	<25	-	-	-	15	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	1.2	<1.0	-	<1.0	2.2	8.7	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.8	-	-	1.5	27	<1.0	3.9	89	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	12.3	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	8.88	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	3.22J	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	11.6	-	<5.00	<5.00	25.9	<5.00	1.38J	69.2	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	8.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	5.51	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	17.5	-	<5.00	8.40	22.0	2.24J	1.00J	64.2	<5.00	<5.00
MW-3	6/22/07	<25	-	-	-	19	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	1.4	<1.0	-	<1.0	2.1	10	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.5	-	-	1.9	23	<1.0	3.2	110	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	12.8	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	20.5	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.74J	6.56	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	6.87	-	<5.00	1.26J	16.5	<5.00	<5.00	142	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	18.1	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	4.44J	4.80J	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	10.7	-	<5.00	1.66J	14.3	1.26J	<5.00	139	<5.00	<5.00
MW-4R	6/22/07	<25	-	-	-	4.4	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	4.2	5.8	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.9	<1.0	5.0	-	-	1.8	70.0	<1.0	9.9	8.7	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	17.8	<5.0	6.9	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	2.29J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	4.02J	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.16J	<5.00	1.95J	-	<5.00	<5.00	31.9	<5.00	8.46	5.42	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	2.19J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	7.11	0.900J	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.96J	0.430J	4.51J	-	<5.00	0.630J	19.8	<5.00	4.15J	4.34J	<5.00	<5.00
MW-5	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	7.3	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0	<5.0	15.1	<5.0	<5.0
	4/4/08	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	0.727J	<5.00	<5.00	<5.00	<5.00	<5.00
	3/12/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	Could Not Locate																																						
MW-6	6/22/07	<25	-	-	-	7.6	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	6.3	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.0	-	-	<1.0	<1.0	<1.0	<1.0	18	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	7.7	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	16.6	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/12/09	<25.0	<25.0	<25.0	-	4.58J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.62J	28.5	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	8.64	-	<5.00	<5.00	<5.00	<5.00	<5.00	15.8	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	4.71J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	4.07J	5.81	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	12.0	-	<5.00	<5.00	2.64J	<5.00	<5.00	11.6	<5.00	<5.00
MW-7R	6/22/07	<25	-	-	-	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	3.6	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	2.9	<1.0	<1.0	5.2	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	9.8	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/12/09	<25.0	<25.0	<25.0	-	1.40J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	5.43	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	1.46J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.93J	1.09J	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.32J	-	<5.00	<5.00	3.72J	<5.00	<5.00	7.36J	<5.00	<5.00
MW-8	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	4.3	2.6	<1.0	<1.0	1.4	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.4	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/12/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	6.32	<5.00	2.29J	4.08J	<5.00	<5.00
	12/4/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	6.45	7.08	<5.00	2.23J	4.18J	<5.00	<5.00

Notes:
Analysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

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SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL

Cockrell Road, Newberry, South Carolina

	Date	Acetone	Acrolein	Acrylonitrile	tert-Amylmethyl ether	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane THM	Bromoform THM	Bromomethane	2-Butanone (MEK)	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform THM	2-Chloroethylvinyl ether	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloropropane	Dibromochloromethane THM	1,2-Dibromoethane (EDB)	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	cis-1,4-Dichloro-2-butene	trans-1,4-Dichloro-2-butene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL		-	-	-	-	5	-	-	-	80	-	-	-	-	-	-	5	100	2	-	-	-	-	-	-	-	-	600	-	75	-	-	-	-	70	-	-	-	-
TWM-9	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	-	-	2.6	11	<1.0	<1.0	21	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	11.1	<5.0	<5.0	19.6	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	4.80J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.94J	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	5.31	-	<5.00	10.3	18.6	<5.00	<5.00	41.6	<5.00	<5.00
	12/3/09	<25.0	<25.0	<25.0	-	3.91J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	5.07	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	8.28	-	<5.00	7.35	15.7	<5.00	0.924J	36.1	<5.00	<5.00
TMW-10	6/22/07	<25	-	-	-	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	1.2	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	2.8	44	<1.0	5.3	6.2	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	39.8	<5.0	<5.0	6.6	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	2.57J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	3.32	61.6	<5.00	9.94	13.0	<5.00	<5.00
	12/3/09	<25.0	<25.0	<25.0	-	2.32J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.16J	-	<5.00	4.27J	50.1	<5.00	7.22	13.9	<5.00	<5.00
TMW-11	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	8.3	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.6	<5.0	<5.0	<5.0	<5.0	<5.0	16.3	<5.0	<5.0
	4/4/08	<25.0	<25.0	<25.0	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	0.740J	<5.00	<5.00	<5.00	<5.00	<5.00
	3/13/09	Could Not Locate																																						
	12/4/09	Well Destroyed																																						
TWMW-12	12/3/09	Insufficient Sample Volume																																						
TWMW-13	12/3/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	2.54J	<5.00	<5.00	<5.00	<5.00	<5.00
Water Well	6/22/07	<25	-	-	-	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	2.9	-	8.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/8/08	<25	-	-	-	<5.0	<5.0	<5.0	6.2	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<10.0	-	22.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	9.86	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	82.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/3/09	Not In Service																																						
Cannons Creek	6/24/07	<25	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<25	<100	<100	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	-	<5.0	-	-	<10.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																						
	3/13/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	2.57J	<5.00	<5.00
	12/3/09	<25.0	<25.0	<25.0	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00

Notes:
Analysis was performed by US EPA Method 8260B.
Bolded and highlighted values exceed the US EPA MCL.

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SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL

Cockrell Road, Newberry, South Carolina

Well ID	Date	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Diethyl ether (Ethyl ether)	Diisopropyl ether	Ethylbenzene	Hexachloro-1,3-butadiene	n-Hexane	2-Hexanone	Isopropylbenzene (Cumene)	p-Isopropyltoluene	Methyl iodide	Methylene chloride	4-Methyl-2-pentanone (MIBK)	Methyl tert-butyl ether (MTBE)	Naphthalene	Pentachloroethane	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,1,2-Trichlorotrifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl acetate	Vinyl chloride	Xylenes (total)
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL																5		40	25							5	1,000												2	10,000
MW-1R	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/12/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
MW-2RR	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	1.8	<1.0	-	32	-	3.6	1.5	-	<1.0	<1.0	<1.0	<1.0	21	1.3	<1.0	<1.0	<1.0	<1.0	14	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	2.8
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	12.2	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	1.96J	-	<5.00	191	<5.00	2.40J	<5.00	-	<5.00	<5.00	<5.00	<5.00	6.03	<5.00	- -	<5.00	<5.00	<5.00	11.9	1.04J	<5.00	-	-	1.14J	<5.00	<5.00	1.73J	11.8
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	5.97	-	<5.00	119	<5.00	4.86J	<5.00	-	<5.00	<5.00	<5.00	<5.00	5.94	<5.00	-	<5.00	<5.00	<5.00	10.7	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	2.01J	18.3
MW-3	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	2.1	<1.0	-	34	-	3.3	1.7	-	<1.0	<1.0	<1.0	<1.0	27	1.6	<1.0	<1.0	<1.0	<1.0	18	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	3.3
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	11.8	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	1.92J	-	<5.00	33.2	<5.00	4.85J	<5.00	-	<5.00	<5.00	<5.00	<5.00	21.7	<5.00	-	<5.00	<5.00	<5.00	13.5	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	2.23J	8.52J
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	1.75J	<5.00	-	<5.00	5.97	-	<5.00	26.6	<5.00	6.64	<5.00	-	<5.00	<5.00	<5.00	<5.00	19.8	3.47J	-	<5.00	<5.00	<5.00	12.0	<5.00	<5.00	-	-	4.54J	<5.00	<5.00	2.18J	15.3
MW-4R	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	1.7	<1.0	-	27	-	5.1	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	2.3	<1.0	<1.0	<1.0	<1.0	2.3	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	2.2
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	17.3	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	1.07J	-	<5.00	8.85J	<5.00	3.07J	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	5.53	-	<5.00	4.09J	<5.00	5.57	9.07	-	<5.00	<5.00	<5.00	<5.00	<5.00	1.23J	-	<5.00	<5.00	<5.00	0.863J	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	5.17J
MW-5	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	61.9	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	15.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	3/12/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	2.75J	-	<5.00	<10.0	<5.00	20.0	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	Could Not Locate																																							
MW-6	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	4.5	<1.0	-	<2.0	-	26	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	67.5	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	18.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/12/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	2.75J	-	<5.00	<10.0	<5.00	20.0	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	6.59	-	<5.00	1.22J	<5.00	16.0	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	0.646J	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	1.55J	<10.0
MW-7R	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	12	-	3.1	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	28.4	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	20.1	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/12/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	9.92J	<5.00	3.72J	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	9.41J	<5.00	7.41	<5.00	-	<5.00	<5.00	<5.00	<5.00	0.973J	<5.00	-	<5.00	<5.00	<5.00	0.937J	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
MW-8	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																							
	3/12/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	1.05J	<5.00	-	<5.00	<5.00	<5.00	2.11J	3.26J	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/4/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	1.03J	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	1.75J	<5.00	-	<5.00	<5.00	<5.00	2.45J	3.22J	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0

Notes:

Analysis was performed by US EPA Method 8260B.

Bolded and highlighted values exceed the US EPA MCL.

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SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL

Cockrell Road, Newberry, South Carolina

	Date	1,2-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Diethyl ether (Ethyl ether)	Diisopropyl ether	Ethylbenzene	Hexachloro-1,3-butadiene	n-Hexane	2-Hexanone	Isopropylbenzene (Cumene)	p-Isopropyltoluene	Methyl iodide	Methylene chloride	4-Methyl-2-pentanone (MIBK)	Methyl-tert-butyl ether (MTBE)	Naphthalene	Pentachloroethane	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,1,2-Trichlorotrifluoroethane	1,2,3-Trimethylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl acetate	Vinyl chloride	Xylene (total)
Units		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
US EPA MCL															5		40	25							5	1,000														10,000
TWM-9	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	56	-	1.1	<1.0	-	<1.0	<1.0	<1.0	<1.0	3.1	<1.0	<1.0	<1.0	<1.0	<1.0	4.1	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	27.6	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	43.8	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																						
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	0.749J	-	<5.00	74.3	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	7.45	<5.00	-	<5.00	<5.00	<5.00	7.93	1.26J	<5.00	-	-	<5.00	<5.00	<5.00	1.36J	11.5
	12/3/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	3.17	-	<5.00	74.3	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	7.45	<5.00	-	<5.00	<5.00	<5.00	7.93	1.26J	<5.00	-	-	<5.00	<5.00	<5.00	1.36J	11.5
TMW-10	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	29	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	4.3	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	11.6	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	25.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																						
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	83.7	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	3.88J	<5.00	-	<5.00	<5.00	<5.00	6.19	1.58J	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/3/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	64.9	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	4.79J	<5.00	-	<5.00	<5.00	<5.00	6.00	1.57J	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
TMW-11	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	68.4	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	17.7	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	3/13/09	Could Not Locate																																						
	12/4/09	Well Destroyed																																						
TWMW-12	12/3/09	Insufficient Sample Volume																																						
TWMW-13	12/3/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
Water Well	6/22/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	1/8/08	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	-	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	-	-	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																						
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/3/09	Not In Service																																						
Cannons Creek	6/24/07	<1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<2.0	-	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	-	<1.0	<2.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
	4/4/08	Not Sampled																																						
	3/13/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0
	12/3/09	<5.00	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	-	<5.00	<5.00	-	<5.00	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	<5.00	<10.0

Notes:

Analysis was performed by US EPA Method 8260B.

Bolded and highlighted values exceed the US EPA MCL.

0770

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
JUNE 2010
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314B

Parameter	Analytical Method	Units	MCL	MW-2RR 6/21/2010	MW-3 6/21/2010	MW-6 6/21/2010	MW-8 6/21/2010	MW-1R 6/22/2010	MW-4R 6/22/2010	MW-5 6/22/2010	MW-7R 6/22/2010	TMW-9 6/22/2010	TMW-10 6/22/2010	TMW-13 6/22/2010
1,1-Dichloroethane	8260B W	ug/L	---	25.2	9.6	1.12J	5.16	<5	22.3	<5	<5	18.4	50.8	<5
1,1-Dichloroethene	8260B W	ug/L	7	<5	<5	<5	1<5	<5	2.83J	<5	<5	<5	<5	<5
1,2-Dichloroethane	8260B W	ug/L	5	2.43J	1.85J	<5	1<5	<5	<5	<5	<5	1.15J	<5	<5
1,4-Dichlorobenzene	8260B W	ug/L	---	16.5	10.6	9.18	1<5	<5	4.49J	<5	<5	9.01	<5	<5
2-Hexanone	8260B W	ug/L	---	<5	<5	<5	1<5	<5	<5	<5	<5	<5	<5	6.27
Acetone	8260B W	ug/L	---	<25	<25	2.52J	<25	<25	<25	<25	<25	<25	<25	<25
Benzene	8260B W	ug/L	5	8.05	15.8	4.93J	1<5	<5	2.69J	<5	<5	4.41J	2.58J	<5
Carbon disulfide	8260B W	ug/L	---	13.2	<5		1.23J	<5	<5	<5	<5	<5	<5	1.02J
Chlorobenzene	8260B W	ug/L	100	3.91J	3.44J	2.94J	1<5	<5	6.11	<5	<5	4.49J	<5	<5
Chloroethane	8260B W	ug/L	---	<5	<5	7.51	1<5	<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	8260B W	ug/L	70	61.9	129	11.7	2.95J	<5	4.80J	<5	2.02J	38.7	13.8	<5
Dichlorodifluoromethane	8260B W	ug/L	---	12.1	<5	<5	10.8	<5	<5	<5	<5	12.8	6.97	<5
Ethylbenzene	8260B W	ug/L	700	<5	<5	0.152J	1<5	<5	<5	<5	<5	<5	<5	<5
m,p-Xylene	8260B W	ug/L	10000*	6.28J	<10	0.579J	<10	<10	<10	<10	<10	2.05J	<10	<10
Methylene chloride	8260B W	ug/L	5	120	20.5	<10	<10	<10	1.94J	<10	1.24J	102	71.5	<10
Tetrachloroethene	8260B W	ug/L	5	<5	4.93J	<5	1<5	<5	<5	<5	<5	6.35	5.4	<5
Toluene	8260B W	ug/L	1000	6	1.34J	1.12J	1.01J	0.927J	2.18J	0.998J	0.924J	1.04J	0.941J	0.889J
Trichloroethene	8260B W	ug/L	5	8.97	1.36J	0.781J	1<5	<5	<5	<5	<5	8.53	5.96	<5
Trichlorofluoromethane	8260B W	ug/L	---	<5	<5	<5	5.17	<5	<5	<5	<5	<5	<5	<5
Vinyl chloride	8260B W	ug/L	2	<5	<5	1.61J	1<5	<5	<5	<5	<5	<5	<5	<5
Xylene (total)	8260B W	ug/L	10000	11.2	4.36J	0.579J	<10	<10	<10	<10	<10	3.55J	<10	<10
2,4-Dichlorophenol	8270D W	ug/L	---	<10.1	<10.1	<10.0	<10.2	<10.1	1.03J	<10.0	<10.1	<10.1	<11.1	<10.0
2-Methylnaphthalene	8270D W	ug/L	---	0.269J	<10.1	0.236J	<10.2	<10.1	0.253J	<10.0	<10.1	<10.1	<11.1	<10.0
Acetophenone	8270D W	ug/L	---	0.807J	0.881J	<10.0	<10.2	<10.1	<10.0	<10.0	<10.1	0.317J	<11.1	<10.0
Bis(2-Ethylhexyl)phthalate	8270D W	ug/L	---	0.745J	3.06J	1.54J	0.634J	<10.1	<10.0	1.28J	0.349J	0.878J	11.8	0.304J
Diethyl phthalate	8270D W	ug/L	---	6.31J	<10.1	<10.0	0.209J	<10.1	2.09J	0.649J	<10.1	2.51J	<11.1	<10.0
Di-n-butyl phthalate	8270D W	ug/L	---	0.241J	0.347J	0.281J	<10.2	<10.1	<10.0	0.533J	<10.1	<10.1	<11.1	<10.0
m,p-Cresol	8270D W	ug/L	---	<10.1	<10.1	24	<10.2	<10.1	<10.0	<10.0	<10.1	<10.1	<11.1	<10.0
Naphthalene**	8270D W	ug/L	25	2.13J	1.79J	0.662J	<10.2	<10.1	<10.0	<10.0	<10.1	<10.1	<11.1	<10.0
Phenanthrene	8270D W	ug/L	---	<10.1	<10.1	0.247J	<10.2	<10.1	<10.0	<10.0	<10.1	<10.1	<11.1	<10.0
2,4-D	8151A W	ug/L	70	11.2	5.53	<0.510	<0.505	<0.505	12.2	<0.510	<0.515	0.887	<0.505	<0.505
4,4'-DDD	8081B W	ug/L	---	<1.05	<1.02	<0.102	<0.103	<0.102	<0.101	<0.108	<0.105	<0.102	0.044J	<0.103
Aldrin	8081B W	ug/L	---	<0.524	0.671	0.019J	<0.052	<0.051	<0.050	<0.054	0.00660J	0.287	0.117	0.041J
alpha-BHC	8081B W	ug/L	---	<0.524	<0.510	<0.051	<0.052	<0.051	0.378	<0.054	<0.053	0.142	<0.051	<0.051
beta-BHC	8081B W	ug/L	---	<0.524	2.05	<0.051	<0.052	<0.051	0.85	<0.054	<0.053	<0.051	0.071	<0.051
Endrin aldehyde	8081B W	ug/L	---	<1.05	<1.02	<0.102	<0.103	<0.102	<0.101	<0.108	<0.105	0.027J	<0.103	<0.103
gamma-BHC (Lindane)	8081B W	ug/L	---	<0.524	0.327J	<0.051	<0.052	<0.051	<0.050	<0.054	<0.053	<0.051	<0.051	<0.051
gamma-Chlordane	8081B W	ug/L	---	<0.524	<0.510	<0.051	<0.052	<0.051	<0.050	<0.054	0.024J	<0.051	<0.051	<0.051
Heptachlor	8081B W	ug/L	0.4	<0.524	<0.510	<0.051	<0.052	<0.051	<0.050	<0.054	<0.053	0.154	0.026J	0.025J
Heptachlor epoxide	8081B W	ug/L	0.2	<0.524	0.63	<0.051	<0.052	<0.051	<0.050	<0.054	<0.053	<0.051	0.022J	0.045J
Arsenic	6010	mg/L	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0046B	<0.010	<0.010	<0.010	<0.010
Barium	6010	mg/L	2	1.5	0.86	0.42	0.096	0.09	0.8	1.94	0.58	1.35	0.19	0.44
Beryllium	6010	mg/L	0.04	0.00064B	0.000080B	0.00029B	0.00014B	0.00016B	<0.0050	0.017	0.000070B	0.0020B	0.00010B	0.0022B
Cadmium	6010	mg/L	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.014	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	6010	mg/L	0.1	0.00082B	0.0023B	0.0011B	0.00046B	0.00063B	0.0013B	0.048	0.0033B	0.0030B	0.00084B	0.012
Cobalt	6010	mg/L	---	<0.010	0.039	0.013	<0.010	<0.010	0.0081B	0.056	0.0028B	0.0061B	<0.010	0.0071B
Copper***	6010	mg/L	1.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.062	<0.010	0.0084B	<0.010	0.0042B
Lead***	6010	mg/L	0.015	0.0022B	0.0025B	0.0038B	<0.015	<0.015	0.0019B	0.14	0.0025B	0.015	0.0026B	0.022
Mercury	7470A W	mg/L	0.002	0.00017B	<0.00020	0.00007B	<0.00020	<0.00020	<0.00020	0.00022	0.00034	0.00052	0.00051	0.00102
Nickel	6010	mg/L	---	0.0016B	0.0017B	0.0012B	0.0014B	<0.040	<0.040	0.027B	<0.040	0.0038B	<0.040	0.0021B
Silver**	6010	mg/L	0.005	<0.010	0.00060B	0.00076B	<0.010	<0.010	0.00092B	<0.010	<0.010	<0.010	<0.010	<0.010
Thallium	6010	mg/L	0.002	<0.020	<0.020	<0.020	0.0025B	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	6010	mg/L	---	0.0051B	0.0038B	0.0067B	<0.020	<0.020	0.0043B	0.18	0.0039B	0.033	0.0018B	0.026
Zinc	6010	mg/L	---	0.043	0.0055B	0.04	0.0051B	<0.020	0.010B	1.44	0.0089B	0.14	0.0075B	0.15
Total Cyanide	335.3 W	mg/L	0.2	<0.0100	0.0050B	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0040B	0.0042B	<0.0100	<0.0100

Notes:
- ug/L — Micrograms per liter (parts per billion)
- mg/L — Milligrams per liter (parts per million)
- < — Indicates concentration below detection limit
- MCL — Maximum Contaminant Level as established by U.S. EPA.
- Bold — indicates that the parameter's reported concentration equaled or exceeded its respective MCL value.
- J — J flagged data indicates that the reported concentration is an estimated value.
- * — MCL is for Total Xylenes
- ** — Risk- Based Screening Level (RBSL)
- *** — Action Level (AL)

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314B

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-1	12/3/2009	20.5/20.5	0.5/0.5	0.0/0.0	0.0/0.0
GMP-3	3/20/2007	15.7/16.0	4.9/4.4	>3.0/>3.0	**>43/>43**
	6/8/2007	18.0/17.8	2.3/1.9	3.2/2.4	**62/47**
	9/20/2007	5.9/2.1	23.0/24.0	23.3/19.3	**>100/>100**
	12/31/2007	15.3/17.7	6.2/4.3	5.5/4.8	**>100/>100**
	3/12/2009	14.0/20.6	6.1/0.8	0.0/0.0	0.0/0.0
	12/3/2009	21.0/21.0	0.1/0.1	0.1/0.0	2.0/2.0
GMP-4	3/20/2007	0.0	>20	5.3	**6.45**
	6/8/2007	0.0	39.9	60.4	**>100**
	9/20/2007	0.2	38.3	36.1	**>100**
	12/31/2007	3.6	26.0	25.8	**>100**
	3/12/2009	Not Found			
	12/3/2009	0.2	39.1	60.5	**1210**
GMP-5	3/20/2007	4.0	17.3	2.8	**32.25**
	6/8/2007	16.5	4.4	4.2	**69**
	9/20/2007	20.3	0.7	0.7	**12**
	12/31/2007	20.1	1.0	0.5	**10**
	3/12/2009	19.2	2.7	4.0	**63**
	12/3/2009	19.2/14.2	2.2/13.0	3.3/18.8	**66.0/360.0**
GMP-6	3/20/2007	0.0	19.4	0.5	**6.02**
	6/8/2007	0.2	35.2	43.3	**>100**
	9/20/2007	0.3	40.5	44.3	**>100**
	12/31/2007	4.3	24.9	21.2	**>100**
	3/12/2009	20.9	0.0	0.1	3
	12/3/2009	21.1/21.1	0.1/0.1	0.0/0.0	0.0/0.0
GMP-7	3/20/2007	19.3	0.1	0.0	0.0
	6/8/2007	16.3	4.4	0.0	**69**
	9/20/2007	19.6	1.0	0.0	0.0
	12/31/2007	16.5	4.3	0.0	0.0
	3/12/2009	20.0	1.5	0.1	3
	12/3/2009	20.9/20.9	0.1/0.1	0.0/0.0	0.0/0.0

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314B

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
Club House	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.2	0.0	0.0	0.0
	9/20/2007	20.6	0.0	0.0	0.0
	12/31/2007	20.8	0.0	0.0	0.0
	3/12/2009	21.3	0.0	0.0	0.0
	12/3/2009	21.0	0.1	0.0	0.0
Shed	3/20/2007	20.9	0.0	0.0	0.0
	6/8/2007	20.3	0.0	0.0	0.0
	9/20/2007	20.7	0.0	0.0	0.0
	12/31/2007	20.9	0.0	0.0	0.0
	3/12/2009	21.2	0.0	0.0	0.0
	12/3/2009	21.1	0.1	0.0	0.0

Notes:

(1) The monitoring points are labeled "GMW-X" in the field, but are reported as "GMP-X" to avoid confusion with groundwater monitoring wells.

Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

3/12/09 data was collected with a Landtec GEM 2000 Landfill Gas Monitor calibrated to a methane standard.

TABLE 6
METHANE MONITORING RESULTS
JUNE 2010
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314B

Monitoring Point	Date	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-1	6/22/2010	17.4/18.2	01.1/00.7	00.1/00.1	0.01/0.02
GMP-3	6/21/2010	16.4/15.8	05.7/05.1	09.3/08.9	**>100/>100**
GMP-4	6/21/2010	9.2	21.2	36.7	**>100**
GMP-5	6/21/2010	14.4/20.5	10.6/00.2	11.5/00.1	**>100**/0.02
GMP-6	6/21/2010	03.6/00.5	24.5/38.4	30.7/52.5	**>100/>100**
GMP-7	6/21/2010	03.9/00.9	19.3/29.7	10.2/21.4	**>100/>100**
Club House	6/22/2010	20.7	0.01	0.00	0.00
Shed	6/22/2010	20.5	00.1	00.1	0.02

Notes:
(1) The monitoring points are labeled "GMW-X" in the field, but are reported as "GMP-X" to avoid confusion with groundwater monitoring wells.
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR AUGUST 2012 of FORMER NEWBERRY COUNTY LANDFILL SITE SCDHEC Solid Waste Permit #: DWP-117 432 Cockrell Road Newberry, South Carolina

Prepared for:

Mr. Mike Pisano, Public Works Director
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Prepared by:

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OCTOBER 2012

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SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR AUGUST 2012
of
FORMER NEWBERRY COUNTY LANDFILL SITE
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road
Newberry, South Carolina

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OCTOBER 2012

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1.0 EXECUTIVE SUMMARY

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week and weekend (usually on Wednesdays, Saturdays, and Sundays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

On August 30 and 31, 2012 TERRY personnel conducted a comprehensive groundwater sampling to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. However, during the sampling event monitoring well TMW-11 could not be located and monitoring wells MW-6 and TMW-12 as well as Cannons Creek and the tributaries were dry; therefore, these locations were not sampled.

Forty-seven (47) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only twelve (12) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's). Due to an insufficient volume of water in monitoring wells MW-3 and MW-5, only a partial list of parameters could be analyzed.

TERRY personnel recorded landfill gas measurements on August 30 and 31, 2012 at six (6) GMPs and two (2) structures located at the former landfill. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3(31%), GMP-4 (>40%), and GMP-5 (>40). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A passive landfill gas venting system was previously installed by TERRY in the vicinity of GMP-5 as directed by SCDHEC.

2.0 BACKGROUND

2.1 Groundwater Monitoring Network

The groundwater monitoring network consists of a total of 13 (thirteen) monitoring wells. Monitoring wells designated as TMW-9, TMW-10, TMW-12 and TMW-13 are located on the northeast side of Interstate Highway 26 (I-26). Monitoring wells TMW-12 and TMW-13 were installed in November 2009 in response to a SCDHEC directive dated September 17, 2009. Monitoring well TMW-11 has not been located since December 2007. All of the monitoring wells at the site were installed by others.

2.2 Methane Monitoring Network

Six (6) methane gas monitoring points (GMPs) identified as GMP-1 and GMP-3 through GMP-7 were previously installed along the boundaries of the former landfill and serve as the landfill gas monitoring network. Newberry County Public Works has installed six passive landfill gas vents as previously directed by SCDHEC. The GMPs are monitored as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). The locations of monitoring wells and GMPs are shown in Figure 2 and monitoring well construction details are summarized in Table 1.

2.3 Site Geology and Hydrogeology

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek. Groundwater flow within the uppermost aquifer has historically been to the east and northeast with discharge occurring into Cannons Creek.

3.0 GROUNDWATER MONITORING RESULTS

On August 30 and 31, 2012 TERRY personnel conducted a comprehensive groundwater sampling event to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. However, during the sampling event monitoring well TMW-11 could not be located and monitoring wells MW-6 and TMW-12 as well as Cannons Creek and the tributaries were dry; therefore, these locations were not sampled.

Prior to sample collection, the depth to water measurements and total well depths were determined relative to the top-of-casing (TOC) elevation. The TOC elevations were provided by previous assessment work performed at the site. The monitoring well and groundwater data are included in Appendix 2, on Table 1 and Table 2 and on the Groundwater Sampling Logs provided in Appendix 4. Water table elevation contour lines were created utilizing the piezometric data and linear interpolation between known groundwater elevations. The resulting Piezometric Map is included in Appendix 1 as Figure 3. General groundwater flow is towards the southeast. The gradient of the piezometric surface was calculated by dividing the change in elevation by the horizontal distance between two points located parallel to the groundwater flow direction. Based upon the piezometric data, a hydraulic gradient of 0.025 ft/ft was calculated.

Samples were collected and placed immediately in laboratory supplied glassware and shipped in a cooler packed with ice to Access Analytical Services, Inc. (SCDHEC Laboratory certification #73006) for analysis. The samples were analyzed for the Appendix V list of parameters as directed in the SCDHEC correspondence dated April 13, 2010. The only exception to this was that Dioxins were not included in the analyses as per the SCDHEC Project Manager as the likelihood of detection was deemed extremely low based on facility history.

Forty-seven (47) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only twelve (12) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's). Due to a limited volume of water in monitoring wells MW-3 and MW-5, only a partial list of parameters could be analyzed.

A table summarizing the parameters detected in concentrations greater than their respective MDLs during the August 2012 monitoring event is provided in Appendix 2, Table 4. Historical groundwater analytical data is provided in Appendix 2, Table 3. A figure depicting the parameters exceeding their respective MCL/RBSL/AL during the August 2012 monitoring event is shown in Figure 4, Appendix 1. A copy of the groundwater analytical report is provided as Appendix 5.

4.0 METHANE MONITORING RESULTS

TERRY personnel recorded landfill gas measurements on August 30 and 31, 2012 at six (6) GMPs and two (2) structures located at the former landfill. The methane concentrations were measured using a Landtec GEM-2000 Landfill Gas Monitor. The instrument simultaneously determines percent oxygen, percent carbon dioxide, percent methane gas, and determines percent LEL (lower explosive limit). A table summarizing the landfill gas data recorded during the August 2012 event is provided in Appendix 2, Table 6. Field data and field data collection logs are provided in Appendix 3. Historical landfill gas data is provided in Appendix 2, Table 5.

The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3, GMP-4, and GMP-5. Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A figure depicting the methane concentrations is shown in Figure 5. A passive landfill gas venting system was previously installed by Newberry County Public Works in the vicinity of GMP-5 as directed by SCDHEC.

5.0 CONCLUSIONS

On August 30 and 31, 2012 TERRY personnel conducted a comprehensive groundwater sampling and recorded landfill gas measurements at six (6) GMPs and two (2) structures located at the former landfill. Forty-seven (47) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only twelve (12) parameters were detected in concentrations that equaled or exceeded their respective established MCLs, RBSL's, or AL's. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3 (31%), GMP-4 (>40%), and GMP-5 (>40%). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling.

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



TERRY ENVIRONMENTAL SERVICES — CLIENTS FIRST ALWAYS	**FIGURE 1** **SITE LOCATION** FORMER NEWBERRY COUNTY MSW LANDFILL 432 Cockrell Road Newberry, South Carolina SCDHEC Solid Waste Permit #: DWP-117			
... providing our clients with the best services available, actually understanding our clients objectives, and making their obectives our own!	SIZE: B	TERRY Project No.: 2314F	DWG NO.: Figure 1 Site Location.dwg	REV
PO Box 25 Summerville, South Carolina 29484 (800) 325-0605 (843)-873-8200 fax: (843)-873-8765	SCALE: NOT TO SCALE		DATE: October 2012	

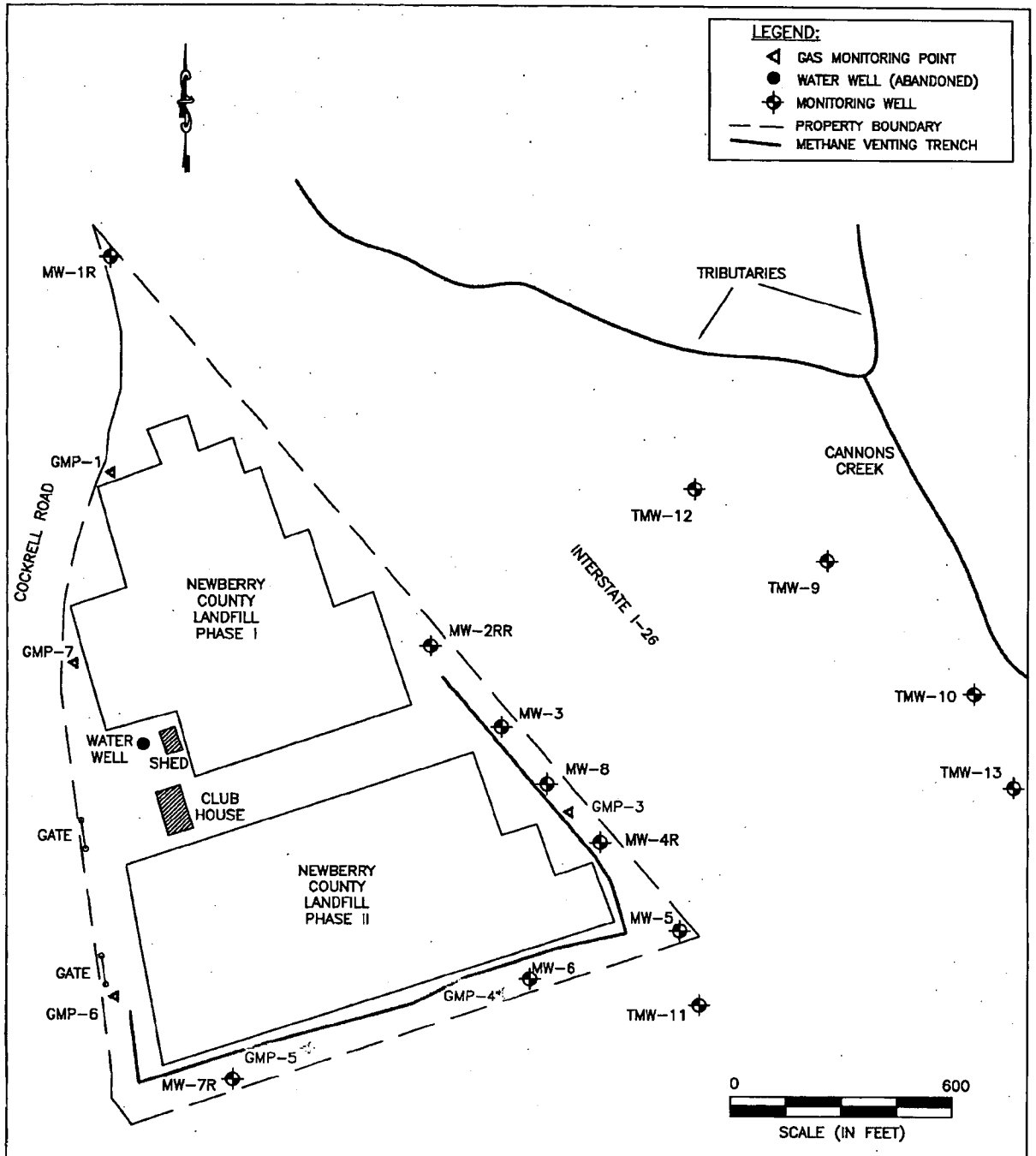


FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

TERRY ENVIRONMENTAL SERVICES
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Summerville, South Carolina 29484
(800) 325-0605 (843)-873-8200 fax: (843)-873-8765

SIZE	TERRY Project No.	DWG NO.	REV
B	2314F	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: October 2012

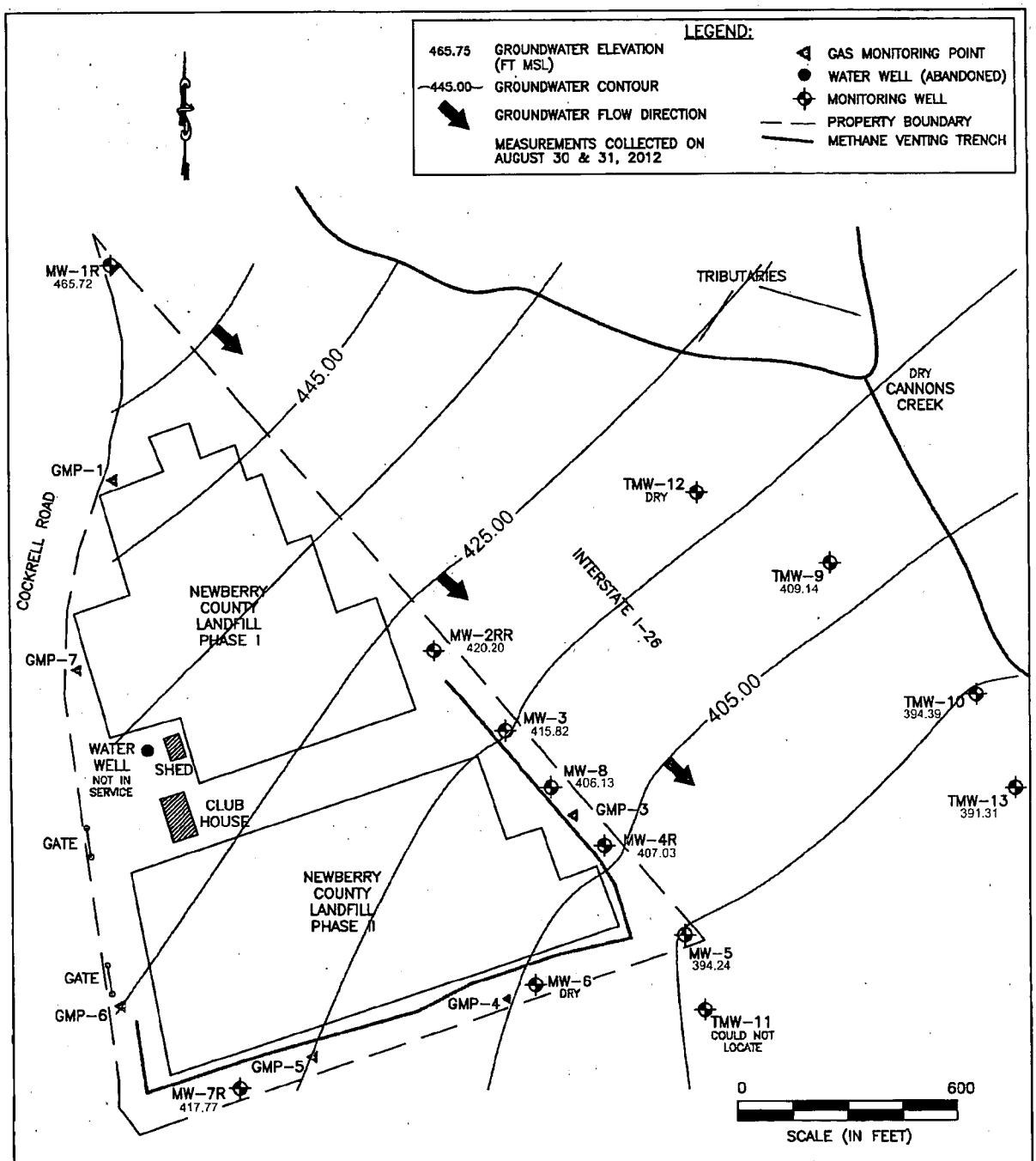


FIGURE 3
PIEZOMETRIC MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO.	REV
B	2314F	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: October 2012

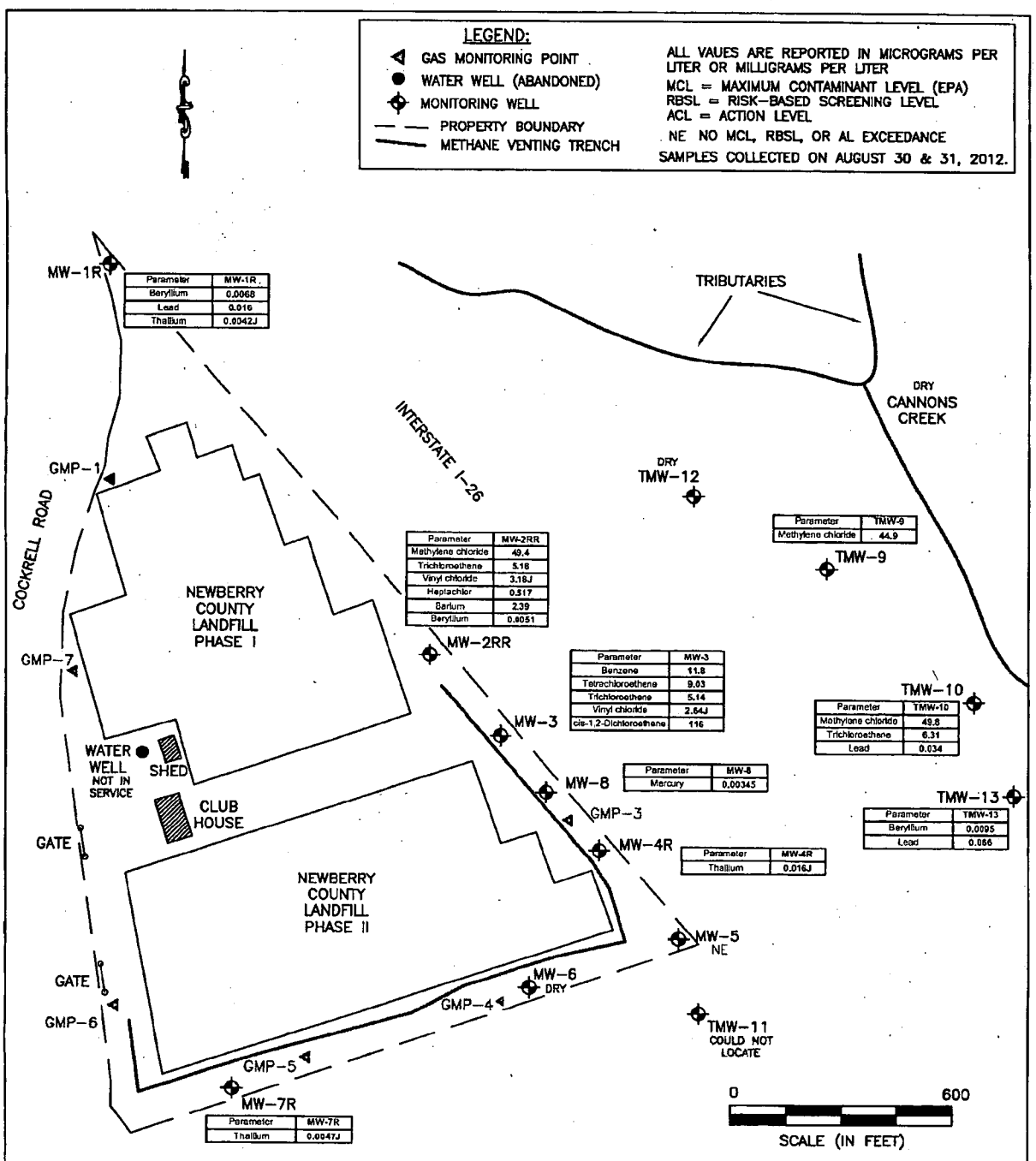


FIGURE 4

Parameters Equal to or Exceeding MCL, RBSL, or AL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO.	REV
B	2314F	Figure 4 Analytical Data.dwg	

SCALE: 1 inch = 400 feet

DATE: October 2012

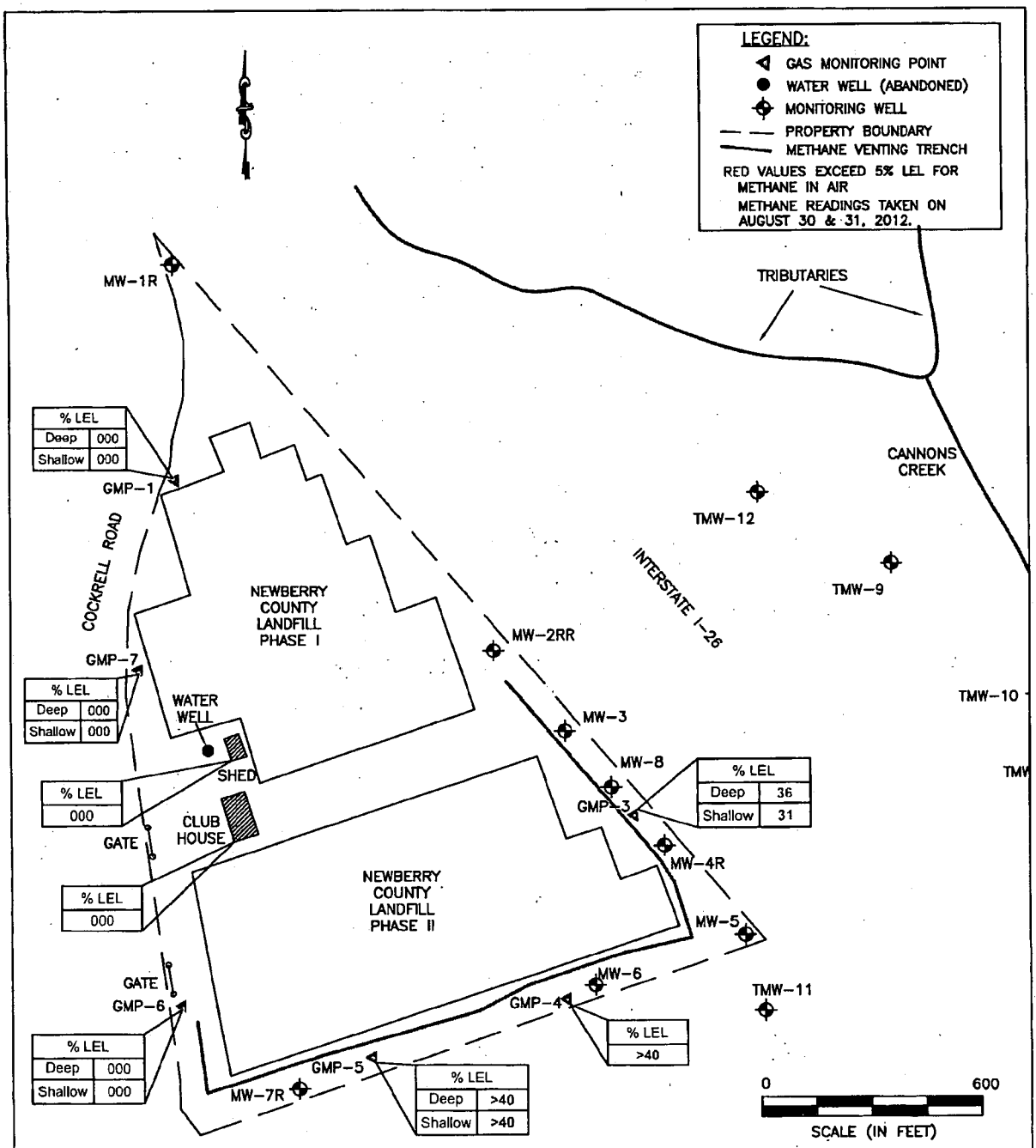


FIGURE 5
METHANE %LEL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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SIZE	TERRY Project No.	DWG NO.	REV
B	2314F	Figure 5 Methane LEL Map.dwg	

SCALE: 1 inch = 400 feet

DATE: October 2012

APPENDIX 2

Tables

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314F

Monitoring Well ID	Reported TOC Elevation*	Reported Total Well Depth**	Measured Well Depth** Aug. 30 & 31, 2012	Reported Screened Interval**(ft)	Reported Latitude	Reported Longitude
MW-1R	504.92	63	60.6	48.0 – 63.0	Unknown	Unknown
MW-2RR	459.82	63	58.7	48.0 – 63.0	Unknown	Unknown
MW-3	453.92	34	38.8	Unknown	34° 17' 50"	81° 33' 07"
MW-4R	441.55	63	62.5	48.0 – 63.0	Unknown	Unknown
MW-5	420.12	31	33.9	Unknown	34° 17' 44"	81° 33' 00"
MW-6	440.55	25	27.8	10.0 – 25.0	34° 17' 42"	81° 33' 08"
MW-7R	457.34	63	62.8	48.0 – 63.0	Unknown	Unknown
MW-8	443.39	68	71.8	58.0 – 68.0	Unknown	Unknown
TMW-9	457.58	75	74.0	65.0 – 75.0	Unknown	Unknown
TMW-10	415.07	45	44.1	35.0 – 45.0	Unknown	Unknown
TMW-11	Unknown	30	Well not located	20.0 – 30.0	Unknown	Unknown
TMW-12	468.18	42.6	42.1	22.6 – 42.6	Unknown	Unknown
TMW-13	409.25	44.4	43.3	14.4 – 44.4	Unknown	Unknown

Notes:
*Relative to an assumed elevation
**Relative to top of casing

TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2012
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314F

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
MW-1R	6/22/2007	504.92	32.18	472.74	
	12/31/2007		35.48	469.44	
	3/12/2009		36.72	468.20	
	12/4/2009		36.36	468.56	
	6/22/2010		32.02	472.90	
	12/2/2010		33.96	470.96	
	2/7/2012		38.03	466.89	
	8/31/2012		39.20	465.72	
MW-2RR	6/22/2007	459.82	36.10	423.72	
	12/31/2007		36.40	423.42	
	3/12/2009		37.41	422.41	
	12/4/2009		37.10	422.72	
	6/21/2010		34.82	452.00	
	12/1/2010		36.04	423.78	
	2/6/2012		38.74	421.08	
	8/30/2012		39.62	420.20	
MW-3	6/22/2007	453.92	35.28	418.64	
	12/31/2007		37.20	416.72	
	3/12/2009		36.75	417.18	
	12/4/2009		36.52	417.40	
	6/21/2010		34.21	419.71	
	12/1/2010		35.14	418.78	
	2/6/2012		37.38	416.54	Limited samples collected
	8/30/2012		38.10	415.82	Limited samples collected
MW-4R	6/22/2007	441.55	31.68	409.87	
	12/31/2007		34.70	406.85	
	3/12/2009		32.56	408.99	
	12/4/2009		32.28	409.27	
	6/22/2010		30.69	410.86	
	12/1/2010		32.72	408.83	
	2/7/2012		34.23	407.32	
	8/30/2012		34.52	407.03	
MW-5	6/22/2007	420.12	23.40	396.72	
	12/31/2007		26.03	394.09	
	3/12/2009		23.95	396.17	
	12/4/2009		-	-	Well not located
	6/22/2010		22.75	397.37	
	12/1/2010		24.90	395.22	
	2/7/2012		25.55	394.57	Limited samples collected
	8/30/2012		25.88	394.24	Limited samples collected

TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2012
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314F

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
MW-6	6/22/2007	440.55	27.22	413.33	
	12/31/2007		25.55	415.00	
	3/12/2009		24.55	416.00	
	12/4/2009		24.30	416.25	
	6/21/2010		21.70	418.85	
	12/2/2010		24.30	416.25	
	2/6/2012		26.77	413.78	Limited samples collected
	8/30/2012		-	-	Dry-No Samples Collected
MW-7R	6/22/2007	457.34	35.78	421.56	
	12/31/2007		37.20	420.14	
	3/12/2009		35.91	421.43	
	12/4/2009		35.30	422.04	
	6/22/2010		33.78	423.56	
	12/2/2010		36.15	421.19	
	2/6/2012		38.88	418.46	
	8/30/2012		39.57	417.77	
MW-8	6/22/2007	443.39	35.50	407.89	
	12/31/2007		37.80	405.59	
	3/12/2009		35.29	408.10	
	12/4/2009		35.04	408.35	
	6/21/2010		33.44	409.95	
	12/1/2010		35.47	407.92	
	2/6/2012		36.92	406.47	
	8/30/2012		37.26	406.13	
TMW-9	6/22/2007	457.58	47.35	410.23	
	12/31/2007		47.33	410.25	
	3/12/2009		47.30	410.27	
	12/3/2009		47.21	410.37	
	6/22/2010		45.63	411.95	
	12/1/2010		46.55	411.03	
	2/6/2012		48.01	409.57	
	8/30/2012		48.44	409.14	
TMW-10	6/22/2007	415.07	18.90	396.17	
	12/31/2007		21.10	393.97	
	3/12/2009		18.75	396.32	
	12/3/2009		18.47	396.60	
	6/22/2010		18.44	396.63	
	12/1/2010		19.99	395.08	
	2/6/2012		20.35	394.72	
	8/30/2012		20.68	394.39	

TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2012
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314F

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water	Water-Level Elevation**	Comment
TMW-11	6/22/2007	Unknown	26.08	-	
	12/31/2007		28.60	-	
	3/12/2009		-	-	Well not located
	12/3/2009		-	-	Well not located
	6/21/2010		-	-	Well not located
	12/2/2010		-	-	Well not located
	2/6/2012		-	-	Well not located
	8/30/2012		-	-	Well not located
TMW-12	12/3/2009	468.18	41.78	426.40	Insufficient volume to sample
	6/22/2010		41.97	426.21	Insufficient volume to sample
	12/1/2010		41.96	426.22	Insufficient volume to sample
	2/6/2012		41.96	426.22	Insufficient volume to sample
	8/30/2012		-	-	Dry-No Samples Collected
TMW-13	12/3/2009	409.25	14.96	394.29	
	6/22/2010		15.20	394.05	
	12/1/2010		17.20	392.05	
	2/6/2012		17.53	391.72	
	8/30/2012		17.94	391.31	

Notes:
*Relative to an assumed elevation
**Relative to top of casing

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Date Sampled	Acetone (µg/L)	Benzene (µg/L)	Bromobenzene (µg/L)	Bromochloromethane (µg/L)	Bromodichloromethane (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)	2-Butanone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Carbon disulfide (µg/L)	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	2-Chlorotoluene (µg/L)	4-Chlorotoluene (µg/L)	Dibromochloromethane (µg/L)	1,2-Dibromo-3-chloropropane (µg/L)	1,2-Dibromoethane (EDB) (µg/L)	Dibromomethane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	Dichlorodifluoromethane (µg/L)	1,1-Dichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	1,2-Dichloropropane (µg/L)	1,3-Dichloropropane (µg/L)	2,2-Dichloropropane (µg/L)	1,1-Dichloropropene (µg/L)	cis-1,3-Dichloropropene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Ethylbenzene (µg/L)	Hexachlorobutadiene (µg/L)	Isopropylbenzene (µg/L)	p-Isopropyltoluene (µg/L)	Methylene chloride (µg/L)	Naphthalene (µg/L)	n-Propylbenzene (µg/L)	Styrene (µg/L)	1,1,1,2-Tetrachloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	Tetrachloroethene (PCE) (µg/L)	Toluene (µg/L)	1,2,3-Trichlorobenzene (µg/L)	1,2,4-Trichlorobenzene (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	Trichloroethene (TCE) (µg/L)	Trichlorofluoromethane (µg/L)	1,2,3-Trichloropropane (µg/L)	1,2,4-Trimethylbenzene (µg/L)	1,3,5-Trimethylbenzene (µg/L)	Vinyl chloride (µg/L)	m,p-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)
	MCL:	Unknown	5	70	70	70	80	4	70	2,000	70	70	70	700	5	100	70	80	70	70	70	80	0.05	0.05	70	600	600	75	1,000	5	5	7	70	100	5	70	70	70	5	70	70	5	70	5	70	5	5	5	70	5	5	5	70	70	10,000	10,000	10,000
	SCDHEC PAL:	Unknown	2,500	1	80	80	0.6	4	1,400	240	70	70	70	700	0.5	20	70	80	70	70	70	80	0.05	0.05	70	600	600	75	200	5	0.38	7	70	100	0.5	70	70	70	0.5	70	70	0.5	70	0.5	70	0.5	0.5	0.5	70	0.5	0.5	0.5	70	70	10,000	10,000	10,000
MW-1R	6/23/07	3.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	10	33	-	<1.0	<1.0	65	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<3.0	<1.0	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	<100	<25	<3.0	<3.0	<100	<100	<3.0	<10.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	4/4/08	Not Sampled																																																																				
	3/13/09	<5.00	<3.00	<5.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<25.0	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<100.0	<5.00	<5.00	<5.00	<5.00	<3.00	<5.00	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	<100.0	<5.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
	12/4/09	<3.00	<3.00	<5.00	<5.00	<3.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<3.00	<3.00	53.00	<3.00	<3.00	<3.00	<100.0	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<100.0	<5.00	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
	6/23/10	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	0.0223	<5	<5	<5	<5	<10	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/7/10	<5.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/7/13	<5.00	<1.00	<3.00	<5.00	<5.00	<5.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	<5.00	<1.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	8/19/13	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	<5.00	<1.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	6/23/07	37	3.9	<1.0	<1.0	<1.0	<1.0	0.8	-	<25	<1.0	15	<1.0	<1.0	-	7.2	8.7	<1.0	<1.0	<1.0	<1.0	32	<1.0	28	1.3	1.4	<1.0	-	<1.0	2.8	89	<1.0	1.2	-	1.1	3.6	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	17.1	<1.0	<5.0	<5.0	<1.0	<5.0	<5.0	<5.0	<100	<25	<5.0	<5.0	<100	<100	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																																																			
	3/13/09	25.9	1.38J	<5.00	<5.00	<3.00	<5.00	<1.00	11.6	<3.00	<25.0	7.83J	<5.00	<5.00	<5.00	1.32J	<5.00	<5.00	<5.00	<1.00	89.5	<2.0	6.83J	<5.00	18.9	3.84J	<3.00	1.33J	11.8	69.2	<3.00	<3.00	-	1.96J	2.40J	1.14J	-	3.47	4.66J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	22.9	1.40J	<5.00	<5.00	2.24J	<5.00	<1.00	17.5	<5.00	<25.0	8.48J	<5.00	<3.00	<5.00	3.51	<1.00	<5.00	8.40	<2.00	819	<5.00	8.94	<5.00	16.7	<5.00	<5.00	2.61J	18.3	64.2	<5.00	<5.00	-	3.47	4.66J	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	23.1	<5	<5	<5	2.43J	<5	<5	16.2	<5	<25	<5.00	<5	<5	13.2	3.91J	<5	<5	13.1	<5	838	<5	<5	6.00	8.97J	<5	<5	<5	11.2	81.9	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/7/10	25	<5.0	<5.0	<5.0	<5.0	<5.0	17	<10	<50	<5.0	<5.0	<5.0	<5.0	12	<5.0	<10	<5.0	12	<5.0	75	<5.0	<5.0	<5.0	9.8	<5.0	<5.0	<10	9.2	11	86	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/8/13	53.1	0.983J	<5	0.477J	3.15J	<5	<5	12.6	<5	<5	5.84J	<5	<5	<5	4.87J	8.25J	<5	7.42	<5	94.3	<5	3.16J	<5	<5.0u	0.412J	<5	2.77J	6.94J	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/20/13	55.1	0.842J	<5.00	0.661J	2.22J	0.516J	<5.00	12.1	<1.00	<5.00	1.18J	1.44J	<5.00	<5.00	<5.00	4.72	<1.00	<5.00	7.03	<5.00	89.4	<5.00	3.71J	<5.00	<5.00	5.18	<5.00	<5.00	3.16J	7.77	<2.1	0.327J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/07	<25	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	7.5	-	<25	89	<1.0	<1.0	-	7.1	16	<1.0	1.9	<1.0	34	<1.0	37	1.6	1.8*	<1.0	-	<1.0	3.3	108	<1.0	1.4	-	2.1	13	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	12.8	<3.0	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	<100	<25	<3.0	<3.0	<100	<100	<3.0	<10.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<100	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	4/4/08	Not Sampled																																																																		
	3/13/09	16.3	<5.00	<5.00	<5.00	<3.00	<5.00	<1.00	6.87	<5.00	<25.0	78.3	<5.00	<5.00	<5.00	2.74J	6.56	<5.00	1.26J	<1.00	2.32J	<5.00	11.7	<5.00	1.32J	<3.00	<5.00	8.52J	143	<3.00	<3.00	-	1.97J	4.83J	<5.00	-	3.97	6.64	4.94J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	14.1	<5.00	<5.00	<5.00	1.26J	<5.00	<1.00	10.7	<5.00	<25.0	18.1	<5.00	<5.00	<5.00	6.44J	4.85J	<5.00	1.64J	<2.00	11.3J	<5.00	19.8	3.47J	1.12J	<5.00	<5.00	2.18J	15.3	104	<5.00	<5.00	-	3.97	6.64	4.94J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	8.66	<5	<5	<5	1.83J	<5	<5	10.6	<5	<25	15.8	<5	<5	<5	3.64J	<5	<5	<5	<5	79.5	<5	4.93J	1.34J	1.26J	<5	<5	<5	4.56J	119	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/7/10	14	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	9.4	<10	<50	24	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	39	<5.0	16	<5.0	<5.0	<5.0	<5.0	3.8J	<5.0	118	<5.0	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/8/13	19.7	<5	<5	0.284J	0.886J	<5	<5	9.49	<5	<5	1.61J	<5	<5	<5	1.43J	2.96	<5	<5	<5	19.2	<5	0.921J	1.71J	<5	<5	<5	1.76J	2.41J	76.9	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/20/13	10.5	0.613J	<5.00	<5.00	0.916J	0.410J	<5.00	3.51J	<5.00	<5.00	<1.00	<5.00	<5.00	<5.00	1.94J	<5.00	<5.00	<5.00	1.16J	2.28J	<5.00	0.83J	3.09J	5.54	<5.00	<5.00	12.4J	2.83J	118	0.625J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/07	29.6	9.9	<1.0	2.9	43.9	<1.0	<1.0	5.6	-	<25	4.4	41.0	<1.0	-	4.2	3.5	<1.0	1.8	<1.0	27	<1.0	<1.0	2.5	2.1	<1.0	-	<1.0	2.2	87	<1.0	<1.0	-	1.7	3.1*	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	17.8	6.9	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	<100	<25	<3.0	<3.0	<100	<100	<3.0	<10.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<100	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	4/4/08	Not Sampled																																																																	
	3/13/09	36.9	8.66	<5.00	1.16J	<5.00	<5.00	<1.00	1.93J	<5.00	<25.0	2.20J	<5.00	<5.00	<5.00	4.02J	<5.00	<2.00	<5.00	<5.00	8.87J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<100.0	3.47	<5.00	<5.00	<5.00	1.07J	3.07J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	19.6	4.13J	<5.00	3.96J	<3.00	<5.00	0.438J	4.51J	<5.00	<25.0	2.19J	<5.00	<5.00	<5.00	7.31	0.902J	<5.00	0.636J	<2.00	4.49J	<5.00	<5.00	1.22J	0.853J	<5.00	<5.00	<3.00	5.47J	4.11J	<5.00	<5.00	-	5.53	3.37	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	27.3	2.83J	<5	<5	<5	<5	<5	4.49J	9.5	<25	2.49J	<5	<5	<5	6.11	<5	<5	<5	<5	1.93J	<5	<5	2.16J	<5	<5	<5	<5	<10	4.80J	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/7/10	25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	4.1J	<5.0	<5.0	<5.0	6.3	<10	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	6.2	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/7/13	10.6	0.613J	<5	0.216J	<5	<5	<5	3.53J	<5	<5	1.43J	<5	<5	<5	4.24J	2.04J	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	4.47J	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/19/13	10.5	0.473J	<5.00	0.736J	<5.00	<5.00	<1.00	3.97J	<5.00	<5.00	1.19J	<5.00	<5.00	<5.00	2.46	<1.00	<5.00	<5.00	<5.00	1.88J	<5.00	<5.00	<5.00	0.483J	0.427J	<5.00	<5.00	0.769J	<1.00	4.36J	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.6*	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/31/07	<5.0	<1.0	<5.0	<5.0	<1.0	<5.0	<5.0	7.0J	<100	<25	7.3	<5.0	<5.0	<100	<100	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<100	<5.0	<5.0	-	<5.0	15.1	<5.0	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	0.727J	<1.00	<3.00	<5.00	<3.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	3/13/09	<5.00	<1.00	<3.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	<5.00	<1.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	12/4/09	<5.00	<1.00	<3.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	<5.00	<1.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	6/23/10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	0.0481J	<5	<5	<5	<5	<10	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/7/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/7/13	1.86J	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	0.473J	<5	<5	<5	<5	0.313J	<5	<5	<5	<5	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/19/13	1.86J	<1.00	<3.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	<5.00	<1.00	<1.00	<5.00	<1.00	<5.00	<5.00	<5.00	0.388J	0.611J	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
µg/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentrations exceeds respective MCL
NS= Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

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TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Sample ID	Sample Date	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes, Total (µg/L)	Acetone (µg/L)	Carbon Disulfide (µg/L)	Methylene Chloride (µg/L)	Naphthalene (µg/L)	1,2,4-Trimethylbenzene (µg/L)	1,3,5-Trimethylbenzene (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Dichlorodifluoromethane (µg/L)	Trichlorofluoromethane (µg/L)	1,1-Dichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Methyl tert-butyl ether (µg/L)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	Vinyl chloride (µg/L)	1,2-Dibromoethane (µg/L)	1,2-Dichloropropane (µg/L)	Isopropylbenzene (µg/L)	n-Propylbenzene (µg/L)	Styrene (µg/L)	Bromobenzene (µg/L)	2-Chlorotoluene (µg/L)	4-Chlorotoluene (µg/L)	p-Isopropyltoluene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	n-Butylbenzene (µg/L)	1,2,4-Trichlorobenzene (µg/L)	Hexachlorobutadiene (µg/L)	Naphthalene (µg/L)
Regulatory Criteria (Federal RSL)		1.2	700	1,000	10,000	14,000	810	4.3	6.2	780	780	0.19	190	200	5,200	3.6	0.12	280	70	140	12	0.41	0.76	0.019	0.054	0.85	690	800	1,600	1.5	160	160	690	780	780	780	3.9	0.86	6.2
Regulatory Criteria (SCDHEC R.61-58)		5	700	1,000	10,000	14,000	810	5	6.2	780	780	80	190	200	5,200	3.6	5	7	70	100	12	5	5	2	0.05	5	690	800	1,600	1.5	160	160	690	780	780	780	3.9	0.86	6.2
TMW-11	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	-	<23	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	7.6	<10.0	<25	8.3	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	16.3	<5.0	-	68.4	<5.0	11.7	<5.0	-	-	-	-
	4/4/08	0.740J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<22.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/16/09	Could Not Locate																																							
	6/22/10	Could Not Locate																																							
	12/2/10	Could Not Locate																																							
	3/6/13	Could Not Locate																																							
	9/30/13	Could Not Locate																																							
TMW-12	12/3/09	Insufficient Sample Volume																																							
	6/22/10	Insufficient Sample Volume																																							
	12/1/10	Insufficient Sample Volume																																							
	3/6/13	Insufficient Sample Volume																																							
	9/30/13	Not Sampled (Dry)																																							
TMW-13	12/3/09	2.34J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00
	6/22/10	<5	<5	<5	<5	<5	<5	<5	<5	4.77	<25	<5	<5	<5	1.02J	<5	<5.0	<5	<5	<5	<5	<10	<5	<5	0.889J	<5	<5	<5	<10.0	<5	<5	<5	-	-	-	-	-	-	-	-	-	-
	12/1/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-	-	-	-
	3/6/13	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10.0	<5	<5	<5	-	-	-	-	-	-	-	-	-	-
	9/30/13	1.0J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	-	-	-	-	-	-	-	-	-	-
Water Well	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	-	<23	<1.0	1.4	<1.0	-	<1.0	3.9	8.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0
	1/8/08	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<10.0	<25	<5.0	6.2	<10.0	-	<5.0	<5.0	10.8	12.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																								
	12/1/09	<5.00	<5.00	<5.00	<5.00	<5.00	<5.0	<5.00	<5.00	<5.00	<25.0	<5.00	9.86	<5.00	<2.00	<5.00	<5.00	87.0	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<10.0	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00
	12/1/09	Not In Service																																								
	6/22/10	Not In Service																																								
	12/1/10	Not In Service																																								
	3/6/13	Not In Service																																								
	9/30/13	Not In Service																																								
Cannons Creek	6/24/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	-	<23	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0	-	-	<1.0	<1.0	<1.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	-	<5.0	<50	<5.0	<10.0	<25	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	-	-	-
	4/4/08	Not Sampled																																								
	1/1/09	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<100	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<10.0	2.37J	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00
	12/3/09	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<10.0	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00	-	-	<5.00	<5.00	<5.00
	6/22/10	Not Sampled																																								
	12/1/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<10	<50	<5.0	<5.0	<5.0	<2.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	<10.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-	-	-	-
	3/6/13	Dry																																								
	9/30/13	Not Sampled (Dry)																																								

Notes
ug/L= Micrograms per liter
mg/L= Milligrams per Liter
MCL= Maximum Contaminant Level
J= Estimated value
Bolded Concentrations exceed respective MCL
INS= Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Date																						

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SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Semivolatile Organic Compounds (Method 8270D)									Chlorinated Pesticides, TCL (Method 8081B)										Chlorinated Herbicides (Method 8151A)
		1,4-Dichlorobenzene	2-Methylnaphthalene	Acenaphthene	Bis(2-Ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate	Naphthalene	Pentachlorophenol	Phenol-Cresol	4,4'-DDD	4,4'-DDT	Aldrin	Endosulfan I	Endrin aldehyde	Heptachlor	Heptachlor epoxide	Alpha-BHC	Beta-BHC	Gamma-BHC (Lindane)	Gamma-Chlordane	2,4-D
Units:		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2B FPA MCL:		-	-	-	-	-	-	25	-	-	-	-	-	6	-	-	0.4	0.2	-	-	0.2	-	70
MW-6	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																					
	3/12/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<10.0	0.7361	<10.0	1.341	<0.7813	<10.0	0.6621	0.2471	24	<0.102	-	0.0191	-	<0.102	<0.051	<0.034	<0.051	<0.031	<0.051	<0.051	<0.316
	12/2/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.250	<2.0
	5/9/12	<10.3	<10.2	<10.3	<10.3	<10.2	<10.3	<10.3	<10.2	<10.3	<0.103	<0.103	<0.026	<0.052	<0.103	<0.051	<0.052	<0.052	<0.052	<0.026	<0.052	<0.257	<0.20
	9/30/12	Not Sampled (Dry)																					
MW-7R	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																					
	3/12/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10.1	<10.1	0.3493	<10.1	<10.1	<10.1	<10.1	<10.1	<0.103	-	0.00607	-	<0.103	<0.053	<0.053	<0.053	<0.053	<0.053	0.0241	<0.315
	12/2/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	5/9/12	<10.1	<10.1	<10.2	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.102	<0.102	<0.025	<0.051	<0.102	<0.051	<0.051	<0.051	<0.051	<0.025	<0.051	<0.251	<0.20
	9/30/12	<10.2	<10.2	<10.2	3.171	<10.2	<10.2	<10.2	<10.2	<10.2	<0.104	<0.104	<0.051	<0.051	<0.104	<0.051	<0.051	<0.051	<0.051	<0.026	<0.051	0.0113	<2.0
MW-8	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																					
	3/12/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<10.2	<10.2	<10.2	0.6342	<10.2	0.2091	<10.2	<10.2	<10.2	<0.103	-	<0.052	-	<0.103	<0.052	<0.052	<0.052	<0.052	<0.052	<0.052	<0.565
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	5/9/12	<10.3	<10.2	<10.3	<10.2	<10.2	<10.3	<10.2	<10.2	<10.2	<0.102	<0.102	<0.025	<0.051	<0.102	<0.051	<0.051	<0.051	<0.051	<0.025	<0.051	<0.257	<0.20
	9/30/13	<10.0	<10.0	<10.0	0.533	<10.0	0.3069	<10.0	<10.0	<10.0	<0.100	0.0151	0.0038	<0.0250	<0.100	<0.050	<0.050	0.0331	<0.030	<0.030	<0.050	<0.250	<2.0
TWM-9	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																					
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10.1	0.3172	0.8788	<10.1	2.361	<10.1	<10.1	<10.1	<0.102	-	0.283	-	0.0231	0.134	<0.051	0.142	<0.051	<0.051	<0.051	0.887
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<50	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	5/9/12	<10.2	<10.2	<10.2	<10.2	<10.2	2.122	<10.2	<10.2	<10.2	<0.102	<0.102	<0.051	<0.051	<0.102	<0.051	<0.052	0.100	0.248	<0.052	<0.052	<0.257	<0.20
	9/30/12	<10.0	<10.0	<10.0	<10.0	<10.0	2.231	0.3962	<10.0	<10.0	<0.102	0.183	0.081	<0.051	<0.102	0.219	<0.051	<0.051	0.178	<0.031	<0.051	<0.255	<10
TMW-10	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																					
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10	0.3173	0.8788	<10.1	2.361	<10.1	<10.1	<10.1	<0.102	-	0.281	-	0.0231	0.134	<0.051	0.142	<0.051	<0.051	<0.051	0.887
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	5/9/12	<10.2	<10.2	<10.3	<10.2	<10.2	<10.3	<10.3	<10.3	<10.3	<0.103	0.00781	<0.026	0.0101	<0.103	<0.051	<0.052	<0.052	0.0481	<0.026	<0.052	<0.257	<0.20
	9/30/12	<10.2	<10.2	<10.2	<10.2	<10.2	0.4645	<10.2	<10.2	<10.2	<0.101	<0.101	0.0191	<0.051	<0.101	0.0181	<0.051	<0.051	<0.051	<0.026	<0.051	<0.253	<2.0

Notes
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bolds= Concentrations exceeds respective MCL
DUP= Duplicate sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Semivolatile Organic Compounds (Method 8270D)									Chlorinated Pesticides, TCL (Method 8081B)											Chlorinated Herbicides (Method 8151A)
		2,4-Dichlorophenol	2-Methylnaphthalene	4-Cresol	Bis(2-Ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate	Naphthalene	Pentachlorophenol	Phenol	4,4'-DDD	4,4'-DDT	Aldrin	Endosulfan I	Endrin aldehyde	Heptachlor	Heptachlor epoxide	Alpha-BHC	Beta-BHC	Gamma-BHC (Lindane)	Gamma-Chlordane	2,4-D
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
40 CFR Part 257		-	-	-	-	-	-	25	-	-	-	-	-	-	-	0.6	0.2	-	-	0.3	-	70
TMW-11	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/3/08	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/13/09	Could Not Locate																				
	12/4/09	Could Not Locate																				
	6/22/10	Could Not Locate																				
	12/2/10	Could Not Locate																				
	2/6/12	Could Not Locate																				
	8/30/12	Could Not Locate																				
TWMW-10	12/3/09	Insufficient Sample Volume																				
	6/22/10	Insufficient Sample Volume																				
	12/1/10	Insufficient Sample Volume																				
	2/6/12	Insufficient Sample Volume																				
	8/30/12	Not Sampled (Dry)																				
TWMW-11	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<10.0	<10.0	<10.0	9.30 J	<10.0	<10.0	<10.0	<10.0	<10.0	<0.981	-	0.0615 J	-	<0.103	0.0251 J	0.0451 J	<0.051	<0.051	<0.051	<0.051	<0.505
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<2.0
	2/6/12	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.102	<0.102	<0.051	<0.050	<0.102	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.50
	8/30/12	<10.1	<10.1	<10.1	1.18J	0.232J	<10.1	<10.1	<10.1	<10.1	<0.100	0.0281 J	0.0151 J	<0.050	<0.100	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0
Water Well	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/3/08	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	Not Sampled																				
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	Not In Service																				
	6/23/10	Not In Service																				
	12/1/10	Not In Service																				
	2/6/12	Not In Service																				
	8/30/12	Not In Service																				
Cannons Creek	6/22/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	Not Sampled																				
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	Not Sampled																				
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<2.0
	2/6/12	Dry																				
	8/30/12	Not Sampled (Dry)																				

Notes
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentration exceeds respective MCL
INS= Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B)																Method 9012A	Method 7470A	Method 9034B
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc	Cyanide	Mercury	Sulfide
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
USEPA MCL		0.010	2	0.004	0.005	0.1	-	1.3	0.015	-	0.05	0.05	0.002	-	-	-	0.2	0.002	-
MW-1R	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/14/08	Not Sampled																	
	1/12/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<0.010	0.09	0.000143	<0.0050	0.000635	<0.010	<0.010	<0.015	<0.040	-	<0.010	<0.020	-	<0.020	<0.020	<0.0100	<0.00020	
	12/2/10	<0.0500	0.161	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0300	<0.0200	<0.0100	<0.0100	<0.0100	0.000279	<0.0100	<0.0200	<0.010	<0.00020	9.60
	2/7/12	<0.010	0.09	0.000781	<0.0050	<0.010	0.00111	0.00247	0.00437	<0.040	<0.010	<0.010	<0.020	<0.013	0.00723	0.026	<0.0100	<0.00020	<2.00
	8/31/12	<0.010	0.61	0.0063	0.00153	0.00247	0.00583	0.025	0.016	<0.040	<0.040	<0.010	0.00423	<0.013	0.037	0.093	<0.010	0.000161	<2.00
MW-2RR	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/14/08	Not Sampled																	
	1/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<0.010	1.3	0.000648	<0.0050	0.000238	<0.010	<0.010	0.00228	0.00165	-	<0.010	<0.020	-	0.00218	0.043	<0.0100	0.000178	-
	12/1/10	<0.0500	1.24	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0300	<0.0200	<0.0100	<0.0100	<0.0200	0.00228	<0.0100	0.00276	<0.010	<0.00020	<2.00
	2/6/12	<0.010	1.37	0.00121	<0.0050	<0.010	<0.010	<0.010	0.00443	<0.040	<0.040	<0.010	<0.020	<0.013	0.0111	0.062	0.0180	<0.00020	<2.00
	8/30/12	<0.010	1.39	0.0021	<0.0050	<0.010	0.00427	<0.010	0.0151	<0.040	<0.040	<0.010	<0.020	<0.013	0.034	0.15	<0.010	0.00023	<2.00
MW-3	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/14/08	Not Sampled																	
	1/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<0.010	0.66	0.000588	<0.0050	0.00238	0.030	<0.010	0.00758	0.00178	-	0.000608	<0.020	-	0.00388	0.00618	0.00508	<0.00020	-
	12/1/10	<0.0500	1.13	<0.0100	<0.0050	<0.0100	0.0323	<0.0100	0.0229	<0.0200	<0.0100	<0.0100	<0.0200	0.00138	0.0120	0.0433	<0.010	<0.00020	<2.00
	2/6/12	<0.010	1.41	0.021	0.00237	0.00195	0.041	0.023	0.13	<0.040	<0.040	<0.010	<0.020	<0.013	0.24	0.72	0.0160	0.00129	INS
	8/30/12	INS															INS	INS	INS
MW-4R	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/14/08	Not Sampled																	
	1/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<0.010	0.83	<0.0050	<0.0050	0.00138	0.00618	<0.010	0.00195	<0.040	-	0.000918	<0.020	-	0.00439	0.0108	<0.0100	<0.00020	-
	12/1/10	<0.0500	0.846	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0300	<0.0200	<0.0100	<0.0100	<0.0200	<0.013	<0.0100	0.0114	<0.010	<0.00020	<2.00
	2/7/12	<0.010	0.88	<0.0050	<0.0050	<0.010	0.00991	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.013	0.00331	<0.020	1.68	<0.00020	<2.00
	8/30/12	<0.010	0.79	0.000132	0.00171	<0.010	0.011	0.00372	<0.015	<0.040	<0.040	<0.010	0.0163	<0.013	0.0137	0.00791	<0.010	0.000153	<2.00
MW-5	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/14/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	Could Not Locate																	
	6/22/10	0.00648	1.94	0.017	0.0164	0.048	0.056	0.062	0.14	0.0378	-	<0.010	<0.020	-	0.11	1.44	<0.0100	0.00031	-
	12/1/10	<0.0500	0.514	<0.0100	0.00775	<0.0100	<0.0200	<0.0100	<0.0300	<0.0200	<0.0100	<0.0100	<0.0200	0.00195	<0.0100	0.0130	<0.010	<0.00020	<2.00
	2/7/12	<0.010	0.11	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.013	<0.010	0.0153	0.0145	<0.00020	<2.00
	8/30/12	<0.010	0.13	0.000751	0.00121	0.00183	0.00641	0.00481	<0.015	<0.040	<0.040	<0.010	<0.020	<0.013	0.00394	0.035	<0.010	0.000143	<2.00

Notes
mg/L= Milligrams per liter
ug/L= Micrograms per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentration exceeds respective MCL
INS= Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B)															Method 9012A	Method 7470A	Method 9030B
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc	Cyanide	Mercury	Sulfide
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
US EPA MCL		0.010	2	0.004	0.005	0.1	-	1.3	0.015	-	0.05	0.005	0.002	-	-	-	0.2	0.002	-
MW-6	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.42	0.000198	<0.0030	0.00118	0.013	<0.010	0.00358	0.00385	-	0.000768	<0.020	-	0.00678	0.04	<0.0100	0.000078	-
	12/7/10	<0.0500	0.361	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0250	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	0.130	<0.010	<0.00020	<1.00
	2/6/12	<0.010	0.48	0.000318	0.00533	0.00701	0.00641	0.017	<0.010	<0.040	<0.040	<0.010	<0.020	<0.025	0.047	0.61	0.00683	0.00071	<1.00
	8/30/12	Not Sampled (Dry)																	
MW-7R	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.28	0.000278	<0.0050	0.00338	0.00258	<0.010	0.00258	<0.040	-	<0.010	<0.020	-	0.00398	0.00988	0.00408	0.00014	-
	12/7/10	<0.0500	0.474	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0250	0.0128	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	<0.00020	<2.00
	2/6/12	<0.010	0.42	<0.0053	<0.0050	<0.010	0.00182	<0.010	<0.010	0.00233	<0.040	<0.010	<0.020	<0.025	0.00437	0.00641	0.1574	<0.00020	<2.00
	8/30/12	0.00643	0.39	<0.0053	0.00141	<0.010	0.00381	0.00417	<0.015	<0.040	<0.040	<0.010	0.00473	<0.025	0.00260	0.00681	0.00126	0.000127	<1.00
MW-8	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/12/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.096	0.000148	<0.0050	0.000465	<0.010	<0.010	<0.015	0.00148	-	<0.010	0.00258	-	<0.020	<0.020	<0.0100	<0.00010	-
	12/7/10	<0.0500	0.103	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0250	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	0.00033	<2.00
	2/6/12	<0.010	0.12	<0.0053	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.020	0.00299	<0.0100	0.00171	<2.00
	8/30/12	<0.010	0.18	<0.0053	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00117	0.0187	<0.010	0.00145	<1.00
TMW-9	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.58	0.00208	<0.0050	0.00338	0.00619	0.00648	0.013	0.00388	-	<0.010	<0.020	-	0.0031	0.04	0.00478	0.00032	-
	12/7/10	<0.0500	0.743	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0250	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	0.0146	<0.010	<0.00020	<2.00
	2/6/12	<0.010	1.07	<0.0053	<0.0050	0.00131	0.00181	0.00581	0.00622	<0.040	<0.040	<0.010	<0.020	<0.025	0.0071	0.081	0.00321	0.000171	<2.00
	8/30/12	0.00361	1.01	0.00108	<0.0050	<0.010	0.00217	0.00161	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.0142	0.059	<0.010	0.00138	<1.00
TMW-10	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.38	0.00203	<0.0050	0.00318	0.00618	0.00548	0.013	0.00388	-	<0.010	<0.020	-	0.0031	0.04	0.00478	0.00032	-
	12/7/10	<0.0500	0.184	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0250	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	0.00079	<2.00
	2/6/12	<0.010	0.18	<0.0030	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00183	0.0037	0.0164	0.00044	<2.00
	8/30/12	<0.010	0.40	0.00217	<0.0050	<0.010	0.00731	0.011	0.024	<0.040	<0.040	0.000437	<0.020	<0.025	0.0122	0.047	<0.010	0.00055	<2.00

Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Contaminant Level
J = Estimated value
Bold = Concentrations exceed respective MCL
INS = Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B)																Method 8012A	Method 7470A	Method 9030B
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc	Chloride	Mercury	Sulfide
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
US EPA MCL		0.010	2	0.004	0.005	0.1		1.3	0.015		0.05	0.005	0.002			250	0.002	
TMW-11	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/9/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/13/09	Could Not Locate																
	12/4/09	Could Not Locate																
	6/22/10	Could Not Locate																
	12/2/10	Could Not Locate																
	2/6/12	Could Not Locate																
	8/30/12	Could Not Locate																
TMMW-12	12/3/09	Insufficient Sample Volume																
	6/23/10	Insufficient Sample Volume																
	12/1/10	Insufficient Sample Volume																
	2/6/12	Insufficient Sample Volume																
	8/30/12	Not Sampled (Dry)																
TMMW-13	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.44	0.00228	<0.0050	0.012	0.00718	0.00648	0.033	0.00213	-	<0.010	<0.020	-	0.026	0.15	<0.0100	0.03121	-
	12/1/10	<0.0500	1.93	<0.0100	<0.0050	0.0168	<0.0200	0.0135	0.0365	<0.0200	<0.0100	<0.0100	<0.0200	0.031	0.0153	0.212	<0.010	0.00101	<2.00
	2/6/12	<0.010	0.34	<0.0050	<0.0050	0.00432	0.00181	<0.010	0.00401	<0.040	<0.040	<0.010	<0.020	<0.025	0.00932	0.069	0.00445	0.00024	<2.00
	8/30/12	<0.010	1.65	0.0093	<0.0050	0.035	0.071	0.027	0.066	<0.040	<0.040	<0.010	<0.020	<0.025	0.081	0.55	<0.010	0.00025	<2.00
Water Well	6/27/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/8/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	Not In Service																	
	6/22/10	Not In Service																	
	12/1/10	Not In Service																	
	2/6/12	Not In Service																	
	8/30/12	Not In Service																	
Cannons Creek	6/27/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	Not Sampled																	
	12/1/10	<0.0500	0.248	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.025	<0.0100	<0.0100	<0.010	<0.00028	<2.00
	2/6/12	Dry																	
	8/30/12	Not Sampled (Dry)																	

Notes
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
e= Estimated value
Bold= Concentration exceeds respective MCL
INS= Insufficient sample volume

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
AUGUST 2012
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314F

Parameter	Analytical Method	Units	MCL	MW-1R	MW-2RR	MW-3	MW-4R	MW-5	MW-7R	MW-8	TMW-9	TMW-10	TMW-13
				8/31/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012
1,1-Dichloroethane	8260B	ug/L	---	<5.00	15.3	10.8	10.5	1.86J	2.37J	7.60	11.7	43.7	1.07J
1,1-Dichloroethene	8260B	ug/L	7	<5.00	0.642J	0.613J	0.874J	<5.00	<5.00	2.05J	<5.00	4.38J	<5.00
1,2-Dichlorobenzene	8260B	ug/L	600	<5.00	0.611J	<5.00	2.76J	<5.00	<5.00	<5.00	0.415J	<5.00	<5.00
1,2-Dichloroethane	8260B	ug/L	5	<5.00	2.22J	0.916J	<5.00	<5.00	<5.00	<5.00	0.626J	<5.00	<5.00
1,2-Dichloropropane	8260B	ug/L	5	<5.00	0.516J	0.420J	<5.00	<5.00	<5.00	<5.00	0.434J	<5.00	<5.00
1,4-Dichlorobenzene	8260B	ug/L	75	<5.00	12.1	5.51	3.92J	<5.00	2.29J	1.16J	6.31	2.10J	<5.00
Acetone	8260B	ug/L	---	<5.00	1.18J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Benzene	8260B	ug/L	5	<5.00	4.45J	**11.8**	1.98J	<5.00	0.857J	0.969J	2.93J	2.81J	<5.00
Chlorobenzene	8260B	ug/L	100	<5.00	4.72J	1.90J	5.46	<5.00	<5.00	0.599J	3.04J	0.368J	<5.00
Dichlorodifluoromethane	8260B	ug/L	---	<5.00	7.02	<5.00	<5.00	0.998J	<5.00	5.56	5.72	4.02J	<5.00
Ethylbenzene	8260B	ug/L	700	<5.00	<5	1.16J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Methylene chloride	8260B	ug/L	5	<5.00	**49.4**	2.20J	<5.00	<5.00	4.81J	4.59J	**44.9**	**49.8**	<5.00
Tetrachloroethene	8260B	ug/L	5	<5.00	3.71J	**9.03**	<5.00	<5.00	0.642J	1.86J	3.49J	4.73J	<5.00
Toluene	8260B	ug/L	1000	<5.00	<5.00	3.09J	0.938J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Trichloroethene	8260B	ug/L	5	<5.00	**5.18**	**5.14**	0.422J	0.388J	0.807J	2.61J	4.33J	**6.31**	<5.00
Trichlorofluoromethane	8260B	ug/L	---	<5.00	<5.00	<5.00	<5.00	0.651J	<5.00	2.39J	<5.00	<5.00	<5.00
Vinyl chloride	8260B	ug/L	2	<5.00	**3.18J**	**2.64J**	0.569J	<5.00	<5.00	<5.00	1.92J	<5.00	<5.00
Xylene (total)	8260B	ug/L	10000	<15.0	7.27J	2.83J	<15.0	<15.0	<15.0	<15.0	2.37J	1.95J	<15.0
cis-1,2-Dichloroethene	8260B	ug/L	70	<5.00	42.1	**116**	4.76J	0.846J	7.71	7.89	27.2	20.4	<5.00
trans-1,2-Dichloroethene	8260B	ug/L	---	<5.00	0.327J	0.625J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
2-Methylnaphthalene	8270D	ug/L	---	<11.1	<10.2	INS	<10.0	<10.3	<10.2	<10.0	<10.0	<10.2	<10.1
Bis(2-Ethylhexyl)phthalate	8270D	ug/L	---	1.10J	<10.2	INS	2.40J	<10.3	5.17J	4.52J	<10.0	<10.2	1.18J
Di-n-butyl phthalate	8270D	ug/L	---	<11.1	<10.2	INS	<10.0	<10.3	<10.2	<10.0	<10.0	<10.2	0.232J
Diethyl phthalate	8270D	ug/L	---	<11.1	<10.2	INS	1.29J	<10.3	<10.2	0.306J	2.23J	0.464J	<10.1
aphthalene	8270D	ug/L	25	<11.1	<10.2	INS	0.378J	<10.3	<10.2	<10.0	0.396J	<10.2	<10.1
4,4'-DDD	8081B	ug/L	---	<0.101	0.296	INS	<0.101	<0.100	<0.101	<0.100	<0.102	<0.101	<0.100
4,4'-DDT	8081B	ug/L	---	<0.101	0.405	INS	<0.101	<0.100	<0.101	0.015J	0.185	<0.101	0.00813J
Aldrin	8081B	ug/L	---	<0.051	0.252	INS	0.017J	<0.050	<0.051	0.058	0.081	0.019J	0.013J
Endosulfan I	8081B	ug/L	---	<0.051	<0.051	INS	<0.051	<0.050	<0.051	<0.050	<0.051	<0.051	<0.050
Heptachlor	8081B	ug/L	0.4	<0.051	**0.517**	INS	0.190	<0.050	<0.051	<0.050	0.239	0.016J	<0.050
alpha-BHC	8081B	ug/L	---	<0.051	<0.051	INS	0.078	<0.050	<0.051	0.033J	<0.051	<0.051	<0.050
beta-BHC	8081B	ug/L	---	<0.051	<0.051	INS	<0.051	<0.050	<0.051	<0.050	0.170	0.035J	<0.050
gamma-Chlordane	8081B	ug/L	---	<0.051	<0.051	INS	0.015J	<0.050	0.011J	<0.050	<0.051	<0.051	<0.050
Arsenic	6010B	mg/L	0.010	<0.010	<0.010	INS	<0.010	<0.010	0.0064J	<0.010	0.0036J	<0.010	<0.010
Barium	6010B	mg/L	2	0.61	**2.39**	INS	0.79	0.15	0.39	0.16	1.01	0.40	1.65
Beryllium	6010B	mg/L	0.004	**0.0068**	**0.0051**	INS	0.00013J	0.00025J	<0.0050	<0.0050	0.0010J	0.0021J	**0.0095**
Cadmium	6010B	mg/L	0.005	0.0015J	<0.0050	INS	0.0017J	0.0023J	0.0014J	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	6010B	mg/L	0.1	0.0034J	<0.010	INS	<0.010	0.0018J	<0.010	<0.010	<0.010	<0.010	0.035
Cobalt	6010B	mg/L	---	0.0088J	0.0042J	INS	0.011	0.00064J	0.0038J	<0.010	0.0023J	0.0023J	0.021
Copper	6010B	mg/L	1.3	0.023	<0.010	INS	0.0057J	0.0040J	0.0043J	<0.010	0.0030J	0.015	0.023
Lead	6010B	mg/L	0.015	**0.016**	0.015J	INS	<0.015	<0.015	<0.015	<0.015	<0.015	**0.034**	**0.066**
Silver	6010B	mg/L	---	<0.010	<0.010	INS	<0.010	<0.010	<0.010	<0.010	<0.010	0.00065J	<0.010
Thallium	6010B	mg/L	0.002	**0.0042J**	<0.020	INS	**0.016J**	<0.020	**0.0047J**	<0.020	<0.020	<0.020	<0.020
Vanadium	6010B	mg/L	---	0.037	0.034	INS	0.017J	0.0029J	0.0080J	0.0017J	0.014J	0.017J	0.082
Zinc	6010B	mg/L	---	0.093	0.15	INS	0.0079J	0.035	0.0098J	0.018J	0.059	0.065	0.55
Cyanide	9012A	mg/L	0.2	<0.010	<0.010	INS	<0.010	<0.010	0.0026J	<0.010	<0.010	<0.010	<0.010
Mercury	7470A	mg/L	0.002	0.00016J	0.00023	INS	0.00015J	0.00014J	0.00015J	**0.00345**	0.00038	0.00055	0.00055

Notes:
- ug/L — Micrograms per liter
- mg/L — Milligrams per liter
- MCL — Maximum Contaminant Level as established by U.S. EPA.
- Bold — Indicates that the parameter's reported concentration equaled or exceeded its respective MCL value.
- J — indicates that the reported concentration is an estimated value.
- INS — Insufficient sample volume for parameter

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314F

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-1	12/3/2009	Deep	20.5	0.5	0.0	0.0
		Shallow	20.5	0.5	0.0	0.0
	6/22/2010	Deep	17.4	01.1	00.1	1
		Shallow	18.2	00.7	00.1	2
	12/2/2010	Deep	19.8	00.1	00.0	0
		Shallow	20.1	00.1	00.1	1
	2/7/2012	Deep	19.8	01.4	00.0	000
		Shallow	19.8	01.3	00.0	001
	8/31/2012	Deep	16.2	04.6	00.0	000
		Shallow	18.6	01.7	00.0	000
GMP-3	3/20/2007	Deep	15.7	4.9	>3.0	**>43**
		Shallow	16.0	4.4	>3.0	**>43**
	6/8/2007	Deep	18.0	2.3	3.2	**62**
		Shallow	17.8	1.9	2.4	**47**
	9/20/2007	Deep	5.9	23.0	23.3	**>100**
		Shallow	2.1	24.0	19.3	**>100**
	12/31/2007	Deep	15.3	6.2	5.5	**>100**
		Shallow	17.7	4.3	4.8	**>100**
	3/12/2009	Deep	14.0	6.1	0.0	0
		Shallow	20.6	0.8	0.0	0
	12/3/2009	Deep	21.0	0.1	0.1	2.0
		Shallow	21.0	0.1	0.1	2.0
	6/21/2010	Deep	16.4	0.57	0.93	**>100**
		Shallow	15.8	0.51	0.89	**>100**
	12/1/2010	Deep	20.7	00.1	00.1	1
		Shallow	20.8	00.1	00.1	2
	2/6/2012	Deep	15.7	07.2	08.8	**>100**
		Shallow	15.1	08.1	09.6	**>100**
	8/30/2012	Deep	19.2	01.5	01.8	**36**
		Shallow	14.3	07.2	01.5	**31**
GMP-4	3/20/2007	Shallow	0.0	>20	5.3	**6.45**
	6/8/2007	Shallow	0.0	39.9	60.4	**>100**
	9/20/2007	Shallow	0.2	38.3	36.1	**>100**
	12/31/2007	Shallow	3.6	26.0	25.8	**>100**
	3/12/2009	Shallow	Not Found			
	12/3/2009	Shallow	0.2	39.1	60.5	**1210**
	6/21/2010	Shallow	9.2	21.2	36.7	**>100**
	12/2/2010	Shallow	7.1	23.4	38.3	**>100**
	2/6/2012	Shallow	00.0	39.7	60.2	**>100**
	8/30/2012	Shallow	00.2	37.8	55.2	**>40**

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314F

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-5	3/20/2007	Shallow	4.0	17.3	2.8	**32.25**
	6/8/2007	Shallow	16.5	4.4	4.2	**69**
	9/20/2007	Shallow	20.3	0.7	0.7	**12**
	12/31/2007	Shallow	20.1	1.0	0.5	**10**
	3/12/2009	Shallow	19.2	2.7	4.0	**63**
	12/3/2009	Deep	19.2	2.2	3.3	**66.0**
		Shallow	14.2	13.0	18.8	**360.0**
	6/21/2010	Deep	14.4	10.6	11.5	**>100**
		Shallow	20.5	00.2	00.1	2
	12/2/2010	Deep	13.8	07.9	00.1	3
		Shallow	20.6	00.4	00:1	3
	2/6/2012	Deep	07.5	10.3	00.6	**022**
		Shallow	00.0	28.6	32.9	**>100**
	8/30/2012	Deep	06.6	14.4	01.2	**>40**
		Shallow	00.2	32.5	47.7	**>40**
GMP-6	3/20/2007	Shallow	0.0	19.4	0.5	**6.02**
	6/8/2007	Shallow	0.2	35.2	43.3	**>100**
	9/20/2007	Shallow	0.3	40.5	44.3	**>100**
	12/31/2007	Shallow	4.3	24.9	21.2	**>100**
	3/12/2009	Shallow	20.9	0.0	0.1	3
	12/3/2009	Deep	21.1	0.1	0.0	0.0
		Shallow	21.1	0.1	0.0	0.0
	6/21/2010	Deep	03.6	24.5	30.7	**>100**
		Shallow	00.5	38.4	52.5	**>100**
	12/2/2010	Deep	20.4	00.1	00.1	3
		Shallow	11.9	13.1	16.8	**>100**
	2/6/2012	Deep	03.2	22.1	22.6	**>100**
		Shallow	00.0	34.9	49.2	**>100**
	8/31/2012	Deep	20.2	00.0	00.0	000
		Shallow	20.2	00.0	00.0	000

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314F

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-7	3/20/2007	Shallow	19.3	0.1	0.0	0.0
	6/8/2007	Shallow	16.3	4.4	0.0	**69**
	9/20/2007	Shallow	19.6	1.0	0.0	0.0
	12/31/2007	Shallow	16.5	4.3	0.0	0.0
	3/12/2009	Shallow	20.0	1.5	0.1	3
	12/3/2009	Deep	20.9	0.1	0.0	0.0
		Shallow	20.9	0.1	0.0	0.0
	6/21/2010	Deep	0.39	19.3	10.2	**>100**
		Shallow	00.9	29.7	21.4	**>100**
	12/2/2010	Deep	19.1	02.9	01.5	**31**
		Shallow	19.2	02.2	00.0	1
	2/7/2012	Deep	20.9	00.1	00.1	002
		Shallow	20.8	00.1	00.1	002
	8/31/2012	Deep	20.4	00.0	00.0	000
		Shallow	20.5	00.0	00.0	000
Club House	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.2	0.0	0.0	0.0
	9/20/2007	Building	20.6	0.0	0.0	0.0
	12/31/2007	Building	20.8	0.0	0.0	0.0
	3/12/2009	Building	21.3	0.0	0.0	0.0
	12/3/2009	Building	21.0	0.1	0.0	0.0
	6/22/2010	Building	20.7	0.1	00.1	0.0
	12/1/2010	Shallow	20.6	0.00	0.00	1
	2/7/2012	Building	20.9	00.1	00.0	001
	8/31/2012	Building	20.6	00.0	00.0	000
Shed	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.3	0.0	0.0	0.0
	9/20/2007	Building	20.7	0.0	0.0	0.0
	12/31/2007	Building	20.9	0.0	0.0	0.0
	3/12/2009	Building	21.2	0.0	0.0	0.0
	12/3/2009	Building	21.1	0.1	0.0	0.0
	6/22/2010	Building	20.5	0.1	00.1	2
	12/1/2010	Shallow	20.6	0.01	0.00	1
	2/7/2012	Building	20.9	00.1	00.1	002
	8/31/2012	Building	20.3	00.0	00.0	000

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

TABLE 6
METHANE MONITORING RESULTS
AUGUST 2012
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314F

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-1	8/31/2012	Deep	16.2	04.6	00.0	000
		Shallow	18.6	01.7	00.0	000
GMP-3	8/30/2012	Deep	19.2	01.5	01.8	**36**
		Shallow	14.3	07.2	01.5	**31**
GMP-4	8/30/2012	Shallow	00.2	37.8	55.2	**>40**
GMP-5	8/30/2012	Deep	06.6	14.4	01.2	**>40**
		Shallow	00.2	32.5	47.7	**>40**
GMP-6	8/31/2012	Deep	20.2	00.0	00.0	000
		Shallow	20.2	00.0	00.0	000
GMP-7	8/31/2012	Deep	20.4	00.0	00.0	000
		Shallow	20.5	00.0	00.0	000
Club House	8/31/2012	Building	20.6	00.0	00.0	000
Shed	8/31/2012	Building	20.3	00.0	00.0	000

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT
FOR FEBRUARY 2013
of
FORMER NEWBERRY COUNTY LANDFILL SITE
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road
Newberry, South Carolina

Prepared for:

Mr. Mike Pisano, Public Works Director
Newberry County
P.O. Box 156
Newberry, South Carolina 29108

Prepared by:

TERRY Environmental Services
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P.O. Box 25
Summerville, South Carolina 29484
(843) 873-8200
Fax (843) 873-8765
www.terryenvironmental.com
TERRY Project # 2314H

APRIL 2013

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SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR FEBRUARY 2013
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KELLY K. CONE, PG
VICE PRESIDENT – ASSESSMENT SERVICES

JASON A. TERRY, PG
PRESIDENT

KELLY K. CONE REGISTERED No. 2509 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

APRIL 2013

County 1981A

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1.0 EXECUTIVE SUMMARY

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week and weekend (usually on Wednesdays, Saturdays, and Sundays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

On February 21, 2013 TERRY personnel conducted a comprehensive groundwater sampling to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. However, during the sampling event monitoring well TMW-11 could not be located and monitoring wells MW-3, MW-6, and TMW-12 were dry; therefore, these locations were not sampled.

Forty-six (46) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only six (6) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's).

TERRY personnel recorded landfill gas measurements on February 21 and 22, 2013 at six (6) GMPs and two (2) structures located at the former landfill. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-4 (>>>), GMP-5 (888), and GMP-6 (696). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A passive landfill gas venting system was previously installed by Newberry County Public Works in the vicinity of GMP-5 as directed by SCDHEC.

County 1983 A

2.0 BACKGROUND

2.1 Groundwater Monitoring Network

The groundwater monitoring network consists of a total of 13 (thirteen) monitoring wells. Monitoring wells designated as TMW-9, TMW-10, TMW-12 and TMW-13 are located on the northeast side of Interstate Highway 26 (I-26). Monitoring wells TMW-12 and TMW-13 were installed in November 2009 in response to a SCDHEC directive dated September 17, 2009. Monitoring well TMW-11 has not been located since April 2008 and assumed destroyed. All of the monitoring wells at the site were installed by others.

2.2 Methane Monitoring Network

Six (6) methane gas monitoring points (GMPs) identified as GMP-1 and GMP-3 through GMP-7 were previously installed along the boundaries of the former landfill and serve as the landfill gas monitoring network. Newberry County Public Works has installed six passive landfill gas vents as previously directed by SCDHEC. The GMPs are monitored as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). The locations of monitoring wells and GMPs are shown in Figure 2 and monitoring well construction details are summarized in Table 1.

2.3 Site Geology and Hydrogeology

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek. Groundwater flow within the uppermost aquifer has historically been to the east and northeast with discharge occurring into Cannons Creek.

3.0 GROUNDWATER MONITORING RESULTS

On February 21, 2013 TERRY personnel conducted a comprehensive groundwater sampling event to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. However, during the sampling event monitoring well TMW-11 could not be located and monitoring wells MW-3, MW-6, and TMW-12 were dry; therefore, these locations were not sampled.

Prior to sample collection, the depth to water measurements and total well depths were determined relative to the top-of-casing (TOC) elevation. The TOC elevations were provided by previous assessment work performed at the site. The monitoring well and groundwater data are included in Appendix 2, on Table 1 and Table 2 and on the Groundwater Sampling Logs provided in Appendix 4. Water table elevation contour lines were created utilizing the piezometric data and linear interpolation between known groundwater elevations. The resulting Piezometric Map is included in Appendix 1 as Figure 3. General groundwater flow is towards the southeast. The gradient of the piezometric surface was calculated by dividing the change in elevation by the horizontal distance between two points located parallel to the groundwater flow direction. Based upon the piezometric data, a hydraulic gradient of 0.028 ft/ft was calculated.

Samples were collected and placed immediately in laboratory supplied glassware and shipped in a cooler packed with ice to Access Analytical Services, Inc. (SCDHEC Laboratory certification #73006) for analysis. The samples were analyzed for the Appendix V list of parameters as directed in the SCDHEC correspondence dated April 13, 2010. The only exception to this was that Dioxins were not included in the analyses as per the SCDHEC Project Manager as the likelihood of detection was deemed extremely low based on facility history.

Forty-six (46) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only six (6) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's).

A table summarizing the parameters detected in concentrations greater than their respective MDLs during the February 2013 monitoring event is provided in Appendix 2, Table 4. Historical groundwater analytical data is provided in Appendix 2, Table 3. A figure depicting the parameters exceeding their respective MCL/RBSL/AL during the February 2013 monitoring event is shown in Figure 4, Appendix 1. A copy of the groundwater analytical report is provided as Appendix 5.

4.0 METHANE MONITORING RESULTS

TERRY personnel recorded landfill gas measurements on February 21 and 22, 2013 at six (6) GMPs and two (2) structures located at the former landfill. The methane concentrations were measured using a Landtec GEM-500 Landfill Gas Monitor. The instrument simultaneously determines percent oxygen, percent carbon dioxide, percent methane gas, and determines percent LEL (lower explosive limit). A table summarizing the landfill gas data recorded during the February 2013 event is provided in Appendix 2, Table 6. Field data and field data collection logs are provided in Appendix 3. Historical landfill gas data is provided in Appendix 2, Table 5.

The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-4, GMP-5, and GMP-6. Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A figure depicting the methane concentrations is shown in Figure 5. A passive landfill gas venting system was previously installed by Newberry County Public Works in the vicinity of GMP-5 as directed by SCDHEC.

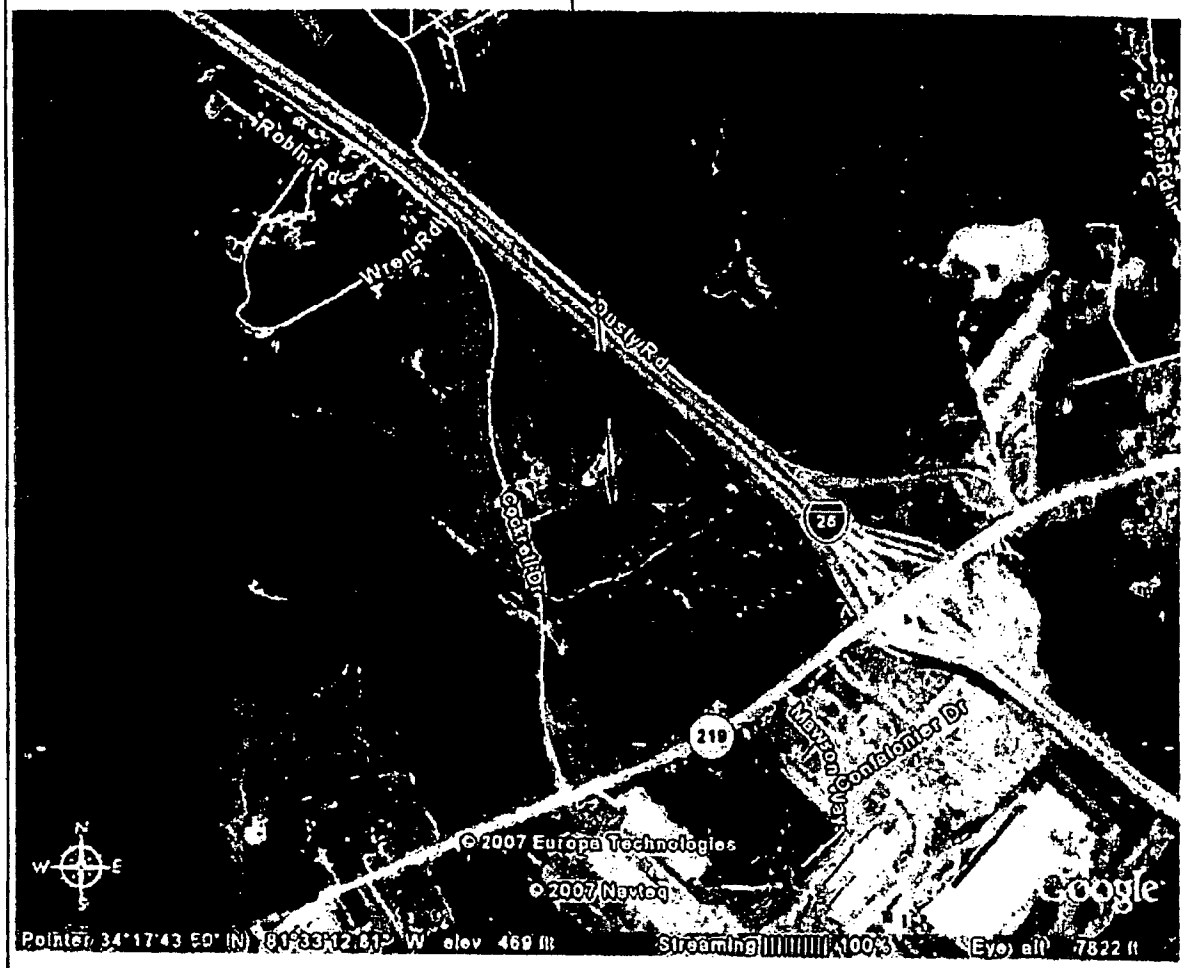
5.0 CONCLUSIONS

On February 21 and 22, 2013 TERRY personnel conducted a comprehensive groundwater sampling and recorded landfill gas measurements at six (6) GMPs and two (2) structures located at the former landfill. Forty-six (46) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only six (6) parameters were detected in concentrations that equaled or exceeded their respective established MCLs, RBSL's, or AL's. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-4 (>>>), GMP-5 (888), and GMP-6 (696). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling.

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



TERRY ENVIRONMENTAL SERVICES "CLIENTS FIRST ALWAYS"	**FIGURE 1** **SITE LOCATION** FORMER NEWBERRY COUNTY MSW LANDFILL 432 Cockrell Road Newberry, South Carolina SCDHEC Solid Waste Permit #: DWP-117			
"providing our clients with the best services available, actually understanding our clients objectives, and making their obbctives our own"	SIZE: B	TERRY Project No.: 2314H	DWG NO.: Figure 1 Site Location.dwg	REV
PO Box 25 Summerville, South Carolina 29484 (800) 325-0605 (843)-873-9200 fax: (843)-873-8765	SCALE: NOT TO SCALE		DATE: April 2013	

County 1989 A

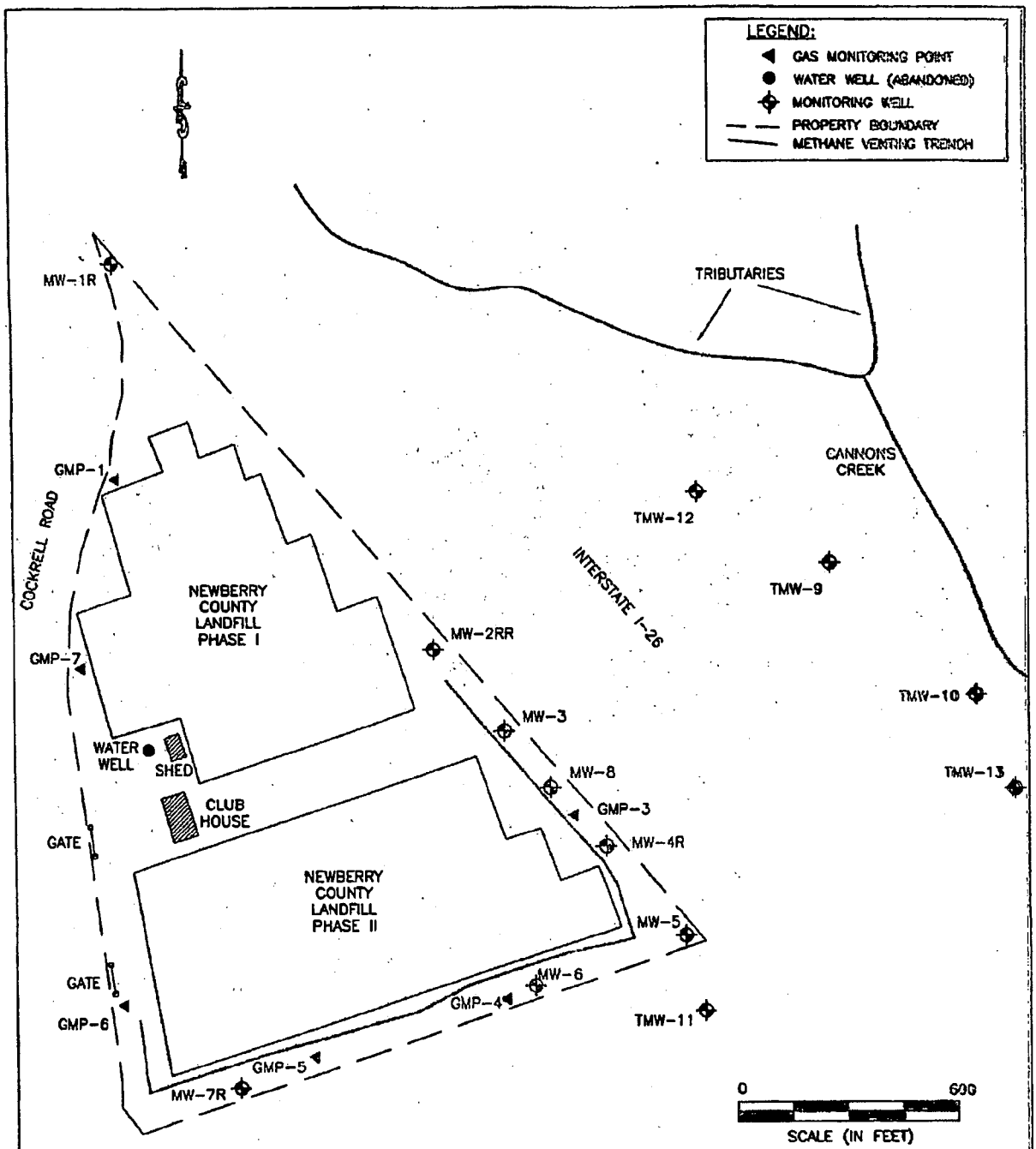


FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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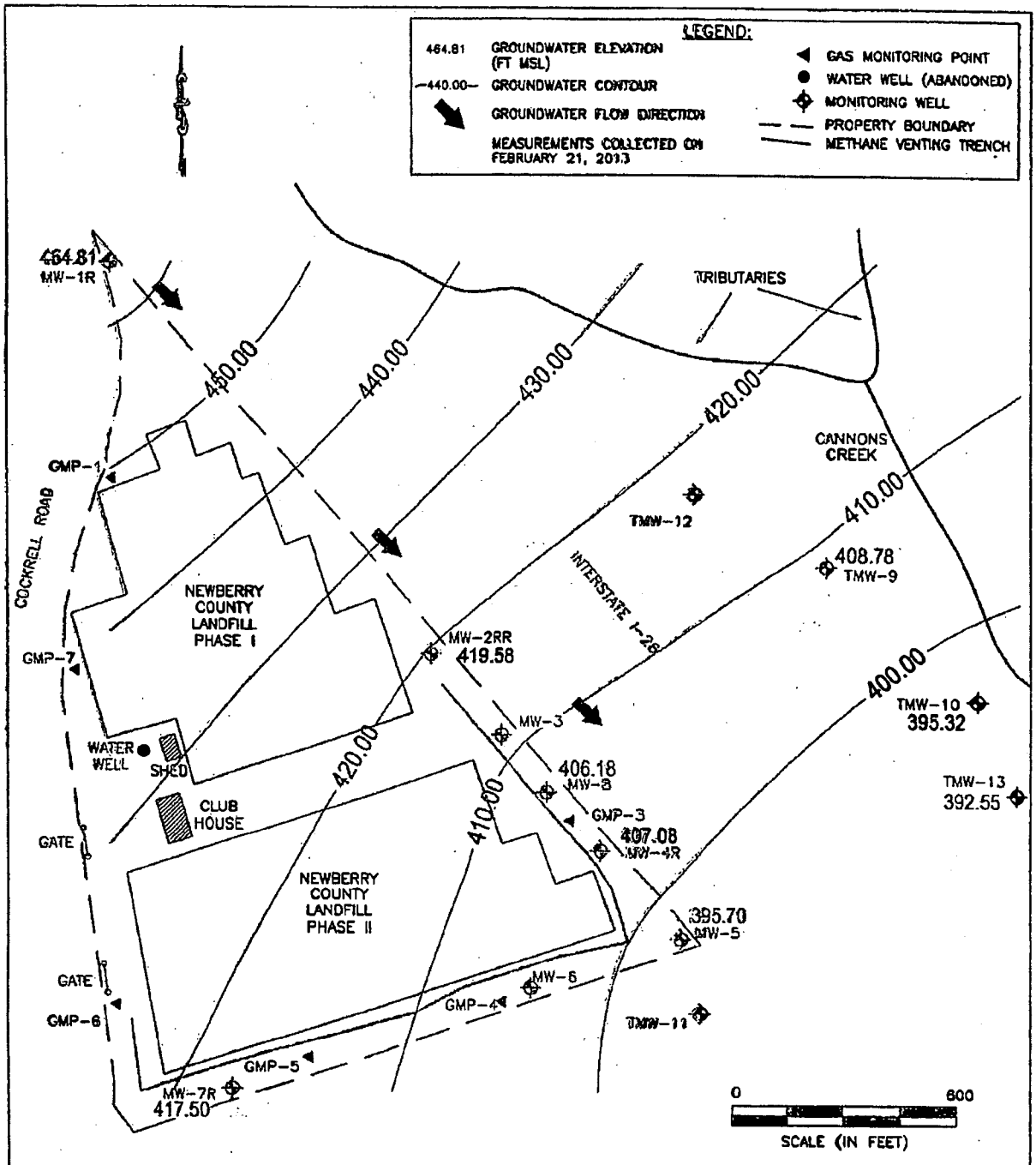
PO Box 25
Summerville, South Carolina 29484
(800) 325-0005 (843)-873-6200 fax: (843)-873-6765

SIZE	TERRY Project No.	DWG NO.	REV
B	2314H	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: April 2013

County 1990 A



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FIGURE 3
PIEZOMETRIC MAP

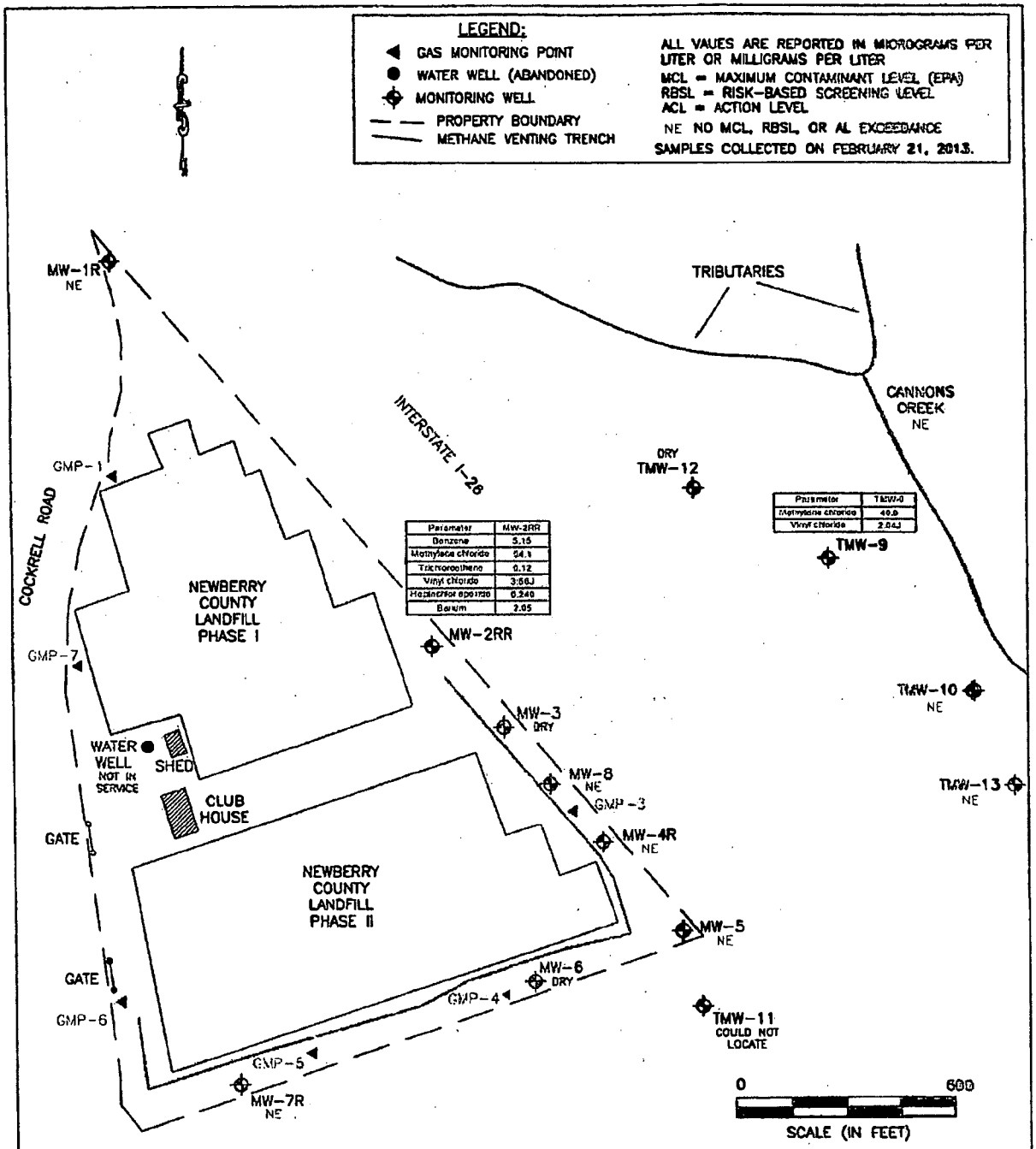
FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No.	DWG NO.	REV
B	2314H	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: April 2013

County 1991A



Parameter	MW-2RR
Benzene	5.15
Methylene chloride	64.1
Trichloroethene	0.12
Vinyl chloride	3.66J
Heptachlor epoxide	0.240
Barium	2.05

Parameter	TMW-9
Methylene chloride	49.8
Vinyl chloride	2.64J

FIGURE 4

Parameters Equal to or Exceeding MCL, RBSL, or AL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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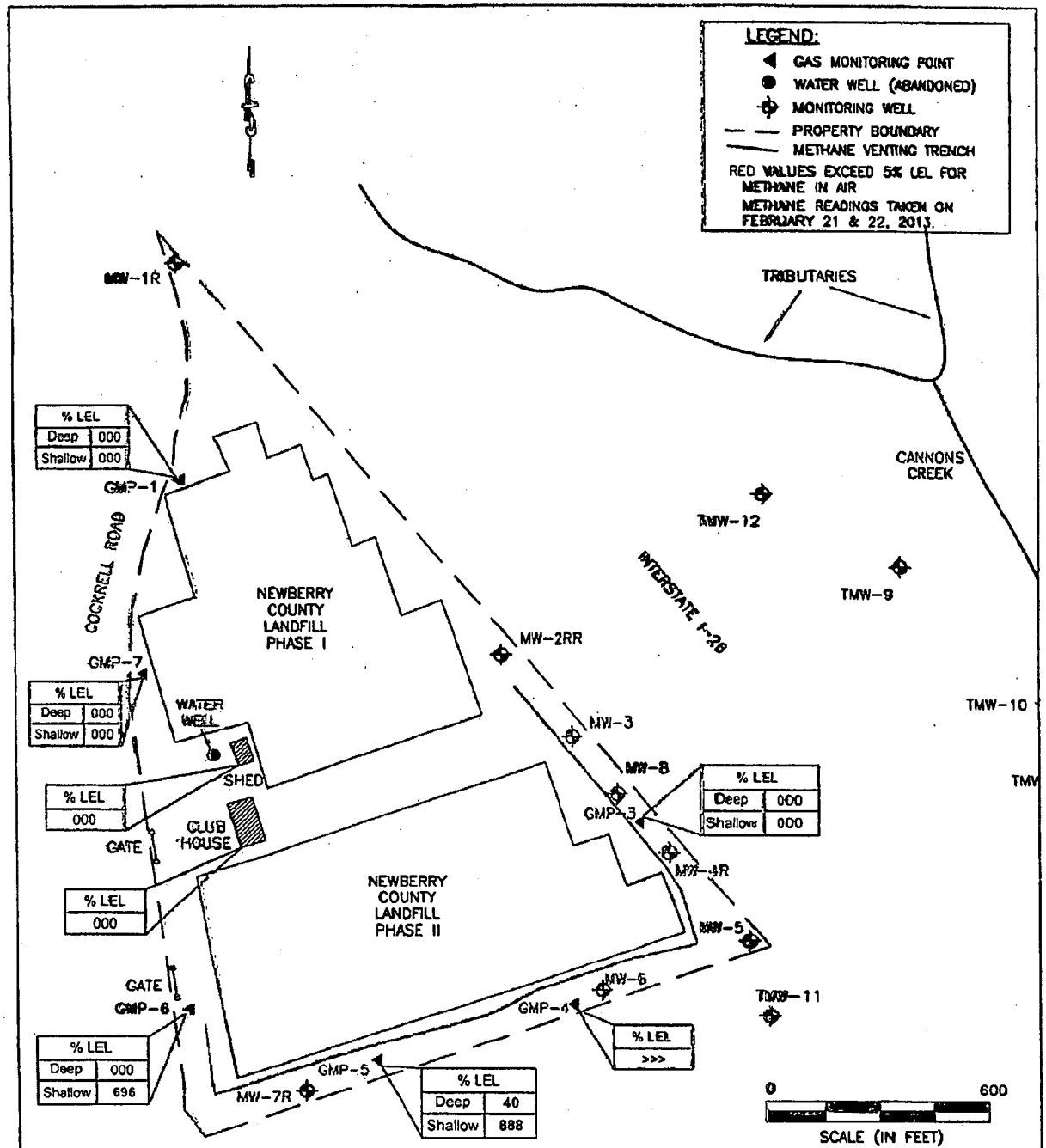
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SIZE	TERRY Project No.	DWG NO.	REV
B	2314H	Figure 4 Analytical Data.dwg	

SCALE: 1 inch = 400 feet

DATE: April 2013

County 1992 A



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FIGURE 5
METHANE %LEL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No.	DWG NO.	REV
B	2314H	Figure 5 Methane LEL Map.dwg	

SCALE: 1 inch = 400 feet

DATE: April 2013

County 1993A

APPENDIX 2

Tables

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314H

Monitoring Well ID	Reported TOC Elevation*	Reported Total Well Depth**	Measured Well Depth** February 21, 2013	Reported Screened Interval**(ft)	Reported Latitude	Reported Longitude
MW-1R	504.92	63	60.5	48.0 – 63.0	Unknown	Unknown
MW-2RR	459.82	63	58.1	48.0 – 63.0	Unknown	Unknown
MW-3	453.92	34	38.9	Unknown	34° 17' 50"	81° 33' 07"
MW-4R	441.55	63	62.5	48.0 – 63.0	Unknown	Unknown
MW-5	420.12	31	33.9	Unknown	34° 17' 44"	81° 33' 00"
MW-6	440.55	25	27.8	10.0 – 25.0	34° 17' 42"	81° 33' 08"
MW-7R	457.34	63	62.8	48.0 – 63.0	Unknown	Unknown
MW-8	443.39	68	71.9	58.0 – 68.0	Unknown	Unknown
TMW-9	457.58	75	74.0	65.0 – 75.0	Unknown	Unknown
TMW-10	415.07	45	44.1	35.0 – 45.0	Unknown	Unknown
TMW-11	Unknown	30	Assumed Destroyed	20.0 – 30.0	Unknown	Unknown
TMW-12	468.18	42.6	42.1	22.6 – 42.6	Unknown	Unknown
TMW-13	409.25	44.4	43.0	14.4 – 44.4	Unknown	Unknown

Notes:

*Relative to an assumed elevation

**Relative to top of casing

0823

County 1995

TABLE 2
WATER TABLE ELEVATION DATA
FEBRUARY 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314H

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
MW-1R	6/22/2007	504.92	32.18	472.74	
	12/31/2007		35.48	469.44	
	3/12/2009		36.72	468.20	
	12/4/2009		36.36	468.56	
	6/22/2010		32.02	472.90	
	12/2/2010		33.96	470.96	
	2/7/2012		38.03	466.89	
	8/31/2012		39.20	465.72	
	2/21/2013		40.11	464.81	
MW-2RR	6/22/2007	459.82	36.10	423.72	
	12/31/2007		36.40	423.42	
	3/12/2009		37.41	422.41	
	12/4/2009		37.10	422.72	
	6/21/2010		34.82	452.00	
	12/1/2010		36.04	423.78	
	2/6/2012		38.74	421.08	
	8/30/2012		39.62	420.20	
	2/21/2013		40.24	419.58	
MW-3	6/22/2007	453.92	35.28	418.64	
	12/31/2007		37.20	416.72	
	3/12/2009		36.75	417.18	
	12/4/2009		36.52	417.40	
	6/21/2010		34.21	419.71	
	12/1/2010		35.14	418.78	
	2/6/2012		37.38	416.54	Limited samples collected
	8/30/2012		38.10	415.82	Limited samples collected
	2/21/2013		-	-	Dry-No Samples Collected
MW-4R	6/22/2007	441.55	31.68	409.87	
	12/31/2007		34.70	406.85	
	3/12/2009		32.56	408.99	
	12/4/2009		32.28	409.27	
	6/22/2010		30.69	410.86	
	12/1/2010		32.72	408.83	
	2/7/2012		34.23	407.32	
	8/30/2012		34.52	407.03	
	2/21/2013		34.47	407.08	

County 1996

TABLE 2
WATER TABLE ELEVATION DATA
FEBRUARY 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314H

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
MW-5	6/22/2007	420.12	23.40	396.72	
	12/31/2007		26.03	394.09	
	3/12/2009		23.95	396.17	
	12/4/2009		-	-	Well not located
	6/22/2010		22.75	397.37	
	12/1/2010		24.90	395.22	
	2/7/2012		25.55	394.57	Limited samples collected
	8/30/2012		25.88	394.24	Limited samples collected
	2/21/2013		24.42	395.70	Limited samples collected
MW-6	6/22/2007	440.55	27.22	413.33	
	12/31/2007		25.55	415.00	
	3/12/2009		24.55	416.00	
	12/4/2009		24.30	416.25	
	6/21/2010		21.70	418.85	
	12/2/2010		24.30	416.25	
	2/6/2012		26.77	413.78	Limited samples collected
	8/30/2012		-	-	Dry-No Samples Collected
	2/21/2013		-	-	Dry-No Samples Collected
MW-7R	6/22/2007	457.34	35.78	421.56	
	12/31/2007		37.20	420.14	
	3/12/2009		35.91	421.43	
	12/4/2009		35.30	422.04	
	6/22/2010		33.78	423.56	
	12/2/2010		36.15	421.19	
	2/6/2012		38.88	418.46	
	8/30/2012		39.57	417.77	
	2/21/2013		39.84	417.50	
MW-8	6/22/2007	443.39	35.50	407.89	
	12/31/2007		37.80	405.59	
	3/12/2009		35.29	408.10	
	12/4/2009		35.04	408.35	
	6/21/2010		33.44	409.95	
	12/1/2010		35.47	407.92	
	2/6/2012		36.92	406.47	
	8/30/2012		37.26	406.13	
	2/21/2013		37.21	406.18	

County 1997

TABLE 2
WATER TABLE ELEVATION DATA
FEBRUARY 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314H

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
TMW-9	6/22/2007	457.58	47.35	410.23	
	12/31/2007		47.33	410.25	
	3/12/2009		47.30	410.27	
	12/3/2009		47.21	410.37	
	6/22/2010		45.63	411.95	
	12/1/2010		46.55	411.03	
	2/6/2012		48.01	409.57	
	8/30/2012		48.44	409.14	
	2/21/2013		48.80	408.78	
TMW-10	6/22/2007	415.07	18.90	396.17	
	12/31/2007		21.10	393.97	
	3/12/2009		18.75	396.32	
	12/3/2009		18.47	396.60	
	6/22/2010		18.44	396.63	
	12/1/2010		19.99	395.08	
	2/6/2012		20.35	394.72	
	8/30/2012		20.68	394.39	
	2/21/2013		19.75	395.32	
TMW-11	6/22/2007	Unknown	26.08	-	
	12/31/2007		28.60	-	
	3/12/2009		-	-	Well not located
	12/3/2009		-	-	Well not located
	6/21/2010		-	-	Well not located
	12/2/2010		-	-	Well not located
	2/6/2012		-	-	Well not located
	8/30/2012		-	-	Well not located
	2/21/2013		-	-	Assumed Destroyed
TMW-12	12/3/2009	468.18	41.78	426.40	Insufficient volume to sample
	6/22/2010		41.97	426.21	Insufficient volume to sample
	12/1/2010		41.96	426.22	Insufficient volume to sample
	2/6/2012		41.96	426.22	Insufficient volume to sample
	8/30/2012		-	-	Dry-No Samples Collected
	2/21/2013		-	-	Dry-No Samples Collected
TMW-13	12/3/2009	409.25	14.96	394.29	
	6/22/2010		15.20	394.05	
	12/1/2010		17.20	392.05	
	2/6/2012		17.53	391.72	
	8/30/2012		17.94	391.31	
	2/21/2013		16.70	392.55	

Notes:

*Relative to an assumed elevation

**Relative to top of casing

County 1998

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Volatile Organic Compounds (Method 8260B)																																			
		1,1-Dichloroethane	1,1-Dichloroethene	1,1,2-Trichloropropane	1,2-Dichloroethane	1,2-Dichloropropane	1,2-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon disulfide	Chlorobenzene	Chloroethane	Chloroform	Dibromochloromethane	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Vinyl acetate	Vinyl chloride	Xylene (total)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	m+p-Xylenes	o-Xylene	Diethyl ether (Ethyl ether)	Isopropylbenzene (Cumene)	Methyl-tert-butyl ether (MTBE)	1,4-Trimethylbenzene
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
US EPA MCL		-	7	-	600	5	5	-	75	-	-	5	-	-	-	100	-	-	-	700	5	100	5	1,000	5	-	2	10,000	70	-	-	-	-	-	-	-	-
MW-1R	6/12/01	3.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	16	3.2	-	<1.0	<1.0	85	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0
	12/31/02	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<25	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0
	6/04/08	Not Sampled																																			
	3/12/09	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<10.0	<3.0	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	-	<3.00	<3.00	<3.00	
	12/6/09	<5.30	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<1.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	
	6/23/10	<2	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	0.971J	<5	<5	<5	<10	<5	<5	<5		-	-	-	-	-
	12/7/10	<5.0	<5.0	<5.0	<1.0	<5.0	<5.0	<5.0	<50	<10	<50	<1.0	<5.0	<5.0	<5.0	<2.0	<10	<5.0	<10	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	-	-	-
	2/7/12	<5.00	<1.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<1.00	5	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	-	-	-	-
	6/13/13	<3.00	<1.00	<5.00	<5.00	<3.00	<3.00	<2.00	<3.00	<5.00	<2.00	<1.00	<3.00	<1.00	<3.00	<2.00	<3.00	<2.00	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	<3.00	-	-	-	-	-
	12/11/13	<2.00	<1.00	<5.00	<3.00	<2.00	<2.00	<2.00	<3.00	<17.00	<2.00	<1.00	<2.00	<1.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	-	-	-	-	-
MW-2RR	6/12/07	27	3.9	<1.0	<1.0	<1.0	<1.0	8.8	-	<20	19	<1.0	<1.0	-	2.2	8.1	<1.0	2.3	<1.0	21	<1.0	21	1.1	14	<1.0	-	<1.0	2.8	69	<1.0	12	-	1.8	2.5	<1.0	
	12/5/07	123	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<25	<1.0	<1.0	<10.0	<10.0	<5.0	<10.0	<1.0	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<1.0	<5.0	-	12.3	<5.0	<5.0	<5.0	
	6/4/08	Not Sampled																																			
	3/13/09	25.9	3.281	<5.00	<5.00	<5.00	<5.00	<5.00	11.6	<5.00	<21.0	8.88	<5.00	<5.00	<5.00	3.231	<5.00	<5.00	<5.00	161	<5.0	6.83	<1.00	11.9	1.041	<5.00	1.751	11.1	69.7	<5.00	<5.00		-	1.06J	2.43	1.14J	
	12/4/09	22.9	3.66J	<5.00	<5.00	2.26J	<5.00	<5.00	17.3	<5.00	<21.0	8.80	<5.00	<5.00	<1.00	3.31	<5.00	<5.00	<5.00	119	<5.00	8.24	<1.00	10.7	<5.00	<5.00	3.01J	10.1	64.2	<5.00	<5.00		-	3.97	4.84	<5.00	
	6/21/10	25.1	<5	<5	<5	2.43J	<5	<5	16.5	<5	<25	8.85	<5	<5	12.7	3.91J	<5	<5	12.1	<5	120	<5	<5	6.00	8.97J	<5	<5	<5	11.2	64.9	<5		-	-	-	-	-
	12/7/10	22	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	17	<50	<50	9.6	<5.0	<5.0	<5.0	<5.0	<50	<5.0	12	<5.0	75	<5.0	<5.0	9.8	<5.0	<10	6.3	11	68	<5.0		-	-	-	-	-
	2/8/12	15.1	0.981J	<5	0.472J	2.15J	<2	<2	12.0	<2	<2	5.84	<5	<2	<2	4.81J	0.833J	<2	7.42	<5	54.2	<1	2.18J	<5	5.06	0.413J	<5	2.77J	6.94J	45.5	<5		-	-	-	-	-
	6/5/13	15.1	0.662J	<1.00	0.611J	1.77J	0.716J	<5.00	13.1	<5.00	11.6	4.43J	<5.00	<5.00	<5.00	4.72J	<2.00	<5.00	7.62	<5.00	49.4	<5.00	2.71J	<5.00	5.36	<5.00	<2.00	3.18J	7.31J	49.1	0.327J		-	-	-	-	-
	12/11/13	16.8	0.813J	<2.00	0.625J	2.76J	<2.00	<2.00	14.2	<8.00	26.8J	5.31	<2.00	<2.00	<2.00	6.13	<2.00	<2.00	14.2	<2.00	54.1	<2.00	2.88J	<2.00	6.33	0.324J	<2.00	3.86J	9.04J	48.7	<2.00		-	-	-	-	-
MW-3	6/12/07	21	12	<1.0	<1.0	<1.0	<1.0	<1.0	7.3	-	<25	18	<1.0	<1.0	<1.0	2.1	10	<1.0	1.8	<1.0	84	<1.0	27	1.6	18	<1.0	-	<1.0	2.3	118	<1.0	14	-	2.1	3.2	<1.0	
	12/31/07	13.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10.0	<25	<1.0	<1.0	<10.0	<10.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	<3.0	<3.0	<3.0	<3.0	<10.0	<10.0	<1.0	<1.0	-	-	-	-	-	11.8	<1.0	<1.0	<1.0
	6/4/08	Not Sampled																																			
	3/13/09	16.1	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	8.37	<5.00	<25.0	10.5	<5.00	<5.00	<5.00	2.74J	6.16	<5.00	1.24J	<1.00	35.4	<5.00	21.7	<5.00	12.5	<5.00	<2.00	3.33J	8.53J	107	<5.00	<5.00		-	1.07J	4.33J	<5.00	
	12/4/09	14.3	<5.00	<5.00	<5.00	1.90J	<5.00	<5.00	10.7	<5.00	<25.0	10.1	<1.00	<5.00	<1.00	4.44J	4.80J	<5.00	1.64J	1.17J	36.4	<5.00	19.8	2.47J	12.8	<5.00	<5.00	3.98J	15.1	139	<5.00	<5.00		-	3.97	6.64	4.54J	
	6/21/10	9.40	<5	<5	<5	1.95J	<5	<5	10.6	<5	<25	10.8	<5	<5	<5	3.44J	<5	<5	<5	<5	10.5	<5	4.99J	1.34J	7.56J	<5	<5	<5	4.74J	139	<5		-	-	-	-	-
	12/7/10	16	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	9.1	<10	<50	14	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<2.0	39	<5.0	16	<5.0	11	<5.0	<10	3.8	<5.0	116	<5.0		-	-	-	-	-
	2/8/12	18.7	<5	<5	0.726J	0.994J	<2	<2	7.45	<2	<5	13.1	<3	<5	<5	1.65J	5.06	<5	<5	2.42J	17.5	<5	1.61	2.33J	7.43	<5	<5	1.90J	5.41J	98.9	<5		-	-	-	-	-
	6/5/13	10.5	0.413J	<5.00	<2.00	0.994J	0.420J	<5.00	5.31	<5.00	<5.00	11.8	<1.00	<5.00	<1.00	1.20J	<2.00	<5.00	<5.00	1.16J	3.20J	<5.00	9.83	1.09J	5.14	<2.00	<5.00	2.64J	2.81J	116	0.625J		-	-	-	-	-
	12/11/13	Not Sampled (Dry)																																			
MW-4R	6/12/07	70.0	9.9	<1.0	2.9	<1.0	<1.0	<1.0	5.8	-	<25	6.4	<1.0	<1.0	-	4.1	2.8	<1.0	1.5	<1.0	37	<1.0	<3.0	2.5	2.1	<1.0	-	<1.0	2.7	57	<1.0	<1.0	-	1.7	2.1	<1.0	
	12/31/07	178	69	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<25	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0		-	17.3	<5.0	<5.0	<5.0
	6/4/08	Not Sampled																																			
	3/13/09	31.7	8.46	<5.00	1.18J	<5.00	<5.00	<5.00	1.99J	<5.00	<25.0	2.79J	<5.00	<5.00	<5.00	4.02J	<5.00	<5.00	<5.00	9.85J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	3.62	<5.00	<5.00		-	1.07J	3.03J	<5.00	
	12/4/09	196	41.5J	<5.00	2.96J	<5.00	<1.00	0.496J	4.31J	<5.00	<25.0	2.19J	<5.00	<5.00	<5.00	7.11	0.908J	<5.00	0.670J	<1.00	4.99J	<5.00	<1.00	1.32J	0.862J	<5.00	<5.00	3.37J	4.33J	<2.00	<5.00		-	3.33	5.31	<5.00	
	6/22/10	33.3	3.32J	<5	<5	<5	<5	<5	4.49J	<5	<25	3.09J	<1	<1	<5	0.11	<5	<5	<5	<5	1.94J	<5	<5	2.18J	<5	<5	<5	<10	4.90J	<5		-	-	-	-	-
	12/8/10	22	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	0.3	<10	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	41<	<2.0	<5.0	62	<5.0		-	-	-	-	-
	2/7/12	19.6	0.993J	<1	2.16J	<5	<5	<5	3.23J	<5	2.41J	1.86J	<3	<1	<3	4.26J	3.04J	<2	<5	<5	<5	<5	<5	<1	<3	<1	<5	<5	<15	47.2J	<5		-	-	-	-	-
	6/13/13	10.3	0.424J	<3.00	2.76J	<3.00	<3.00	<3.00	3.92J	<3.00	<3.00	1.98J	<3.00	<3.00	<3.00	3.49	<3.00	<3.00	<5.00	<3.00	<3.00	<3.00	<3.00	0.911J	0.922J	<3.00	<10.00	0.369J	<12.0	4.70J	<5.00		-	-	-	-	-
	12/11/13	8.661	0.863J	<5.00	0.501J	<5.00	<5.00	<5.00	1.12J	<3.00	1.31J	1.75J	<5.00	<5.00	<5.00	0.881J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.61J	<5.00	<5.00	<5.00	<5.00	<15.0	1.91J	<5.00		-	-	-	-	-
MW-5	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<7.0	<1.0	<3.0	<1.0	<1.0	<1.0	<1.0	<2.0	<7.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0
	12/31/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.0	<10.0	<25	7.3	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<5.0	<10.0	11.1	<5.0		-	-	-	-	-
	6/4/08	0.727J	<2.00	<5.00	<2.00	<5.00	<5.00	<5.00	<2.00	<5.00	<25.0	<5.00	<2.00	<2.00	<2.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00
	3/12/09	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00
	12/4/09	Could Not Locate																																			
	6/22/10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	0.999J	<5	<5	<5	<5	<10	<5	<5		-	-	-	-	-
	12/11/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<2.0	<5.0	<5.0	<5.0		-	-	-	-	-
	2/7/12	1.86J	<5	<1	<3	<5	<5	<5	<5	<5	<5	<3	<3	<1	<3	<3	<5	<2	0.477J	<5	<5	<5	<5	<1	0.512J	<5	<5	<15	0.233J	<5		-	-	-	-	-
	6/13/13	1.36J	<1.00	<5.00	<5.00	<3.00	<1.00	<5.00	<3.00	<5.00	<5.00	<1.00	<3.00	<3.00	<1.00	<5.00	<3.00	<1.00	0.998J	<5.00	<2.00	<5.00	<5.00	0.318J	0.651J	<5.00	<3.00	<10.0	0.465J	<5.00		-	-	-	-	-
	12/11/13	1.15J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<2.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	0.533J	<5.00	<5.00	<5.00	<5.00	<5.00	0.395J	<5.00	<5.00	<10.0	0.184J	<5.00		-	-	-	-	-

Notes:
µg/L= micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentration exceeds respective MCL
DUP= Duplicate sample number

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Volatile Organic Compounds (Method 8260B)																																								
		1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Butanone	2-Hexanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon disulfide	Chlorobenzene	Chloroethane	Chloroform	Dichlorodifluoromethane	Ethylbenzene	Methyl tert-butyl ether	Methylene chloride	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Vinyl acetate	Vinyl chloride	Xylenes (total)	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Isopropylbenzene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Naphthalene (Cumene)	n-Propylbenzene (Cumene)	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
US EPA MCL		-	7	-	600	5	5	-	75	-	-	-	5	-	-	-	100	-	-	-	-	700	5	100	5	1,000	5	-	-	2	10,000	70	-	-	-	-	-	40	-	-	-	-
MW-6	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	88	-	<25	9.6	<1.0	<1.0	-	<1.0	6.1	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-	1.5	<2.1	18	<1.0	<1.0	4.3	26	<1.0	-	-
	12/21/07	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	78	<10.0	<25	7.7	<2.0	<2.0	<10.0	<10.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<10.0	<2.0	<2.0	<10.0	16.6	<2.0	-	47.3	<2.0	11	<2.0
	4/4/08	Not Sampled																																								
	9/13/08	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	8.66	<3.00	<25.0	4.38J	<1.00	<1.00	<3.00	1.60J	29.3	<1.00	<1.00	<3.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	2.71J	29.6	<1.00	
	12/4/08	2.44J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	120	<5.00	<25.0	4.71J	<1.00	<5.00	<5.00	4.07J	3.81J	<5.20	<5.00	<5.00	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.33J	<1.00	31.6	<5.00	<5.00	-	6.59	18.9	<5.00			
	6/21/10	1.13J	<5	<5	<5	<5	<5	<5	91.8	<5	2.33J	4.93J	<5	<5	<5	3.96J	7.5J	<5	<5	0.935J	<10	<5	<5	1.77J	0.781J	<5.0	<5.0	<10	2.8	<5.0	15	<5.0	-	-	-	-	-	-	-	-	-	-	
	12/20/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	71	<10	<50	6.7	<5.0	<5.0	<5.0	<5.0	2.2J	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1.48J	0.966J	17.2	<5	-	-	-	-	-	-	-	-	
	2/9/12	1.48J	<5	<5	<5	<5	<5	<5	8.92	<5	1.43J	7.41	<5	<5	<5	<5	3.31J	2.21J	<5	<5	<5	<5	0.329J	<5	<5	<5	0.617J	<5	<5	1.48J	0.966J	17.2	<5	-	-	-	-	-	-	-	-	-	
	8/20/13	Not Sampled (Dry)																																								
	2/21/14	Not Sampled (Dry)																																								
MW-7R	6/22/07	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	3.2	<1.0	<1.0	-	<1.0	3.6	<1.0	<1.0	<1.0	<1.0	13	<1.0	<1.0	<1.0	1.1	<1.0	-	<1.0	<2.0	32	<1.0	<1.0	-	-	<1.0	3.1	<2.0			
	12/21/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20.0	<25	<1.0	<1.0	<1.0	<100	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	25.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	<100	<1.0	<1.0	<100	9.8	<1.0	-	28.4	<1.0	<1.0	<1.0
	4/4/08	Not Sampled																																								
	9/12/08	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<3.00	<25.0	1.40J	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	9.23J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	5.43	<1.00	<1.00	<1.00	<1.00	<1.00	3.77J	<1.00			
	12/4/08	1.72J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.27J	<5.00	<25.0	1.66J	<5.00	<5.00	<5.00	1.37J	1.07J	<5.20	<5.00	<5.00	<1.00	1.24J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	3.60J	<1.00	<5.00	<5.00	<5.00	<5.00	7.48	<5.00			
	6/22/10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	0.924J	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	-	-	-	-	-	-	-
	12/20/10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	-	-	-	-
	2/9/12	3.16J	<5	<5	<5	<5	<5	<5	2.97J	<5	0.969J	0.966J	<5	<5	<5	0.775J	2.13J	<5	<5	<5	<5	3.78J	<5	0.947J	<5	<5	0.917J	<5	<5	0.917J	<5	<5	<5	<5	<5	<5	1.71	<5	-	-	-	-	-
	8/20/13	2.31J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.59J	<5.00	<5.00	0.853J	<1.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	6.91J	<5.00	0.963J	<5.00	<5.00	0.874J	<5.00	<5.00	0.917J	<5.00	<5.00	<5.00	<5.00	<5.00	6.51	<5.00	-	-	-	-	-
	2/21/14	2.30J	<5.00	<5.00	0.703J	<5.00	<5.00	<5.00	2.21J	<5.00	3.99J	0.867J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	0.763J	<5.00	<5.00	0.763J	<5.00	<5.00	-	<5.00	<5.00	<5.00	<5.00	<5.00	1.4	<5.00	<5.00	<5.00	<5.00	<5.00
MW-8	6/22/07	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	4.1	<1.0	<2.0	<1.0	<1.0	<1.0	1.8	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0
	12/21/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100.0	<25	<5.0	<5.0	<100.0	<100.0	<1.0	<100.0	<1.0	<1.0	<5.0	5.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100.0	<100.0	<5.0	<5.0	<100.0	<5.0	<5.0	-	<1.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																								
	9/13/08	6.37	2.29J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	1.84J	<5.00	2.11J	1.76J	<5.00	<5.00	<10.0	4.08J	<5.00	<5.00	-	<5.00	<5.00	<5.00			
	12/4/08	7.08	2.23J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	8.45	<5.00	6.03J	<5.00	1.13J	<5.00	2.45J	2.22J	<5.00	<5.00	<10.0	4.18J	<5.00	<5.00	-	<5.00	<5.00	<5.00			
	6/21/10	3.16	<1	<1	<1	<1	<1	<1	<1	<5	<25	<5	<1	<1	<5	1.32J	<1	<1	<1	10.8	<2	<10	<1	1.38J	<1	<5.0	1.17	<1	<1	2.91J	<1	-	-	-	-	-	-	-	-	-	-	
	12/21/10	7.6	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<12.5	<5.0	<5.0	<5.0	<5.0	13	<5.0	<20	<5.0	<5.0	<5.0	<20	8.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-	-	
	2/8/12	8.70	2.67J	<5	<5	<5	<5	<5	0.991J	<5	<5	<5	0.875J	<5	<5	<5	0.330J	<5	<5	8.03	<5	3.87J	<5	1.34J	<5	2.82J	3.95J	<5	<5	1.63	<5	-	-	-	-	-	-	-	-	-	-	
	8/19/13	7.90	2.00J	<5.00	<5.00	<5.00	<5.00	<5.00	1.16J	<5.00	<5.00	0.960J	<5.00	<5.00	<5.00	0.399J	<5.00	<5.00	<5.00	3.56	<5.00	4.39J	<5.00	1.86J	<5.00	2.64J	3.39J	<5.00	<5.00	<10.0	<5.00	-	-	-	-	-	-	-	-	-	-	
	2/21/14	8.49	2.79J	<5.00	<5.00	<5.00	<5.00	<5.00	0.966J	<5.00	<5.00	0.830J	<5.00	<5.00	<5.00	0.782J	<5.00	<5.00	<5.00	3.27	<5.00	3.23J	<5.00	1.59J	<5.00	2.73J	3.89J	<5.00	<5.00	<10.0	2.83J	<5.00	<5.00	-	-	-	-	-	-	-	-	
EMW-9	6/22/07	18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	-	<25	<1.0	<1.0	<1.0	-	<1.0	1.6	<1.0	<1.0	2.6	<1.0	56	<1.0	3.1	<1.0	6.1	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0
	12/21/07	11.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100.0	<25	<5.0	<5.0	<100.0	<100.0	<5.0	<100.0	<5.0	<5.0	<5.0	<5.0	44.6	<5.0	<5.0	<5.0	<5.0	<100.0	<100.0	<5.0	<5.0	<150.0	19.6	<5.0	-	27.6	<5.0	<5.0	<5.0		
	4/4/08	Not Sampled																																								
	9/13/08	18.0	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	2.21J	<3.00	<25.0	4.88J	<3.00	<3.00	<3.00	1.94J	<3.00	<3.00	<3.00	19.3	<3.00	99.8	<3.00	6.81	<3.00	8.62	<3.00	<3.00	<3.00	2.91J	41.6	<3.00	<3.00	-	0.749J	<3.00	<3.00			
	12/3/08	13.7	0.934J	<3.00	<3.00	<3.00	<3.00	<3.00	8.35	<3.00	<25.0	3.04J	<3.00	<3.00	<3.00	5.07	<3.00	<3.00	7.35	<3.00	74.3	<3.00	7.45	<3.00	7.93	1.26J	<3.00	1.36J	31.5	35.1	<3.00	<3.00	-	5.17	<3.00	<3.00			
	6/22/10	19.4	<1	<1	<1	1.15J	<1	<1	9.86	<1	<25	4.44J	<1	<1	<1	6.48J	<1	<1	13.8	<2	101	<1	6.25	1.04J	8.53	<1	<1	3.33J	38.7	<2	-	-	-	-	-	-	-	-	-	-	
	12/21/10	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	8.1	<10	<50	5.1	<5.0	<5.0	<5.0	<5.0	<10	<5.0	14	<5.0	91	<5.0	6.4	<5.0	9.7	<5.0	<10	3.1	<5.0	39	<5.0	-	-	-	-	-	-	-	-	-	-	
	2/8/12	23.4	0.837J	<5	0.979J	<5	<5	<5	7.33	<5	<25	3.33J	<5	<5	<5	5.32J	0.588J	<5	9.32J	<2	51.2	<5	6.14J	<5	6.37	0.877J	<5	1.37J	27.7J	10.1	<5	-	-	-	-	-	-	-	-	-	-	
	8/19/13	11.7	<5.00	<5.00	0.612J	0.929J	0.659J	<5.00	5.31	<5.00	<25.00	2.91J	<5.00	<5.00	<5.00	3.29J	<5.00	<5.00	3.26J	<5.00	43.9	<5.00	4.23J	<5.00	4.66J	0.723J	<5.00	2.84J	23.1J	29.4	<5.00	-	-	-	-	-	-	-	-	-	-	
	2/21/13	12.4	0.949J	<5.00	0.730J	<5.00	<5.00	<5.00	5.57	<5.00	<25.00	2.75J	<5.00	<5.00	<5.00	2.85J	<5.00	<5.00	9.11	<5.00	40.9	<5.00	3.46J	<5.00	4.66J	0.723J	<5.00	2.84J	23.1J	29.4	<5.00	-	-	-	-	-	-	-	-	-	-	
EMW-10	6/22/07	84	3.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	8.3	<1.0	<1.0	-	<1.0	1.7	<1.0	2.8	<1.0	29	<1.0	2.8	<1.0	4.3	<1.0	4.3	<1.0	-	<1.0	<2.0	6.2	<1.0	<1.0	-	11.6	<1.0	<1.0	<1.0	<1.0	<1.0
	12/21/07	39.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100.0	<25	<5.0	<5.0	<100.0	<100.0	<5.0	<100.0	<5.0	<5.0	<5.0	<5.0	25.6	<5.0	<5.0	<5.0	<5.0	<100.0	<100.0	<5.0	<5.0	<100.0	6.6	<5.0	-	-	<5.0	<5.0	<5.0	<5.0	<5.0
	4/4/08	Not Sampled																																								
	9/13/08	91.6	9.94	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<25.0	5.21J	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	3.22	<3.00	83.7	<3.00	3.88J	<3.00	6.19	1.38J	<3.00	<3.00	<10.0	13.0	<3.00	<3.00	-	<3.00	<3.00	<3.00			
	12/3/08	58.1	7.13	<5.00	<5.00	<5.00	<5.00	<5.00	3.16J	<5.00	<25.0	3.33J	<5.00	<5.00	<5.00	4.03J	<5.00	<5.00	4.27J	<5.00	64.9	<5.00	4.79J	<5.00	6.80	1.37J	<5.00	<5.00	<10.0	11.9	<5.00	<5.00	-	<5.00	<5.00	<5.00			
	6/22/10	68.4	<5	<5	<5	1.13J	<5	<5	9.61	<5	<25	4.61J	<5	<5	<5	4.49J	<5	<5	12.8	<5	101	<5	6.35	1.04J	8.53	<5	<5	<5.0	38	<5.0	-	-	-	-	-	-	-	-	-	-	
	12/21/10	31	1.8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	78	<5.0	5.3	<5.0	9.6	<5.0	<10	<5.0	<5.0	18	<5.0	-	-	-	-	-	-	-	-	-	-	
	2/8/12	48.1	4.96J	<5	<5	<5	<5	<5	<5	<5	<25	2.87J	<5	<5	<5	<5	1.03J	<5	8.35	<2	53.7	0.967J	4.96J	<5	4.93	1.85J	<5	<5	1.77J	18.9	<5	-	-	-	-	-	-	-	-	-	-	
	8/20/13	41.7	4.38J	<5.00	<5.00	<5.00	<5.00	<5.00	2.18J	<5.00	<25.00	2.81J	<5.00	<5.00	<5.00	0.916J	<5.00	<5.00	4.72J	<5.00	49.8	<5.00	4.73J	<5.00	6.31	<5.00	<5.00	<5.00	<5.00	1.79J	20.4	<5.00	<5.00	-	-	-	-	-	-	-	-	
	2/21/13	3.91J	0.445J	<5.00	<5.00	<5.00	<5.00	<5.00	0.644J	<5.00	<25.00	1.22J	0.543J	<5.00	<5.00	<5.00	<5.00	<5.00	0.763J	<5.00	3.34J	<5.00	0.648J	<5.00	0.698J	<5.00	<5.00	<5.00	<5.00	<15.0	2.02J	<5.00	<5.00	-	-	-	-	-	-	-	-	

Notes
mg/L = milligrams per liter
ug/L = Micrograms per liter
MCL = Maximum Contaminant Level
J = Estimated value
Bold = Concentration exceeds respective MCL
BOLD = Surface sample interval

County 2000

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Volatile Organic Compounds (Method 8260B)																																					
		1,1-Dichloroethane	1,1-Dichloroethene	1,1,2-Trichloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Benzene	Bromodichloromethane	Bromomethane	Carbon disulfide	Chlorobenzene	Chloroethane	Chloroform	Dichlorodifluoromethane	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Vinyl acetate	Vinyl chloride	Xylene (total)	cis-1,3-Dichloropropene	trans-1,2/1,4-Dichloropropene	Gross Beta Emitters	Tritium	Methyl-tert-butyl ether (MTBE)	1,2,4-Trimethylbenzene
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	pCi/L	µg/L	µg/L
US EPA MCL		-	7	-	600	5	5	-	75	5	-	-	-	-	100	-	-	-	700	5	100	5	1,000	5	-	-	3	10,000	70	-	-	-	60
TMW-11	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<35	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
	12/11/07	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.6	<100	<25	8.3	<5.0	<100	<100	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<100	<5.0	<5.0	<100	163	<5.0	-	86.4	<5.0	17.1	<2.0
	6/4/08	8.1402	<5.00	<3.00	<5.00	<3.00	<3.00	<5.00	<5.00	<5.00	<25.0	<5.00	<5.00	<2.00	<5.00	<5.00	<3.00	<3.00	<5.00	<3.20	<5.00	<40.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<10.0	<5.00	<5.00	<5.00	-	<5.00	<5.00	<5.00
	3/13/09	Could Not Locate																																					
	12/4/09	Could Not Locate																																					
	6/22/10	Could Not Locate																																					
	12/2/10	Could Not Locate																																					
	2/6/12	Could Not Locate																																					
	8/30/12	Could Not Locate																																					
	3/20/13	Could Not Locate																																					
TMW-12	12/3/09	Insufficient Sample Volume																																					
	6/22/10	Insufficient Sample Volume																																					
	12/8/10	Insufficient Sample Volume																																					
	2/6/13	Insufficient Sample Volume																																					
	8/30/11	Not Sampled (Dry)																																					
	2/7/13	Not Sampled (Dry)																																					
TMW-11	12/3/09	7.342	<5.00	<5.00	<3.00	<5.00	<5.00	<3.00	<5.00	<5.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<3.00	<5.00	<5.00	-	<3.00	<5.00	<5.00
	6/22/10	<5	<5	<5	<5	<5	<5	<5	<5	6.37	<25	<5	<5	<5	1.021	<5	<5	<5	<5	<5	<10	<5	<5	0.8991	<5	<5	<5	<5	<10	<5	<5	-	-	-	-	-	-	-
	12/1/10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	-	-	-	-	-	-	-
	2/6/12	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<15	<5	<5	-	-	-	-	-	-	-	-
	8/30/12	1.012	<3.00	<5.00	<5.00	<3.00	<3.00	<3.00	<5.00	<3.00	<5.00	<5.00	<3.00	<5.00	<3.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<15.0	<3.00	<5.00	<5.00	-	-	-	-	-	-	-
	2/7/13	1.242	<2.00	<3.00	<3.00	<5.00	<5.00	<3.00	<5.00	<3.00	<5.00	<3.00	<3.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<15.0	<3.00	<5.00	<5.00	-	-	-	-	-	-	-
Water Well	6/22/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	<1.0	<1.0	-	<1.0	2.9	8.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
	1/4/08	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<25	<5.0	6.2	<100	-	<5.0	<100	22.4	<5.0	<5.0	<20	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<100	<5.0	<100	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0
	4/4/08	-																																					
	3/13/09	Not Sampled																																					
	12/3/09	<5.00	<1.00	<3.00	<3.00	<1.00	<2.0	<5.00	<5.00	<3.00	<25.0	<3.00	9.86	<3.00	<5.00	<5.00	<5.00	8.20	<3.00	<3.00	<10.0	<5.00	<3.00	<3.00	<5.00	<5.00	<5.00	<5.00	<100	<3.00	<5.00	<5.00	-	<1.00	<1.00	<1.00
	6/22/10	Not In Service																																					
	12/1/10	Not In Service																																					
	2/6/12	Not In Service																																					
	8/30/12	Not In Service																																					
	2/7/13	Not In Service																																					
Cannons Creek	6/26/07	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<25	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<2.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
	12/11/07	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<100	<25	<5.0	<5.0	<100	<100	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<100	<5.0	<5.0	<100	<5.0	<5.0	-	<36	<5.0	<5.0	<5.0
	6/4/08	-																																					
	3/13/09	Not Sampled																																					
	12/3/09	<5.00	<5.00	<1.00	<3.00	<5.00	<3.00	<5.00	<5.00	<3.00	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<10.0	<3.00	<5.00	<5.00	-	<5.00	<5.00	<5.00
	6/22/10	Not Sampled																																					
	12/1/10	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<2.0	<5.0	<10	<5.0	<5.0	-	-	-	-	-	-	-
	2/6/12	Dry																																					
	8/30/12	Not Sampled (Dry)																																					
	2/7/13	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	2.231	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<15.0	0.331	<3.00	-	-	-	-	-	-	-

Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Contaminant Level
J = Estimated Value
Bold = Concentration exceeds respective MCL
INS = Insufficient sample volume

County 2001

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Semivolatile Organic Compounds (Method 8270D)									Chlorinated Pesticides, TCL (Method 8081B)																Chlorinated Herbicides (Method 8151A)
		2,4-Dichlorophenol	2-Methylnaphthalene	Acenaphthene	Bis(2-Ethylhexyl)phthalate	Butylbenzylphthalate	Dibutylphthalate	Naphthalene	Phenanthrene	Pyrene	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan I	Endosulfan II	Endrin	Endrin aldehyde	Heptachlor	Heptachlor epoxide	Methoxychlor	Alpha-BHC	Alpha-Chlordane	Beta-BHC	Delta-BHC	Gamma-BHC (Lindane)	Gamma-Chlordane	
Units		ppb/L	ppb/L	ppb/L	ppb/L	ppb/L	ppb/L	ppb/L	ppb/L	ppb/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
US EPA MCL		-	-	-	-	-	-	21	-	-	-	-	-	-	-	-	2	-	-	0.4	0.2	40	-	-	-	0.2	-	70
MW-3R	6/23/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																										
	3/12/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.102	<0.102	-	<0.051	-	<0.102	<0.102	<0.102	<0.0511	<0.511	<0.319	<0.051	<0.511	<0.511	<0.0511	<0.511	<0.511	<0.505
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<9.10	<0.005	<0.050	<0.10	<0.10	<0.10	<0.0500	<0.050	<0.50	<0.050	<0.050	<0.099	<0.050	<0.050	<0.10	<0.050	<2.0
	2/7/12	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<0.102	<0.102	<0.102	<0.051	<0.051	<0.102	<0.102	<0.102	<0.051	<0.051	<0.511	<0.051	<0.511	<0.511	<0.0511	<0.051	<0.051	<0.50
	8/13/12	<11.1	<11.1	<11.1	1.03	<11.1	<11.1	<11.1	<11.1	<11.1	<0.105	<0.105	<0.105	<0.053	<0.053	<0.105	<0.105	<0.105	<0.053	<0.053	<0.526	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<3.0
	2/21/13	<19.6	<19.6	<19.6	<19.6	<19.6	<19.6	<19.6	<19.6	<19.6	<0.100	<0.100	<0.100	<0.050	<0.050	<0.100	<0.100	<0.100	<0.050	<0.050	<0.500	0.0182	<0.050	<0.050	<0.050	0.000753	<0.050	<2.0
MW-3R3	6/23/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																										
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<10.1	0.2601	0.8931	0.7432	0.2411	6.311	2.131	<10.1	<10.1	<1.05	<1.05	-	<0.524	-	<1.05	<1.05	<1.05	<0.524	<0.524	<0.324	<0.324	<0.524	<0.324	<0.524	<0.524	<0.524	11.2
	12/8/10	<20	<20	<40	<20	<20	<20	<20	<20	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.0500	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	2/9/12	<10.2	0.3312	<10.2	<10.2	<10.2	7.812	1.833	<10.2	<10.2	<0.102	<0.102	0.2110	<0.051	<0.051	<0.102	<0.102	<0.102	<0.051	<0.051	<0.511	<0.051	<0.051	<0.051	<0.0511	<0.051	<0.051	<0.50
	8/30/12	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	0.206	<0.101	0.405	0.253	<0.051	<0.101	<0.101	<0.101	<0.051	0.519	<0.051	<0.508	<0.051	<0.051	<0.0511	<0.051	<0.051	<10
	2/21/13	<10.0	0.3568	<10.0	<10.0	<10.0	3.857	1.532	<10.0	<10.0	<0.100	<0.100	0.128	0.166	<0.050	<0.100	<0.100	<0.100	<0.050	0.184	0.249	<0.500	<0.050	<0.050	0.350	<0.050	<0.050	<20
MW-3	6/23/07	-	-	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																										
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<10.1	<10.1	0.5811	3.061	0.3471	<10.1	1.751	<10.1	<10.1	<1.05	<1.02	-	0.631	-	<1.02	<1.02	<1.02	<0.510	0.63	<3.10	<0.510	<0.510	3.05	<0.510	0.3219	<0.510	1.51
	12/8/10	<30	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	0.097	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	2/6/12	DNS									Pvt Sampled (Dry)																	DNS
	8/13/12	DNS						-			Pvt Sampled (Dry)																	DNS
	2/21/13																											
MW-4R	6/23/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																										
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	9.87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	1.037	0.2233	<100	<100	<100	2.091	<100	<100	<100	<0.101	<0.101	-	<0.050	-	<0.101	<0.101	<0.101	<0.107	<0.050	<0.050	<0.0503	0.378	<0.050	0.83	<0.050	<0.050	<0.050	12.2
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	2/7/12	<10.1	<10.1	<10.1	<10.1	<10.1	1.241	<10.1	<10.1	<10.1	<0.101	<0.101	0.176	<0.051	0.0696(J)	<0.101	<0.101	<0.101	<0.051	<0.051	<0.505	0.134	<0.051	<0.051	<0.0511	<0.051	<0.051	1.9
	8/30/12	<10.0	<10.0	<10.0	2.402	<10.0	1.291	0.3181	<10.0	<10.0	<0.101	<0.101	<0.101	0.0171	<0.051	<0.101	<0.101	<0.101	<0.051	0.1901	<0.051	<0.505	0.078	<0.051	<0.051	<0.0511	<0.051	<2.0
	2/21/13	<10.0	<10.0	<10.0	1.561	<10.0	1.201	<10.0	<10.0	<10.0	<0.100	<0.100	<0.100	0.004632	<0.050	0.004218	0.002311	<0.100	0.0191	<0.050	0.009221	0.0471	<0.050	0.0132	0.0013(J)	0.0191	<0.050	<2.0
MW-5	6/23/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/12/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	Could Not Locate																										
	6/22/10	<100	<100	<100	1.792	0.3337	0.6491	<100	<100	<100	<0.196	<0.108	-	<0.054	-	<0.109	<0.108	<0.108	<0.054	<0.054	<0.541	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	<0.519
	12/8/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050
	2/7/12	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.101	<0.101	<0.101	<0.051	<0.051	<0.101	<0.101	<0.101	<0.051	<0.051	<0.505	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.50
	8/30/12	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.100	<0.100	<0.100	<0.050	<0.050	<0.100	<0.100	<0.100	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0
	2/21/13	<10.0	<10.0	<10.0	0.7612	<10.0	<10.0	<10.0	<10.0	<10.0	<0.100	<0.100	<0.100	<0.050	<0.050	<0.100	<0.100	<0.100	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0

Notes:
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCLs Maximum Contaminant Level
J= Estimated value
State= Commission exceeds respective MCL
ND= Not/Below sample volume

County 2002

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Semivolatile Organic Compounds (Method 8270D)									Chlorinated Pesticides, TCL (Method 8081B)															Chlorinated Herbicides (Method 8151A)
		2,4,5-Trichlorophenol	2-Methylnaphthalene	4-Methylphenol	Bis(2-Ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate	Naphthalene	Phenanthrene	Pyrene	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan I	Endosulfan II	Endrin	Endrin aldehyde	Heptachlor	Heptachlor epoxide	Methoxychlor	Alpha-BHC	Alpha-Chlordane	Beta-BHC	Delta-BHC	Gamma-BHC (Lindane)	Gamma-Chlordane	2,4-D
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ng/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SC EPA MCL		-	-	-	-	-	-	35	-	-	-	-	-	-	-	-	3	-	0.4	0.2	40	-	-	-	0.2	-	70
MW-6	6/27/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																									
	3/11/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<10.0	0.2342	<10.0	1.541	<0.2858	<10.0	0.6431	0.2471	34	<0.103	<0.102	-	0.0486	-	<0.102	<0.105	<0.107	<0.0951	<0.051	<0.508	<0.051	<0.051	<0.051	<0.051	<0.051	<0.110
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.05	<0.020	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<2.0
	2/5/12	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	<10.1	<10.3	<0.105	<0.101	<0.101	<0.053	<0.052	<0.103	<0.105	<0.101	<0.0952	<0.052	<0.513	<0.052	<0.052	<0.052	<0.052	<0.052	<0.55
	8/30/12	Not Sampled (Dry)																									
	2/21/13	Not Sampled (Dry)																									
MW-7R	6/27/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																									
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10.1	<10.1	0.3419	<10.1	<10.1	<10.1	<10.1	<10.1	<0.103	<0.103	-	0.0066481	-	<0.103	<0.105	<0.106	<0.053	<0.053	<0.514	<0.053	<0.053	<0.053	<0.053	<0.053	<0.111
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	0.0290	<0.106	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.055
	2/6/12	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.102	<0.102	<0.101	<0.051	<0.051	<0.102	<0.105	<0.106	<0.051	<0.051	<0.514	<0.051	<0.051	<0.051	<0.051	<0.051	<0.55
	8/30/12	<10.2	<10.2	<10.2	0.173	<10.2	<10.2	<10.2	<10.2	<10.2	<0.101	<0.101	<0.101	<0.051	<0.051	<0.103	<0.101	<0.101	<0.051	<0.051	<0.505	<0.051	<0.051	<0.051	<0.051	<0.051	<0.11
	2/21/13	<10.0	<10.0	<10.0	0.431	<10.0	<10.0	<10.0	<10.0	<10.0	<0.100	<0.100	<0.100	<0.050	<0.050	<0.100	<0.100	<0.100	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.2
MW-8	6/27/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																									
	3/11/09	-	-	-	-	-	-	<1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<10.2	<10.2	<10.2	0.4342	<10.2	0.2051	<10.2	<10.2	<10.2	<0.103	<0.103	-	<0.051	-	<0.103	<0.105	<0.107	<0.052	<0.052	<0.515	<0.052	<0.052	<0.052	<0.052	<0.052	<0.565
	12/6/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.550
	2/9/12	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<0.103	<0.103	<0.102	<0.051	<0.051	<0.103	<0.105	<0.107	<0.051	<0.051	<0.513	<0.051	<0.051	<0.051	<0.051	<0.051	<0.550
	8/30/12	<10.0	<10.0	<10.0	<10.0	<10.0	0.3083	<10.0	<10.0	<10.0	<0.100	<0.100	<0.0997	<0.050	<0.050	<0.100	<0.105	<0.106	<0.050	<0.050	<0.500	0.0331	<0.050	<0.050	<0.050	<0.050	<0.550
	2/21/13	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.100	<0.100	<0.100	0.0153	<0.050	<0.100	<0.100	<0.100	<0.050	0.0101161	0.004772	<0.500	0.003297	0.0214	<0.050	0.0031902	0.009562	<0.050	<2.0
TMW-9	6/27/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																									
	3/13/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	<2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10.1	0.3172	0.3792	<10.1	2.532	<10.1	<10.1	<10.1	<0.102	<0.102	-	0.0281	-	<0.102	<0.105	<0.107	0.0671	0.154	<0.051	<0.510	0.149	<0.051	<0.051	<0.051	<0.051	0.557
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.550
	2/6/12	<10.2	<10.2	<10.2	<10.2	<10.2	2.121	<10.2	<10.2	<10.2	<0.103	<0.103	<0.102	<0.052	<0.052	<0.103	<0.105	<0.107	<0.052	<0.052	<0.513	0.100	<0.052	0.248	<0.052	<0.052	<0.550
	8/30/12	<10.0	<10.0	<10.0	<10.0	<10.0	2.331	0.3582	<10.0	<10.0	<0.100	<0.100	0.185	0.081	<0.051	<0.103	<0.105	<0.106	<0.051	0.119	<0.514	<0.051	<0.051	0.172	<0.051	<0.051	<0.55
	2/21/13	<10.0	<10.0	<10.0	1.60	<10.0	1.782	<10.0	<10.0	<10.0	<0.100	0.0271	<0.100	0.047	<0.050	<0.100	<0.100	<0.100	0.0431	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0
TMW-10	6/27/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																									
	3/13/09	-	-	-	-	-	-	<1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	<2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<10.1	<10.1	0.3171	0.4149	<10.1	2.311	<10.1	<10.1	<10.1	0.0441	<0.103	<0.101	0.111	<0.051	<0.103	<0.105	<0.106	0.0551	0.8238	<0.513	<0.051	<0.051	0.071	<0.051	<0.051	0.897
	12/7/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.550
	2/6/12	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<10.1	<0.101	<0.101	0.007704	<0.051	0.0102	<0.103	<0.105	<0.106	<0.051	<0.051	<0.505	<0.051	<0.051	0.0432	<0.051	<0.051	<0.55
	8/30/12	<10.2	<10.2	<10.2	<10.2	0.6442	<10.2	<10.2	<10.2	<10.2	<0.101	<0.101	<0.101	0.0152	<0.051	<0.103	<0.105	<0.106	<0.051	0.0163	<0.505	<0.051	<0.051	0.0212	<0.051	<0.051	<0.54
	2/21/13	<10.0	<10.0	<10.0	2.40	<10.0	<10.0	<10.0	<10.0	<10.0	<0.100	0.0111	<0.100	<0.050	0.00600	<0.100	<0.100	<0.100	0.00674	<0.050	0.009799	<0.500	<0.050	0.008168	<0.050	<0.050	<0.550

Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Contaminant Level
> = Estimated value
Bold = Concentrations exceeds regulatory MCL
Dry = insufficient sample volume

County 2003

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Semivolatile Organic Compounds (Method 8270D)									Chlorinated Pesticides, TCL (Method 8081B)																	Chlorinated Herbicides (Method 8151A)
		2,4-Dichlorophenol	2-Methylphenol	Acetophenone	Bis(2-Ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate	Naphthalene	Pentachlorophenol	Phenol	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan I	Endosulfan II	Endrin	Endrin aldehyde	Heptachlor	Heptachlor epoxide	Methoxychlor	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC (Lindane)	Gamma-Chlordane	2,4-D
Date		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
US EPA MCL		-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	2	-	-	0.4	0.2	40	-	-	-	0.2	-	70
TMW-11	8/2/07	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/1/09	Could Not Locate																										
	12/4/09	Could Not Locate																										
	6/22/10	Could Not Locate																										
	12/2/10	Could Not Locate																										
	2/6/12	Could Not Locate																										
	6/19/12	Could Not Locate																										
	3/7/13	Could Not Locate																										
TMW-12	12/3/09	Insufficient Sample Volume																										
	6/23/10	Insufficient Sample Volume																										
	12/1/10	Insufficient Sample Volume																										
	2/6/12	Insufficient Sample Volume																										
	6/19/12	Not Sampled (Dry)																										
	3/7/13	Not Sampled (Dry)																										
TMW-13	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<10.0	<5.0	<10.0	5.3041	<10.0	<10.0	<10.0	<10.0	<10.0	<0.105	<0.101	-	0.0411	-	<0.103	<0.109	<0.101	<0.101	0.1311	0.0412	<0.313	<0.051	<0.051	<0.061	0.0432	<0.051	<0.951	<0.505
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.0538	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	2/6/12	<10.1	<10.1	<10.1	<10.1	<10.1	<13.1	<10.1	<10.1	<10.1	<0.102	<0.102	<0.102	<0.051	<0.051	<0.102	<0.102	<0.102	<0.102	<0.051	<0.051	<0.510	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.10
	6/19/12	<10.1	<10.1	<10.1	1.181	2.121	<10.1	<10.1	<10.1	<10.1	<0.100	<0.100	0.008133	0.0133	<0.050	<0.100	<0.100	<0.100	<0.100	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0
	3/7/13	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.190	<0.100	<0.100	<0.050	<0.050	<0.100	<0.100	<0.100	<0.100	<0.050	0.0041251	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0
Water Well	8/7/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/4/08	-	-	-	-	-	-	<2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																											
	3/1/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	Not In Service																											
	6/23/10	Not In Service																											
	12/1/10	Not In Service																											
	2/6/12	Not In Service																											
	6/19/12	Not In Service																											
	3/7/13	Not In Service																											
Caveners Creek	8/7/07	-	-	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	Not Sampled																											
	3/1/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	<5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	Not Sampled																											
	12/1/10	<10	<10	<10	<10	<10	<10	<10	<10	-	<0.10	<0.10	<0.10	<0.051	<0.051	<0.10	<0.10	<0.10	<0.10	<0.0513	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<2.0
	2/6/12	Dry																											
	6/19/12	Not Sampled (Dry)																											
	3/7/13	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.102	<0.102	<0.102	<0.050	<0.050	<0.102	<0.102	<0.102	<0.102	<0.050	<0.050	<0.509	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0

Notes:
µg/L = Micrograms per liter
MCL = Maximum Contaminant Level
J = Estimated value
Bold = Concentration exceeds respective MCL
Insufficient sample volume

County 2004

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B/6010C)																Method 9012A	Method 7470A	Method 9056B
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc		Cyanide	Mercury	Nitrate
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
US EPA MCL		0.010	2	0.004	0.005	0.1	-	1.3	0.015	-	0.05	0.095	0.002	-	-	-		0.2	0.002	10
NW-1R	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/4/08	Not Sampled																		
	9/12/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/22/10	<0.010	0.09	0.000168	<0.0050	0.000439	<0.010	<0.010	<0.015	<0.040	-	<0.010	<0.020	-	<0.020	<0.020		<0.0100	<0.00020	
	12/2/10	<0.0100	0.141	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0400	<0.0200	<0.0200	<0.0100	<0.0200	0.000278	<0.0200	<0.0200		<0.010	<0.00020	5.60
	3/7/12	<0.010	0.28	0.000311	<0.0050	<0.010	0.00111	0.00164	0.00961	<0.040	<0.050	<0.010	<0.020	<0.025	0.0072	0.026		<0.0100	<0.00020	<2.00
	9/31/12	<0.010	0.61	0.0068	0.00148	0.00161	0.00387	0.021	0.016	<0.040	<0.050	<0.010	0.00433	<0.025	0.033	0.091		<0.010	0.00016	<2.00
	3/7/13	<0.020	0.14	<0.0040	0.0033	<0.010	<0.010	0.0117	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.020	0.024		<0.0010	<0.00030	<2.00
NW-2RR	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/4/08	Not Sampled																		
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/21/10	<0.010	1.5	0.000448	<0.0050	0.000376	<0.010	<0.010	0.00378	0.00168	-	<0.010	<0.020	-	0.00516	0.043		<0.0100	0.000178	-
	12/1/10	<0.0500	2.31	<0.0100	<0.0050	<0.100	<0.0200	<0.0100	<0.0170	<0.0200	<0.0200	<0.0100	<0.0200	0.0275	<0.0200	0.0656		<0.010	<0.00020	<2.00
	3/8/12	<0.010	2.21	0.00131	<0.0050	<0.010	<0.010	<0.010	0.00441	<0.040	<0.050	<0.010	<0.020	<0.025	0.0141	0.063		0.0130	<0.00020	<2.00
	9/13/12	<0.010	1.29	0.0051	<0.0050	<0.010	<0.010	0.0102	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.024	0.11		<0.010	0.00013	<2.00
	3/7/13	<0.020	1.09	0.0030	<0.0050	<0.010	<0.010	0.00782	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.022	0.090		<0.010	<0.00020	<2.00
MW-3	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/4/08	Not Sampled																		
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/21/10	<0.010	0.96	0.000468	<0.0050	0.00128	0.029	<0.010	0.00218	0.00178	-	0.000609	<0.020	-	0.00288	0.00358		0.00408	<0.00020	-
	12/1/10	<0.0250	1.12	<0.0100	<0.0050	<0.0100	0.0752	<0.0100	0.0129	<0.0200	<0.0200	<0.0100	<0.0200	0.0138	0.0154	0.0641		<0.010	<0.00020	<2.00
	3/6/12	<0.010	1.41	0.027	0.00157	0.00991	0.041	0.025	0.11	<0.040	<0.041	<0.010	<0.020	<0.025	0.19	0.71		0.0150	0.00120	ENS
	9/10/12	ENS																ENS	ENS	ENS
	3/7/13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
NW-4R	6/22/07	Not Sampled (Dry)																		
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/4/08	Not Sampled																		
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/22/10	<0.010	0.091	<0.0050	<0.0050	0.00139	0.00618	<0.010	0.00189	<0.040	-	0.000978	<0.020	-	0.00199	0.00189		<0.0100	<0.00020	-
	12/1/10	<0.0500	0.849	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	<0.0025	<0.0100	0.0316		<0.010	<0.00020	<2.00
	3/7/12	<0.010	0.80	<0.0050	<0.0050	<0.010	0.00295	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00112	<0.020		1.48	<0.0010	<2.00
	9/10/12	<0.010	0.73	0.00131	0.00132	<0.010	0.011	0.00512	<0.015	<0.040	<0.040	<0.010	0.0161	<0.025	0.0178	0.00791		<0.010	0.00014	<2.00
	3/7/13	<0.020	0.64	<0.0040	<0.0050	<0.010	0.00698	0.0149	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00751	0.012		0.00141	<0.00020	<2.00
MW-5	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	6/4/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	12/4/09	Could Not Locate																		
	6/23/10	0.00648	1.94	0.813	0.814	0.063	0.056	0.062	0.24	0.0278	-	<0.010	<0.020	-	0.18	1.44		<0.0100	0.00072	
	12/1/10	<0.0500	0.574	<0.0100	0.0973	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	0.00198	<0.0100	0.130		<0.010	<0.00020	<2.00
	7/7/12	<0.010	0.11	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.041	<0.010	<0.020	<0.025	<0.020	0.0160		0.0648	<0.00020	<2.00
	9/10/12	<0.010	0.15	0.00211	0.00217	0.0218	0.000443	0.00402	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00291	0.015		<0.010	0.00014	<2.00
	3/7/13	<0.020	0.13	<0.0040	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.020	0.026		0.00162	<0.00020	<2.00

Notes:
ug/L = Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
X= Estimated value
Bold= Concentration exceeds maximum MCL
ENS= Insufficient sample volume

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B/6010C)																Method 9012A	Method 7470A	Method 9056B
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc	Cyanide	Mercury	Sulfide
Units		ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L
US EPA MCL		0.010	2	0.004	0.005	0.1	-	1.3	0.015	-	0.05	0.095	0.002	-	-	-	0.2	0.002	-
MW-6	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/21/10	<0.010	0.43	0.002298	<0.0050	0.00118	0.013	<0.010	0.00388	0.00518	-	0.000768	<0.020	-	0.00178	0.08	<0.0100	0.000078	-
	12/7/10	<0.0500	0.367	<0.0197	<0.0050	<0.0100	<0.0078	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	0.110	<0.010	<0.00200	<2.00
	7/6/12	<0.010	0.78	0.000253	0.00751	0.00208	0.00127	0.00943	0.0017	<0.040	<0.040	<0.010	<0.020	<0.025	0.041	0.41	0.00681	0.00021	<2.00
	8/30/12	Not Sampled (Dry)																	
	2/13/13	Not Sampled (Dry)																	
MW-7R	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/23/10	<0.010	0.58	0.0000781	<0.0050	0.00338	0.00758	<0.010	0.00758	<0.040	-	<0.010	<0.020	-	0.00798	0.00988	0.00469	0.00034	-
	12/7/10	<0.0500	0.474	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	0.0128	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	<0.00200	<2.00
	7/6/12	<0.010	0.43	<0.0050	<0.0050	<0.010	0.00159	<0.010	<0.015	0.00733	<0.040	<0.010	<0.020	<0.025	0.00413	0.0264	0.1334	<0.00200	<2.00
	8/30/12	0.00543	0.29	<0.0050	0.00141	<0.010	0.00789	0.00431	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00864	0.00982	0.00784	0.000352	<2.00
	2/13/13	<0.020	4.30	<0.0040	0.00151	0.00561	0.00264	<0.020	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.0041	0.0165	0.00521	<0.00020	<2.00
MW-8	6/23/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/4/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<0.010	0.398	0.0011 19	<0.0050	0.00448	<0.010	<0.010	<0.011	0.00148	-	<0.010	0.00158	-	<0.010	<0.020	<0.0100	<0.00200	-
	12/7/10	<0.0500	0.163	<0.0100	<0.0050	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	0.00033	<2.00
	7/6/12	<0.010	0.11	<0.0038	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.025	0.00397	<0.0100	0.00071	<2.00
	8/30/12	<0.010	0.16	<0.0038	<0.0050	<0.010	<0.010	<0.010	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00173	0.0182	<0.010	0.00045	<2.00
	2/13/13	<0.020	0.13	<0.0040	0.00161	<0.010	<0.010	<0.020	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.029	0.0162	<0.00020	<0.00010	<2.00
TMW-9	6/23/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<0.010	0.18	0.00208	<0.0050	0.00318	0.00618	0.00648	0.015	0.00188	-	<0.010	<0.020	-	0.011	0.14	0.00423	0.00052	-
	12/7/10	<0.0500	0.143	<0.0100	<0.0050	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	0.0445	<0.010	<0.00200	<2.00
	7/6/12	<0.010	1.03	<0.0050	<0.0050	0.00133	0.00164	0.00583	0.00621	<0.040	<0.040	<0.010	<0.020	<0.025	0.011	0.082	0.00731	0.00117	<2.00
	8/30/12	0.00168	1.61	0.00148	<0.0050	<0.010	0.00217	0.00233	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.0167	0.059	<0.010	0.00218	<2.00
	2/13/13	<0.020	0.17	<0.0040	0.00211	<0.010	<0.010	0.00871	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00681	0.041	<0.020	<0.00020	<2.00
TMW-10	6/22/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/31/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	<0.010	0.28	0.00288	<0.0050	0.00338	0.00618	0.00648	0.015	0.00188	-	<0.010	<0.020	-	0.011	0.14	0.00428	0.00052	-
	12/7/10	<0.0500	0.184	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.0200	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	0.00029	<2.00
	7/6/12	<0.010	0.18	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.011	<0.040	<0.040	<0.010	<0.020	<0.025	0.00581	0.00733	0.0154	0.00144	<2.00
	8/30/12	<0.010	0.85	0.00211	<0.0050	<0.010	0.00211	0.013	0.004	<0.040	<0.040	0.00065	<0.020	<0.025	0.0173	0.063	<0.010	0.00055	<2.00
	2/13/13	<0.020	0.054	<0.0040	<0.0050	<0.010	<0.010	0.0131	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	<0.029	0.04	<0.020	0.00053	<2.00

Notes
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Contaminant Level
J = Estimated value
Bold = Concentration exceeds respective MCL
FD = Indicates sample replicate

County 2008

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date	Metals, Total (Method 6010B/6010C)																	Method 9012A	Method 7470A	Method 9034
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc	Cyanide	Mercury	Sulfide
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
DHEC RPA MPC		0.010	2	0.004	0.005	0.1	-	1.3	0.015	-	0.05	0.05	0.002	-	-	-	0.2	0.002	-
TMW-11	8/2/2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/13/09	Could Not Locate																	
	12/4/09	Could Not Locate																	
	6/22/10	Could Not Locate																	
	12/2/10	Could Not Locate																	
	2/6/12	Could Not Locate																	
	8/10/12	Could Not Locate																	
	2/1/13	Could Not Locate																	
TMW-12	12/1/09	Insufficient Sample Volume																	
	6/21/10	Insufficient Sample Volume																	
	12/1/10	Insufficient Sample Volume																	
	2/6/12	Insufficient Sample Volume																	
	8/9/12	Not Sampled (Dry)																	
	2/1/13	Not Sampled (Dry)																	
TMW-13	12/3/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/25/08	<0.010	0.44	0.00228	<0.0050	0.012	0.00715	0.00468	0.0033	0.00318	-	<0.010	<0.020	-	0.024	0.11	<0.0100	0.00100	-
	12/1/10	<0.0005	1.95	<0.0100	<0.0050	0.0168	<0.0200	0.0013	0.0265	<0.0200	<0.0250	<0.0100	<0.0200	0.013	0.0135	0.212	<0.010	0.00196	<2.00
	2/6/12	<0.010	0.24	<0.0010	<0.0050	0.00432	0.00181	<0.01	0.00901	<0.040	<0.040	<0.010	<0.020	<0.025	0.00933	0.104	0.00442	0.00074	<2.00
	8/30/12	<0.010	1.63	<0.0001	<0.0010	0.033	0.021	0.021	0.004	<0.040	<0.040	<0.010	<0.020	<0.025	0.067	0.11	<0.010	0.00061	<2.00
	2/1/13	<0.010	0.19	<0.0040	<0.0010	0.00251	<0.010	<0.020	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00971	0.047	<0.020	0.00021	<2.00
Water Well	6/7/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/8/08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	Not in Service																	
	6/22/10	Not in Service																	
	12/1/10	Not in Service																	
	2/6/12	Not in Service																	
	8/10/12	Not in Service																	
	2/1/13	Not in Service																	
Cannons Creek	6/7/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/11/07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/4/08	Not Sampled																	
	3/13/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12/3/09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/22/10	Not Sampled																	
	12/1/10	<0.0500	0.248	<0.0100	<0.0050	<0.0100	<0.0200	<0.0100	<0.0100	<0.0200	<0.0250	<0.0100	<0.0200	<0.025	<0.0100	<0.0200	<0.010	<0.00200	<2.00
	2/6/12	Dry																	
	8/13/12	Not Sampled (Dry)																	
	2/1/13	<0.020	0.032	<0.0040	<0.0020	<0.010	<0.010	<0.020	<0.015	<0.040	<0.040	<0.010	<0.020	<0.025	0.00541	<0.020	<0.020	<0.00020	<2.00

Notes
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
E= Estimated value
Bold= Concentration exceeds regulatory MCL
INS= Insufficient sample volume

County 2007

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
FEBRUARY 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314H

Parameter	Analytical Method	Units	MCL	MW-1R	MW-2RR	MW-4R	MW-5	MW-7R	MW-8	TMW-9	TMW-10	TMW-13	Cannons Creek
				2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013	2/21/2013
1,1-Dichloroethane	8260B	ug/L	---	<5.00	16.8	4.69J	1.55J	2.30J	8.49	12.4	3.47J	1.24J	<5.00
1,1-Dichloroethene	8260B	ug/L	7	<5.00	0.815J	0.867J	<5.00	<5.00	2.79J	0.549J	0.445J	<5.00	<5.00
1,2-Dichlorobenzene	8260B	ug/L	600	<5.00	0.625J	0.502J	<5.00	0.205J	<5.00	0.330J	<5.00	<5.00	<5.00
1,2-Dichloroethane	8260B	ug/L	5	<5.00	2.26J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
1,2-Dichloropropane	8260B	ug/L	5	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
1,4-Dichlorobenzene	8260B	ug/L	75	<5.00	14.2	1.12J	<5.00	2.21J	0.666J	5.57	0.444J	<5.00	<5.00
Acetone	8260B	ug/L	---	<5.00	2.68J	1.55J	<5.00	3.96J	<5.00	<5.00	1.32J	<5.00	2.23J
Benzene	8260B	ug/L	5	<5.00	**5.15**	1.75J	<5.00	0.687J	0.620J	2.75J	0.245J	<5.00	<5.00
Chlorobenzene	8260B	ug/L	100	<5.00	6.15	0.801J	<5.00	<5.00	0.325J	2.65J	<5.00	<5.00	<5.00
Dichlorodifluoromethane	8260B	ug/L	---	<5.00	14.2	<5.00	0.522J	<5.00	13.2	9.31	0.745J	<5.00	<5.00
Methylene chloride	8260B	ug/L	5	<5.00	**54.1**	<5.00	<5.00	0.385J	3.53J	**40.9**	3.56J	<5.00	<5.00
Tetrachloroethene	8260B	ug/L	5	<5.00	3.88J	<5.00	<5.00	0.765J	1.59J	3.46J	0.688J	<5.00	<5.00
Toluene	8260B	ug/L	1000	<5.00	<5.00	1.67J	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Trichloroethene	8260B	ug/L	5	<5.00	**6.12**	<5.00	<5.00	0.740J	2.72J	4.60J	0.690J	<5.00	<5.00
Trichlorofluoromethane	8260B	ug/L	---	<5.00	0.524J	<5.00	0.305J	<5.00	3.89J	0.723J	<5.00	<5.00	<5.00
Vinyl chloride	8260B	ug/L	2	<5.00	**3.56J**	<5.00	<5.00	<5.00	<5.00	**2.04J**	<5.00	<5.00	<5.00
Xylene (total)	8260B	ug/L	10000	<15.0	9.09J	<15.0	<15.0	<15.0	<15.0	2.03J	<15.0	<15.0	<15.0
cis-1,2-Dichloroethene	8260B	ug/L	70	<5.00	48.7	1.97J	0.486J	6.51	5.82	25.4	2.07J	<5.00	.233J
2-Methylnaphthalene	8270D	ug/L	---	<10.0	0.356J	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Bis(2-Ethylhexyl)phthalate	8270D	ug/L	---	<10.0	<10.0	1.50J	0.761J	1.63J	<10.0	1.84J	2.40J	<10.0	<10.0
Di-n-butyl phthalate	8270D	ug/L	---	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Diethyl phthalate	8270D	ug/L	---	<10.0	5.85J	1.20J	<10.0	<10.0	<10.0	1.78J	<10.0	<10.0	<10.0
Naphthalene	8270D	ug/L	25	<10.0	1.52J	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
4,4'-DDE	8081B	ug/L	---	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.027J	0.011J	<0.100	<0.100
4,4'-DDT	8081B	ug/L	---	<0.100	0.128	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Aldrin	8081B	ug/L	---	<0.050	0.166	0.00460J	<0.050	<0.050	0.015J	0.097	0.00400J	<0.050	<0.050
Endosulfan II	8081B	ug/L	---	<0.100	<0.100	0.00427J	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Endrin	8081B	ug/L	2	<0.100	<0.100	0.00231J	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Heptachlor	8081B	ug/L	0.4	<0.050	0.186	0.019J	<0.050	<0.050	0.00316J	0.043J	0.00436J	<0.050	<0.050
Heptachlor epoxide	8081B	ug/L	0.2	<0.050	**0.240**	<0.050	<0.050	<0.050	0.00427J	<0.050	<0.050	0.00925J	<0.050
Methoxychlor	8081B	ug/L	40	<0.500	<0.500	0.00922J	<0.500	<0.500	<0.500	<0.500	0.00979J	<0.500	<0.500
alpha-BHC	8081B	ug/L	---	0.038J	<0.050	0.047J	<0.050	<0.050	0.00329J	<0.050	<0.050	<0.050	<0.050
alpha-Chlordane	8081B	ug/L	---	<0.050	<0.050	<0.050	<0.050	<0.050	0.014J	<0.050	<0.050	<0.050	<0.050
beta-BHC	8081B	ug/L	---	<0.050	0.330	0.015J	<0.050	<0.050	<0.050	<0.050	0.00830J	<0.050	<0.050
delta-BHC	8081B	ug/L	---	<0.050	<0.050	0.00380J	<0.050	<0.050	0.00380J	<0.050	<0.050	<0.050	<0.050
gamma-BHC (Lindane)	8081B	ug/L	0.2	0.00970J	<0.050	0.039J	<0.050	<0.050	0.00956J	<0.050	<0.050	<0.050	<0.050
Barium	6010B	mg/L	2	0.14	**2.05**	0.44	0.13	0.30	0.15	0.77	0.054	0.19	0.052
Beryllium	6010B	mg/L	0.004	<0.0040	0.0020J	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cadmium	6010B	mg/L	0.005	0.0033J	<0.0050	<0.0050	<0.0050	0.0035J	0.0019J	0.0031J	<0.0050	<0.0050	<0.0050
Chromium	6010B	mg/L	0.1	<0.010	<0.010	<0.010	<0.010	0.0036J	<0.010	<0.010	<0.010	0.0025J	<0.010
Cobalt	6010B	mg/L	---	<0.010	<0.010	0.0069J	<0.010	0.0026J	<0.010	<0.010	<0.010	<0.010	<0.010
Copper	6010B	mg/L	1.3	0.011J	0.0070J	0.019J	<0.020	<0.020	<0.020	0.0087J	0.013J	<0.020	<0.020
Vanadium	6010B	mg/L	---	<0.020	0.022	0.0078J	<0.020	0.0064J	<0.020	0.0068J	<0.020	0.0092J	0.0056J
Zinc	6010B	mg/L	---	0.036	0.090	0.032	0.036	0.016J	0.016J	0.041	0.16	0.042	<0.020
Cyanide	9012A	mg/L	0.2	<0.0050	<0.020	0.0016J	0.0016J	0.0052J	<0.0050	<0.020	<0.020	<0.020	<0.020
Mercury	7470A	mg/L	0.002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00036	<0.00020	0.00015J	0.00026	<0.00020

Notes
ug/L Micrograms per liter
mg/L Milligrams per liter
MCL Maximum Contaminant Level as established by U S EPA
Bold Indicates that the parameter's reported concentration equaled or exceeded its respective MCL value
J Indicates that the reported concentration is an estimated value

County 2008

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314H

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-1	12/3/2009	Deep	20.5	0.5	0.0	0.0
		Shallow	20.5	0.5	0.0	0.0
	6/22/2010	Deep	17.4	01.1	00.1	1
		Shallow	18.2	00.7	00.1	2
	12/2/2010	Deep	19.8	00.1	00.0	0
		Shallow	20.1	00.1	00.1	1
	2/7/2012	Deep	19.8	01.4	00.0	000
		Shallow	19.8	01.3	00.0	001
	8/31/2012	Deep	16.2	04.6	00.0	000
		Shallow	18.6	01.7	00.0	000
	2/21/2013	Deep	18.5	1.6	00.0	000
		Shallow	13.1	7.5	00.0	000
GMP-3	3/20/2007	Deep	15.7	4.9	>3.0	**>43**
		Shallow	16.0	4.4	>3.0	**>43**
	6/8/2007	Deep	18.0	2.3	3.2	**62**
		Shallow	17.8	1.9	2.4	**47**
	9/20/2007	Deep	5.9	23.0	23.3	**>100**
		Shallow	2.1	24.0	19.3	**>100**
	12/31/2007	Deep	15.3	6.2	5.5	**>100**
		Shallow	17.7	4.3	4.8	**>100**
	3/12/2009	Deep	14.0	6.1	0.0	0
		Shallow	20.6	0.8	0.0	0
	12/3/2009	Deep	21.0	0.1	0.1	2.0
		Shallow	21.0	0.1	0.1	2.0
	6/21/2010	Deep	16.4	0.57	0.93	**>100**
		Shallow	15.8	0.51	0.89	**>100**
	12/1/2010	Deep	20.7	00.1	00.1	1
		Shallow	20.8	00.1	00.1	2
	2/6/2012	Deep	15.7	07.2	08.8	**>100**
		Shallow	15.1	08.1	09.6	**>100**
	8/30/2012	Deep	19.2	01.5	01.8	**36**
		Shallow	14.3	07.2	01.5	**31**
	2/22/2013	Deep	20.2	00.0	00.0	000
		Shallow	20.2	00.0	00.0	000

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314H

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-4	3/20/2007	Shallow	0.0	>20	5.3	6.45
	6/8/2007	Shallow	0.0	39.9	60.4	>100
	9/20/2007	Shallow	0.2	38.3	36.1	>100
	12/31/2007	Shallow	3.6	26.0	25.8	>100
	3/12/2009	Shallow	Not Found			
	12/3/2009	Shallow	0.2	39.1	60.5	1210
	6/21/2010	Shallow	9.2	21.2	36.7	>100
	12/2/2010	Shallow	7.1	23.4	38.3	>100
	2/6/2012	Shallow	00.0	39.7	60.2	>100
	8/30/2012	Shallow	00.2	37.8	55.2	>40
	2/22/2013	Shallow	00.0	37.5	61.3	>>>
GMP-5	3/20/2007	Shallow	4.0	17.3	2.8	32.25
	6/8/2007	Shallow	16.5	4.4	4.2	69
	9/20/2007	Shallow	20.3	0.7	0.7	12
	12/31/2007	Shallow	20.1	1.0	0.5	10
	3/12/2009	Shallow	19.2	2.7	4.0	63
	12/3/2009	Deep	19.2	2.2	3.3	66.0
		Shallow	14.2	13.0	18.8	360.0
	6/21/2010	Deep	14.4	10.6	11.5	>100
		Shallow	20.5	00.2	00.1	2
	12/2/2010	Deep	13.8	07.9	00.1	3
		Shallow	20.6	00.4	00.1	3
	2/6/2012	Deep	07.5	10.3	00.6	022
		Shallow	00.0	28.6	32.9	>100
	8/30/2012	Deep	06.6	14.4	01.2	>40
		Shallow	00.2	32.5	47.7	>40
	2/22/2013	Deep	15.0	5.8	2.8	40
		Shallow	2.1	26.6	43.3	888

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314H

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-6	3/20/2007	Shallow	0.0	19.4	0.5	**6.02**
	6/8/2007	Shallow	0.2	35.2	43.3	**>100**
	9/20/2007	Shallow	0.3	40.5	44.3	**>100**
	12/31/2007	Shallow	4.3	24.9	21.2	**>100**
	3/12/2009	Shallow	20.9	0.0	0.1	3
	12/3/2009	Deep	21.1	0.1	0.0	0.0
		Shallow	21.1	0.1	0.0	0.0
	6/21/2010	Deep	03.6	24.5	30.7	**>100**
		Shallow	00.5	38.4	52.5	**>100**
	12/2/2010	Deep	20.4	00.1	00.1	3
		Shallow	11.9	13.1	16.8	**>100**
	2/6/2012	Deep	03.2	22.1	22.6	**>100**
		Shallow	00.0	34.9	49.2	**>100**
	8/31/2012	Deep	20.2	00.0	00.0	000
		Shallow	20.2	00.0	00.0	000
	2/22/2013	Deep	20.1	00.1	00.0	000
		Shallow	4.2	24.1	34.3	**696**
GMP-7	3/20/2007	Shallow	19.3	0.1	0.0	0.0
	6/8/2007	Shallow	16.3	4.4	0.0	**69**
	9/20/2007	Shallow	19.6	1.0	0.0	0.0
	12/31/2007	Shallow	16.5	4.3	0.0	0.0
	3/12/2009	Shallow	20.0	1.5	0.1	3
	12/3/2009	Deep	20.9	0.1	0.0	0.0
		Shallow	20.9	0.1	0.0	0.0
	6/21/2010	Deep	0.39	19.3	10.2	**>100**
		Shallow	00.9	29.7	21.4	**>100**
	12/2/2010	Deep	19.1	02.9	01.5	**31**
		Shallow	19.2	02.2	00.0	1
	2/7/2012	Deep	20.9	00.1	00.1	002
		Shallow	20.8	00.1	00.1	002
	8/31/2012	Deep	20.4	00.0	00.0	000
		Shallow	20.5	00.0	00.0	000
	2/22/2013	Deep	20.1	00.1	00.0	000
		Shallow	20.1	00.1	00.0	000

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314H

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
Club House	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.2	0.0	0.0	0.0
	9/20/2007	Building	20.6	0.0	0.0	0.0
	12/31/2007	Building	20.8	0.0	0.0	0.0
	3/12/2009	Building	21.3	0.0	0.0	0.0
	12/3/2009	Building	21.0	0.1	0.0	0.0
	6/22/2010	Building	20.7	0.1	00.1	0.0
	12/1/2010	Shallow	20.6	0.00	0.00	1
	2/7/2012	Building	20.9	00.1	00.0	001
	8/31/2012	Building	20.6	00.0	00.0	000
	2/22/2013	Building	20.2	0.0	0.0	000
Shed	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.3	0.0	0.0	0.0
	9/20/2007	Building	20.7	0.0	0.0	0.0
	12/31/2007	Building	20.9	0.0	0.0	0.0
	3/12/2009	Building	21.2	0.0	0.0	0.0
	12/3/2009	Building	21.1	0.1	0.0	0.0
	6/22/2010	Building	20.5	0.1	00.1	2
	12/1/2010	Shallow	20.6	0.01	0.00	1
	2/7/2012	Building	20.9	00.1	00.1	002
	8/31/2012	Building	20.3	00.0	00.0	000
	2/22/2013	Building	20.1	00.0	00.0	000

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

County 2012

TABLE 6
METHANE MONITORING RESULTS
FEBRUARY 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314H

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-1	2/21/2013	Deep	18.5	1.6	00.0	000
		Shallow	13.1	7.5	00.0	000
GMP-3	2/22/2013	Deep	20.2	00.0	00.0	000
		Shallow	20.2	00.0	00.0	000
GMP-4	2/22/2013	Shallow	00.0	37.5	61.3	>>>
GMP-5	2/22/2013	Deep	15.0	5.8	2.8	**40**
		Shallow	2.1	26.6	43.3	**888**
GMP-6	2/22/2013	Deep	20.1	00.1	00.0	000
		Shallow	4.2	24.1	34.3	**696**
GMP-7	2/22/2013	Deep	20.1	00.1	00.0	000
		Shallow	20.1	00.1	00.0	000
Club House	2/22/2013	Building	20.2	0.0	0.0	000
Shed	2/22/2013	Building	20.1	00.0	00.0	000

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

County 2013

SEMI-ANNUAL GROUNDWATER AND METHANE MONITORING REPORT FOR SEPTEMBER 2013

of

FORMER NEWBERRY COUNTY LANDFILL SITE
SCDHEC Solid Waste Permit #: DWP-117
432 Cockrell Road
Newberry, South Carolina

Prepared for:

Mr. Mike Pisano, Public Works Director
Newberry County
P.O. Box 156
Newberry, South Carolina 29108

Prepared by:

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TERRY Project # 2314I

KELLY K. CONE, PG
VICE PRESIDENT – ASSESSMENT SERVICES

JASON A. TERRY, PG
PRESIDENT

KELLY K. CONE REGISTERED No. 2509 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

September 2013

ALL-STATE LEGAL® PLAINTIFF'S EXHIBIT 16-T

County 2202

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County 2203

1.0 EXECUTIVE SUMMARY

The subject site is located at 432 Cockrell Road, Newberry, South Carolina approximately 2 miles east of the City of Newberry and approximately 40 miles northwest of Columbia, South Carolina. Newberry County operated the landfill until December 1993 when it stopped accepting waste at this facility and operations began at the Newberry County Transfer Station. The Newberry County Transfer Station is located approximately 0.1 miles east of Interstate I-26 along SC Highway 34. An aerial image of the subject site is included in Appendix 1 as Figure 1.

The landfill is currently leased to the Triangle Gun Club and is used for competitive skeet shooting. There are no permanent residents at the facility and the gun range is only open periodically throughout the week and weekend (usually on Wednesdays, Saturdays, and Sundays). Two small structures are located on the landfill; a small clubhouse and a storage shed. An out of service water well is also located on the site near the storage shed. A site plan is provide in Appendix 1 as Figure 2. This figure was prepared based on information taken from previous environmental work performed at the site by another firm.

On August 29, 2013 TERRY personnel conducted a comprehensive groundwater sampling to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. During the sampling event, monitoring wells MW-3, MW-6, and TMW-12 were dry; therefore, these locations were not sampled. Monitoring well TMW-11 is assumed destroyed.

Thirty (30) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only nine (9) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's).

TERRY personnel recorded landfill gas measurements on August 29, 2013 at six (6) GMPs and two (2) structures located at the former landfill. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3(52.8%), GMP-4 (60.1%), GMP-5 (58.1%), and GMP-6 (57.0%). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A passive landfill gas venting system was previously installed by Newberry County Public Works in the vicinity of GMP-5 as directed by SCDHEC.

County 2204

2.0 BACKGROUND

2.1 Groundwater Monitoring Network

The groundwater monitoring network consists of a total of 13 (thirteen) monitoring wells. Monitoring wells designated as TMW-9, TMW-10, TMW-12 and TMW-13 are located on the northeast side of Interstate Highway 26 (I-26). Monitoring wells TMW-12 and TMW-13 were installed in November 2009 in response to a SCDHEC directive dated September 17, 2009. Monitoring well TMW-11 has not been located since April 2008 and assumed destroyed. All of the monitoring wells at the site were installed by others.

2.2 Methane Monitoring Network

Six (6) methane gas monitoring points (GMPs) identified as GMP-1 and GMP-3 through GMP-7 were previously installed along the boundaries of the former landfill and serve as the landfill gas monitoring network. Newberry County Public Works has installed six passive landfill gas vents as previously directed by SCDHEC. The GMPs are monitored as required by the South Carolina Department of Health and Environmental Control (SCDHEC) Municipal Solid Waste (MSW) Regulations (R.61-107.258.23 Explosive Gas Control). The locations of monitoring wells and GMPs are shown in Figure 2 and monitoring well construction details are summarized in Table 1.

2.3 Site Geology and Hydrogeology

The site geology consists of metamorphic rocks that are highly weathered forming a saprolitic soil that overlies the bedrock. The bedrock beneath the landfill site is a massive granite unit that is associated with the Charlotte Belt of the Piedmont Physiographic Province. The thickness of soil (saprolite) that overlies the bedrock is as thin as 26 feet as indicated in boring TW-3 installed by C&L Consultants, Inc. and as thick as 40 feet as documented in the boring log for TW-1. Fractured granite was observed along Cannons Creek (south and east of the landfill site) by C&L Consultants during their groundwater assessment in 1998. The soil in the saprolite unit of the aquifer is red-brown to green-grey silt with coarse sand and quartz fragments. Methane migration can occur through the fractures and pore spaces in the unsaturated zone of the saprolite and bedrock.

The landfill is located on the east flank of a north-south trending ridge. The topography in the area of the landfill shows minor relief (50 feet) sloping generally toward the south. Surface water drainage is generally toward the southeast into the tributaries of Cannons Creek. Groundwater flow within the uppermost aquifer has historically been to the east and northeast with discharge occurring into Cannons Creek.

County 2205

3.0 GROUNDWATER MONITORING RESULTS

On August 29, 2013 TERRY personnel conducted a comprehensive groundwater sampling event to include thirteen (13) monitoring wells and a surface water sample from Cannons Creek. During the sampling event monitoring wells MW-3, MW-6, and TMW-12 were dry; therefore, these locations were not sampled. Monitoring well TMW-11 is assumed destroyed.

Prior to sample collection, the depth to water measurements and total well depths were determined relative to the top-of-casing (TOC) elevation. The TOC elevations were provided by previous assessment work performed at the site. The monitoring well and groundwater data are included in Appendix 2, on Table 1 and Table 2 and on the Groundwater Sampling Logs provided in Appendix 4. Water table elevation contour lines were created utilizing the piezometric data and linear interpolation between known groundwater elevations. The resulting Piezometric Map is included in Appendix 1 as Figure 3. General groundwater flow is towards the southeast. The gradient of the piezometric surface was calculated by dividing the change in elevation by the horizontal distance between two points located parallel to the groundwater flow direction. Based upon the piezometric data, a hydraulic gradient of 0.029 ft/ft was calculated.

Samples were collected and placed immediately in laboratory supplied glassware and shipped in a cooler packed with ice to Pace Analytical Services, Inc. (SCDHEC Laboratory certification # 99006001) for analysis. The samples were analyzed for the Appendix V list of parameters as directed in the SCDHEC correspondence dated April 13, 2010. The only exception to this was that Dioxins were not included in the analyses as per the SCDHEC Project Manager as the likelihood of detection was deemed extremely low based on facility history.

Thirty (30) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only nine (9) parameters were detected in concentrations that equaled or exceeded their respective established U.S. EPA Maximum Contaminant Levels (MCLs), Risk-Based Screening Levels (RBSL's), or Action Levels (AL's).

A table summarizing the parameters detected in concentrations greater than their respective MDLs during the August 2013 monitoring event is provided in Appendix 2, Table 4. Historical groundwater analytical data is provided in Appendix 2, Table 3. A figure depicting the parameters exceeding their respective MCL/RBSL/AL during the August 2013 monitoring event is shown in Figure 4, Appendix 1. A copy of the groundwater analytical report is provided as Appendix 5.

4.0 METHANE MONITORING RESULTS

TERRY personnel recorded landfill gas measurements on August 29, 2013 at six (6) GMPs and two (2) structures located at the former landfill. The methane concentrations were measured using a Landtec GEM-500 Landfill Gas Monitor. The instrument simultaneously determines percent oxygen, percent carbon dioxide, percent methane gas, and determines percent LEL (lower explosive limit). A table summarizing the landfill gas data recorded during the August 2013 event is provided in Appendix 2, Table 6. Field data and field data collection logs are provided in Appendix 3. Historical landfill gas data is provided in Appendix 2, Table 5.

The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3, GMP-4, GMP-5, and GMP-6. Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling. A figure depicting the methane concentrations is shown in Figure 5. A passive landfill gas venting system was previously installed by Newberry County Public Works in the vicinity of GMP-5 as directed by SCDHEC.

County 2207

5.0 CONCLUSIONS

On August 29, 2013 TERRY personnel conducted a comprehensive groundwater sampling and recorded landfill gas measurements at six (6) GMPs and two (2) structures located at the former landfill. Thirty (30) parameters were detected in concentrations greater than their respective method detection limits (MDLs) in the groundwater samples collected; however, only nine (9) parameters were detected in concentrations that equaled or exceeded their respective established MCLs, RBSL's, or AL's. The LEL action level for methane (5% in air) was exceeded in monitoring points GMP-3(52.8%), GMP-4 (60.1%), GMP-5 (58.1%), and GMP-6 (57.0%). Visible off gassing was observed at monitoring well MW-3 after the well cap was removed prior to sampling.

County 2208

APPENDIX 1

Figures

FORMER NEWBERRY CO. MSW LANDFILL
SCDHEC Soild Waste Permit #: DWP-117
432 Cockrell Road,Newberry, SC



FIGURE 1
SITE LOCATION

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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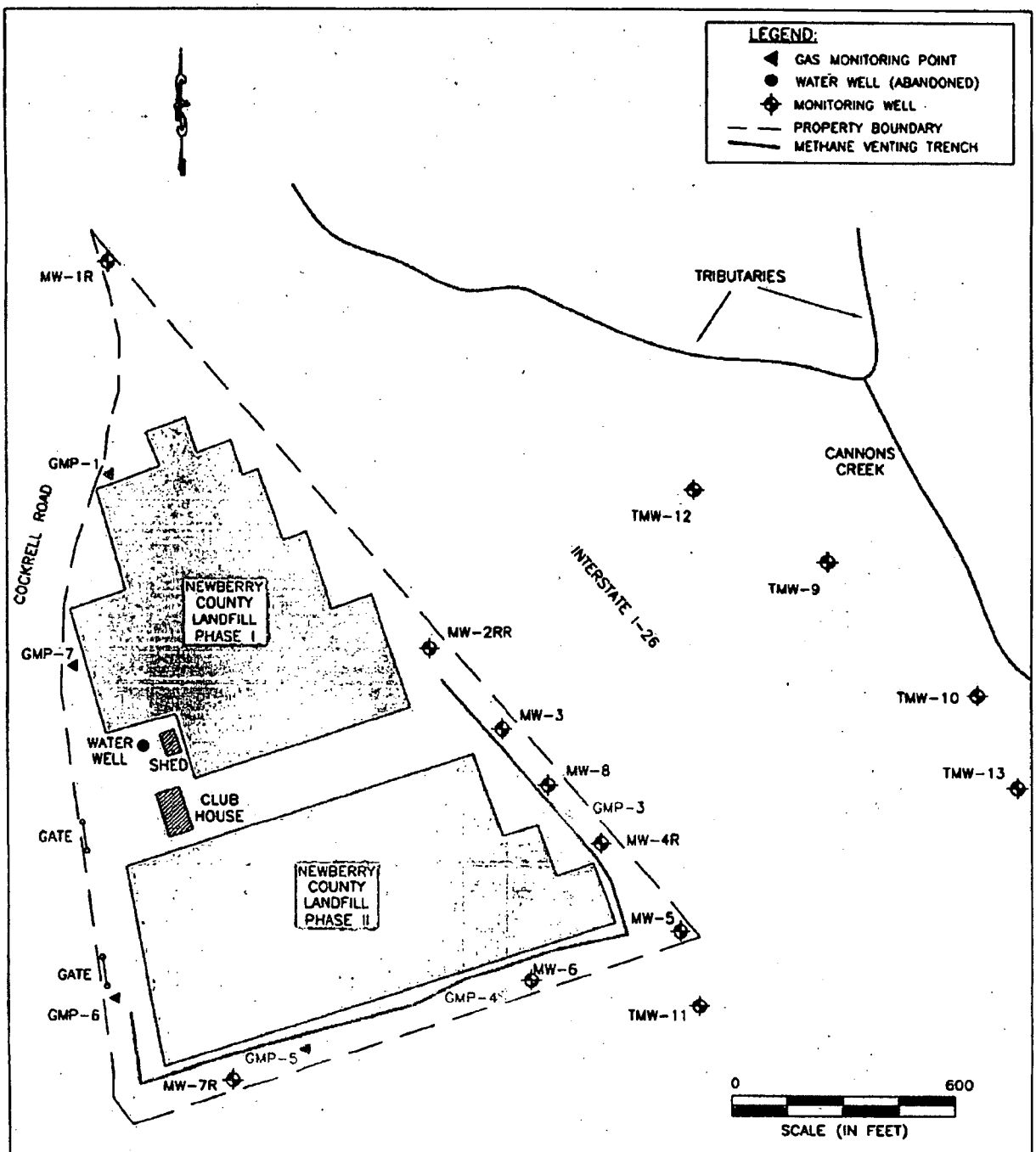
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SIZE	TERRY Project No.	DWG NO.	REV
B	2314I	Figure 1 Site Location.dwg	

SCALE: NOT TO SCALE

DATE: September 2013

County 2210



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FIGURE 2
SITE PLAN

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No.	DWG NO.	REV
B	2314I	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: September 2013

County 2211

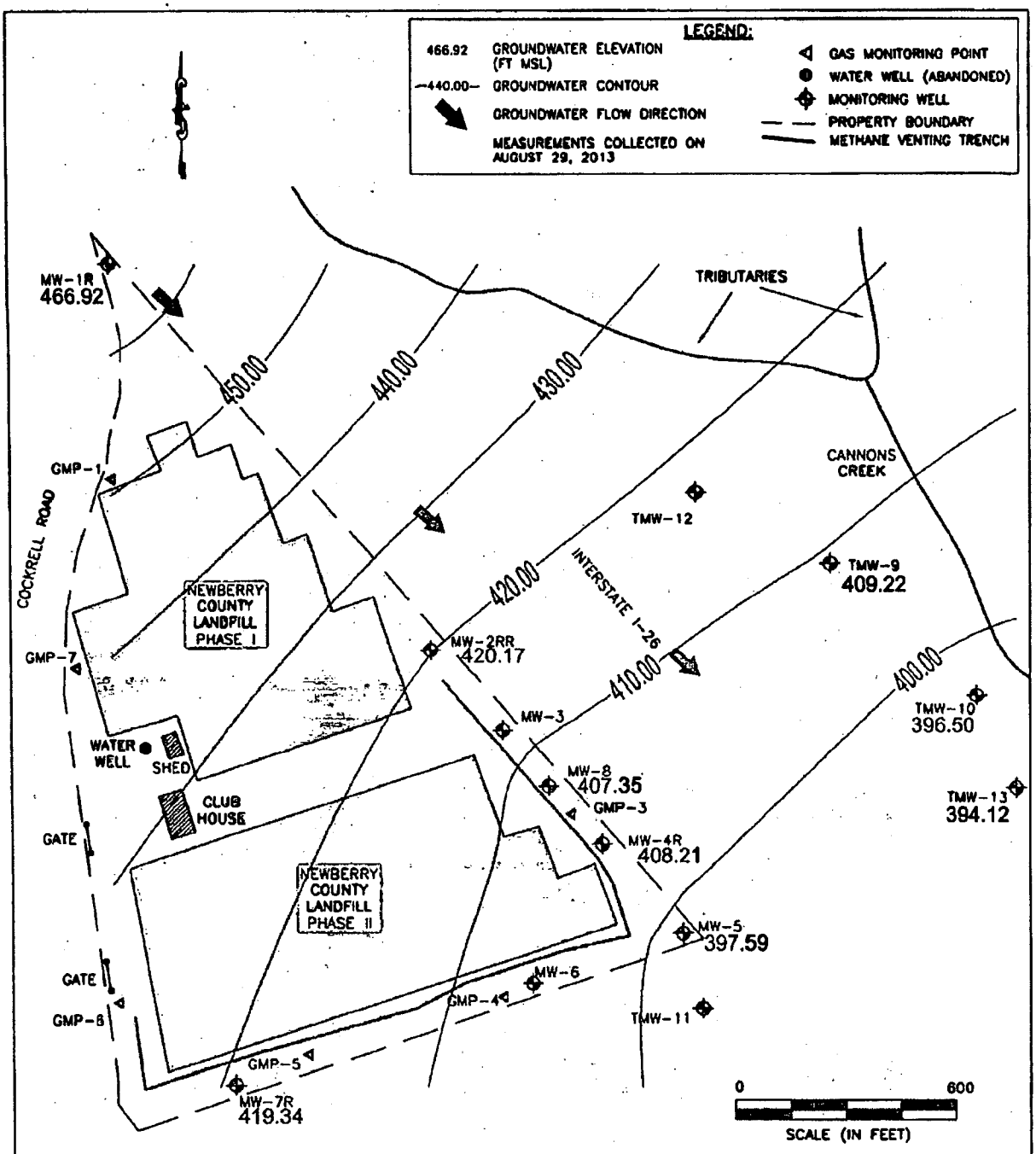


FIGURE 3
PIEZOMETRIC MAP

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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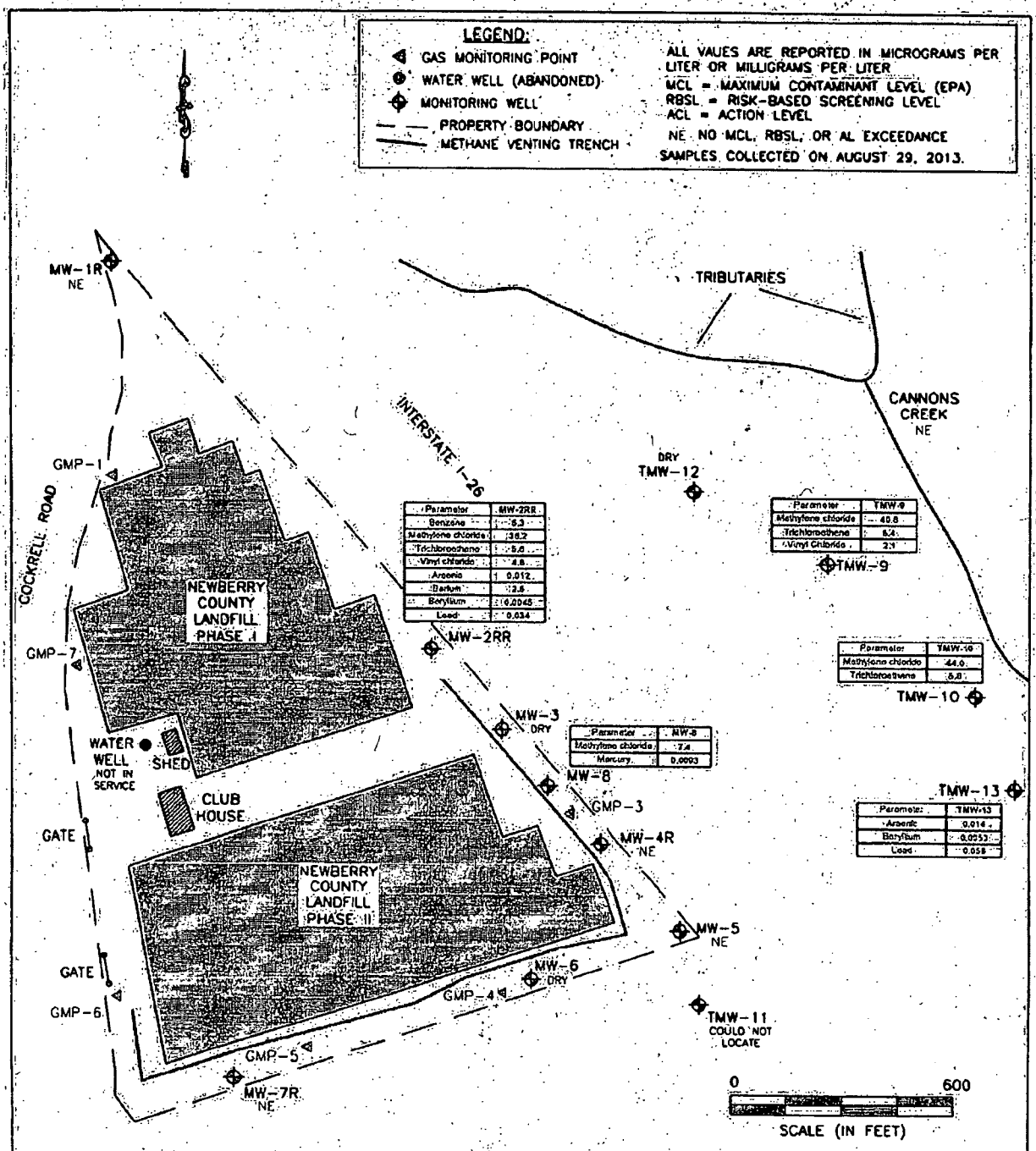
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SIZE	TERRY Project No.	DWG NO.	REV
B	2314I	Figure 2 Site Plan.dwg	

SCALE: 1 inch = 400 feet

DATE: September 2013

County 2212



Parameter	MW-2RR
Benzene	6.3
Methylene chloride	36.2
Trichloroethene	5.0
Vinyl chloride	4.8
Arsenic	0.012
Barium	3.8
Beryllium	0.0045
Lead	0.034

Parameter	TMW-9
Methylene chloride	40.8
Trichloroethene	5.4
Vinyl Chloride	2.1

Parameter	TMW-10
Methylene chloride	44.0
Trichloroethene	5.8

Parameter	MW-3
Methylene chloride	7.4
Mercury	0.0093

Parameter	TMW-13
Arsenic	0.014
Beryllium	0.0053
Lead	0.058

FIGURE 4
Parameters Equal to or Exceeding MCL, RBSL, or AL

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

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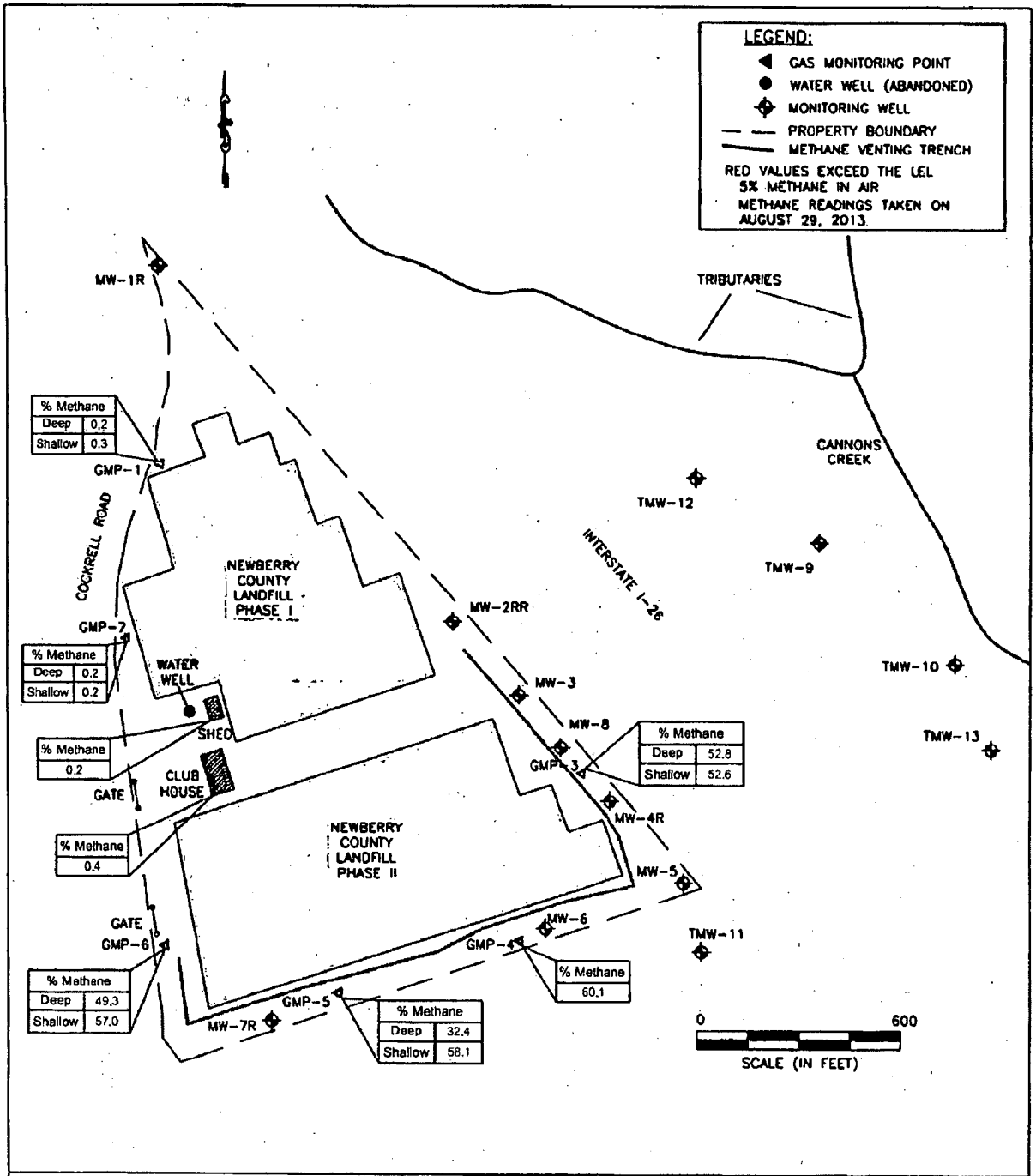
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SIZE	TERRY Project No.	DWG NO.	REV
B	2314I	Figure 4 Analytical Data.dwg	

SCALE: 1 inch = 400 feet

DATE: September 2013

County 2213



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FIGURE 5
PERCENT METHANE

FORMER NEWBERRY COUNTY MSW LANDFILL
432 Cockrell Road
Newberry, South Carolina
SCDHEC Solid Waste Permit #: DWP-117

SIZE	TERRY Project No.	DWG NO.	REV
B	2314l	Figure 5 Methane LEL Map.dwg	

SCALE: 1 inch = 400 feet

DATE: September 2013

County 2214

APPENDIX 2

Tables

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314I

Monitoring Well ID	Reported TOC Elevation*	Reported Total Well Depth**	Measured Well Depth** August 29, 2013	Reported Screened Interval**(ft)	Reported Latitude	Reported Longitude
MW-1R	504.92	63	60.5	48.0 – 63.0	Unknown	Unknown
MW-2RR	459.82	63	58.4	48.0 – 63.0	Unknown	Unknown
MW-3	453.92	34	38.8	Unknown	34° 17' 50"	81° 33' 07"
MW-4R	441.55	63	62.5	48.0 – 63.0	Unknown	Unknown
MW-5	420.12	31	33.9	Unknown	34° 17' 44"	81° 33' 00"
MW-6	440.55	25	27.8	10.0 – 25.0	34° 17' 42"	81° 33' 08"
MW-7R	457.34	63	62.9	48.0 – 63.0	Unknown	Unknown
MW-8	443.39	68	71.9	58.0 – 68.0	Unknown	Unknown
TMW-9	457.58	75	74.0	65.0 – 75.0	Unknown	Unknown
TMW-10	415.07	45	44.1	35.0 – 45.0	Unknown	Unknown
TMW-11	Unknown	30	Assumed Destroyed	20.0 – 30.0	Unknown	Unknown
TMW-12	468.18	42.6	42.1	22.6 – 42.6	Unknown	Unknown
TMW-13	409.25	44.4	42.8	14.4 – 44.4	Unknown	Unknown

Notes:

*Relative to an assumed elevation

**Relative to top of casing

0856

County 2216

TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314I

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water Level Elevation**	Comment
MW-1R	6/22/2007	504.92	32.18	472.74	
	12/31/2007		35.48	469.44	
	3/12/2009		36.72	468.20	
	12/4/2009		36.36	468.56	
	6/22/2010		32.02	472.90	
	12/2/2010		33.96	470.96	
	2/7/2012		38.03	466.89	
	8/31/2012		39.20	465.72	
	2/21/2013		40.11	464.81	
	8/29/2013		38.00	466.92	
MW-2RR	6/22/2007	459.82	36.10	423.72	
	12/31/2007		36.40	423.42	
	3/12/2009		37.41	422.41	
	12/4/2009		37.10	422.72	
	6/21/2010		34.82	452.00	
	12/1/2010		36.04	423.78	
	2/6/2012		38.74	421.08	
	8/30/2012		39.62	420.20	
	2/21/2013		40.24	419.58	
	8/29/2013		39.65	420.17	
MW-3	6/22/2007	453.92	35.28	418.64	
	12/31/2007		37.20	416.72	
	3/12/2009		36.75	417.18	
	12/4/2009		36.52	417.40	
	6/21/2010		34.21	419.71	
	12/1/2010		35.14	418.78	
	2/6/2012		37.38	416.54	Limited samples collected
	8/30/2012		38.10	415.82	Limited samples collected
	2/21/2013		-	-	Dry-No Samples Collected
	8/29/2013		-	-	Dry-No Samples Collected
MW-4R	6/22/2007	441.55	31.68	409.87	
	12/31/2007		34.70	406.85	
	3/12/2009		32.56	408.99	
	12/4/2009		32.28	409.27	
	6/22/2010		30.69	410.86	
	12/1/2010		32.72	408.83	
	2/7/2012		34.23	407.32	
	8/30/2012		34.52	407.03	
	2/21/2013		34.47	407.08	
	8/29/2013		33.34	408.21	

County 2217

TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314I

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water **	Water-Level Elevation**	Comment
MW-5	6/22/2007	420.12	23.40	396.72	
	12/31/2007		26.03	394.09	
	3/12/2009		23.95	396.17	
	12/4/2009		-	-	Well not located
	6/22/2010		22.75	397.37	
	12/1/2010		24.90	395.22	
	2/7/2012		25.55	394.57	Limited samples collected
	8/30/2012		25.88	394.24	Limited samples collected
	2/21/2013		24.42	395.70	Limited samples collected
	8/29/2013		22.53	397.59	Limited samples collected
MW-6	6/22/2007	440.55	27.22	413.33	
	12/31/2007		25.55	415.00	
	3/12/2009		24.55	416.00	
	12/4/2009		24.30	416.25	
	6/21/2010		21.70	418.85	
	12/2/2010		24.30	416.25	
	2/6/2012		26.77	413.78	Limited samples collected
	8/30/2012		-	-	Dry-No Samples Collected
	2/21/2013		-	-	Dry-No Samples Collected
	8/29/2013		-	-	Dry-No Samples Collected
MW-7R	6/22/2007	457.34	35.78	421.56	
	12/31/2007		37.20	420.14	
	3/12/2009		35.91	421.43	
	12/4/2009		35.30	422.04	
	6/22/2010		33.78	423.56	
	12/2/2010		36.15	421.19	
	2/6/2012		38.88	418.46	
	8/30/2012		39.57	417.77	
	2/21/2013		39.84	417.50	
	8/29/2013		38.00	419.34	
MW-8	6/22/2007	443.39	35.50	407.89	
	12/31/2007		37.80	405.59	
	3/12/2009		35.29	408.10	
	12/4/2009		35.04	408.35	
	6/21/2010		33.44	409.95	
	12/1/2010		35.47	407.92	
	2/6/2012		36.92	406.47	
	8/30/2012		37.26	406.13	
	2/21/2013		37.21	406.18	
	8/29/2013		36.04	407.35	

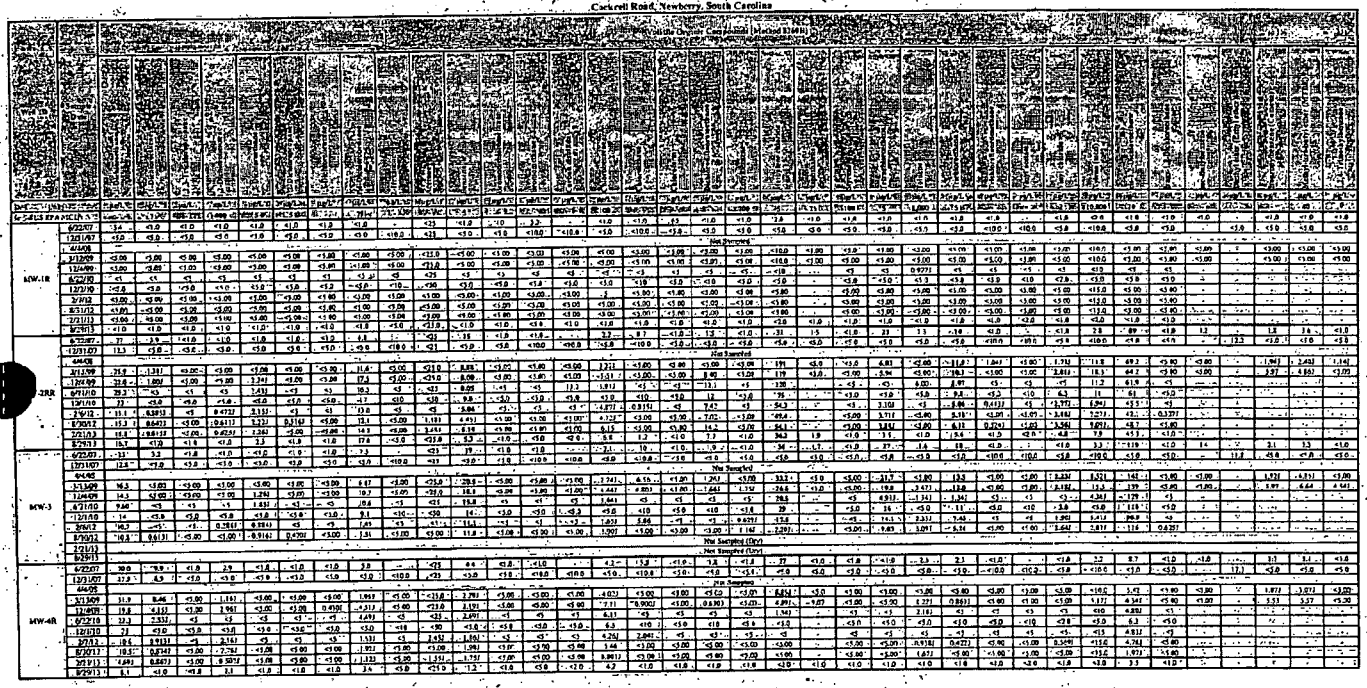
TABLE 2
WATER TABLE ELEVATION DATA
AUGUST 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 2314I

Monitoring Well ID	Sample Date	Reported TOC Elevation*	Depth to Water**	Water-Level Elevation**	Comment
TMW-9	6/22/2007	457.58	47.35	410.23	
	12/31/2007		47.33	410.25	
	3/12/2009		47.30	410.27	
	12/3/2009		47.21	410.37	
	6/22/2010		45.63	411.95	
	12/1/2010		46.55	411.03	
	2/6/2012		48.01	409.57	
	8/30/2012		48.44	409.14	
	2/21/2013		48.80	408.78	
	8/29/2013		48.36	409.22	
TMW-10	6/22/2007	415.07	18.90	396.17	
	12/31/2007		21.10	393.97	
	3/12/2009		18.75	396.32	
	12/3/2009		18.47	396.60	
	6/22/2010		18.44	396.63	
	12/1/2010		19.99	395.08	
	2/6/2012		20.35	394.72	
	8/30/2012		20.68	394.39	
	2/21/2013		19.75	395.32	
	8/29/2013		18.57	396.50	
TMW-11	6/22/2007	Unknown	26.08	-	
	12/31/2007		28.60	-	
	3/12/2009		-	-	Well not located
	12/3/2009		-	-	Well not located
	6/21/2010		-	-	Well not located
	12/2/2010		-	-	Well not located
	2/6/2012		-	-	Well not located
	8/30/2012		-	-	Well not located
	2/21/2013		-	-	Assumed Destroyed
TMW-12	12/3/2009	468.18	41.78	426.40	Insufficient volume to sample
	6/22/2010		41.97	426.21	Insufficient volume to sample
	12/1/2010		41.96	426.22	Insufficient volume to sample
	2/6/2012		41.96	426.22	Insufficient volume to sample
	8/30/2012		-	-	Dry-No Samples Collected
	2/21/2013		-	-	Dry-No Samples Collected
	8/29/2013		-	-	Dry-No Samples Collected
TMW-13	12/3/2009	409.25	14.96	394.29	
	6/22/2010		15.20	394.05	
	12/1/2010		17.20	392.05	
	2/6/2012		17.53	391.72	
	8/30/2012		17.94	391.31	
	2/21/2013		16.70	392.55	
	8/29/2013		15.13	394.12	

Notes:
*Relative to an assumed elevation
**Relative to top of casing

County 2219

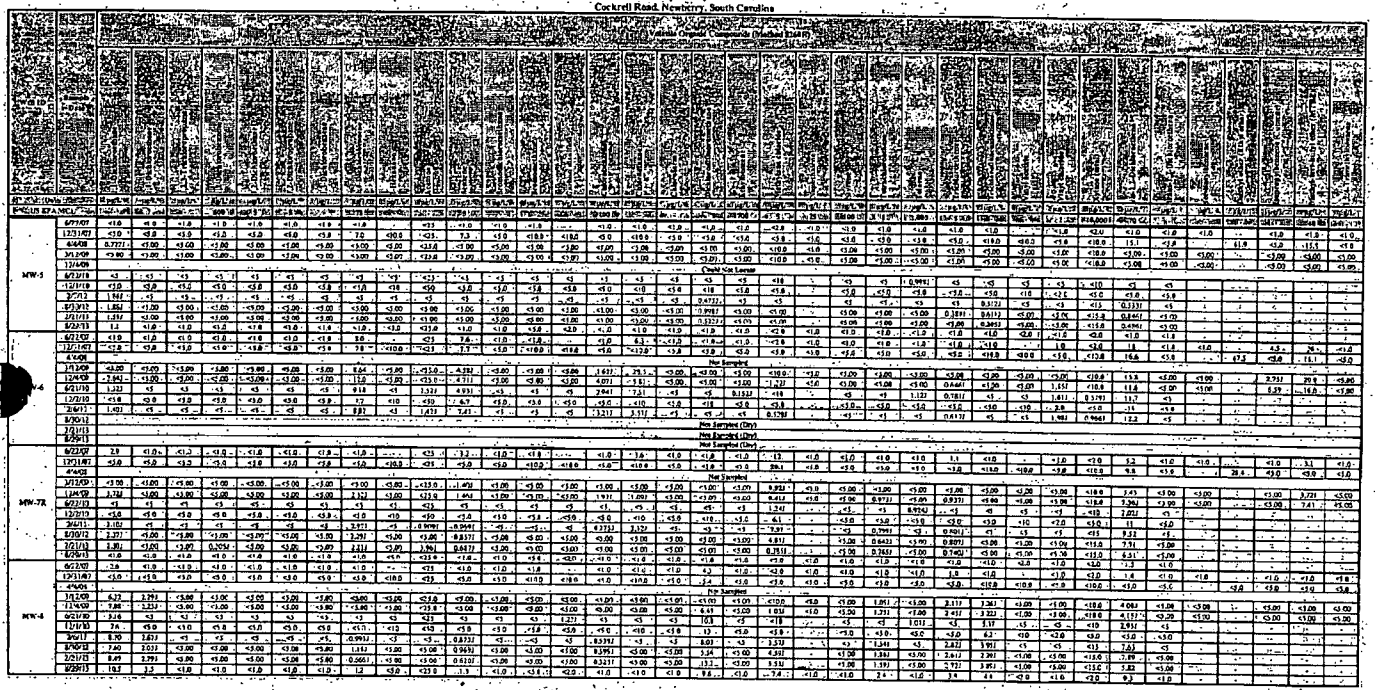
TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L = Micrograms per liter
mg/L = milligrams per liter
MCL = Maximum Contaminant Level
J = Estimated value
Bold = Concentration exceeds respective MCL
DUP = Duplicate sample volume

County 2220

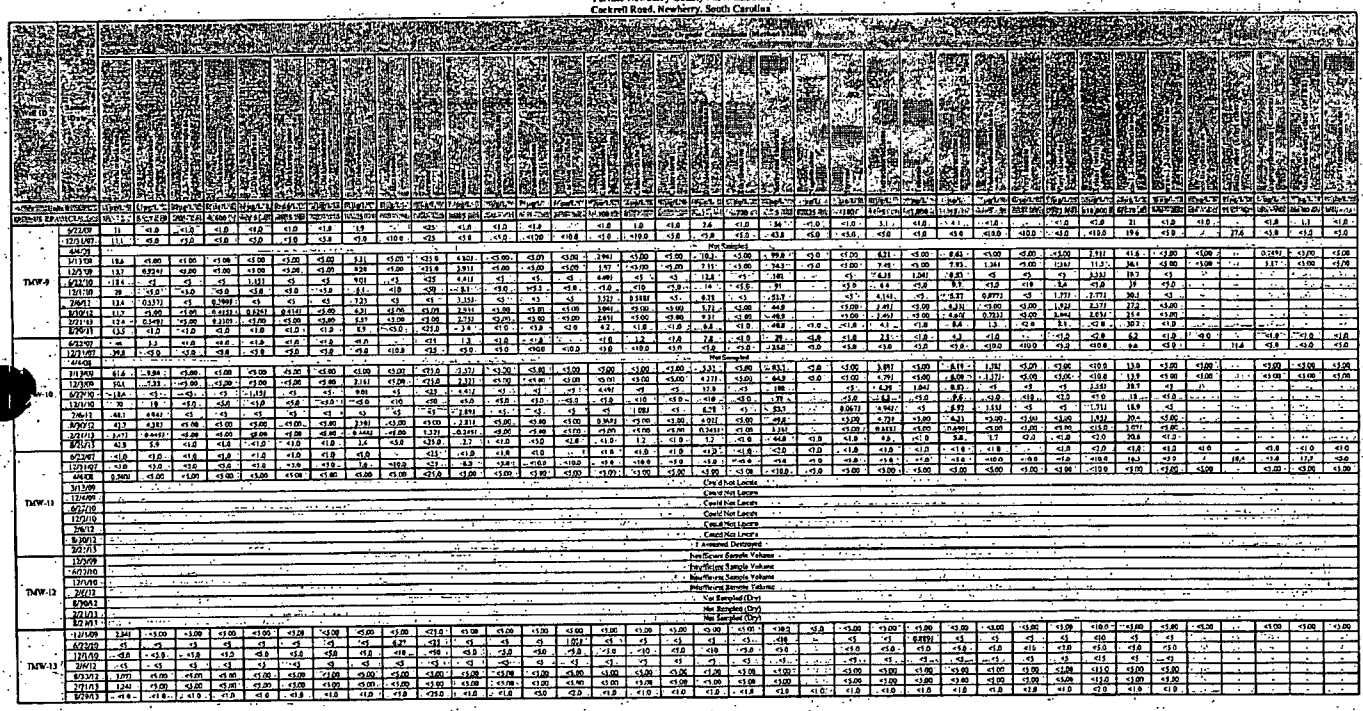
TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
Bold= Concentrations exceeds respective MCL
With= Insufficient sample volume

County 2221

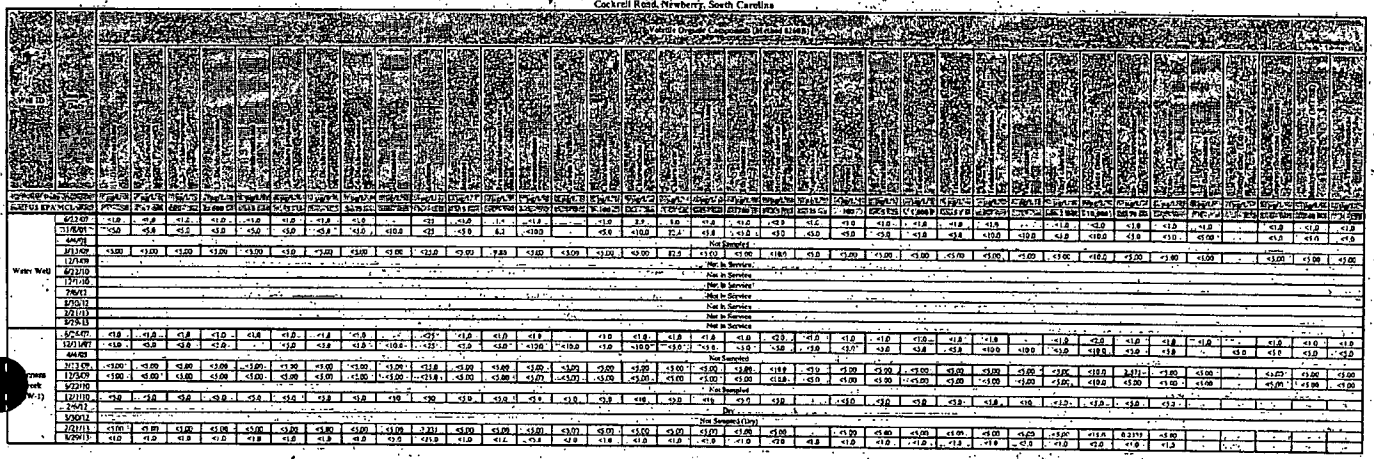
TABLE 3.
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Concentration Level
J= Estimated value
Bold= Concentration exceeds respective MCL
INS= Insufficient sample volume

County 2222

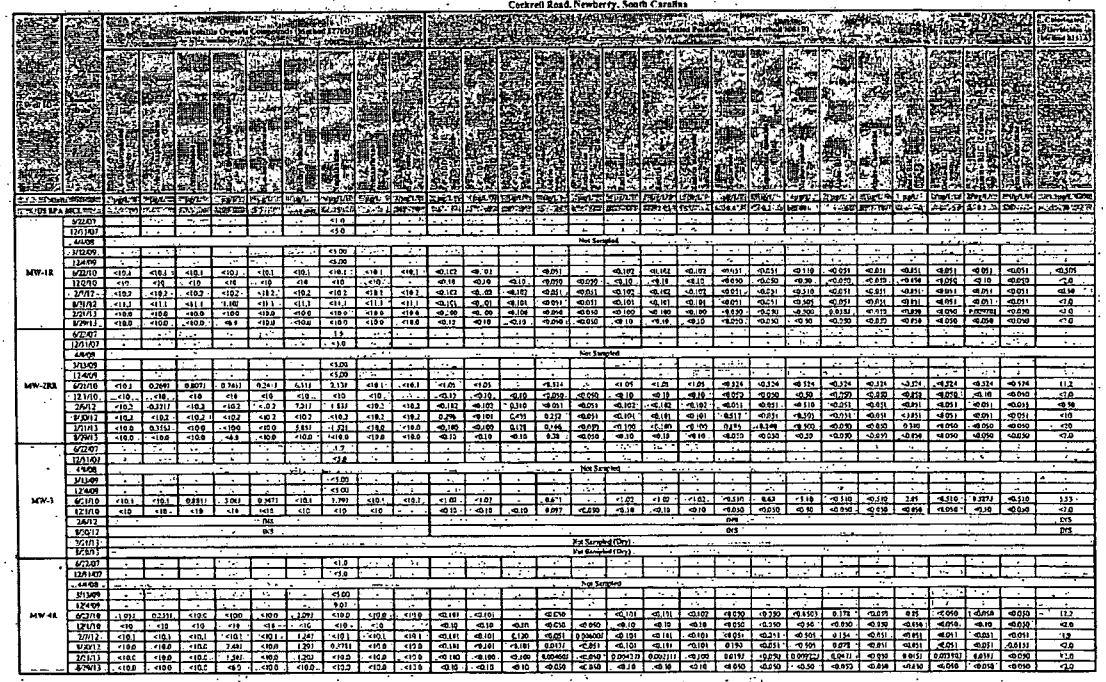
TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL = Maximum Contaminant Level
J= Estimated value
Bold= Concentrations exceeding MCL
NS= Insufficient sample volume

County 2223

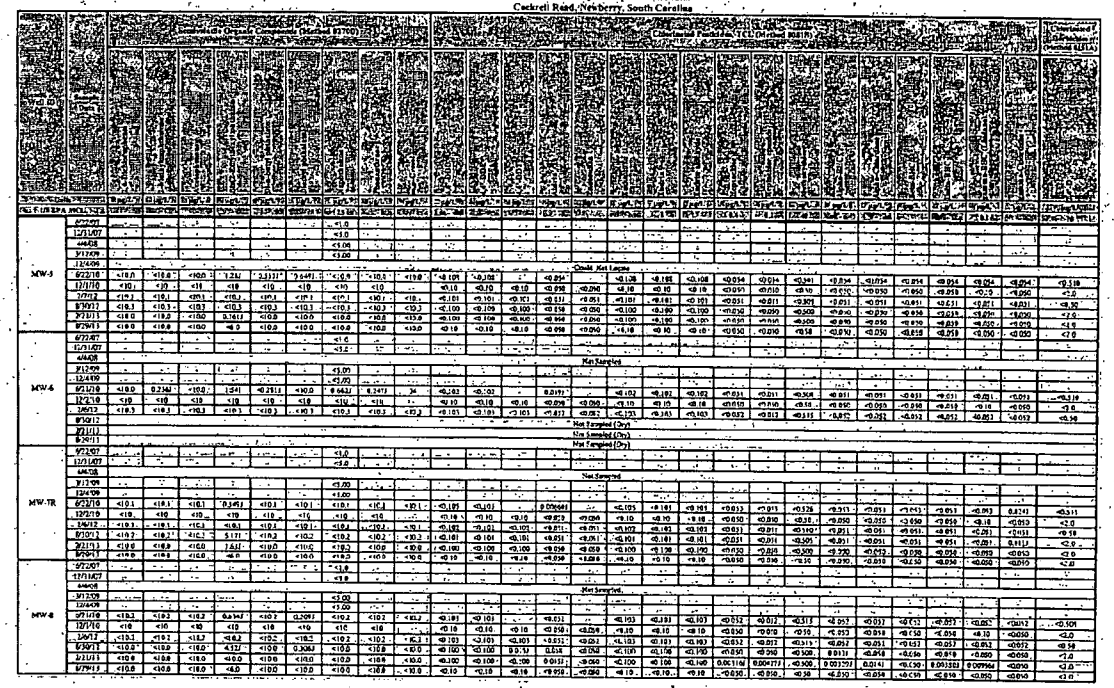
TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L= Micrograms per liter
mg/L = Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentration exceeds respective MCL
NR= Insufficient sample volume

County 2224

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



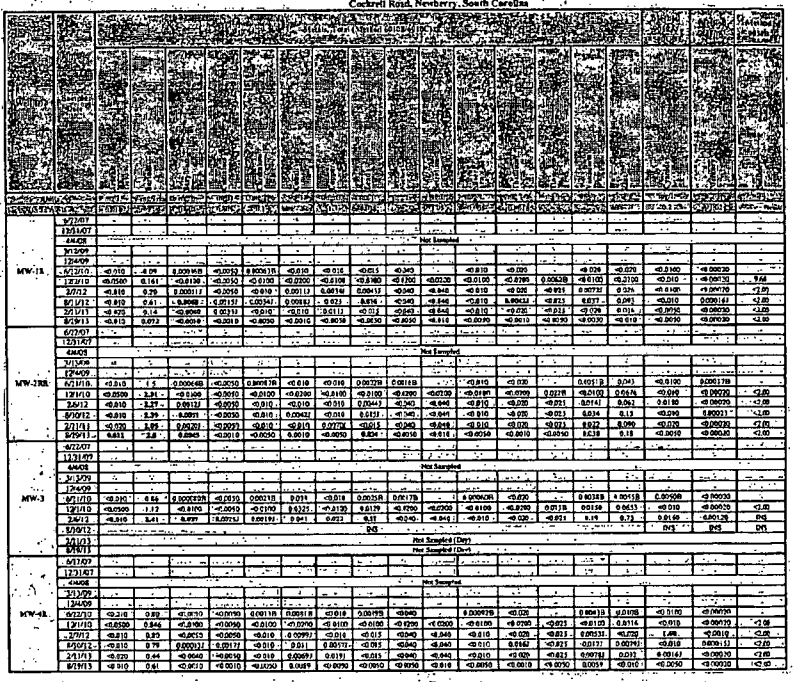
Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Contaminant Level
E = Estimated value
Bold = Concentration exceeds respective MCL
NS = Insufficient sample volume

County 2225

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

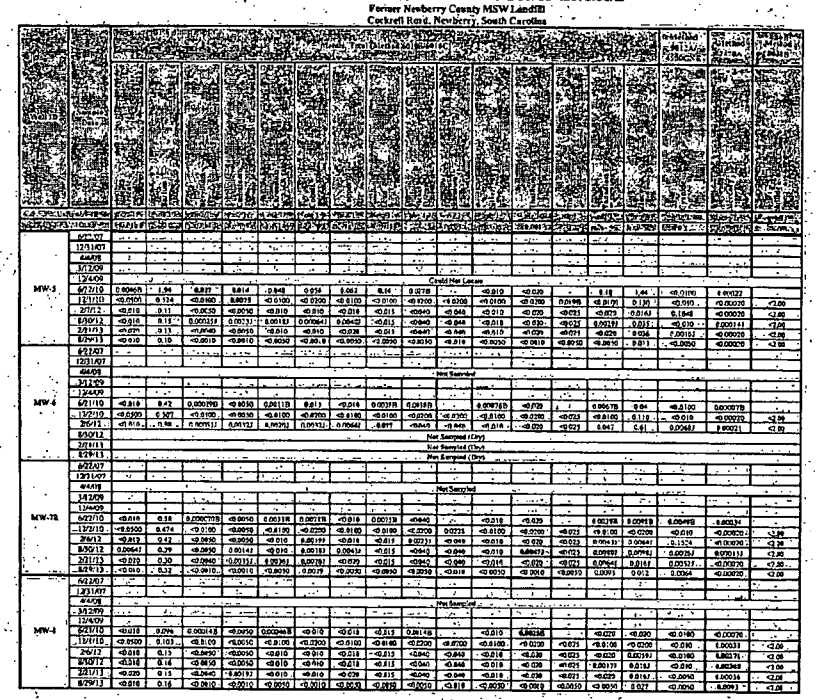
TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
MCL = Maximum Concentration Level
J= Estimated value
Bold= Concentration exceeds respective MCL
DNS= Insufficient sample volume

County 2228

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina



Notes:
ug/L= Micrograms per liter
mg/L= Milligrams per liter
MCL= Maximum Contaminant Level
J= Estimated value
Bold= Concentration exceeds regulatory MCL
NS= Insufficient sample volume

County 2229

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

TABLE 3
SUMMARY OF DETECTED REGULATED COMPOUNDS - HISTORICAL
- Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina

Well ID	Sample Date																			

TABLE 4
SUMMARY OF DETECTED REGULATED COMPOUNDS
AUGUST 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project # 23141

Parameter	Analytical Method	Units	MCL	MW-1R	MW-2RR	MW-4R	MW-5	MW-7R	MW-8	TMW-9	TMW-10	TMW-13	Cannons Creek (SW-1)
				8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013
1,1-Dichloroethane	8260B	ug/L	---	<1.0	16.7	8.1	1.1	<1.0	10.5	13.5	42.9	<1.0	<1.0
1,1-Dichloroethene	8260B	ug/L	7	<1.0	<1.0	<1.0	<1.0	<1.0	3.5	<1.0	5.9	<1.0	<1.0
1,2-Dichlorobenzene	8260B	ug/L	600	<1.0	<1.0	2.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	8260B	ug/L	5	<1.0	2.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	8260B	ug/L	75	<1.0	17.6	3.6	<1.0	<1.0	1.2	8.9	2.4	<1.0	<1.0
Benzene	8260B	ug/L	5	<1.0	5.3	1.2	<1.0	<1.0	1.3	3.4	2.7	<1.0	<1.0
Chlorobenzene	8260B	ug/L	100	<1.0	6.8	4.2	<1.0	<1.0	<1.0	4.2	<1.0	<1.0	<1.0
Chloroethane	8260B	ug/L	---	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0
Dichlorodifluoromethane	8260B	ug/L	---	<1.0	7.7	<1.0	<1.0	<1.0	9.6	6.8	5.2	<1.0	<1.0
Methylene chloride	8260B	ug/L	5	<2.0	**36.2**	<2.0	<2.0	<2.0	**7.4**	**40.8**	**44.0**	<2.0	<2.0
Naphthalene	8260B	ug/L	25	<1.0	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	8260B	ug/L	5	<1.0	3.5	<1.0	<1.0	<1.0	2.4	4.1	4.6	<1.0	<1.0
Trichloroethene	8260B	ug/L	5	<1.0	5.6	<1.0	<1.0	<1.0	3.9	**5.4**	**5.8**	<1.0	<1.0
Trichlorofluoromethane	8260B	ug/L	---	<1.0	<1.0	<1.0	<1.0	<1.0	4.4	1.3	1.7	<1.0	<1.0
Vinyl chloride	8260B	ug/L	2	<1.0	**4.8**	<1.0	<1.0	<1.0	<1.0	**2.1**	<1.0	<1.0	<1.0
Xylene (total)	8260B	ug/L	10000	<2.0	7.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethene	8260B	ug/L	70	<1.0	45.3	3.5	<1.0	1.5	9.3	30.2	20.6	<1.0	<1.0
Aldrin	8081B	ug/L	---	<0.050	0.38	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Arsenic	6010B	mg/L	0.010	<0.010	**0.012**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.014**	<0.010
Barium	6010B	mg/L	2	0.072	**2.5**	0.61	0.10	0.32	0.16	0.80	0.27	0.73	0.060
Beryllium	6010B	mg/L	0.004	<0.0010	**0.0045**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0053**	<0.0010
Cadmium	6010B	mg/L	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	<0.0010
Chromium	6010B	mg/L	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.031	<0.0050
Cobalt	6010B	mg/L	---	<0.0010	0.0010	0.0089	<0.0010	0.0039	<0.0010	<0.0010	<0.0010	0.0013	<0.0010
Copper	6010B	mg/L	1.3	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.034	<0.0050
Lead	6010B	mg/L	0.015	<0.0050	**0.034**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.010	**0.058**	<0.0050
Vanadium	6010B	mg/L	---	<0.0050	0.038	0.0059	<0.0050	0.0095	<0.0050	<0.0050	<0.0050	0.084	<0.0050
Zinc	6010B	mg/L	---	<0.010	0.18	<0.010	0.013	0.012	0.027	0.020	0.025	0.43	<0.010
Cyanide	9012A	mg/L	0.2	<0.0050	<0.0050	<0.0050	<0.0050	0.0064	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Mercury	7470A	mg/L	0.002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	**0.0093**	<0.00020	0.00030	0.00030	<0.00020

Notes:
- ug/L — Micrograms per liter
- mg/L — Milligrams per liter
- MCL — Maximum Contaminant Level as established by U.S. EPA.
- Bold — Indicates that the parameter's reported concentration equaled or exceeded its respective MCL value.
- J — indicates that the reported concentration is an estimated value.

County 2232

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314I

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-1	12/3/2009	Deep	20.5	0.5	0.0	0.0
		Shallow	20.5	0.5	0.0	0.0
	6/22/2010	Deep	17.4	1.1	0.0	1.0
		Shallow	18.2	0.7	0.1	2.0
	12/2/2010	Deep	19.8	0.1	0.0	0.0
		Shallow	20.1	0.1	0.0	1.0
	2/7/2012	Deep	19.8	1.4	0.0	0.0
		Shallow	19.8	1.3	0.0	1.0
	8/31/2012	Deep	16.2	4.6	0.0	0.0
		Shallow	18.6	1.7	0.0	0.0
	2/21/2013	Deep	18.5	1.6	0.0	0.0
		Shallow	13.1	7.5	0.0	0.0
	8/29/2013	Deep	16.3	1.5	0.2	4.0
		Shallow	6.0	9.3	0.3	6.0
GMP-3	3/20/2007	Deep	15.7	4.9	>3.0	>43
		Shallow	16.0	4.4	>3.0	>43
	6/8/2007	Deep	18.0	2.3	3.2	62
		Shallow	17.8	1.9	2.4	47
	9/20/2007	Deep	5.9	23.0	**23.3**	**>100**
		Shallow	2.1	24.0	**19.3**	**>100**
	12/31/2007	Deep	15.3	6.2	**5.5**	**>100**
		Shallow	17.7	4.3	4.8	100
	3/12/2009	Deep	14.0	6.1	0.0	0.0
		Shallow	20.6	0.8	0.0	0.0
	12/3/2009	Deep	21.0	0.1	0.1	2.0
		Shallow	21.0	0.1	0.1	2.0
	6/21/2010	Deep	16.4	0.6	**9.3**	**>100**
		Shallow	15.8	0.5	**8.9**	**>100**
	12/1/2010	Deep	20.7	0.1	0.1	1.0
		Shallow	20.8	0.1	0.1	2.0
	2/6/2012	Deep	15.7	7.2	**8.8**	**>100**
		Shallow	15.1	8.1	**9.6**	**>100**
	8/30/2012	Deep	19.2	1.5	1.8	36
		Shallow	14.3	7.2	1.5	31
	2/22/2013	Deep	20.2	0.0	0.0	0.0
		Shallow	20.2	0.0	0.0	0.0
	8/29/2013	Deep	0.1	38.8	**52.8**	**>100**
		Shallow	0.1	37.7	**52.6**	**>100**

County 2233

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314I

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-4	3/20/2007	Shallow	0.0	>20	0.5	6.5
	6/8/2007	Shallow	0.0	39.9	**60.4**	**>100**
	9/20/2007	Shallow	0.2	38.3	**36.1**	**>100**
	12/31/2007	Shallow	3.6	26.0	**25.8**	**>100**
	3/12/2009	Shallow	Not Found			
	12/3/2009	Shallow	0.2	39.1	**60.5**	**>100**
	6/21/2010	Shallow	9.2	21.2	**36.7**	**>100**
	12/2/2010	Shallow	7.1	23.4	**38.3**	**>100**
	2/6/2012	Shallow	0.0	39.7	**60.2**	**>100**
	8/30/2012	Shallow	0.2	37.8	**55.2**	**>100**
	2/22/2013	Shallow	0.0	37.5	**61.3**	**>100**
	8/29/2013	Shallow	0.1	39.8	**60.1**	**>100**
GMP-5	3/20/2007	Shallow	4.0	17.3	2.8	32
	6/8/2007	Shallow	16.5	4.4	4.2	69
	9/20/2007	Shallow	20.3	0.7	0.7	12
	12/31/2007	Shallow	20.1	1.0	0.5	10
	3/12/2009	Shallow	19.2	2.7	4.0	63
	12/3/2009	Deep	19.2	2.2	3.3	66
		Shallow	14.2	13.0	**18.8**	**>100**
	6/21/2010	Deep	14.4	10.6	**11.5**	**>100**
		Shallow	20.5	0.2	0.1	2.0
	12/2/2010	Deep	13.8	7.9	0.1	3.0
		Shallow	20.6	0.4	0.1	3.0
	2/6/2012	Deep	7.5	10.3	0.6	22
		Shallow	0.0	28.6	**32.9**	**>100**
	8/30/2012	Deep	6.6	14.4	1.2	40
		Shallow	0.2	32.5	**47.7**	**>100**
	2/22/2013	Deep	15.0	5.8	2.8	40
		Shallow	2.1	26.6	**43.3**	**>100**
	8/29/2013	Deep	1.1	29.6	**32.4**	**>100**
		Shallow	0.1	39.8	**58.1**	**>100**

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314I

Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
GMP-6	3/20/2007	Shallow	0.0	19.4	0.5	6.0
	6/8/2007	Shallow	0.2	35.2	**43.3**	**>100**
	9/20/2007	Shallow	0.3	40.5	**44.3**	**>100**
	12/31/2007	Shallow	4.3	24.9	**21.2**	**>100**
	3/12/2009	Shallow	20.9	0.0	0.1	3.0
	12/3/2009	Deep	21.1	0.1	0.0	0.0
		Shallow	21.1	0.1	0.0	0.0
	6/21/2010	Deep	3.6	24.5	**30.7**	**>100**
		Shallow	0.5	38.4	**52.5**	**>100**
	12/2/2010	Deep	20.4	0.1	0.1	3.0
		Shallow	11.9	13.1	**16.8**	**>100**
	2/6/2012	Deep	3.2	22.1	**22.6**	**>100**
		Shallow	0.0	34.9	**49.2**	**>100**
	8/31/2012	Deep	20.2	0.0	0.0	0.0
		Shallow	20.2	0.0	0.0	0.0
	2/22/2013	Deep	20.1	0.1	0.0	0.0
		Shallow	4.2	24.1	**34.3**	**>100**
	8/29/2013	Deep	0.2	36.0	**49.3**	**>100**
		Shallow	0.1	39.3	**57.0**	**>100**
GMP-7	3/20/2007	Shallow	19.3	0.1	0.0	0.0
	6/8/2007	Shallow	16.3	4.4	0.0	0.0
	9/20/2007	Shallow	19.6	1.0	0.0	0.0
	12/31/2007	Shallow	16.5	4.3	0.0	0.0
	3/12/2009	Shallow	20.0	1.5	0.1	3.0
	12/3/2009	Deep	20.9	0.1	0.0	0.0
		Shallow	20.9	0.1	0.0	0.0
	6/21/2010	Deep	0.4	19.3	**10.2**	**>100**
		Shallow	0.9	29.7	**21.4**	**>100**
	12/2/2010	Deep	19.1	2.9	1.5	31
		Shallow	19.2	2.2	0.0	1.0
	2/7/2012	Deep	20.9	0.1	0.1	2.0
		Shallow	20.8	0.1	0.1	2.0
	8/31/2012	Deep	20.4	0.0	0.0	0.0
		Shallow	20.5	0.0	0.0	0.0
	2/22/2013	Deep	20.1	0.1	0.0	0.0
		Shallow	20.1	0.1	0.0	0.0
	8/29/2013	Deep	17.9	0.0	0.2	4.0
		Shallow	17.6	0.2	0.2	4.0

TABLE 5
METHANE MONITORING RESULTS - HISTORICAL
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314I

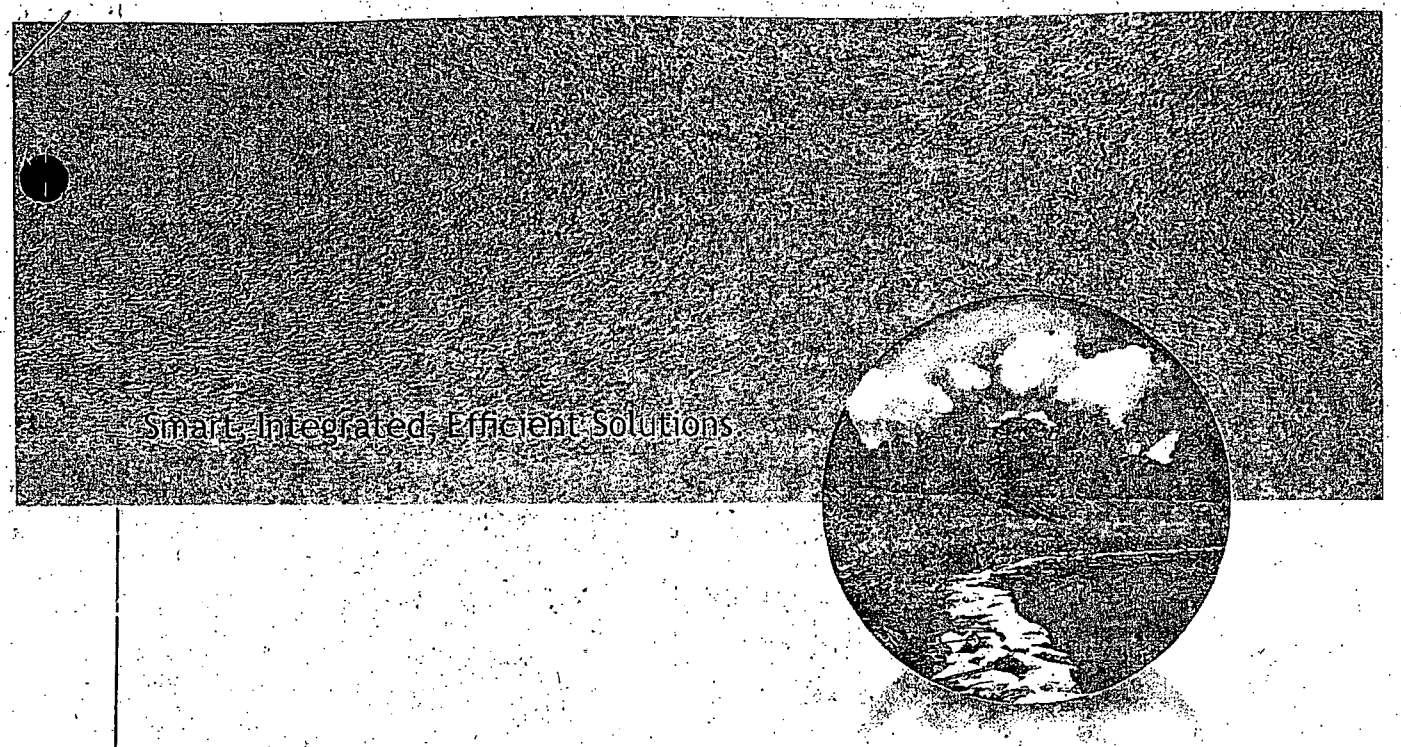
Monitoring Point	Date	Gas Vent	%O_2	%CO_2	%Methane	%LEL
Club House	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.2	0.0	0.0	0.0
	9/20/2007	Building	20.6	0.0	0.0	0.0
	12/31/2007	Building	20.8	0.0	0.0	0.0
	3/12/2009	Building	21.3	0.0	0.0	0.0
	12/3/2009	Building	21.0	0.1	0.0	0.0
	6/22/2010	Building	20.7	0.1	0.0	0.0
	12/1/2010	Shallow	20.6	0.0	0.0	1.0
	2/7/2012	Building	20.9	0.1	0.0	1.0
	8/31/2012	Building	20.6	0.0	0.0	0.0
	2/22/2013	Building	20.2	0.0	0.0	0.0
	8/29/2013	Building	17.7	0.0	0.4	8.0
Shed	3/20/2007	Building	20.9	0.0	0.0	0.0
	6/8/2007	Building	20.3	0.0	0.0	0.0
	9/20/2007	Building	20.7	0.0	0.0	0.0
	12/31/2007	Building	20.9	0.0	0.0	0.0
	3/12/2009	Building	21.2	0.0	0.0	0.0
	12/3/2009	Building	21.1	0.1	0.0	0.0
	6/22/2010	Building	20.5	0.1	0.1	2.0
	12/1/2010	Shallow	20.6	0.0	0.0	1.0
	2/7/2012	Building	20.9	0.1	0.1	2.0
	8/31/2012	Building	20.3	0.0	0.0	0.0
	2/22/2013	Building	20.1	0.0	0.0	0.0
	8/29/2013	Building	18.0	0.0	0.2	4.0

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).

TABLE 6
METHANE MONITORING RESULTS
AUGUST 2013
Former Newberry County MSW Landfill
Cockrell Road, Newberry, South Carolina
TERRY Project #2314I

Monitoring Point	Date	Gas Vent	$\%O_2$	$\%CO_2$	%Methane	%LEL
GMP-1	8/29/2013	Deep	16.3	1.5	0.2	4.0
		Shallow	6.0	9.3	0.3	6.0
GMP-3	8/29/2013	Deep	0.1	38.8	**52.8**	**>100**
		Shallow	0.1	37.7	**52.6**	**>100**
GMP-4	8/29/2013	Shallow	0.1	39.8	**60.1**	**>100**
GMP-5	8/29/2013	Deep	1.1	29.6	**32.4**	**>100**
		Shallow	0.1	39.8	**58.1**	**>100**
GMP-6	8/29/2013	Deep	0.2	36.0	**49.3**	**>100**
		Shallow	0.1	39.3	**57.0**	**>100**
GMP-7	8/29/2013	Deep	17.9	0.0	0.2	4.0
		Shallow	17.6	0.2	0.2	4.0
Club House	8/29/2013	Building	17.7	0.0	0.4	8.0
Shed	8/29/2013	Building	18.0	0.0	0.2	4.0

Notes:
Bolded and highlighted readings exceed the lower explosive limit for methane in air (5%).



2014 Annual Groundwater & Methane Monitoring Report

Former Newberry County Landfill
SCDHEC Solid Waste Permit #DWP-117
432 Cockrell Road
Newberry, South Carolina

Rogers & Callcott Project # 2014-071

Prepared for:
Mr. Mike Pisano, Public Works Director
Newberry County
PO Box 156
Newberry, South Carolina 29108

January 2015

LABORATORY

ENGINEERING

ASSESSMENT

REMEDIATION

AIR QUALITY

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Laboratory

Engineering

Assessment

Remediation

Air Quality

Compliance

January 30, 2015

Mr. John D. Abernathy
Solid Waste Groundwater Section
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Colombia, South Carolina 29201-1708

Subject: 2014 Annual Groundwater and Methane Monitoring Report
Former Newberry County Landfill—DWP-117
Rogers & Callcott Project Number: 2014-071

Dear Mr. Abernathy:

Rogers & Callcott Environmental is pleased to present this copy of the *2014 Annual Groundwater and Methane Monitoring Report* for the Former Newberry County Landfill. This report includes the results of groundwater and surface water sampling, as well as methane monitoring, performed in November 2014. Samples were collected in accordance with the approved *Sampling and Analysis Plan* dated October 2014. The data presented within includes field measurements and laboratory analyses of groundwater and surface water samples, a compilation of historical analytical data, and statistical analyses of inorganic constituents in groundwater. One copy of the report is enclosed along with an electronic version on CD.

Thank you for your assistance with this project. Please contact me at 864.232.1556 or via email (stan.golaski@rogersandcallcott.com) if you have any questions or comments.

Sincerely,

ROGERS & CALLCOTT ENVIRONMENTAL

STANLEY WILLIAM GOLASKI, III REGISTERED No. 2579 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

Stan Golaski, P.G.
Assessment & Remediation Manager

Enclosure

cc: Mike Pisano, Newberry County

PO Box 5655 | Greenville, SC 29606 | 426 Fairforest Way | Greenville, SC 29607 | main 864.232.1556 | fax 864.233.9058 rogersandcallcott.com
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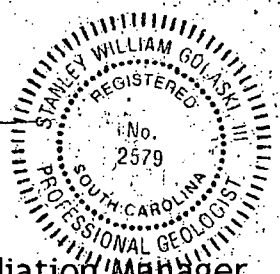
COUNTY 2583



2014 Annual Groundwater & Methane Monitoring Report

Former Newberry County Landfill
SCDHEC Solid Waste Permit #DWP-117
432 Cockrell Road
Newberry, South Carolina

Prepared for:
Mr. Mike Pisano, Public Works Director
Newberry County
PO Box 156
Newberry, South Carolina 29108



Stan Golaski, P.G.
Assessment & Remediation Manager
(SC Reg. #2579)

January 2015

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COUNTY 2584

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
County	Newberry County
EPA	United States Environmental Protection Agency
ft btoc	feet below top of casing
ft rsd	feet relative to a Site datum
LEL	lower explosive limit
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
ppm	parts per million
Rogers & Callcott	Rogers & Callcott Environmental
SCDHEC	South Carolina Department of Health and Environmental Control
Site	Former Newberry County Landfill 432 Cockrell Road, Newberry, Newberry County, South Carolina
SWM	Solid Waste Management
VOC	volatile organic compound
µg/L	micrograms per liter
VOC	volatile organic compound

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1.0 INTRODUCTION AND BACKGROUND

This *Annual Groundwater and Methane Monitoring Report* has been prepared on behalf of Newberry County (the County) to describe groundwater, surface water, and methane monitoring activities and results for the fourth quarter 2014 monitoring event at the former Newberry County Landfill (Solid Waste Permit #DWP-117) located at 432 Cockrell Road in Newberry, Newberry County, South Carolina (the Site). Although routine semi-annual monitoring will typically be performed in the first and third quarters of each year, the South Carolina Department of Health and Environmental Control (SCDHEC) granted the County an extension for the third quarter 2014 sampling while contracting for Site work was finalized. Hence, monitoring activities were completed in November 2014 after SCDHEC approved the *Sampling and Analysis Plan* (Rogers & Callcott Environmental [Rogers & Callcott], October 2014).

Background information was obtained from the *Semi-Annual Groundwater and Methane Monitoring Report for February 2014* dated March 2014 (Terry Environmental Services). The Site is a closed landfill located approximately 2 miles east of the City of Newberry and 40 miles northwest of Columbia, South Carolina (**Figure 1**). The County operated the landfill until December 1993, when waste handling operations were relocated to the Newberry County Transfer Station located approximately 1.5 miles northwest of the landfill. Presently, the landfill is leased to the Triangle Gun Club for competitive skeet shooting. There are no permanent residents at the Site, and the skeet range is typically open on Wednesdays, Saturdays, and Sundays.

A small clubhouse and storage shed are located on-Site, and an out-of-service water well is located near the storage shed (**Figure 2**). The Site is in post-closure monitoring in accordance with SCDHEC Solid Waste Management (SWM) regulation R61-107.19. Groundwater is monitored using a network of 13 monitoring wells located both on- and off-Site. Six on-Site gas monitoring points are used to monitor methane gas, and six passive landfill gas vents are present. Methane concentrations are also measured in the clubhouse and storage shed on-Site. Surface water is sampled at one location in Cannons Creek. Monitoring locations are listed in **Table 1** and illustrated on **Figure 2**.

Table 1: Monitoring Locations

Monitoring Wells	
MW-1R	MW-8
MW-2RR	TMW-9
MW-3	TMW-10
MW-4R	TMW-11
MW-5	TMW-12
MW-6	TMW-13
MW-7R	

Gas Monitoring Points
GMP-1
GMP-3
GMP-4
GMP-5
GMP-6
GMP-7
Clubhouse
Shed

Surface Water Sample
Cannons Creek

COUNTY 2587

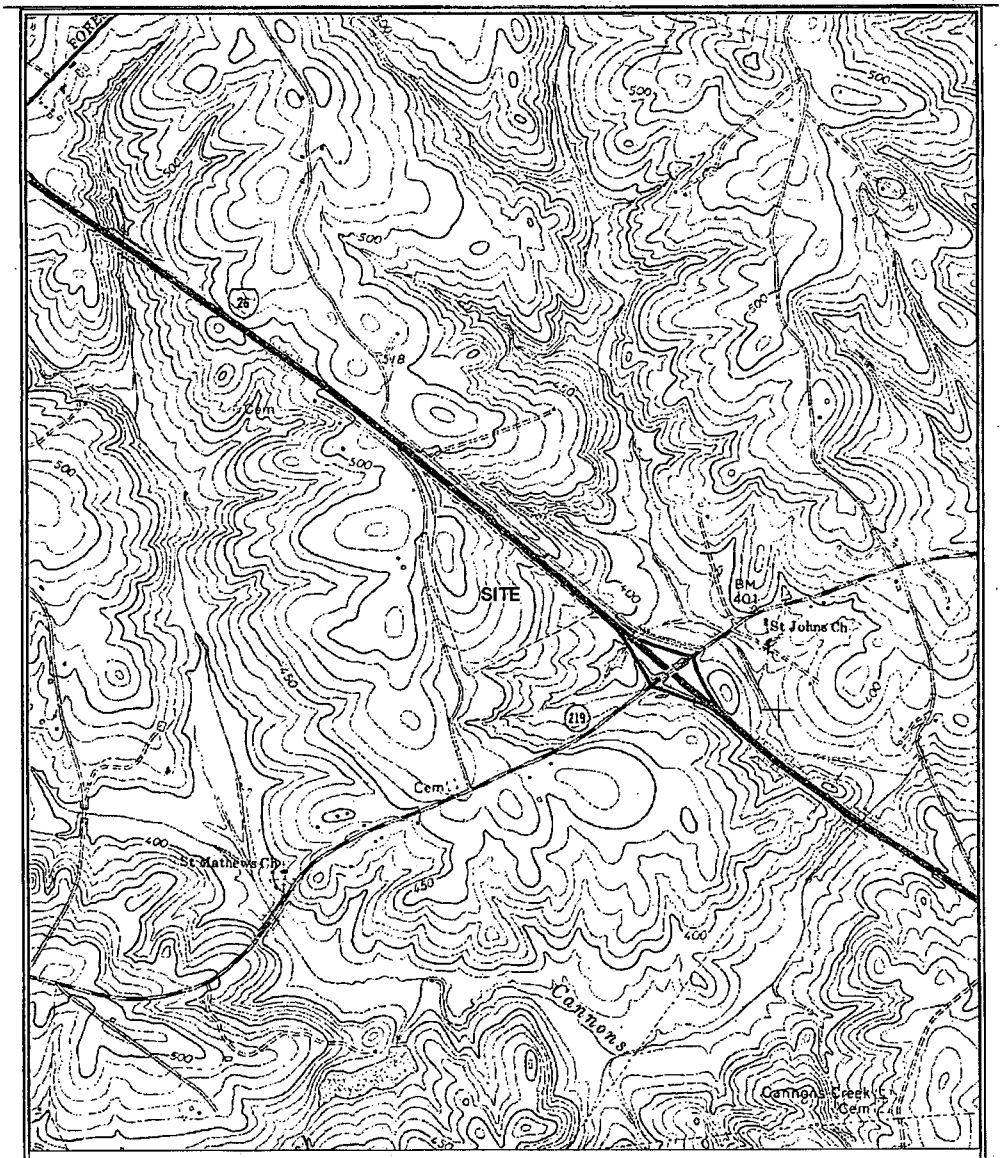
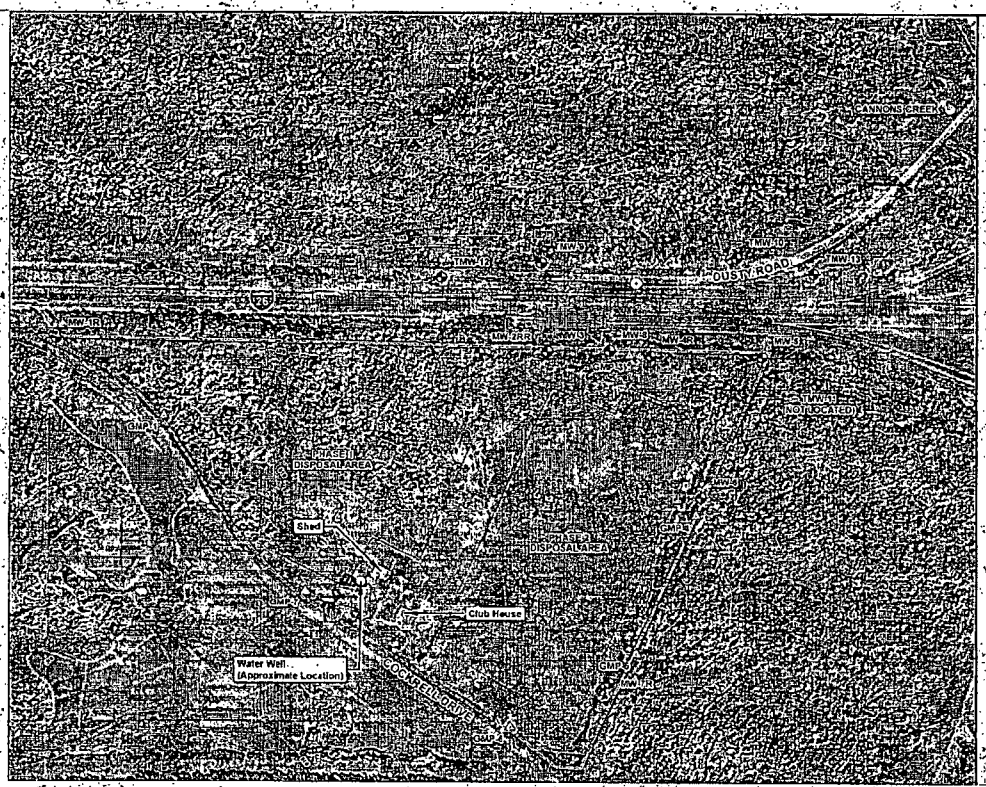


FIGURE 1
SITE LOCATION MAP
FORMER
NEWBERRY COUNTY
LANDFILL
Cockrell Drive
Newberry, South Carolina

COUNTY 2588

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FIGURE 2
MONITORING POINT LOCATIONS

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

- Surface Water Sample
- Gas Monitoring Wells
- Groundwater Monitoring Wells
- Unidentified Piezometer
- Topographic Lines
- Disposal Area
- Approximate Parcel Boundary

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 12, 2014
2013 Aerial photograph from NRCS.

0 200 400 800
Feet

COUNTY 2589

Samples were historically analyzed for the parameters listed in Appendix V of SWM regulation R61-107.19 (excluding dioxins) as directed by SCDHEC in a letter dated April 13, 2010. With SCDHEC's approval of Rogers & Callcott's *Sampling and Analysis Plan* (October 2014), the analyte list was reduced to four field parameters (pH, temperature, conductivity, and turbidity) and a Site-specific list of volatile organic compounds (VOCs), chlorinated pesticides, and metals (**Table 2**).

Table 2: Site-Specific Analyte List

Analysis	EPA Method	Analyte
Field Parameters	EPA 9040C	pH
	SM 2550B	Temperature
	EPA 9050A	Conductivity
	Field Screen	Turbidity
VOCs	8260B	1,1-Dichloroethane
		1,1-Dichloroethene
		1,2-Dichloroethane
		Benzene
		Chloromethane
		Dichlorodifluoromethane
		Methylene Chloride
		Tetrachloroethene
		Trichloroethene
		Vinyl Chloride
		cis-1,2-Dichloroethene
		trans-1,2-Dichloroethene
Chlorinated Pesticides	8081B	Heptachlor
		Heptachlor Epoxide
		Alpha-BHC
		Beta-BHC
		Gamma-BHC
Metals	6020A	Antimony
	6020A	Arsenic
	6010C	Barium
	6020A	Beryllium
	6020A	Lead
	7470A	Mercury

2.0 ACTIVITIES AND RESULTS

Groundwater and surface water sampling, as well as methane monitoring, were performed in accordance with the SCDHEC-approved *Sampling and Analysis Plan* dated October 2014.

2.1 GROUNDWATER MONITORING

Twelve of the 13 Site monitoring wells were located during monitoring activities. Well TMW-11 has not been located since April 2008. An unidentified, 1-inch diameter piezometer was observed on

COUNTY 2590

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the south side of Dusty Road between TMW-9 and TMW-10. This piezometer is not shown on previous Site maps, and no information concerning the well was found. The total depth of the piezometer was measured as 14.14 feet below the top of the well casing during this sampling event. No survey data is available for the piezometer. Because of the significantly shallow depth of the piezometer and its water level compared to nearby wells at the Site, it is not expected to be representative of groundwater at this location. The piezometer was not sampled because there is insufficient water (0.41 foot water column) and its association with the Site is unknown.

Depth-to-water measurements were taken at the 12 located Site monitoring wells and the unidentified piezometer on November 3, 2014. These measurements were used to determine the groundwater elevations listed in **Table 3** and to prepare the potentiometric map included as **Figure 3**. Groundwater elevations ranged from 469.45 feet relative to a site datum (ft rsd) and 392.88 ft rsd. Groundwater flow is generally to the southeast with a calculated gradient of 0.022 foot per foot. The piezometer is not included in **Table 3** or on the potentiometric map.

Table 3: Well Specifications and Groundwater Elevations

Monitoring Well ID	Top of Casing Elevation (ft rsd)	Reported Well Depth (ft btoc)	Measured Well Depth (ft btoc)	Reported Screened Interval (ft)	Reported Latitude	Reported Longitude	11/3/14 Depth to Groundwater (ft btoc)	11/3/14 Groundwater Elevation (ft rsd)
MW-1R	504.92	63.0	60.54	48.0 - 63.0	Unknown	Unknown	35.47	469.45
MW-2RR	459.82	63.0	59.61	48.0 - 63.0	Unknown	Unknown	38.56	421.26
MW-3	453.92	34.0	38.77	Unknown	34° 17' 50"	81° 33' 07"	37.37	416.55
MW-4R	441.55	63.0	62.40	48.0 - 63.0	Unknown	Unknown	33.21	408.34
MW-5	420.12	31.0	34.13	Unknown	34° 17' 44"	81° 33' 00"	24.37	395.75
MW-6	440.55	25.0	27.76	10.0 - 25.0	34° 17' 42"	81° 33' 08"	26.33	414.22
MW-7R	457.34	63.0	62.76	48.0 - 63.0	Unknown	Unknown	38.79	418.55
MW-8	443.39	68.0	71.81	58.0 - 68.0	Unknown	Unknown	35.98	407.41
TMW-9	457.58	75.0	73.99	65.0 - 75.0	Unknown	Unknown	47.71	409.87
TMW-10	415.07	45.0	44.09	35.0 - 45.0	Unknown	Unknown	19.21	395.86
TMW-11	Unknown	30.0	Not Located	20.0 - 30.0	Unknown	Unknown	NA	NA
TMW-12	468.18	42.6	42.03	22.6 - 42.6	Unknown	Unknown	41.85	426.33
TMW-13	409.25	44.4	42.84	14.4 - 44.4	Unknown	Unknown	16.37	392.88

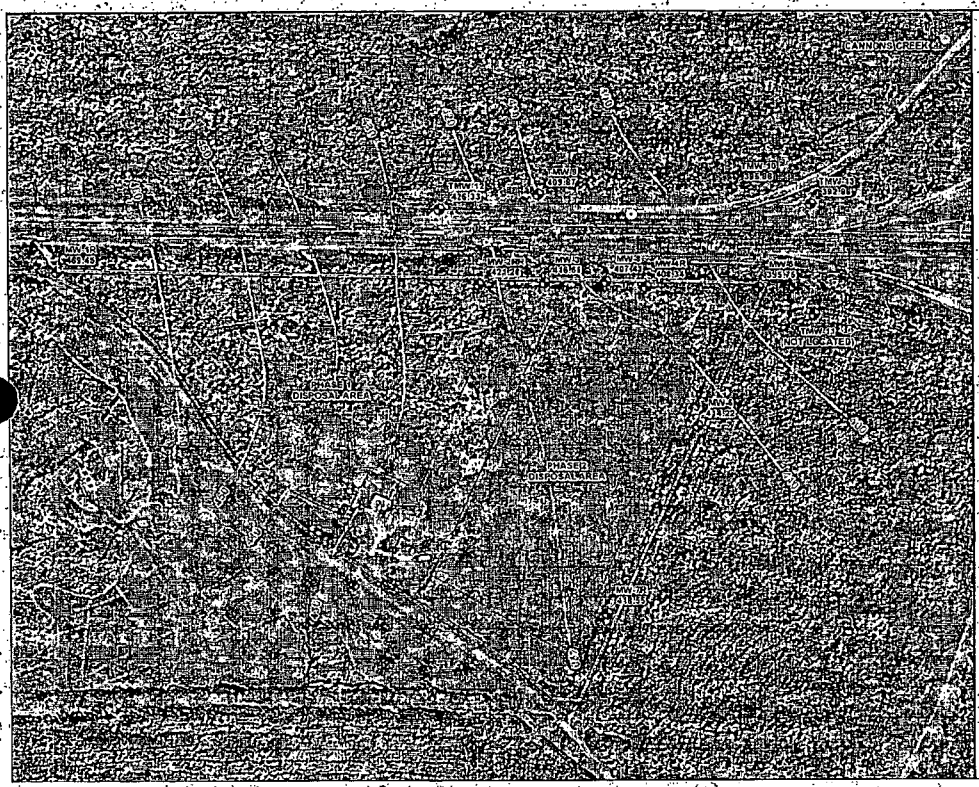
Notes:
ft rsd **feet relative to a Site datum**
ft btoc **feet below top of casing**
NA **not available**
Well construction data based on information provided in Terry Environmental's *Semi-Annual Groundwater and Methane Monitoring Report for February 2014* (March 2014).

Groundwater samples were collected from 11 of 13 monitoring wells on November 3 and 4, 2014. No sample was collected from well TMW-11, which was not located. Additionally, no sample was collected from well TMW-12, which has been reported "dry" since December 2009 and did not contain sufficient groundwater column (0.18 foot) for sampling during this monitoring event.

Well MW-3 had been reported dry and not sampled since February 2013. Similarly, well MW-6 had been reported dry and not sampled since August 2012. During this sampling event, 1.40 feet and 1.43 feet of water were measured in these two wells, respectively (less than 0.25 gallon of water in each). MW-3 and MW-6 were purged dry and allowed to recover for several hours. The wells were

COUNTY 2591

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FIGURE 3
GROUNDWATER POTENTIOMETRIC MAP
NOVEMBER 3, 2014

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

- Surface Water Sample
- Groundwater Monitoring Wells
- Unidentified Piezometer
- Groundwater Contours
- Disposal Area
- Approximate Parcel Boundary
- Groundwater Flow Direction

Contour lines are extrapolated based on data at the sample locations. These lines are approximate as conditions between locations may vary.

REFERENCE:
1. Site Features from Site Plan drawing by SCS Engineers, May 22, 2014.
2014 Aerial photograph from NRCS.

0 200 400 800 Feet

N

COUNTY 2592

then sampled and analyzed only for the Site-specific list of VOCs using United States Environmental Protection Agency (EPA) method 8260B and the Site-specific list of metals using EPA methods 6010C, 6020A, and 7470A—the volume of water in the wells was insufficient to collect samples for pesticide analysis.

The remaining wells (MW-1R, MW-2RR, MW-4R, MW-5, MW-7R, MW-8, TMW-9, TMW-10, and TMW-13) were sampled and analyzed for the Site-specific list of VOCs using EPA method 8260B; the Site-specific list of metals using EPA methods 6010C, 6020A, and 7470A; and organochlorine pesticides using EPA method 8081B (**Table 2**). All analyses were performed by the Rogers & Callcott laboratory (SCDHEC Certification Number 23105) in Greenville, South Carolina.

Analytical results are generally consistent with historical data. No organochlorine pesticides were detected at or above laboratory reporting limits in any of the samples analyzed. No analytes were detected at or above their respective EPA Maximum Contaminant Levels (MCLs) in wells MW-1R, MW-4R, MW-5, MW-6, MW-7R, or TMW-13. Antimony and arsenic were not detected at or above laboratory reporting limits in any of the samples analyzed.

In well MW-2RR, barium was reported below its MCL for the first time since June 2010. With the exception of lead in well MW-3, no metals were reported above their respective MCL; however, as discussed in **Section 3.0**, the concentration of lead reported in MW-3 is not statistically significant.

Benzene, a petroleum-related constituent, and chlorinated compounds with their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-2RR and MW-3. Chlorinated compounds and their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-8, TMW-9, and TMW-10. Methylene chloride was reported above its MCL of 5.0 micrograms per liter (µg/L) for the first time in well MW-8 in August 2013, and the concentration has increased slightly in the two successive sampling events, reaching 17.4 ug/L in November 2014.

A summary of the laboratory analytical results is included as **Table 4**. A database of historical analytical results, including groundwater elevations, is included as **Appendix A**. **Figure 4** depicts analytes exceeding their respective MCL during the November 2014 monitoring event. The complete laboratory analytical report is included as **Appendix B**.

2.2 SURFACE WATER MONITORING

One surface water sample was collected from Cannons Creek, approximately 1/3-mile east-southeast of the Site, and analyzed at the Rogers & Callcott laboratory for the Site-specific list of VOCs using EPA method 8260B; the Site-specific list of metals using EPA methods 6010C, 6020A, and 7470A; and organochlorine pesticides using EPA method 8081B (**Table 2**). With the exception of barium, which was reported at a concentration of 0.056 mg/L (well below its MCL of 2.0 mg/L), no analytes were detected at or above laboratory reporting limits in the surface water sample. A summary of the laboratory analytical results is included in **Table 4**. Historical analytical data is included in **Appendix A**. The complete laboratory analytical report is included as **Appendix B**.

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Table 4: Summary of Laboratory Analytical Results

Sample I.D.	Benzene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Vinyl Chloride	Dichloro-difluoro-methane	Methylene Chloride	Chloro-methane	Total VOCs	Antimony	Arsenic	Barium	Beryllium	Lead	Mercury	Organo-chlorine Pesticides
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)
MW-1R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.086	<0.002	<0.002	<0.00020	ND
MW-2RR	5.8	2.9	5.0	50.3	<1.0	<1.0	18.2	2.6	6.7	7.8	29.3	<1.0	64.6	<0.005	<0.005	1.8	<0.002	<0.002	<0.00020	ND
MW-3	7.5	7.3	3.0	83.3	<1.0	<1.0	7.3	<1.0	2.8	<1.0	<2.0	<1.0	10.1	<0.005	<0.005	0.92	0.003	0.018	<0.00020	NS
MW-4R	1.4	<1.0	<1.0	4.2	<1.0	1.2	9.5	<1.0	1.1	<1.0	<2.0	<1.0	10.6	<0.005	<0.005	0.57	<0.002	<0.002	<0.00020	ND
MW-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.25	<0.002	0.010	<0.00020	ND
MW-6	4.0	<1.0	<1.0	7.9	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	<2.0	<1.0	1.9	<0.005	<0.005	0.46	<0.002	<0.002	<0.00020	NS
MW-7R	1.7	<1.0	<1.0	6.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.31	<0.002	<0.002	<0.00020	ND
MW-8	1.3	2.6	4.8	12.5	<1.0	6.0	14.1	<1.0	<1.0	12.5	17.4	<1.0	44.0	<0.005	<0.005	0.16	<0.002	<0.002	0.0012	ND
TMW-9	3.5	3.2	5.3	34.7	<1.0	<1.0	15.6	<1.0	2.8	6.9	42.0	<1.0	67.3	<0.005	<0.005	0.81	<0.002	<0.002	<0.00020	ND
TMW-10	3.3	5.7	7.8	34.0	<1.0	5.5	40.6	<1.0	<1.0	7.0	45.8	<1.0	93.4	<0.005	<0.005	0.22	<0.002	<0.002	0.00050	ND
TMW-11	Well not located																			
TMW-12	Insufficient water for sampling																			
TMW-13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.13	<0.002	<0.002	0.00050	ND
Cannons Creek	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.056	<0.002	<0.002	<0.00020	ND
MCLs	*5.0*	*5.0*	*5.0*	*70*	*100*	*7.0*	*NE*	*5.0*	*2.0*	*NE*	*5.0*	*NE*	*NA*	*0.006*	*0.010*	*2.0*	*0.004*	*0.015*	*0.002*	*NA*

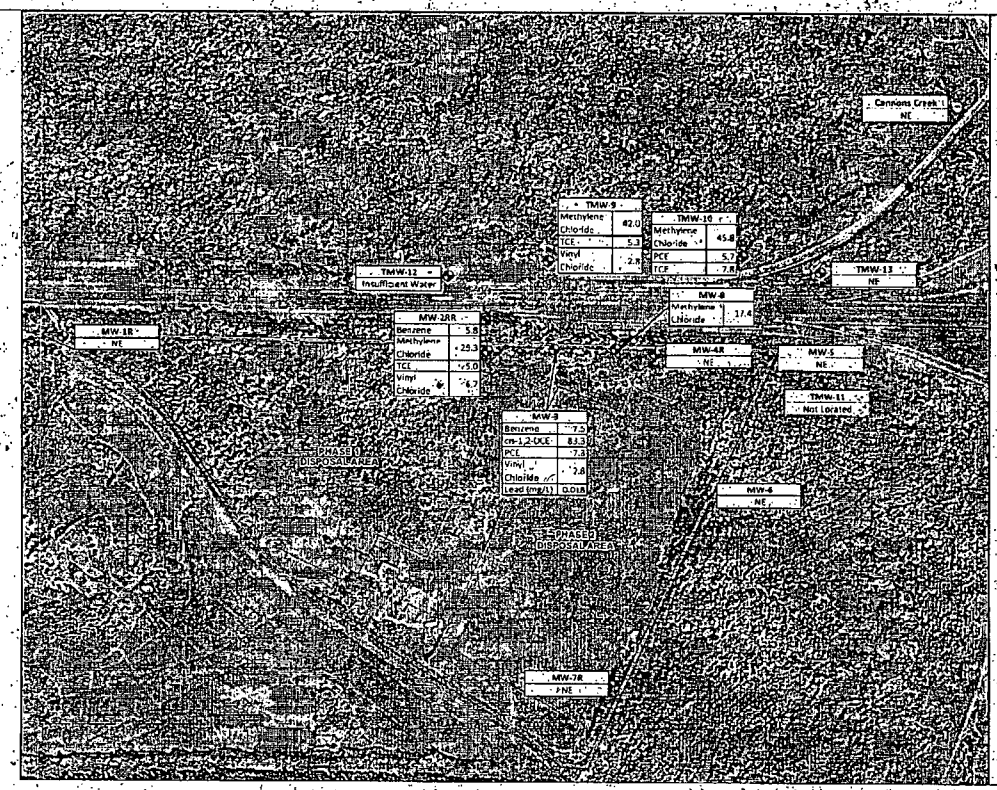
Notes:

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
cis-1,2-DCE	cis-1,2-dichloroethene
PCE	tetrachloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
TCE	trichloroethene
VOCs	volatile organic compounds
µg/L	micrograms per liter
mg/L	milligrams per liter
ND	not detected
NS	not sampled—insufficient water
NE	not established
NA	not applicable
MCL	United States Environmental Protection Agency Maximum Contaminant Level
< X.X	analyte not detected at or above indicated laboratory reporting limit

Detected analytes are in bold type.

Shaded cells indicate the reported value exceeds the respective MCL.

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ENVIRONMENTAL

FIGURE 4
ANALYTES EQUAL TO OR EXCEEDING MCLS
NOVEMBER 2014

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

- Surface Water Sample
- Groundwater Monitoring Wells
- Disposal Area
- Approximate Parcel Boundary

NOTES:
NE - No analytes exceed the MCL.
All units are in µg/L unless otherwise noted.

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 27, 2014
2013 Aerial photograph from NRCS.

DRAWN BY: MAL 1/15/2015
CHECKED BY: JWG
APPROVED BY: DWM

0 200 400 800 Feet

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2.3 METHANE MONITORING

Rogers & Callcott monitored methane concentrations using a Bacharach Gas Pup® natural gas detection instrument at the six gas monitoring points (GMP-1 and GMP-3 through GMP-7) and two structures (the clubhouse and shed) on November 4, 2014. Sampling locations are illustrated on **Figure 2** and **Figure 5**. Methane concentrations are measured in shallow and deep zones from nested wells at each GMP location except GMP-4, which was installed only to monitor the shallow zone. The Gas Pup® displays methane concentrations as parts per million (ppm) at low concentrations (0–2,500 ppm) and as a percentage by volume at mid to high concentrations (0.2–100 percent).

Methane concentrations exceeded the lower explosive limit (LEL) action level of 5 percent in air in both the shallow and deep zones at monitoring points GMP-3, GMP-5, and GMP-6, as well as the shallow zone at GMP-4. Note the upper explosive limit for methane is 15 percent in air. Results of methane monitoring during this semi-annual event are summarized in **Table 5** and illustrated on **Figure 5**. Historical methane monitoring data is provided as **Appendix C**, and a copy of the methane monitoring field form is included as **Appendix D**.

Table 5: Methane Monitoring Results

Monitoring Point	Date	Gas Vent	Percent Methane	Percent of the LEL
GMP-1	11/4/2014	Deep	0.0	0.0
		Shallow	0.0	0.0
GMP-3	11/4/2014	Deep	**6.5**	**>100**
		Shallow	**15.0**	**>100**
GMP-4	11/4/2014	Shallow	**39.0**	**>100**
GMP-5	11/4/2014	Deep	**5.6**	**>100**
		Shallow	**34.0**	**>100**
GMP-6	11/4/2014	Deep	**22.0**	**>100**
		Shallow	**34.0**	**>100**
GMP-7	11/4/2014	Deep	0.3	6.0
		Shallow	0.03	0.6
Club House	11/4/2014	Building	0.01	0.25
Shed	11/4/2014	Building	0.01	0.25

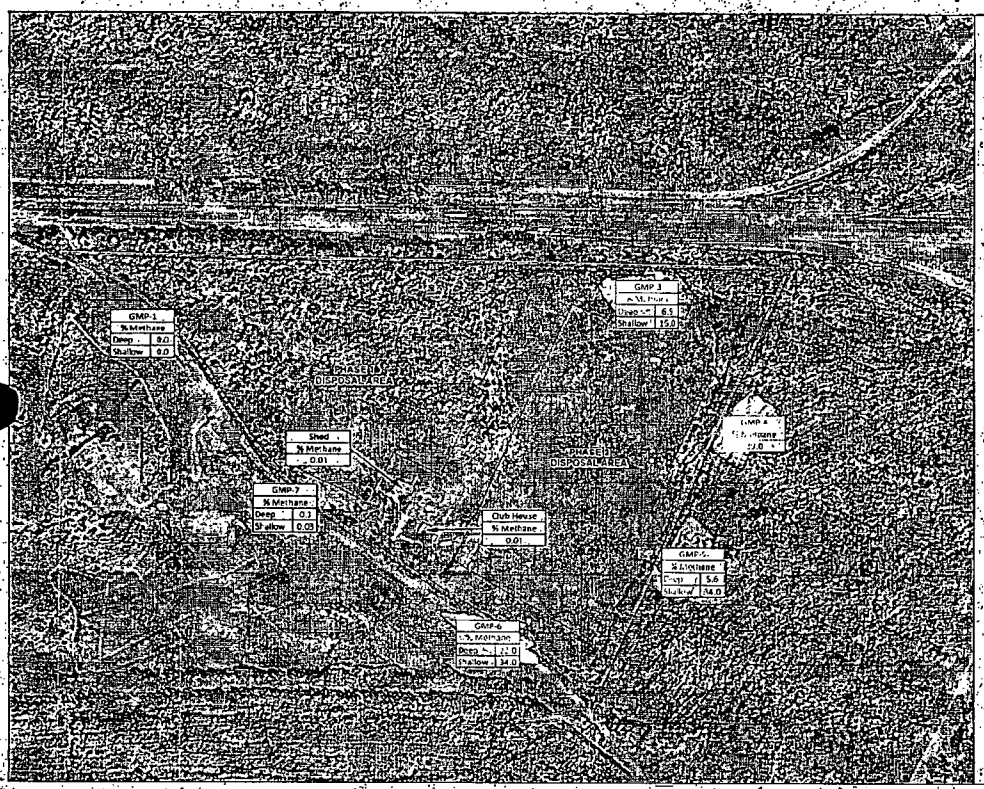
Notes:
LEL lower explosive limit
Bold and shaded readings exceed the LEL for methane in air of 5 percent.

3.0 STATISTICAL ANALYSIS

Data sets of groundwater monitoring results were evaluated for each inorganic constituent. Those sets with less than 15 percent non-detects were analyzed using a parametric ANOVA analysis. However, if original values showed evidence of non-normal distribution at the 1 percent and 5 percent levels of significance, log transform values were used for the analysis. If the log residuals (derived from the log transform values) also showed evidence of non-normal distribution at the 1 percent and 5 percent levels of significance, a non-parametric analysis (Kruskal-Wallis) was performed. Data sets with 15 percent to 85 percent non-detects were analyzed using the Kruskal-Wallis test. Data sets with 85 percent or greater non-detects were analyzed using the Wilcoxon

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Rogers & Callcott
ENVIRONMENTAL

FIGURE 5
METHANE MONITORING RESULTS
NOVEMBER 2014

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

Gas Monitoring Wells
Disposal Area
Approximate Parcel Boundary

NOTES:
- Highlighted results exceed the lower explosive limit.

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 22, 2014.
2013 Aerial photograph from NRCS.

0 200 400 800
Feet

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Rank-Sum method. Additionally, EPA guidance (1992) recommends samples with greater than 90 percent non-detects be analyzed using one of the Poisson methods. The Poisson Tolerance Limit analysis was conducted on these samples (in addition to the Wilcoxon method). **Table 6** summarizes the total number of samples, percent of non-detects, and the statistical analysis methods used for each parameter.

Table 6: Percent Non-Detects and Statistical Methods

Parameter	Total Number of Samples	% Non-Detect for Data Set	Statistical Analysis Method
Antimony	80	98	Wilcoxon Rank-Sum/Poisson Tolerance Limit
Arsenic	80	94	Wilcoxon Rank-Sum/Poisson Tolerance Limit
Barium	80	0	Parametric ANOVA
Beryllium	80	68	Kruskal-Wallis Test
Lead	80	61	Kruskal-Wallis Test
Mercury	80	53	Kruskal-Wallis Test

Statistical analyses are used to determine if levels of a specific constituent observed in the downgradient wells vary significantly from levels of the same constituent observed in the upgradient well. The ChemStat computer program by Starpoint Software was used to perform the statistical evaluation of the data. **Table 7** is a summary of the results of these analyses.

Table 7: Summary of Statistical Analysis Results

Analyte	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8	TMW-9	TMW-10	TMW-13
Antimony	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arsenic	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Barium	**YES**	**YES**	**YES**	NO	NO	NO	NO	**YES**	NO	**YES**
Beryllium	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lead	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Mercury	NO	NO	NO	NO	NO	NO	**YES**	NO	**YES**	**YES**

NOTES: **YES** indicates a statistically significant variation from the background well (MW-1R)

The upgradient monitoring well, MW-1R, serves as the background well, and all other wells serve as the downgradient, compliance monitoring wells. A "Yes" in **Table 7** indicates a statistically significant variation when compared to MW-1R.

Statistical analysis was performed using all available groundwater quality data for six inorganic parameters that were analyzed for the Site during the 4th quarter 2014 (**Appendix A**). All of the constituents tested have the minimum of six sampling events required for statistically significant

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data sets. The statistical analysis datasets and worksheets for each of the statistically evaluated constituents are included as **Appendix E**.

As shown in the statistical analysis results (**Table 7**), the data indicate a statistically significant variance from the background well for barium at MW-2RR, MW-3, MW-4R, TMW-9, and TMW-13 and for mercury at MW-8, TMW-10, and TMW-13. However, none of the statistically significant variations is an MCL exceedance during this reporting period. The detection of lead above its MCL in MW-3 is not statistically significant.

4.0 CONCLUSIONS

Rogers & Callcott completed semi-annual groundwater, surface water, and methane monitoring at the Site on November 3 and 4, 2014. A total of 12 groundwater samples and 1 surface water sample were collected, and methane gas concentrations were measured at 6 gas monitoring points and 2 structures located on-Site.

No analytes were detected at or above their respective MCLs in 7 of the 12 groundwater monitoring wells sampled. No organochlorine pesticides were detected at or above laboratory reporting limits in any of the groundwater samples collected. Benzene, a petroleum-related constituent, and chlorinated compounds with their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-2RR and MW-3. Chlorinated compounds and their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-8, TMW-9, and TMW-10. Lead was detected slightly above its MCL in MW-3, but the detection is not statistically significant.

With the exception of barium, no analytes were detected at or above laboratory reporting limits in the surface water sample collected from Cannons Creek.

Based on a review of historical data and the most recent analytical results, pesticides and metals do not appear to be significant contaminants of concern at the Site. Additional samples will be collected in the first quarter 2015. If analyte concentrations remain similar to those reported during this sampling event, these analytes should be eliminated from the sampling requirements for the Site.

Methane concentrations exceeded the LEL action level of 5 percent in air in both the shallow and deep zones at monitoring points GMP-3, GMP-5, and GMP-6, as well as the shallow zone at GMP-4.

Site monitoring shall continue in accordance with the solid waste permit for the Site and the SCDHEC-approved *Sampling and Analysis Plan* (Rogers & Callcott, October 2014).

5.0 SCHEDULE

Groundwater, surface water, and methane monitoring will be performed in the first quarter 2015. A semi-annual report will be submitted within 45 days of the end of the quarter.

COUNTY 2599

Limited Site Investigation

West & Fretwell v. Newberry County
Cockrell Road Tracts
Newberry County, South Carolina



March 21, 2014
Terracon Project No. 73137066

Prepared For:
Bruner Powell Wall & Mullins, LLC
Columbia, South Carolina

Prepared by:
Terracon Consultants, Inc.
Columbia, South Carolina

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West & Fretwell v. Newberry County
Newberry County, South Carolina
Terracon Project No. 73137066
March 21, 2014

1.0 INTRODUCTION

This assessment was conducted in response to the ongoing legal proceedings related to known and/or suspected impacts to both the West and Fretwell Tracts related to the adjacent former landfill. Currently, both tracts border the closed Newberry County Landfill property. Multiple phases of assessment have been conducted at the landfill and the surrounding properties. Previous assessments have identified environmental impairment related to methane and volatile organic compounds (VOCs) in ground water and soil gas.

The objective of this assessment was to evaluate the presence of volatile organic compounds (VOCs) and/or methane above action levels in the groundwater and soil gas on both tracts as a result of potential releases from the landfill.

1.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These LSI services were performed in accordance with the scope of work agreed with you, our client, as reflected in our proposal and were not restricted by ASTM E1903-11.

1.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this LSI. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

1.3 Reliance

This report has been prepared for the exclusive use of West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of West/Hobby LLC, Fretwell LLC, Bruner Powell Wall & Mullins, LLC, and Terracon. Any unauthorized distribution or reuse is at West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, LSI report, and Terracon's Agreement for Services. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC and all relying parties unless otherwise agreed in writing.

2.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) is a description of the site and site features pertinent to identifying possible site contaminants, determining how those contaminants may behave relative to site conditions, and understanding potential receptor pathways. The findings of this assessment may alter the CSM; any updates to the CSM are described in Section 5.2.

2.1 Site Physical Description

The site is located at 300 Cockrell Road in Newberry, Newberry County, South Carolina, and is comprised of the following Newberry County parcels:

Parcel No.	Owner	Acreage
449-1	Fretwell, LLC	145
449-2	West/Hobby, LLC	42

The site consists of two parcels, the West Tract is largely cleared, grassed land; the Fretwell tract is primarily wooded. The tracts are located near the intersection of Cockrell Drive and SC Highway 219, west of Interstate 26. An excerpt of the topographic map for the site is included as Figure 1. A site diagram is included as Figure 2.

The site's physical setting is described in the following table:

Physical Setting Information		Source
Topography (Refer to Appendix A, Figure 1, for an excerpt of the Topographic Map)		
Site Elevation	Approximately 390 to 500 feet	USGS Topographic Map, Newberry East, SC Quadrangle, 1968
Surface Runoff/ Topographic Gradient	Gently sloping to the south and east, toward the unnamed tributary at the eastern portion of the Fretwell Tract. The tributary flows to the east, toward Cannons Creek.	
Closest Surface Water	On-site unnamed tributary of Cannons Creek.	

2.2 Surrounding Properties Development

The West Tract is bound to the east by Cockrell Drive with the former Newberry County Landfill beyond. The Fretwell Tract is bisected by Cockrell Drive into eastern and western portions. The eastern portion is adjoined to the north by the former landfill. The western portion adjoins the West Tract.

2.3 Areas of Concern / Potential Sources

Former Newberry County Landfill
The landfill consists of two cells, Phase I and Phase II, both closed. The Phase I cell reportedly opened in the 1980s and closed in 1990. Phase II began receiving waste in 1990 and was closed in 1993.

2.4 Potential Pathways Evaluation

Potential Pathways for Contaminant Transport

The site is largely undeveloped except for a single residence near the northeast corner of the West Tract. Transport of contaminants onto the properties would occur through soil vapor, or soil gas, migration along diffusion or pressure gradients, ground water contaminant migration, or as a release of vapors from impacted ground water.

Potential Exposure Pathways

Surface Soils – Currently, the site is not used for any purpose that would create a soil exposure scenario. The soils pathway was not evaluated.

Indoor Air – There may be exposure potential for vapor migration from contaminated ground water or directly from decomposing materials within the landfill to indoor air within any proposed

site structures. Vapors released from contaminated media may migrate through subsurface utility trenches or along pressure/diffusion gradients and enter enclosed spaces through the annular space, voids, or components of a utility. Vapors may also be released from source material or contaminated media and directly enter proposed structures through cracks or other penetrations of the foundation. The soil gas pathway was evaluated as part of this assessment.

Surface Water – An unnamed stream bisects the eastern portion of the Fretwell tract. Previous sampling has not identified impacts in the stream. The surface water pathway was not evaluated as part of this investigation.

Ground Water – There are two identified exposure routes to ground water currently existing at the site or in the immediate vicinity. Water supply wells are located at the West Tract residence, and on the Newberry County landfill property between the Phase I and Phase II fill areas. Previous sample data from the two water supply wells did not indicate impact from the landfill. Currently, there are no known plans for future improvements that would create an exposure pathway to ground water. An evaluation of the ground water pathway was attempted as described in subsequent sections.

3.0 SAMPLE COLLECTION

The sample collection approach outlined below describes data collection activities described in our proposal P73137066 dated January 30, 2014. The assessment activities described herein were conducted in general accordance with Terracon Standard Operating Procedures (TSOP) and US EPA Region IV Field Branches Quality System and Technical Procedures.

3.1 Soil Gas Sampling

The potential for soil gas impact is not limited to areas directly overlying ground water plumes or contaminated soils. Soil gases can migrate through the subsurface by diffusion and pressure gradients, as well as preferential pathways. The eight soil gas sample locations, shown on Figure 2, were based on the proximity of the former landfill and previous on-site data. Four sample points were installed on the West Tract and four sample points were installed on the Fretwell Tract.

The soil gas points were advanced via direct-push continuous coring techniques to equipment refusal. The borings were converted to soil gas sampling points installed six inches above the bottom of the boring. The stainless steel sampling points were configured with lateral ports for the vapor inlet and a barb fitting on the top to connect to small bore (0.25 inches O.D.) nylon sample tubing. The ports are protected from clogging by fine-grained sediments with a Teflon disk and stainless steel screen to prevent clogging. A sand filter pack was placed within the annulus opposite the screen to a height of six inches above the screen point. Granular bentonite

was placed in the borehole annulus above the sand pack and hydrated in approximate 1-foot lifts to the land surface.

Prior to VOC sampling, each soil gas point was metered for methane and hydrogen sulfide using a calibrated GEM 2000 Plus Gas Analyzer landfill gas meter. Soil gas samples were collected from each point into 1-liter (L) SUMMA canisters supplied by the laboratory. Each canister was filled using a dedicated, 5-minute (min), flow controller set to a sample rate less than or equal to 200 milliliters (mL) per min (200 mL/min x 5 min = 1 L sample volume). An "in line" vacuum gauge was installed at the sample controller to verify initial vacuum levels within the canister and as an indicator that final pressure equalization was reached (i.e. sampling is complete). The soil gas samples were packaged for shipment to the laboratory and analyzed for VOCs per EPA Method TO-15 as described in Section 3.3 below. General weather conditions at the time of sampling (temperature, barometric pressure) were recorded for informational purposes.

Drilling equipment was cleaned using a high-pressure washer prior to beginning the project and before beginning each boring. Non-dedicated sampling equipment was cleaned using an Alconox® detergent wash and potable water rinse prior to commencement of the project and between each sample collection.

3.2 Ground Water

Eight shallow monitoring wells were drilled at areas on the site as shown on the attached Figure 2. Four wells were located on each tract. Drilling activities were supervised by a South Carolina registered Professional Geologist (P.G.). Monitoring well approval was obtained from SCDHEC prior to installation, and all monitoring wells were installed by a South Carolina licensed well driller in accordance with R.61-71, SC Well Standards and Regulations. Water Well Record (SCDHEC 1903) forms were completed with Geologist's Logs to include the well construction details, well driller name, and certification number.

The monitoring wells were attempted by driving a continuous core sampler approximately 5 feet into the initial water table, if possible. The core was extracted from the sampler and the lithology was described. The boring was then converted into a monitoring well, when saturated conditions were encountered prior to drill refusal. The monitoring well construction procedure was as follows:

- Installation of 1-inch diameter, 0.010-inch machine slotted PVC well screen with a threaded bottom cap (10-foot section to bracket the water table);
- Installation of 1-inch diameter, threaded, flush-joint PVC riser pipe to surface; and,

- Addition of pre-sieved 20/40 grade silica sand for annular sand pack around the well screen from the bottom of the boring to approximately 2-feet above the top of the well screen.

Subsequent to the boring or well installation, the water levels in the wells / borehole were measured using an electronic water level indicator. Ground water was not encountered above equipment refusal.

3.3 Assessment Sampling Program

Terracon's sampling program consisted of the following:

SOIL GAS

- Eight laboratory analyses for VOCs via SW846 Method TO-15
- Eight field analyses for methane and H_2S using a calibrated GEM 2000 Plus Gas Analyzer

GROUND WATER (attempted)

- Eight laboratory analyses for TCL VOCs via SW846 Method 8260

BLANKS

- Aqueous: Two trip blanks and one field blank for VOCs via SW846 Method 8260
- Gaseous: One equipment/ambient air blank for VOCs via SW846 Method TO-15

3.4 Significant Deviations

Terracon documented the following deviations in data collection activities outlined in the proposal:

Variance #1: Ground water was not encountered due to drilling refusal.

> **Response Action #1:** Terracon attempted to install ground water monitoring wells using direct push techniques and a track-mounted Geoprobe 6620DT at each boring location; however, tooling refusal was encountered above the initial water table. Terracon attempted to install a monitoring well using 4.25-inch (ID) augers at the TW-4 location; however, tooling refusal was also encountered above the water table as verified using an electronic water level indicator. As such, Terracon was unable to obtain ground water samples using Geoprobe technology. Due to the varied depths of tooling refusal, Terracon installed soil gas points at the direct-push tooling refusal depth at all locations.

Variance #2: Soil gas sample SG-7 became obstructed.

Response Action #2: Field instrumentation and SUMMA can sampling equipment would not function when attached to the sample string due to a back pressure on the sample line. A vapor sample could not be collected at this location.

Variance #3: Sampling activities were delayed due to snow and ice accumulation during the week of February 10.

Response Action #3: Sampling was resumed once road and field conditions were determined to be safe for travel; however, much of the site was covered with snow and ice during sampling activities. A larger drill rig was not contemplated during this drilling event due to a high potential to become stuck in the field or wooded areas of the site.

4.0 PROJECT DATA

4.1 Geology/Hydrogeology

The site is situated within the Piedmont physiographic province. The shallow soil lithology was determined to be surficial sandy and silty clays and clayey sands overlying dense sandy clay saprolite (weathered rock sediment) and partially weathered rock. Tooling refusal was encountered at depths ranging from 16 feet below ground surface (bgs) to 34 feet bgs. The saprolite thickness was observed to range from 8 to 28 feet in the borings. The ground water table was not encountered in the borings.

4.2 Soil Gas Data

Soil VOC data are presented in Appendix C, Table 1. Field soil gas data (metered parameters) are presented in Appendix C, Table 2.

Soil VOC data were compared to Generic Screening Levels (GSLs) derived from the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (*EPA Subsurface Vapor Intrusion Guidance*), Target Deep Soil Gas Concentration (sample depth greater than 5 feet bgs) Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.01; Risk Level = 10^{-6}.

Thirty-three (33) VOC analytes of the 61 total VOC compounds on the method TO-15 list were detected in the soil gas samples (see Table 1). In general, sample SG-1 on the West Tract and samples SG-5 and SG-6 on the Fretwell Tract exhibited the highest VOC concentrations. SG-1 had the highest benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations of the 7 samples, indicative of petroleum hydrocarbons in the soil gas. SG-6 generally had the highest chlorinated VOC concentrations of the 7 samples, indicative of chlorinated solvents in the soil

gas. The Chloroform and Trichloroethene concentrations at sample location SG-6 were 12 $\mu g/m^3$ and 3.3 $\mu g/m^3$, respectively, and above the respective GSLs of 11 $\mu g/m^3$ and 2.0 $\mu g/m^3$. No additional TO-15 compounds were reported above the EPA Generic Screening Levels.

No methane or hydrogen sulfide were detected at the seven soil gas points on the day of the gas point installations. Note, landfill gas detections and concentrations can be highly variable in the subsurface due to weather conditions (predominately temperature and barometric pressure) at the time of sample collection.

5.0 FINDINGS

5.1 Conclusions

Based on the scope of services described in this report and subject to the limitations described herein, Terracon concludes the following.

- Shallow soil lithology was determined to be surficial sandy and silty clays and clayey sands overlying dense saprolite to the total investigated depth of 34 feet bgs. Tooling refusal was encountered at depths ranging from 16 feet bgs to 34 feet bgs. The ground water table was not encountered.

- Thirty-three (33) VOC analytes (total) were detected in the seven soil gas samples collected from the West and Fretwell Tracts. Methane was not detected in the gas points using the field meter on the day of gas point installation.

- Soil gas sample SG-1 on the West Tract and samples SG-5 and SG-6 on the Fretwell Tract exhibited the highest VOC concentrations. Chloroform and Trichloroethene concentrations at SG-6 exceeded the EPA Generic Screening Levels.

- The horizontal extent of soil gas VOCs on West and Fretwell Tracts has not been determined

5.2 Updates to the Conceptual Site Model

No CSM updates were identified during this assessment aside from the analytical data.

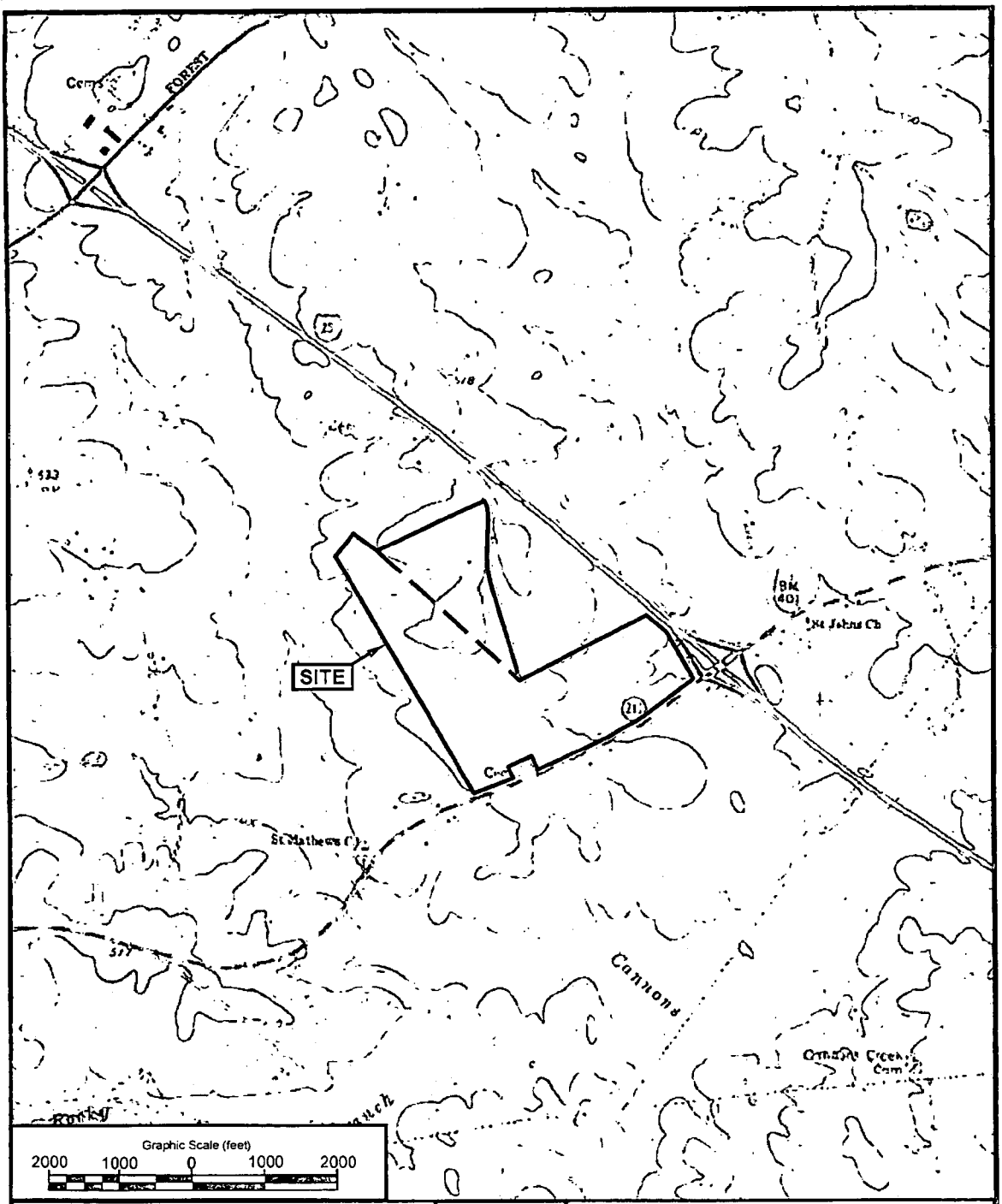
6.0 RECOMMENDATIONS

- Given the highly weather-dependent nature (i.e, temperature and barometric pressure) of VOC and methane soil gas detections in subsurface gas point samples, additional soil gas data should be collected at the site to evaluate trends over time.

- A vapor mitigation system may be an appropriate design engineering control to minimize a vapor intrusion concern for a future structure located on the West or the Fretwell Tract.

- If impacted soils or groundwater are encountered during future excavations or construction activities, proper procedures should be followed with respect to worker health and safety, and any affected soil or groundwater encountered should be properly characterized, treated and/or disposed in accordance with applicable local, state or federal regulations.

APPENDIX A – FIGURES



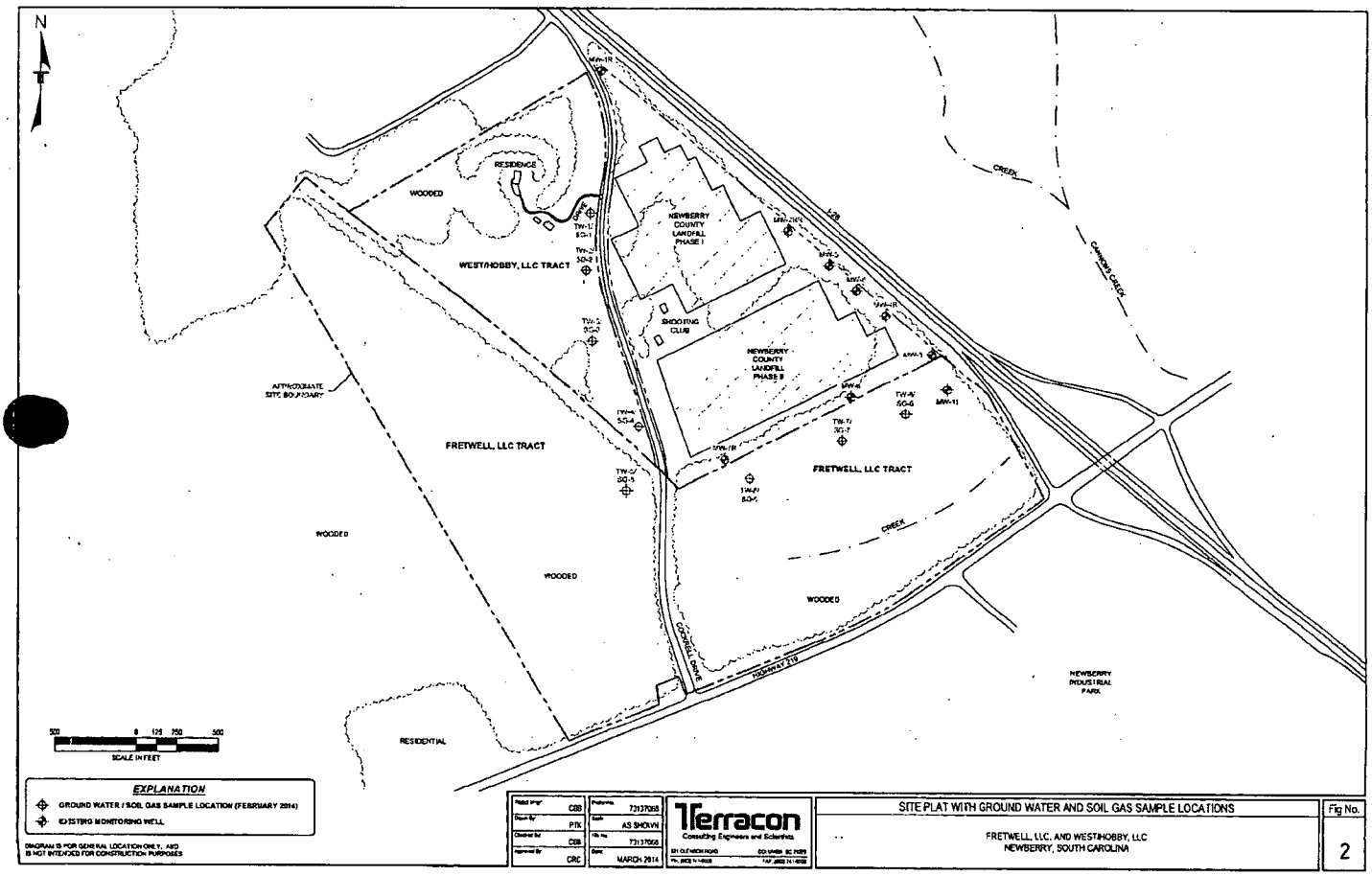
USGS TOPOGRAPHIC QUADRANGLE MAP
NEWBERRY EAST, SOUTH CAROLINA

DATE: 1968
SCALE: 1 INCH = 2000 FEET
PROJECT NO. 73137066

Terracon

SITE LOCATION MAP
FRETWELL, LLC AND WEST/HOBBY, LLC
NEWBERRY, SOUTH CAROLINA

FIGURE 1: TOPOGRAPHIC MAP


N
RESIDENCE
WOODED
WEST/HOBBY, LLC TRACT
NEWBERRY COUNTY LANDFILL PHASE I
SHOOTING CLUB
NEWBERRY COUNTY LANDFILL PHASE II
FRETWELL, LLC TRACT
FRETWELL, LLC TRACT
APPROXIMATE SITE BOUNDARY
WOODED
WOODED
WOODED
RESIDENTIAL
CREEK
CANNONS CREEK
CREEK
I-26
COUNSEL DRIVE
NEWBERRY INDUSTRIAL PARK
SCALE IN FEET
EXPLANATION
GROUND WATER / SOIL GAS SAMPLE LOCATION (FEBRUARY 2014)
EXISTING MONITORING WELL
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES
Terracon
Consulting Engineers and Scientists
SITE PLAT WITH GROUND WATER AND SOIL GAS SAMPLE LOCATIONS
FRETWELL, LLC, AND WEST/HOBBY, LLC
NEWBERRY, SOUTH CAROLINA
Fig No.
2
MARCH 2014

APPENDIX B – TABLES

Table 1
Soil Gas Analytical Data- Volatile Organic Compounds Detections
Fretwell & West/Hobby Tracts
Terracon Project No. 73137066

Analyte	GSL	Sample Location																	
		SG-1		SG-2		SG-3		SG-4		SG-5		SG-6		SG-8		Equip Blank			
	micrograms per cubic meter ($\mu g/m^3$)																		
1,1,2-Trichlorotrifluoroethane	3,000,000	1.3	U	1.3	U	1.3	U	1.3	U	32.0		12.1		1.3	U	1.3	U		
1,1-Dichloroethane	50,000	0.65	U	0.69	U	0.65	U	0.65	U	0.69	U	4.8		0.69	U	0.69	U		
1,2,4-Trimethylbenzene	600	3.1		1.9		2.0		1.2	J	0.84	U	5.7		0.84	U	0.84	U		
1,3,5-Trimethylbenzene	600	0.2	U	0.22	U	0.2	U	0.2	U	0.22	U	1.4	J	0.22	U	0.22	U		
1,4-Dichlorobenzene	80,000	10.0		8.4		8.9		6.5		4.4		16.8		4.7		4.1			
2-Butanone (MEK)	100,000	18.9		20.8		13.9		18.8		80.2		38.9		22.9		28.8			
2-Propanol	*ne*	0.14	U	0.15	U	77.6		0.14	U	208		47.5		0.15	U	125			
4-Ethyltoluene	*ne*	2.0		1.1	J	1.3	J	1.1	J	0.85	J	2.3		1.0	J	1.3	J		
4-Methyl-2-pentanone (MIBK)	8,000	0.65	U	0.95	J	0.75	J	0.65	U	2.6		2.5		0.7	U	0.7	U		
Acetone	35,000	82.3		79.8		68.0		63.4		143		87.9		60.0		130			
Benzene	31	19.1		7.7		1.9		6.9		4.9		2.5		11.6		1.5			
Carbon disulfide	70,000	6.9		5.9		1.4		3.6		7.4		1	J	2.5		3.0			
Chloroform	11	0.78	U	0.92	J	0.78	U	0.78	U	0.83	U	12.0		0.83	U	0.83	U		
Chloromethane	*ne*	11.7		0.35	U	0.33	U	0.33	U	0.35	U	0.35	U	0.35	U	1.2			
Cyclohexane	*ne*	5.0		3.4		1.3		3.9		0.59	U	2.1		7.0		0.59	U		
Dichlorodifluoromethane	20,000	227		35.7		27.1		0.79	U	76.4		64.8		7.0		1.9			
Dichlorotetrafluoroethane	*ne*	123		54.3		15.6		0.33	U	33.0		1.9	J	17.6		0.36	U		
Ethanol	*ne*	30.3		52.5		37.2		108		136		90.6		53.3		71.5			
Ethyl acetate	320,000	0.56	U	0.6	U	2.9		0.56	U	0.6	U	5.4		0.6	U	7.4			
Ethylbenzene	220	8.8		2.6		2.4		2.5		1.8		3.9		2.8		2.8			
m&p-Xylene	700,000	24.7		8.2		8.4		8.2		5.5		12.3		8.4		8.9			
Methylene Chloride	520	5.3		13.2		2.9		3.0		7.2		3.2		4.9		3.8			
Naphthalene	300	1.3	J	0.9	U	0.91	J	1.8		0.9	U	0.9	U	0.9	U	0.9	U		
n-Heptane	2,000	16.4		8.6		3.6		8.2		0.7	U	5.2		10.1		5.6			
n-Hexane	*ne*	16.5		17.6		4.4		18.2		41.0		5.7		19.9		5.1			
o-Xylene	700,000	8.3		3.3		3.1		3.2		0.22	U	4.9		0.22	U	3.3			
Propylene	*ne*	57.8		150		36.9		210		591		73.9		205		0.29	U		
Styrene	100,000	0.68	U	0.73	U	0.72	J	0.68	U	0.73	U	0.8	J	0.73	U	0.73	U		
Tetrachloroethene	81	2.8		1.1	J	0.54	U	0.54	U	0.58	U	1.9		0.58	U	0.58	U		
Tetrahydrofuran	*ne*	11.1		11.2		8.9		13.7		16.8		33.9		14.8		6.8			
Toluene	40,000	64.1		20.7		13.8		19.9		32.5		17.3		24.8		22.0			
Trichloroethene	2	0.43	U	0.46	U	0.43	U	0.43	U	0.46	U	3.3		0.46	U	0.46	U		
Trichlorofluoromethane	70,000	95.3		0.37	U	0.35	U	0.35	U	54.2		86.1		0.37	U	0.37	U		

NOTES:

1) Data were collected on February 14 and 17, 2014; Analytical method SW-846 Method TO-15

2) Equipment Blank was collected from ambient air through 25-foot of dedicated sample tubing

3) GSL - Generic Screening Level derived from OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Target Deep Soil Gas Concentration (sample depth greater then 5 feet bgs) Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.01; Risk Level = 10^{-4}

4) Results shown in bold exceed the Deep Soil Gas GSL

5) U - indicates the analyte was not detected above the Method Detection Limit (MDL)

6) J - indicates the analyte was detected above the MDL but below the Practical Quantitation Limit (PQL)

7) ne - action level for the analyte has not been established for soil vapor

8) SG-7 could not be sampled due to restricted flow

Table 2
Soil Gas Field Readings
Fretwell & West/Hobby Tracts
Terracon Project No. 73137066

Parameter	Soil Gas Sample Location						
	SG-1	SG-2	SG-3	SG-4	SG-5	SG-6	SG-8
	all data presented in percent by volume except hydrogen sulfide, which is in parts per million (ppm)						
Methane	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
Carbon Dioxide	10.1	7.9	1.4	12.4	6.3	6.3	4.1
Oxygen	11.4	10.6	20	8	14.6	15.5	14.3
Hydrogen Sulfide	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
Balance	79.1	81.5	78.6	81.5	79.1	78.2	81.7

NOTES:
1) Data were collected on February 14 and 17, 2014 with a Landtec GEM 2000 Plus Landfill Gas Meter
2) BDL -below instrument detection limits
3) Soil Vapor Point SG-7 could not be sampled due to restricted flow

Environmental Sampling Report

West/Hobby & Fretwell v. Newberry County
Cockrell Road Tracts
Newberry County, South Carolina



January 29, 2015
Terracon Project No. 73137066

Prepared For:
Bruner Powell Wall & Mullins, LLC
Columbia, South Carolina

Prepared by:
Terracon Consultants, Inc.
Columbia, South Carolina

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APPENDIX C – LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODY

West/Hobby & Fretwell v. Newberry County
Newberry County, South Carolina
Terracon Project No. 73137066
January 29, 2015

1.0 INTRODUCTION

This report of Environmental Sampling was conducted in response to the ongoing legal proceedings related to known and/or suspected impacts to both the West and Fretwell Tracts sourced from the adjacent former Newberry County Landfill. Currently, both tracts border the closed Newberry County Landfill property. Multiple phases of assessment have been conducted at the landfill and the surrounding properties. Previous assessments have identified environmental impairment related to methane and volatile organic compounds (VOCs) in ground water and soil gas.

The objective of this assessment was to evaluate the presence of volatile organic compounds (VOCs) and/or methane above action levels in the groundwater and soil gas on both tracts as a result of potential releases from the landfill.

1.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These LSI services were performed in accordance with the scope of work agreed with you, our client, as reflected in our proposal and were not restricted by ASTM E1903-11.

1.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this LSI. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

1.3 Reliance

This report has been prepared for the exclusive use of West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of West/Hobby LLC, Fretwell LLC, Bruner Powell Wall & Mullins, LLC, and Terracon. Any unauthorized distribution or reuse is at West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, LSI report, and Terracon's Agreement for Services. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to West/Hobby LLC, Fretwell LLC, and Bruner Powell Wall & Mullins, LLC and all relying parties unless otherwise agreed in writing.

2.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) is a description of the site and site features pertinent to identifying possible site contaminants, determining how those contaminants may behave relative to site conditions, and understanding potential receptor pathways. The findings of this assessment may alter the CSM; any updates to the CSM are described in Section 5.2.

2.1 Site Physical Description

The site is located at 300 Cockrell Road in Newberry, Newberry County, South Carolina, and is comprised of the following Newberry County parcels:

Parcel No.	Owner	Acreage
449-1	Fretwell, LLC	145
449-2	West/Hobby, LLC	42

The site consists of two parcels, the West Tract is largely cleared, grassed land; the Fretwell tract is primarily wooded. The tracts are located near the intersection of Cockrell Drive and SC Highway 219, west of Interstate 26. An excerpt of the topographic map for the site is included in Appendix A as Figure 1. A site plat with the sample locations is included as Figure 2.

The site's physical setting is described in the following table:

Physical Setting Information		Source
Topography (Refer to Appendix A, Figure 1, for an excerpt of the Topographic Map)		
Site Elevation	Approximately 390 to 500 feet	USGS Topographic Map, Newberry East, SC Quadrangle, 1968
Surface Runoff/ Topographic Gradient	Gently sloping to the south and east, toward the unnamed tributary at the eastern portion of the Fretwell Tract. The tributary flows to the east, toward Cannons Creek.	
Closest Surface Water	On-site unnamed tributary of Cannons Creek.	

2.2 Surrounding Properties Development

The West Tract is bound to the east by Cockrell Drive with the former Newberry County Landfill beyond. The Fretwell Tract is bisected by Cockrell Drive into eastern and western portions. The eastern portion is adjoined to the north by the former landfill. The western portion adjoins the West Tract.

2.3 Areas of Concern / Potential Sources

Former Newberry County Landfill

The landfill consists of two cells, Phase I and Phase II, both closed. The Phase I cell reportedly opened in the 1980s and closed in 1990. Phase II began receiving waste in 1990 and was closed in 1993.

2.4 Potential Pathways Evaluation

Potential Pathways for Contaminant Transport

The site is largely undeveloped except for a single residence near the northeast corner of the West Tract. Transport of contaminants onto the properties would occur through soil vapor, or soil gas, migration along diffusion or pressure gradients, ground water contaminant migration, or as a release of vapors from impacted ground water.

Potential Exposure Pathways

Surface Soils – Currently, the site is not used for any purpose that would create a soil exposure scenario. The soils pathway was not evaluated.

Indoor Air – There may be exposure potential for vapor migration from contaminated ground water or directly from decomposing organic materials (such as methane or VOCs) within the

landfill to indoor air within any proposed site structures. Vapors released from contaminated media may migrate through subsurface utility trenches or along pressure/diffusion gradients and enter enclosed spaces through the annular space, voids, or components of a utility. Vapors may also be released from source material or contaminated media and directly enter proposed structures through cracks or other penetrations of the foundation. The soil gas pathway was evaluated as part of this assessment.

Surface Water – An unnamed stream bisects the eastern portion of the Fretwell tract. Previous sampling has not identified impacts in the stream. The surface water pathway was not evaluated as part of this investigation.

Ground Water – There are two identified exposure routes to ground water currently existing at the site or in the immediate vicinity. Water supply wells are located at the West Tract residence, and on the Newberry County landfill property between the Phase I and Phase II fill areas. Previous sample data from the two water supply wells did not indicate impact from the landfill. Currently, there are no known plans for future improvements that would create an exposure pathway to ground water. An evaluation of the ground water pathway was attempted as described in subsequent sections.

3.0 SAMPLE COLLECTION

The sample collection approach outlined below describes data collection activities described in our proposal P73137066 dated January 30, 2014, and Supplemental Proposal dated December 29, 2014. The assessment activities described herein were conducted in general accordance with Terracon Standard Operating Procedures (TSOP) and US EPA Region IV Field Branches Quality System and Technical Procedures.

3.1 Soil Gas Sampling

The potential for soil gas impact is not limited to areas directly overlying ground water plumes or contaminated soils. Soil gases can migrate through the subsurface by diffusion and pressure gradients, as well as preferential pathways. The eight soil gas sample locations (SG-1 through SG-8), as shown on Figure 2, were based on the proximity of the former landfill and previous on-site data. The four sample points on the West Tract and the four sample points on the Fretwell Tract were installed in February 2014.

Soil vapor point SG-7 was apparently clogged during the previous sampling event in February 2014, and it was determined that it would not yield a vapor sample during the December 19, 2014 event. Therefore, a replacement soil gas sampling point, denoted SG-7R, was installed adjacent to the SG-7 location with a clean stainless steel hand auger to a depth of 5 feet. The stainless steel sampling point was configured with a lateral port for the vapor inlet and a barb

fitting on the top to connect to small bore (0.25 inch O.D.) nylon sample tubing. The port was protected from clogging by fine-grained sediments with a Teflon disk and a stainless steel screen. A sand filter pack was placed within the annulus opposite the screen to a height of six inches above the screen point. Granular bentonite was placed in the borehole annulus above the sand pack and hydrated in approximate 1-foot lifts to the land surface.

Soil gas samples were collected from each point into 1-liter (L) SUMMA canisters supplied by Centek Laboratories, LLC. Each canister was filled using a dedicated, 5-minute (min), flow controller set to a sample rate less than or equal to 200 milliliters (mL) per min (200 mL/min x 5 min = 1 L sample volume). An "in line" vacuum gauge was installed at the sample controller to verify initial vacuum levels within the canister and as an indicator that final pressure equalization was reached (i.e. sampling is complete). The soil gas samples were packaged for shipment to the laboratory and analyzed for VOCs and methane per EPA Method TO-15 as described in Section 3.3 below. General weather conditions at the time of sampling (temperature, barometric pressure) were recorded for informational purposes.

3.2 Ground Water Sampling

Terracon attempted to sample three existing ground water monitoring wells (TW-4, MW-11, TMW-11) at the site; however, MW-11 was not able to be found, and the water table was not encountered at TW-4, as verified using an electronic water level indicator. As such, Terracon was able to obtain a ground water sample at TMW-11 only.

Prior to purging and sampling, the water levels in the wells were measured using an electronic water level indicator. Ground water was encountered at 27.89 feet below ground surface (bgs) at TMW-11. The ground water samples were collected with a new, dedicated polyethylene bailer, placed in an iced cooler, and delivered to Access Analytical for analysis of VOCs.

3.3 Assessment Sampling Program

Terracon's sampling program consisted of the following:

<u>SOIL GAS</u>

- Eight laboratory analyses for VOCs via SW846 Method TO-15
- Eight laboratory analyses for methane via SW846 Method TO-15

<u>GROUND WATER</u>

- One laboratory analysis for TCL VOCs via SW846 Method 8260

4.0 PROJECT DATA

4.1 Geology/Hydrogeology

The site is situated within the Piedmont physiographic province. The shallow soil lithology was previously determined to be surficial sandy and silty clays and clayey sands overlying dense sandy clay saprolite (weathered rock sediment) and partially weathered rock. Tooling refusal was previously encountered at depths ranging from 16 feet bgs to 34 feet bgs. The saprolite thickness was observed to range from 8 to 28 feet in the previous borings. The ground water table was encountered at 27.89 feet bgs at TMW-11.

4.2 Soil Gas Data

Soil VOC and methane gas data are presented in the laboratory report in Appendix C. The soil gas VOC detections are summarized in Table 1, in Appendix B.

Soil VOC data were compared to Generic Screening Levels (GSLs) derived from the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (*EPA Subsurface Vapor Intrusion Guidance*), Target Deep Soil Gas Concentration (sample depth greater than 5 feet bgs) Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.01; Risk Level = 10^{-6}. The soil gas data was also compared to the EPA Regional Screening levels (RSLs) for Residential Air (November 2014 edition).

The soil gas sample data indicated 21 VOCs on the method TO-15 list were detected in the eight samples (see Table 1). The most detections at highest concentrations were from sample location SG-1 (8 VOCs were highest detections) on the West/Hobby Tract, and sample SG-6 (4 highest VOC detections) on the Fretwell Tract. Samples SG-2 and SG-4 on the West/Hobby Tract indicated 4 detections and 3 detections, respectively, at highest concentrations. Samples SG-5 and SG-7 both indicated 2 of the highest VOC detections of the eight samples. Samples SG-3 and SG-8 did not have a high VOC detection.

All soil gas VOC detections were below the Generic Screening Level (OSWER GSL) for evaluating vapor intrusion to indoor air. However, benzene was above the EPA Regional Screening Level (RSL) for Residential Air at samples from all eight soil gas points; chloroform was above the RSL for Residential Air at SG-6 and SG-7R; 1,1-dichloroethane was above the RSL for Residential Air at SG-6; and ethylbenzene was above the RSL for Residential Air at SG-1 and SG-2.

In general, sample SG-1 on the West/Hobby Tract had the highest total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations of the eight samples, indicative of petroleum

hydrocarbons in the soil gas. Sample SG-6 on the Fretwell Tract generally had the highest chlorinated VOC concentrations of the eight samples, indicative of chlorinated solvents in the soil gas.

No methane was detected above the laboratory detection limit of 0.58% at the eight soil gas points. Note, landfill gas detections and concentrations can be highly variable in the subsurface due to weather conditions (predominately temperature and barometric pressure) at the time of sample collection.

4.3 Groundwater Data

Groundwater VOC data are presented in the laboratory report in Appendix C. The well location map is presented on Figure 2 in Appendix A.

No VOCs were detected above the method detection limit in the groundwater sample from well TMW-11.

5.0 FINDINGS

5.1 Conclusions

Based on the scope of services described in this sampling report and subject to the limitations described herein, Terracon concludes the following.

- Twenty-one (21) VOC analytes (total) were detected in the eight soil gas samples collected from the West/Hobby and Fretwell Tracts. Methane was not detected in the gas point samples.
- Soil gas VOC detections were below the Generic Screening Level (OSWER GSL) for evaluating vapor intrusion to indoor air. However, benzene was above the EPA Regional Screening Level (RSL) for Residential Air at samples from all eight soil gas points; chloroform was above the RSL for Residential Air at SG-6 and SG-7R; 1,1-dichloroethane was above the RSL for Residential Air at SG-6; and ethylbenzene was above the RSL for Residential Air at SG-1 and SG-2.
- No VOCs were detected above the method detection limit in the groundwater sample from well TMW-11.

5.2 Updates to the Conceptual Site Model

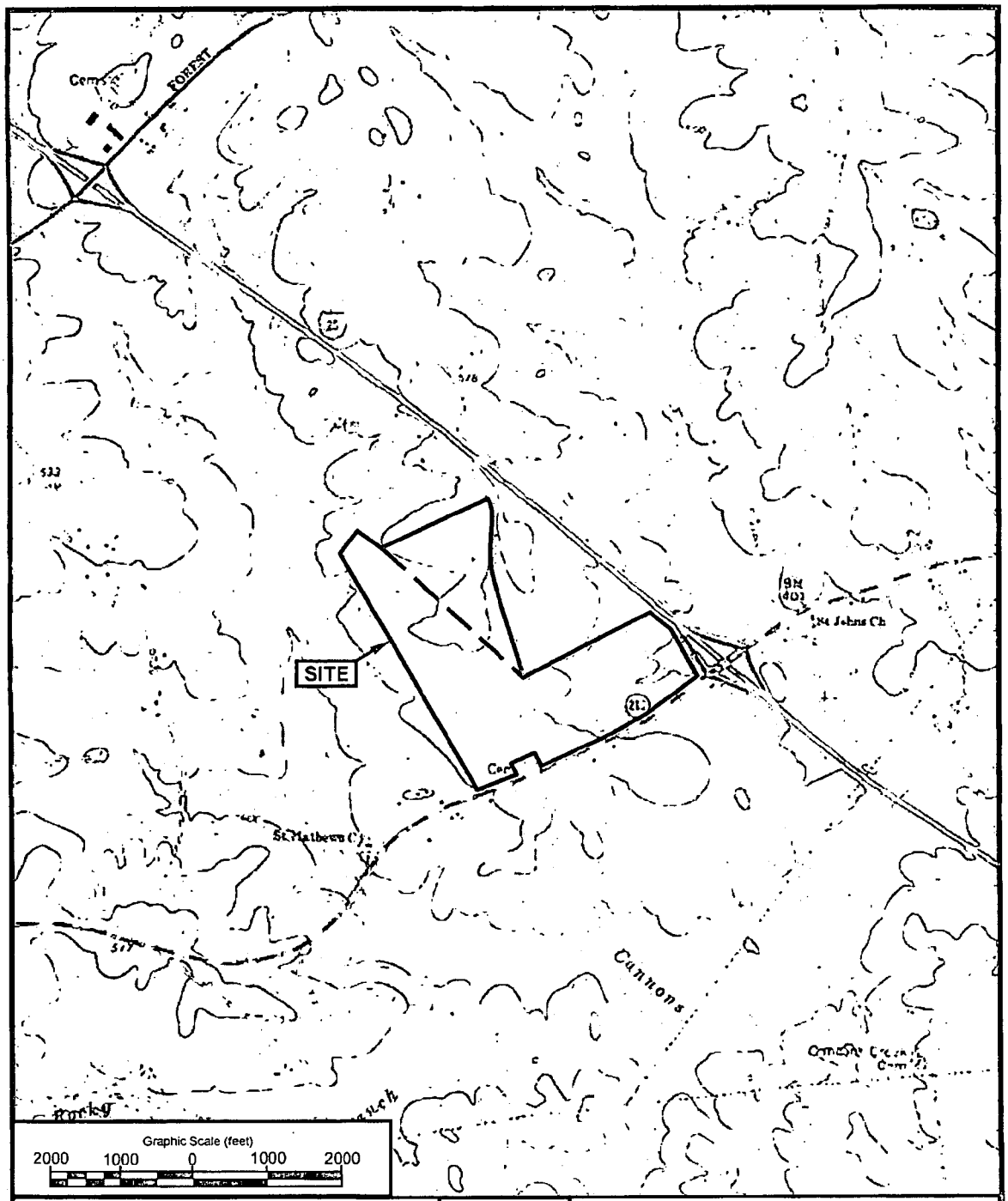
No CSM updates were identified during this assessment aside from the analytical data.

6.0 RECOMMENDATIONS

- Given the highly weather-dependent nature (i.e, ambient temperature and barometric pressure) of VOC and methane soil gas detections in subsurface soil gas samples, seasonal soil gas data should be collected at the site to evaluate the concentration trends over time.

- A vapor mitigation system may be an appropriate design engineering control to minimize a vapor intrusion concern if a future structure is planned on the West/Hobby Tract or the Fretwell Tract.

APPENDIX A – FIGURES



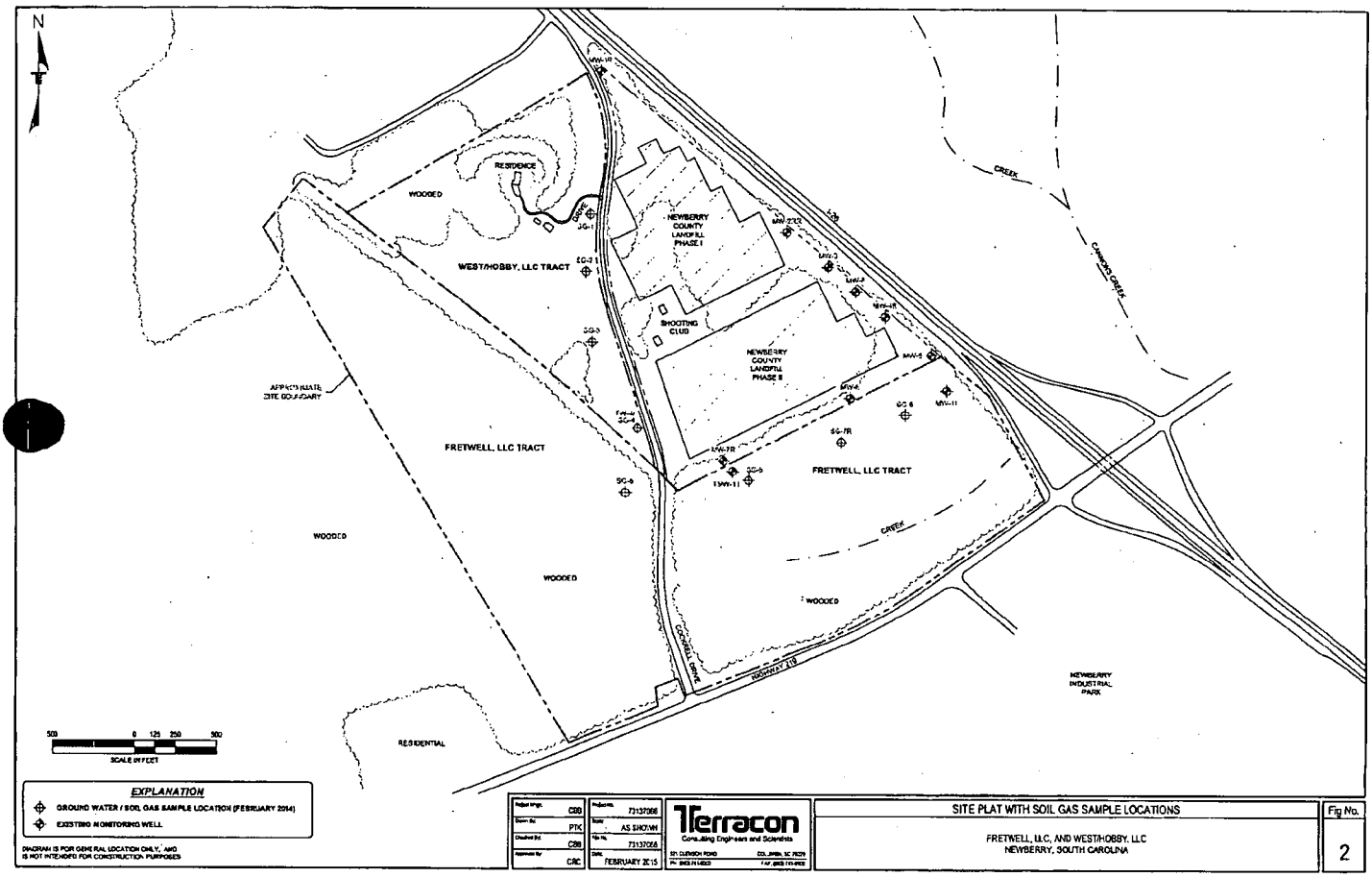
USGS TOPOGRAPHIC QUADRANGLE MAP
NEWBERRY EAST, SOUTH CAROLINA

DATE: 1968
SCALE: 1 INCH = 2000 FEET
PROJECT NO. 73137066

Terracon

SITE LOCATION MAP
FRETWELL, LLC AND WEST/HOBBY, LLC
NEWBERRY, SOUTH CAROLINA

FIGURE 1: TOPOGRAPHIC MAP


N
RESIDENCE
WOODED
DRIVE
WEST/HOBBY, LLC TRACT
NEWBERRY COUNTY LANDFILL PHASE I
SHOOTING CLUB
NEWBERRY COUNTY LANDFILL PHASE II
FRETWELL, LLC TRACT
FRETWELL, LLC TRACT
WOODED
WOODED
WOODED
RESIDENTIAL
CREEK
CREEK
COOKS CREEK
HIGHWAY 176
NEWBERRY INDUSTRIAL PARK
SCALE IN FEET
500 0 125 250 500
EXPLANATION
GROUND WATER / SOIL GAS SAMPLE LOCATION (FEBRUARY 2014)
EXISTING MONITORING WELL
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES
Terracon
Consulting Engineers and Scientists
SITE PLAT WITH SOIL GAS SAMPLE LOCATIONS
FRETWELL, LLC, AND WEST/HOBBY, LLC
NEWBERRY, SOUTH CAROLINA
Fig No.
2
Project Mngr. CSB
Drawn By PTK
Checked By CSB
Approved By CRC
Project No. 73137056
Scale AS SHOWN
File No. 73137056
Date FEBRUARY 2015

APPENDIX B – TABLES

Table 1
Soil Gas Analytical Data- Volatile Organic Compounds Detections
Fretwell & West/Hobby Tracts
Terracon Project No. 73137066

Analyte	Residential RSL	GSL	Sample Location							
			SG-1	SG-2	SG-3	SG-4	SG-5	SG-6	SG-7R	SG-8
	micrograms per cubic meter (µg/m³)									
1,1-Dichloroethane	1.8	50,000	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	4.3	0.97	0.012 U
1,2,4-Trimethylbenzene	7.3	600	5.3	0.017 U	0.017 U	0.64	0.017 U	0.69	0.017 U	0.017 U
1,3,5-Trimethylbenzene	ne	600	3.6	3.6	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U
2-Butanone (MEK)	5200	100,000	550	480	300	81	0.012 U	5.6	2.7	2.0
4-Ethyltoluene	ne	*ne*	1.0	1.5	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Acetone	32,000	35,000	2500	3600	2000	1500	78	48	71	33
Benzene	0.36	31	1.1	1.3	1.1	2.0	1.3	0.67	1.1	0.57
Carbon disulfide	730	70,000	21	21	3.1	12	21	3.9	1.2	16
Chloroform	0.12	11	0.015 U	0.015 U	0.015 U	0.54	0.015 U	5.2	0.49	0.015 U
Chloromethane	94	*ne*	0.03 U	0.03 U	0.03 U	0.03 U	6.6	2.3	0.03 U	0.03 U
Cyclohexane	1,000	*ne*	3.7	1.5	1.5	0.018 U	1.0	0.018 U	0.018 U	0.018 U
Ethylbenzene	1.1	220	1.6	2.6	1.0	0.78	0.69	0.69	0.82	0.52
m&p-Xylene	100	700,000	29	2.6	2.9	6.6	2.4	3.1	1.5	1.4
Methylene Chloride	100	520	0.017 U	0.35	0.017 U	0.56	0.017 U	0.017 U	0.017 U	0.017 U
n-Heptane	ne	2,000	39	14	0.025 U	6.2	3.8	0.78	1.5	0.98
n-Hexane	730	*ne*	0.018 U	0.018 U	0.018 U	18	7.8	2.8	1.8	2.6
o-Xylene	100	700,000	5.9	1.6	0.87	0.96	0.52	0.91	0.69	0.56
Styrene	1,000	100,000	0.018 U	0.018 U	0.018 U	0.68	0.77	1.3	1.2	0.018 U
Tetrachloroethene	11	81	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	2.8	0.017 U	0.017 U
Tetrahydrofuran	2,100	*ne*	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	6.5	0.018 U
Toluene	5,200	40,000	4.2	7.4	2.3	3.5	1.6	4.5	5.8	1.1

NOTES:
1) Data were collected on December 19, 2014; Analytical method SW-846 Method TO-15
2) SG-7 could not be sampled due to restricted flow; SG-7R was installed to 5 ft depth beside SG-7 and sampled for soil gas analysis on 12/19/14
3) GSL - Generic Screening Level derived from OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Target Deep Soil Gas Concentration (sample depth greater then 5 feet bgs) Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.03; Risk Level = 10^{-6}
4) RSL - Regional Screening Level for Residential Air (EPA November 2014 edition)
5) Results shown in bold exceed the Regional Screening Level for Residential Air
6) U - Indicates the analyte was not detected above the Method Detection Limit (MDL)
7) J - Indicates the analyte was detected above the MDL but below the Practical Quantitation Limit (PQL)
8) ne - action level for the analyte has not been established for soil vapor

Rogers & Callcott
ENVIRONMENTAL

Laboratory
Engineering
Assessment
Remediation
Air Quality
Compliance

November 10, 2015

Mr. John D. Abernathy
Solid Waste Groundwater Section
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Colombia, South Carolina 29201-1708

PLAINTIFF'S EXHIBIT
16-X
ALL-STATE LEGAL®

Subject: Quarterly Methane Monitoring Report, August–October 2015
Former Newberry County Landfill—DWP-117
Rogers & Callcott Project Number: 2014-071

Dear Mr. Abernathy:

Rogers & Callcott Environmental has compiled this quarterly Methane Monitoring Report as an update on the soil gas extraction system and methane monitoring at the Former Newberry County Landfill in Newberry, South Carolina (see enclosed figure). Monitoring and reporting are being performed in accordance with the South Carolina Department of Health and Environmental Control (SCDHEC) approved *Operation, Maintenance, and Monitoring Plan* dated June 2015 (SCS Engineers). This submittal describes system monitoring Rogers & Callcott completed in August, September, and October 2015 and includes a general description of the system, flow rates and methane content measured at the blower inlet, perimeter probe monitoring results, and data collected at the extraction well heads.

Construction of an active subsurface soil gas extraction system around the Phase II disposal area at the landfill was completed in May 2015. The gas extraction system includes 24 extraction wells installed between the limits of the waste and the property boundary. A vacuum is applied to the wells via a 10-horsepower blower and an underground piping network to withdraw soil vapor from the subsurface. The system is divided into three zones with their own dedicated header pipe and condensate sumps.

Extracted gas is transferred to the treatment compound, which includes the blower enclosure, a vapor-phase activated carbon canister, an air compressor, an aboveground storage tank for condensate, a piping control panel with three actuated valves, and an electrical panel. An electronic control system allows automated operation of the three zones and can be adjusted to control the timing for each zone. The extracted gas is passed through activated carbon to absorb odors before discharge to the atmosphere.

Start-up monitoring was completed during the first 3 months of operation by SCS Engineers. In August 2015, Rogers & Callcott began monthly monitoring of the system. Monthly monitoring includes inspecting system components; performing routine maintenance; measuring and recording flow, vacuum, pressures, and concentration data at multiple system components; and measuring and recording the methane gas concentrations and static pressure at monitoring points GMP-3, GMP-4, GMP-5, and GMP-6.

PO Box 5655 | Greenville, SC 29606 | 426 Fairforest Way | Greenville, SC 29607 · main 864.232.1556 | fax 864.233.9058 rogersandcallcott.com
an employee-owned company

During the first full quarter of operation (August to October 2015), the system operated as established during the startup period (May to July 2015). No adjustments were made. A summary of the flow and methane concentrations measured at the blower inlet during this quarter is provided in **Table 1**.

Table 1: Blower Inlet Measurements

Date	Flow Rate (SCFM)	Methane (Percent)
August 7, 2015	205	9.8
September 3, 2015	210	9.0
October 6, 2015	190	13.4

Note:
SCFM standard cubic feet per minute

Operation of the gas extraction system has decreased the methane concentrations at monitoring points GMP-3, GMP-4, and GMP-5 to undetectable levels. However, the methane concentration at GMP-6 remains unchanged. Hence, the static vacuum in nearby soil gas extraction wells will be increased in November 2015. A summary of the methane concentrations measured at the monitoring points during this quarter is provided in **Table 2**, and a database of historical methane concentrations measured at the gas monitoring points is enclosed. Data measured at each extraction well head during this quarter, including methane and oxygen concentrations and flow rates, and field forms are also enclosed.

Table 2: Summary of Methane Concentrations

Monitoring Point	Date	Gas Vent	Percent Methane	Percent of the LEL
GMP-3	8/7/2015	Deep	0.0	0
		Shallow	0.0	0
	9/3/2015	Deep	0.0	0
		Shallow	0.0	0
	10/6/2015	Deep	0.0	0
		Shallow	0.0	0
GMP-4	8/7/2015	Shallow	0.0	0
	9/3/2015	Shallow	0.00	0
	10/6/2015	Shallow	--	--
GMP-5	8/7/2015	Deep	0.0	0
		Shallow	0.0	0
	9/3/2015	Deep	0.0	0
		Shallow	0.0	0
	10/6/2015	Deep	0.0	0
		Shallow	0.0	0
GMP-6	8/7/2015	Deep	**46.3**	**>100**
		Shallow	**38.4**	**>100**
	9/3/2015	Deep	**54.2**	**>100**
		Shallow	**48.4**	**>100**
	10/6/2015	Deep	**45.0**	**>100**
		Shallow	**38.0**	**>100**

Rogers & Callcott will continue monthly monitoring to maintain system components and assess performance. The next quarterly methane monitoring report will be submitted in February 2016.

One hard copy and one electronic copy of this report is enclosed. Please contact me at 864.232.1556 or via email (stan.golaski@rogersandcallcott.com) if you have any questions or comments.

Sincerely,

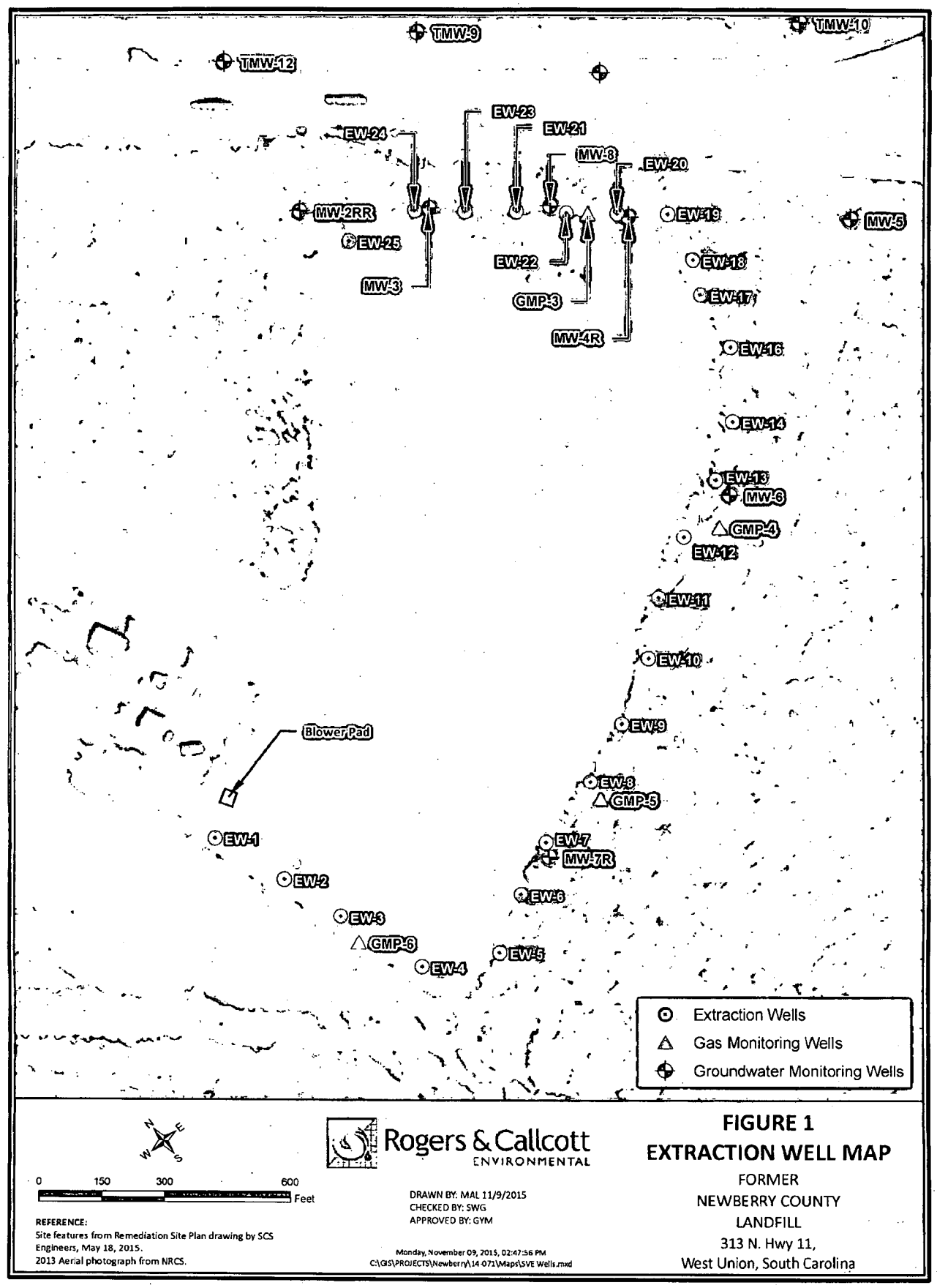
ROGERS & CALLCOTT ENVIRONMENTAL



Stan Golaski, P.G.
SC Reg. #2579
Assessment & Remediation Manager

Enclosures

cc: Mike Pisano, Newberry County


TMW-9
TMW-10
TMW-12
EW-23
EW-21
EW-24
MW-8
EW-20
MW-2RR
EW-19
MW-5
EW-25
EW-22
EW-18
MW-3
GMP-3
EW-17
MW-4R
EW-16
EW-14
EW-13
MW-6
GMP-4
EW-12
EW-11
EW-10
Blower Pad
EW-9
EW-8
GMP-5
EW-1
EW-7
MW-7R
EW-2
EW-6
EW-3
GMP-6
EW-5
EW-4
Extraction Wells
Gas Monitoring Wells
Groundwater Monitoring Wells
N
E
W
S
0
150
300
600
Feet
REFERENCE:
Site features from Remediation Site Plan drawing by SCS Engineers, May 18, 2015.
2013 Aerial photograph from NRCS.
Rogers & Callcott
ENVIRONMENTAL
DRAWN BY: MAL 11/9/2015
CHECKED BY: SWG
APPROVED BY: GYM
Monday, November 09, 2015, 02:47:56 PM
C:\GIS\PROJECTS\Newberry\14-071\Maps\SVE Wells.mxd
FIGURE 1
EXTRACTION WELL MAP
FORMER
NEWBERRY COUNTY
LANDFILL
313 N. Hwy 11,
West Union, South Carolina

Methane Monitoring Database
Former Newberry County Landfill

GMP-1

Date	Gas Vent	Percent Methane	Percent of the LEL
3/12/2009	Deep	0.0	0.0
	Shallow	0.0	0.0
6/22/2010	Deep	0.0	1.0
	Shallow	0.1	2.0
2/12/2010	Deep	0.0	0.0
	Shallow	0.0	1.0
7/2/2012	Deep	0.0	0.0
	Shallow	0.0	1.0
8/31/2012	Deep	0.0	0.0
	Shallow	0.0	0.0
2/21/2013	Deep	0.0	0.0
	Shallow	0.0	0.0
8/29/2013	Deep	0.2	4.0
	Shallow	0.3	6.0
2/5/2014	Not Monitored		
11/4/2014	Deep	0.0	0.0
	Shallow	0.0	0.0
2/4/2015	Deep	0.1	1.3
	Shallow	0.1	1.3
7/28/2015	Deep	0.0	0.0
	Shallow	0.0	0.0
8/7/2015	Deep	NM	NM
	Shallow	NM	NM

Methane Monitoring Database
Former Newberry County Landfill

GMP-3

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Deep	>3.0	>43
	Shallow	>3.0	>43
8/6/2007	Deep	3.2	62
	Shallow	2.4	47
9/20/2007	Deep	**23.3**	**>100**
	Shallow	**19.3**	**>100**
12/31/2007	Deep	**5.5**	**>100**
	Shallow	4.8	100
3/12/2009	Deep	0.0	0.0
	Shallow	0.0	0.0
3/12/2009	Deep	0.1	2.0
	Shallow	0.1	2.0
6/21/2010	Deep	**9.3**	**>100**
	Shallow	**8.9**	**>100**
12/1/2010	Deep	0.1	1.0
	Shallow	0.1	2.0
6/2/2012	Deep	**8.8**	**>100**
	Shallow	**9.6**	**>100**
8/30/2012	Deep	1.8	36
	Shallow	1.5	31
2/22/2013	Deep	0.0	0.0
	Shallow	0.0	0.0
8/29/2013	Deep	**52.8**	**>100**
	Shallow	**52.6**	**>100**
5/2/2014	Deep	**28.5**	**>100**
	Shallow	**30.7**	**>100**
11/4/2014	Deep	**6.5**	**>100**
	Shallow	**15.0**	**>100**
2/4/2015	Deep	**6.5**	**>100**
	Shallow	**8.0**	**>100**
7/28/2015	Deep	0.0	0
	Shallow	0.03	0.5
8/7/2015	Deep	0.0	0
	Shallow	0.0	0
9/3/2015	Deep	0.0	0
	Shallow	0.0	0
10/6/2015	Deep	0.0	0
	Shallow	0.0	0

Methane Monitoring Database

Former Newberry County Landfill

GMP-4

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Shallow	0.5	6.5
8/6/2007	Shallow	60.4	>100
9/20/2007	Shallow	36.1	>100
12/31/2007	Shallow	25.8	>100
12/3/2009	Shallow		Not Found
3/12/2009	Shallow	60.5	>100
6/21/2010	Shallow	36.7	>100
2/12/2010	Shallow	38.3	>100
2/6/2012	Shallow	60.2	>100
8/30/2012	Shallow	55.2	>100
2/22/2013	Shallow	61.3	>100
8/29/2013	Shallow	60.1	>100
5/2/2014	Shallow	59.0	>100
11/4/2014	Shallow	39.0	>100
2/4/2015	Shallow	37.0	>100
7/28/2015	Shallow	0.01	0.2
8/7/2015	Shallow	0.0	0
9/3/2015	Shallow	0.00	0
10/6/2015	Shallow	--	--

Methane Monitoring Database

Former Newberry County Landfill

GMP-5

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Shallow	2 .8	32
8/6/2007	Shallow	4.2	69
9/20/2007	Shallow	0.7	12
12/31/2007	Shallow	0.5	10
3/12/2009	Shallow	4.0	63
3/12/2009	Deep	3.3	66
	Shallow	**18.8**	**>100**
6/21/2010	Deep	**11.5**	**>100**
	Shallow	0.1	2.0
2/12/2010	Deep	0.1	3.0
	Shallow	0.1	3.0
6/2/2012	Deep	0.6	22
	Shallow	**32.9**	**>100**
8/30/2012	Deep	1.2	40
	Shallow	**47.7**	**>100**
2/22/2013	Deep	2 .8	40
	Shallow	**43.3**	**>100**
8/29/2013	Deep	**32.4**	**>100**
	Shallow	**58.1**	**>100**
5/2/2014	Deep	**19.1**	**>100**
	Shallow	**57.2**	**>100**
11/4/2014	Deep	**5.6**	**>100**
	Shallow	**34.0**	**>100**
2/4/2015	Deep	2.5	50
	Shallow	**27.0**	**>100**
7/28/2015	Deep	0.0	0
	Shallow	0.0	0
8/7/2015	Deep	0.0	0
	Shallow	0.0	0
9/3/2015	Deep	0.0	0
	Shallow	0.0	0
10/6/2015	Deep	0.0	0
	Shallow	0.0	0

Methane Monitoring Database
Former Newberry County Landfill

GMP-6

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Shallow	0.5	6.0
8/6/2007	Shallow	43.3	>100
9/20/2007	Shallow	44.3	>100
12/31/2007	Shallow	21.2	>100
12/3/2009	Shallow	0.1	3.0
3/12/2009	Deep	0.0	0.0
	Shallow	0.0	0.0
6/21/2010	Deep	30.7	>100
	Shallow	52.5	>100
2/12/2010	Deep	0.1	3.0
	Shallow	16.8	>100
2/6/2012	Deep	22.6	>100
	Shallow	49.2	>100
8/31/2012	Deep	0.0	0.0
	Shallow	0.0	0.0
2/22/2013	Deep	0.0	0.0
	Shallow	34.3	>100
8/29/2013	Deep	49.3	>100
	Shallow	57.0	>100
5/2/2014	Deep	41.8	>100
	Shallow	47.1	>100
11/4/2014	Deep	22.0	>100
	Shallow	34.0	>100
2/4/2015	Deep	18.0	>100
	Shallow	27.0	>100
7/28/2015	Deep	17.0	>100
	Shallow	14.0	>100
8/7/2015	Deep	46.3	>100
	Shallow	38.4	>100
9/3/2015	Deep	54.2	>100
	Shallow	48.4	>100
10/6/2015	Deep	45.0	>100
	Shallow	38.0	>100

Methane Monitoring Database

Former Newberry County Landfill

GMP-7

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Shallow	0.0	0.0
8/6/2007	Shallow	0.0	0.0
9/20/2007	Shallow	0.0	0.0
12/31/2007	Shallow	0.0	0.0
3/12/2009	Shallow	0.1	3.0
3/12/2009	Deep	0.0	0.0
	Shallow	0.0	0.0
6/21/2010	Deep	**10.2**	**>100**
	Shallow	**21.4**	**>100**
2/12/2010	Deep	1.5	31
	Shallow	0.0	1.0
7/2/2012	Deep	0.1	2.0
	Shallow	0.1	2.0
8/31/2012	Deep	0.0	0.0
	Shallow	0.0	0.0
2/22/2013	Deep	0.0	0.0
	Shallow	0.0	0.0
8/29/2013	Deep	0.2	4.0
	Shallow	0.2	4.0
5/2/2014	Deep	**16.3**	**>100**
	Shallow	0.1	2.0
11/4/2014	Deep	0.3	6.0
	Shallow	0.03	0.6
2/4/2015	Deep	0.08	1.6
	Shallow	0.00	0.0
7/28/2015	Deep	0.0	0
	Shallow	0.0	0
8/7/2015	Deep	NM	NM
	Shallow	NM	NM

Methane Monitoring Database
Former Newberry County Landfill

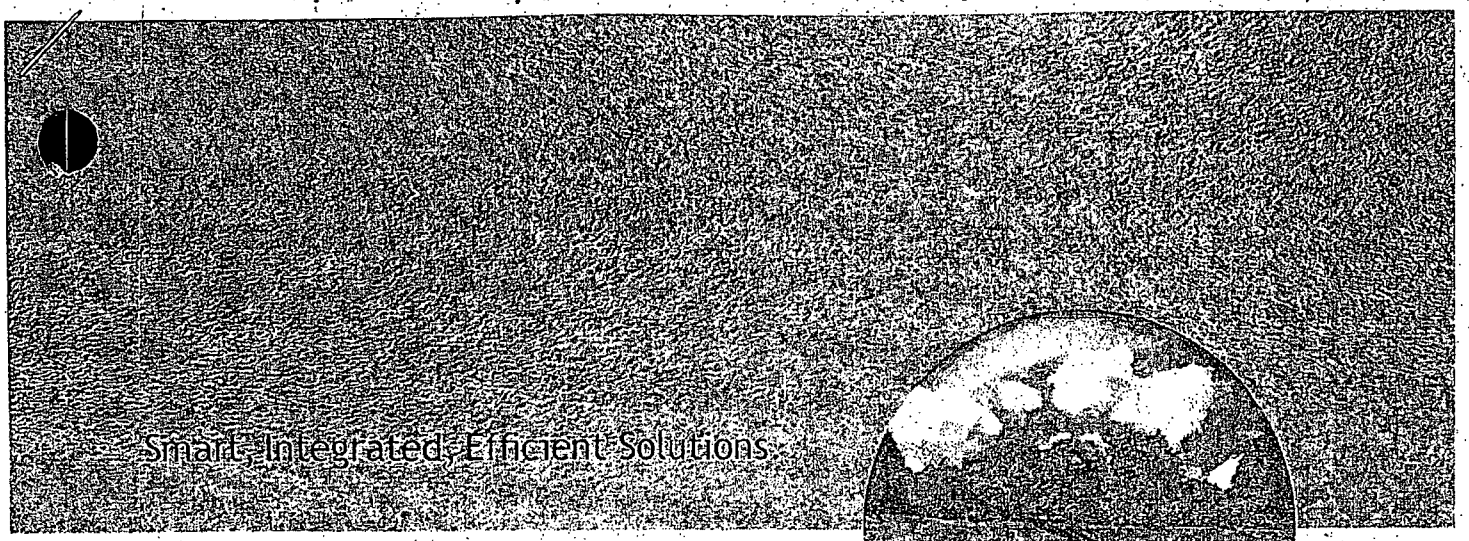
Clubhouse

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Building	0.0	0.0
8/6/2007	Building	0.0	0.0
9/20/2007	Building	0.0	0.0
12/31/2007	Building	0.0	0.0
12/3/2009	Building	0.0	0.0
3/12/2009	Building	0.0	0.0
6/22/2010	Building	0.0	0.0
12/1/2010	Shallow	0.0	LO
2/7/2012	Building	0.0	LO
8/31/2012	Building	0.0	0.0
2/22/2013	Building	0.0	0.0
8/29/2013	Building	0.4	8.0
5/2/2014	Building	0.1	2.0
11/4/2014	Building	0.01	0.25
2/4/2015	Building	0.00	0.0
7/28/2015	Building	0.00	0.0
8/7/2015	Building	NM	NM

Methane Monitoring Database
Former Newberry County Landfill

Shed

Date	Gas Vent	Percent Methane	Percent of the LEL
3/20/2007	Building	0.0	0.0
8/6/2007	Building	0.0	0.0
9/20/2007	Building	0.0	0.0
12/31/2007	Building	0.0	0.0
3/12/2009	Building	0.0	0.0
3/12/2009	Building	0.0	0.0
6/22/2010	Building	0.1	2.0
12/1/2010	Shallow	0.0	1.0
7/2/2012	Building	0.1	2.0
8/31/2012	Building	0.0	0.0
2/22/2013	Building	0.0	0.0
8/29/2013	Building	0.2	4.0
5/2/2014	Building	0.1	2.0
11/4/2014	Building	0.01	0.25
2/4/2015	Building	0.00	0.0
7/28/2015	Building	0.00	0.0
8/7/2015	Building	NM	NM



2015 Annual Groundwater & Methane Monitoring Report

Former Newberry County Landfill
SCDHEC Solid Waste Permit #DWP-117
432 Cockrell Road
Newberry, South Carolina

Rogers & Callcott Project # 2014-071

Prepared for:
Mr. Mike Pisano, Public Works Director
Newberry County
PO Box 156
Newberry, South Carolina 29108

August 2015

LABORATORY

ENGINEERING

ASSESSMENT

REMEDIATION

AIR QUALITY

COMPLIANCE

ALL-STATE LEGAL®
PLAINTIFF'S EXHIBIT
16-Y

Rogers & Callcott ENVIRONMENTAL

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
County	Newberry County
EPA	United States Environmental Protection Agency
ft btoc	feet below top of casing
ft rsd	feet relative to a Site datum
LEL	lower explosive limit
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
ppm	parts per million
Rogers & Callcott	Rogers & Callcott Environmental
SCDHEC	South Carolina Department of Health and Environmental Control
Site	Former Newberry County Landfill 432 Cockrell Road, Newberry, Newberry County, South Carolina
SWM	Solid Waste Management
VOC	volatile organic compound
µg/L	micrograms per liter
VOC	volatile organic compound

1.0 INTRODUCTION AND BACKGROUND

This *Annual Groundwater and Methane Monitoring Report* has been prepared on behalf of Newberry County (the County) to describe groundwater, surface water, and methane monitoring activities and results for the third quarter 2015 monitoring event at the former Newberry County Landfill (Solid Waste Permit #DWP-117) located at 432 Cockrell Road in Newberry, Newberry County, South Carolina (the Site). Semi-annual monitoring activities were completed in July 2015 in accordance with the South Carolina Department of Health and Environmental Control (SCDHEC) approved *Sampling and Analysis Plan* (Rogers & Callcott Environmental [Rogers & Callcott], October 2014). Also included herein are the results of the first monthly gas extraction system operation and maintenance (O&M) Site visit completed in accordance with the SCDHEC-approved *Operation, Maintenance, and Monitoring Plan* (SCS Engineers, May 2015) in August 2015.

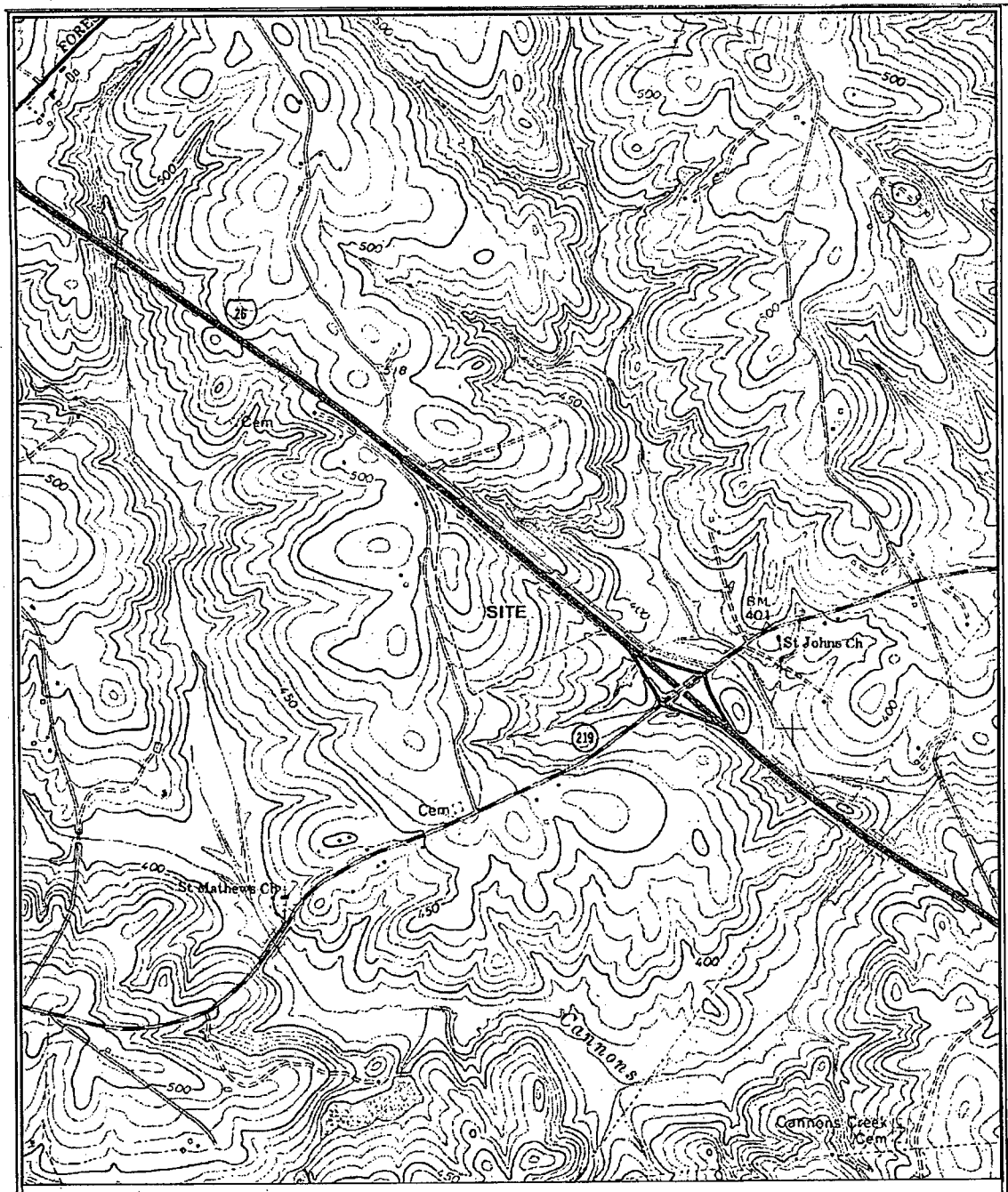
Background information was obtained from the *Semi-Annual Groundwater and Methane Monitoring Report for February 2014* (Terry Environmental Services, March 2014) and the soil gas extraction system *Operation, Maintenance, and Monitoring Plan* (SCS Engineers, May 2015). The Site is an unlined landfill that accepted municipal solid waste (MSW) from about 1972 until December 1993. It consists of 56.7 acres located approximately 2 miles east of the City of Newberry and 40 miles northwest of Columbia, South Carolina (**Figure 1**). There are two disposal areas—Phase I, which is approximately 27.2 acres, is located in the northern portion of the Site and Phase II, comprised of approximately 29.5 acres, is located in the southern portion of the Site.

Waste handling operations were relocated to the Newberry County Transfer Station located approximately 1.5 miles northwest of the landfill in December 1993. The Phase II disposal area was closed with a 2-foot engineered soil cap in November 1994. In accordance with SCDHEC Solid Waste Management (SWM) regulations and the Landfill Closure and Pose Closure Plan, perimeter gas monitoring probes and a network of groundwater monitoring wells were installed. Details concerning closure of the Phase I disposal area are not available, but Phase I is currently heavily vegetated and no known visible waste is present.

The landfill is leased to the Triangle Gun Club for competitive skeet shooting. There are no permanent residents at the Site, and the skeet range is typically open on Wednesdays, Saturdays, and Sundays. A small clubhouse and storage shed are located on-Site, and an out-of-service water well is located near the storage shed (**Figure 2**).

The Site is in post-closure monitoring in accordance with SCDHEC SWM regulation R61-107.19. Groundwater is monitored using a network of 13 monitoring wells located both on- and off-Site. Six on-Site gas monitoring points are used to monitor methane gas, and six passive landfill gas vents are present. Methane concentrations are also measured in the clubhouse and storage shed on-Site. Surface water is sampled at one location in Cannons Creek. Monitoring locations are listed in **Table 1** and illustrated on **Figure 2**.

As a result of intermittent elevated methane concentrations in several gas monitoring probes, the County initiated a phased corrective measures approach starting in 2006. Despite passive corrective measures, methane concentrations in several gas monitoring probes around Phase II remained above the compliance limit. Hence, an active subsurface soil gas extraction system was installed in


SITE
St Johns Ch
St Mathews Ch
Cannons Creek
Cem
BM
401
219
26
500
450
400
N
W
E
S
0
1000
2000
4000
Feet
Rogers & Callcott
ENVIRONMENTAL
DRAWN BY: MAL 8/7/2015
CHECKED BY: SWG
APPROVED BY: GYM
REFERENCE:
Newberry East USGS 7.5 Minute Quadrangel obtained from SCDNR.
Property boundary from Site Plan drawing by SCS Engineers.
FIGURE 1
SITE LOCATION MAP
FORMER
NEWBERRY COUNTY
LANDFILL
Cockrell Drive
Newberry, South Carolina

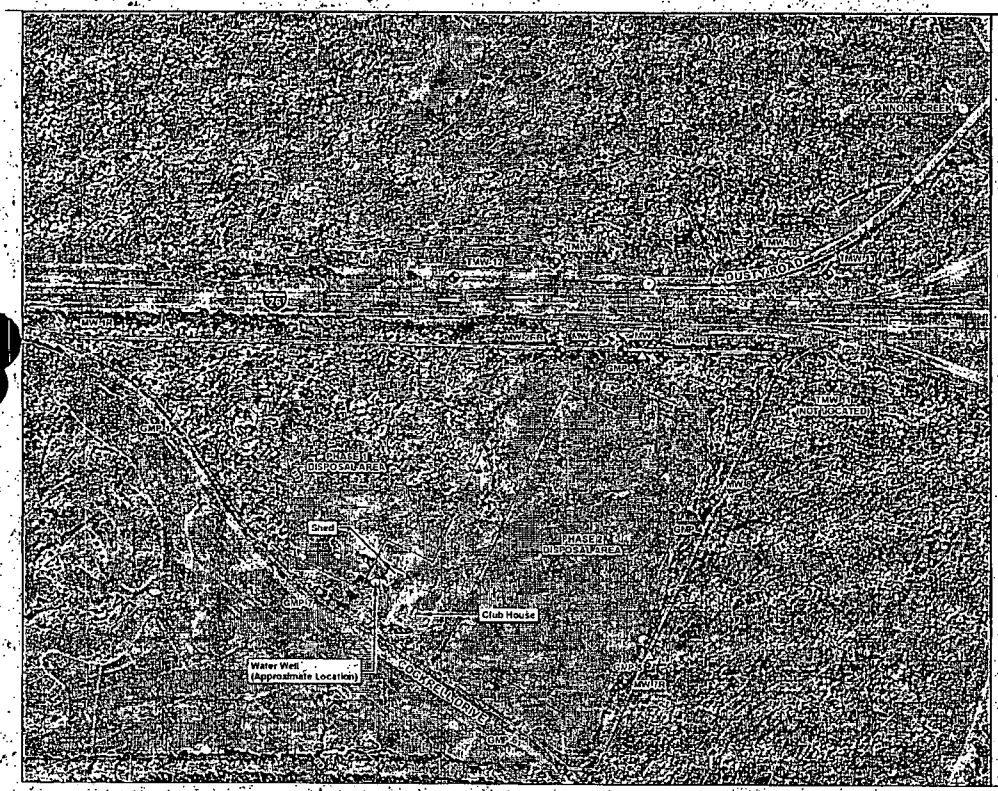

PHASE 1
DISPOSAL AREA
PHASE 2
DISPOSAL AREA
PHASE 3
DISPOSAL AREA
Shed
Club House
Water Well
(Approximate Location)
TMW-11
TMW-12
TMW-13
TMW-14
TMW-15
TMW-16
TMW-17
TMW-18
TMW-19
TMW-20
TMW-21
TMW-22
TMW-23
TMW-24
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TMW-40
TMW-41
TMW-42
TMW-43
TMW-44
TMW-45
TMW-46
TMW-47
TMW-48
TMW-49
TMW-50

Table 1: Monitoring Locations

Monitoring Wells	
MW-1R	MW-8
MW-2RR	TMW-9
MW-3	TMW-10
MW-4R	TMW-11
MW-5	TMW-12
MW-6	TMW-13
MW-7R	

Gas Monitoring Points
GMP-1
GMP-3
GMP-4
GMP-5
GMP-6
GMP-7
Clubhouse
Shed

Surface Water Sample
Cannons Creek

May 2015. The gas extraction system includes 24 extraction wells installed between the limits of the waste and the property boundary. Extracted gas is passed through activated carbon to absorb odors before discharge to the atmosphere. Monthly O&M of the gas extraction system began in August 2015.

Samples were historically analyzed for the parameters listed in Appendix V of SWM regulation R61-107.19 (excluding dioxins) as directed by SCDHEC in a letter dated April 13, 2010. With SCDHEC's approval of Rogers & Callcott's *Sampling and Analysis Plan* (October 2014), the analyte list was reduced to four field parameters (pH, temperature, conductivity, and turbidity) and a Site-specific list of volatile organic compounds (VOCs), chlorinated pesticides, and metals (**Table 2**).

Table 2: Site-Specific Analyte List

Analysis	EPA Method	Analyte	Container	Preservative
Field Parameters	EPA 9040C	pH	250-mL Polyethylene	None
	SM 2550B	Temperature		
	EPA 9050A	Conductivity		
	Field Screen	Turbidity		
VOCs	8260B	1,1-Dichloroethane	3 X 40-mL Glass	1 vial HCl (ph<2), 2 vials unpreserved Cool
		1,1-Dichloroethene		
		1,2-Dichloroethane		
		Benzene		
		Chloromethane		
		Dichlorodifluoromethane		
		Methylene Chloride		
		Tetrachloroethene		
		Trichloroethene		
		Vinyl Chloride		
		cis-1,2-Dichloroethene		
		trans-1,2-Dichloroethene		

Analysis	EPA Method	Analyte	Container	Preservative
Chlorinated Pesticides	8081B	Heptachlor	2.5-L Amber	None
		Heptachlor Epoxide		
		Alpha-BHC		
		Beta-BHC		
		Gamma-BHC		
Metals	6020A	Antimony	500-mL Plastic	Nitric Acid
	6020A	Arsenic		
	6010C	Barium		
	6020A	Beryllium		
	6020A	Lead		
	7470A	Mercury		

2.0 ACTIVITIES AND RESULTS

Groundwater and surface water sampling, as well as semi-annual methane monitoring, were performed in accordance with the SCDHEC-approved *Sampling and Analysis Plan* dated October 2014. Operation, maintenance (O&M), and monthly monitoring of the soil gas extraction system were performed in accordance with the SCDHEC-approved *Operation, Maintenance, and Monitoring Plan* (SCS Engineers, May 2015).

2.1 GROUNDWATER MONITORING

Twelve of the 13 Site monitoring wells were located during monitoring activities. (Well TMW-11 has not been located since April 2008.) Depth-to-water measurements were taken at the 12 Site monitoring wells on July 27, 2015. These measurements were used to determine the groundwater elevations listed in **Table 3** and to prepare the potentiometric map included as **Figure 3**. Groundwater elevations ranged between 393.26 feet relative to a site datum (ft rsd) and 470.74 ft rsd. Groundwater flow is generally to the southeast with a calculated gradient of 0.022 foot per foot.

Groundwater samples were collected from 11 of 13 monitoring wells on July 27 and 28, 2015. Well TMW-11 was not located and could not be sampled. Additionally, no sample was collected from well TMW-12, which has been reported "dry" since December 2009 and did not contain sufficient groundwater column (0.11 foot) for sampling during this monitoring event.

Well MW-3 had been reported dry and not sampled from February 2013 through February 2014. Similarly, well MW-6 had been reported dry and not sampled from August 2012 through February 2014. During this sampling event, 3.46 feet and 2.57 feet of water were measured in these two wells, respectively. MW-3 and MW-6 were purged dry and allowed to recover overnight. The wells were then sampled and analyzed only for the Site-specific list of VOCs using United States Environmental Protection Agency (EPA) method 8260B—the volume of water in the wells was insufficient to collect samples for pesticide and metals analysis.

Table 3: Well Specifications and Groundwater Elevations

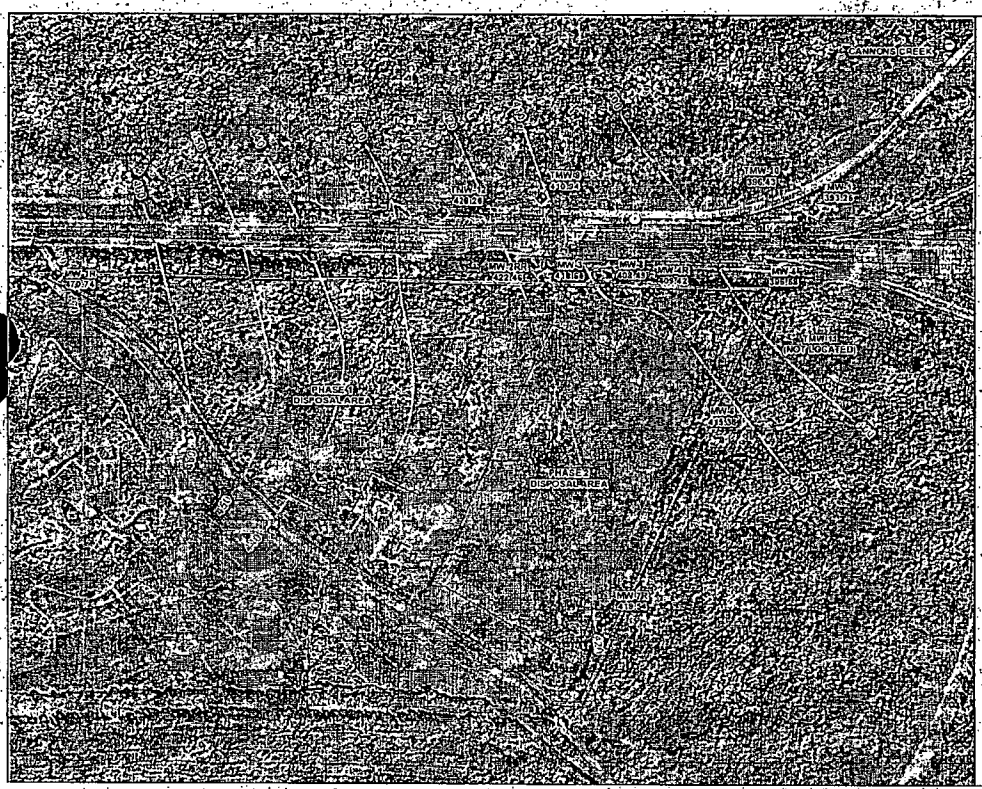
Monitoring Well ID	Top of Casing Elevation (ft rsd)	Reported Well Depth (ft btoc)	Measured Well Depth (ft btoc)	Reported Screened Interval (ft)	Latitude (Approximate)	Longitude (Approximate)	7/27/15 Depth to Groundwater (ft btoc)	7/27/15 Groundwater Elevation (ft rsd)
MW-1R	504.92	63.0	60.53	48.0 - 63.0	N34° 17' 59.472"	W81° 33' 22.739"	34.18	470.74
MW-2RR	459.82	63.0	59.52	48.0 - 63.0	N34° 17' 48.957"	W81° 33' 7.984"	37.36	422.46
MW-3	453.92	34.0	38.78	Unknown	N34° 17' 47.412"	W81° 33' 5.547"	35.32	418.60
MW-4R	441.55	63.0	62.38	48.0 - 63.0	N34° 17' 44.825"	W81° 33' 2.000"	32.13	409.42
MW-5	420.12	31.0	33.07	Unknown	N34° 17' 42.089"	W81° 32' 57.974"	23.54	396.58
MW-6	440.55	25.0	27.76	10.0 - 25.0	N34° 17' 39.408"	W81° 33' 4.241"	25.19	415.36
MW-7R	457.34	63.0	62.74	48.0 - 63.0	N34° 17' 36.114"	W81° 33' 12.929"	37.80	419.54
MW-8	443.39	68.0	71.81	58.0 - 68.0	N34° 17' 45.947"	W81° 33' 3.292"	34.90	408.49
TMW-9	457.58	75.0	73.99	65.0 - 75.0	N34° 17' 50.180"	W81° 33' 3.198"	46.64	410.94
TMW-10	415.07	45.0	44.02	35.0 - 45.0	N34° 17' 45.650"	W81° 32' 56.043"	18.64	396.43
TMW-11	Unknown	30.0	Not Located	20.0 - 30.0	Not Located	Not Located	NA	NA
TMW-12	468.18	42.6	42.03	22.6 - 42.6	N34° 17' 52.112"	W81° 33' 7.179"	41.92	426.26
TMW-13	409.25	44.4	42.38	14.4 - 44.4	N34° 17' 43.314"	W81° 32' 53.705"	15.99	393.26

Notes:
ft rsd feet relative to a Site datum
ft btoc feet below top of casing
NA not available
Well construction data based on information provided in Terry Environmental's *Semi-Annual Groundwater and Methane Monitoring Report for February 2014* (March 2014).

The remaining wells (MW-1R, MW-2RR, MW-4R, MW-5, MW-7R, MW-8, TMW-9, TMW-10, and TMW-13) were sampled and analyzed for the Site-specific list of VOCs using EPA method 8260B; the Site-specific list of metals using EPA methods 6010C, 6020A, and 7470A; and the Site-specific list of organochlorine pesticides using EPA method 8081B (**Table 2**). All analyses were performed by the Rogers & Callcott laboratory (SCDHEC Certification Number 23105) in Greenville, South Carolina.

A summary of the laboratory analytical results is included as **Table 4**. The July 2015 results are generally consistent with historical data (**Appendix A**). No organochlorine pesticides were detected at or above laboratory reporting limits in any of the samples analyzed. No analytes were detected at or above their respective EPA Maximum Contaminant Levels (MCLs) in wells MW-1R, MW-4R, MW-7R, or TMW-13. Low concentrations of 1,1-DCA and dichlorodifluoromethane were detected in some Site wells (**Table 4**); however, no MCL has been established for these constituents.

In general, detected constituent concentrations are low even when MCLs are exceeded (**Table 4**). In well MW-2RR, TCE was reported below its MCL of 5.0 µg/L for the first time since December 2007. Benzene, a petroleum-related constituent, as well as methylene chloride and vinyl chloride were reported at concentrations slightly greater than their respective MCLs in MW-2RR. Vinyl chloride was the only analyte reported above its MCL in MW-3. Lead was reported just above its MCL in well MW-5, and vinyl chloride was reported just above its MCL in MW-6. Chlorinated compounds and their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-8, TMW-9, and TMW-10. **Figure 4** depicts analytes exceeding their respective MCL during the July 2015 monitoring event. The complete laboratory analytical report is included as **Appendix B.**



Rogers & Callcott
ENVIRONMENTAL

FIGURE 3
GROUNDWATER
POTENTIOMETRIC MAP
JULY 27, 2015

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

- Surface Water Sample
- Groundwater Monitoring Wells
- Unidentified Piezometer
- Groundwater Contours
- Disposal Area
- Approximate Parcel Boundary
- Groundwater Flow Direction

Contour lines are extrapolated based on data at the sample locations. These lines are approximate as conditions between locations may vary.

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 22, 2014.
2013 Aerial photograph from NRCS.

DRAWN BY: MAL 8/7/2015
CHECKED BY: SWB
APPROVED BY: CPH

0 200 400 800
Feet

Friday, August 07, 2015, 3:44:51 PM
C:\GIS\PROJECTS\Newberry\11-071\Maps\LU\MAP-fig1_GWT.mxd

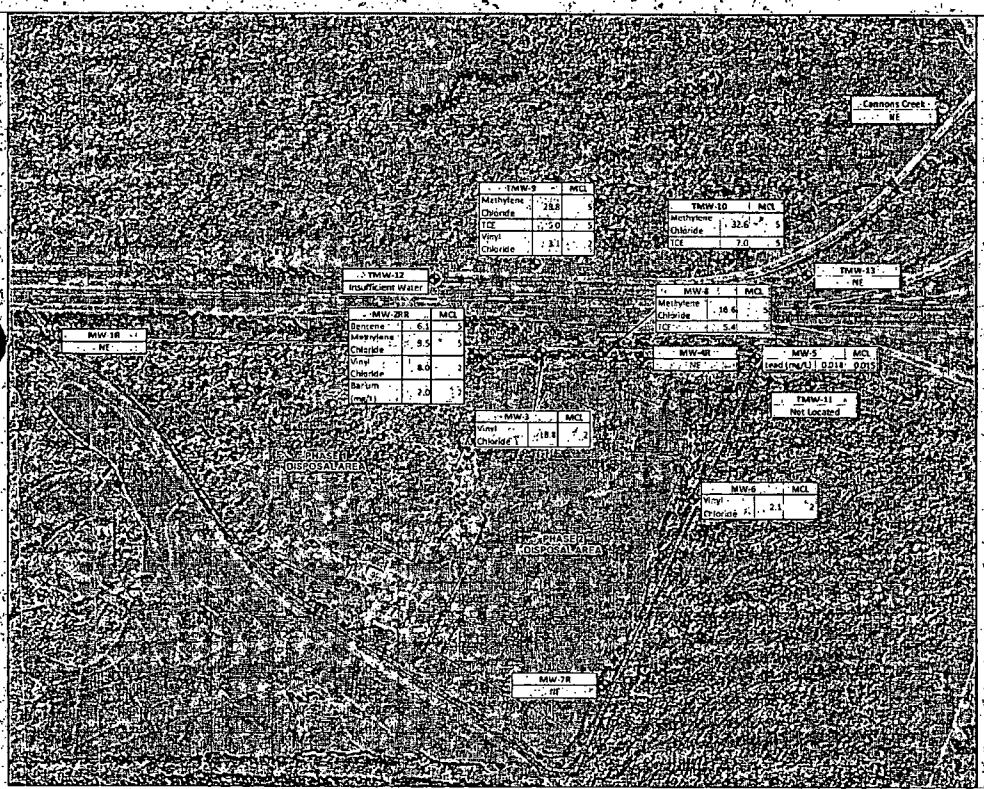
Table 4: Summary of Laboratory Analytical Results

Sample I.D.	Benzene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Vinyl Chloride	Dichloro-difluoro-methane	Methylene Chloride	Chloro-methane	Total VOCs	Antimony	Arsenic	Barium	Beryllium	Lead	Mercury	Organo-chlorine Pesticides
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)
MW-1R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.18	<0.002	<0.007	<0.00020	ND
MW-2RR	6.1	1.6	4.4	41.3	<1.0	<1.0	16.3	2.9	8.0	5.0	9.5	<1.0	95.1	<0.005	<0.005	2.0	<0.002	<0.002	<0.00020	ND
MW-3	4.3	2.2	1.5	41.7	<1.0	<1.0	5.5	<1.0	18.8	<1.0	<2.0	<1.0	74.0	NS	NS	NS	NS	NS	NS	NS
MW-4R	1.5	<1.0	<1.0	3.6	<1.0	<1.0	9.4	<1.0	1.6	<1.0	<2.0	<1.0	16.1	<0.005	<0.005	0.62	<0.002	<0.002	<0.00020	ND
MW-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.37	<0.002	0.018	<0.00020	ND
MW-6	2.6	<1.0	<1.0	6.9	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<2.0	<1.0	11.6	NS	NS	NS	NS	NS	NS	NS
MW-7R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.25	<0.002	<0.002	<0.00020	ND
MW-8	1.4	2.2	5.4	18.4	<1.0	5.9	16.9	<1.0	<1.0	13.0	16.6	<1.0	74.8	<0.005	<0.005	0.17	<0.002	<0.002	0.00021	ND
TMW-9	3.4	3.0	5.0	31.6	<1.0	<1.0	16.8	1.1	3.1	7.6	28.8	<1.0	100	<0.005	<0.005	1.1	<0.002	0.004	<0.00020	ND
TMW-10	3.1	4.9	7.0	30.7	<1.0	5.0	40.5	<1.0	<1.0	7.5	32.6	<1.0	131	<0.005	<0.005	0.21	<0.002	<0.002	<0.00020	ND
TMW-11	Well not located																			
TMW-12	Insufficient water for sampling																			
TMW-13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.20	<0.002	0.002	<0.00020	ND
Cannons Creek	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	ND	<0.005	<0.005	0.074	<0.002	<0.002	<0.00020	ND
MCLs	*5.0*	*5.0*	*5.0*	*70*	*100*	*7.0*	*NE*	*5.0*	*2.0*	*NE*	*5.0*	*NE*	*NA*	*0.006*	*0.010*	*2.0*	*0.004*	*0.015*	*0.002*	*NA*

Notes:

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
cis-1,2-DCE	cis-1,2-dichloroethene
PCE	tetrachloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
TCE	trichloroethene
VOCs	volatile organic compounds
µg/L	micrograms per liter
mg/L	milligrams per liter
ND	not detected
NS	not sampled—insufficient water
NE	not established
NA	not applicable
MCL	United States Environmental Protection Agency Maximum Contaminant Level
< X.X	analyte not detected at or above indicated laboratory reporting limit

Detected analytes are in bold type.
Shaded cells indicate the reported value exceeds the respective MCL.



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ENVIRONMENTAL

FIGURE 4
ANALYTES EQUAL TO OR EXCEEDING MCLS
JULY 2015

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

- Surface Water Sample
- Groundwater Monitoring Wells
- Disposal Area
- Approximate Parcel Boundary

NOTES:
NE - No analytes exceed the MCL.
All units are in µg/L unless otherwise noted.

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 22, 2014
2013 Aerial photograph from NRCS.

0 200 400 800
Feet

2.2 SURFACE WATER MONITORING

One surface water sample was collected from Cannons Creek, approximately 1/3-mile east-southeast of the Site, and analyzed at the Rogers & Callcott laboratory for the Site-specific list of VOCs using EPA method 8260B; the Site-specific list of metals using EPA methods 6010C, 6020A, and 7470A; and the Site-specific list of organochlorine pesticides using EPA method 8081B (Table 2). With the exception of barium, which was reported at a concentration of 0.074 milligrams per liter (mg/L)—well below its MCL of 2.0 mg/L—no analytes were detected at or above laboratory reporting limits in the surface water sample. A summary of the laboratory analytical results is included in Table 4. Historical analytical data is included in Appendix A. The complete laboratory analytical report is included as Appendix B.

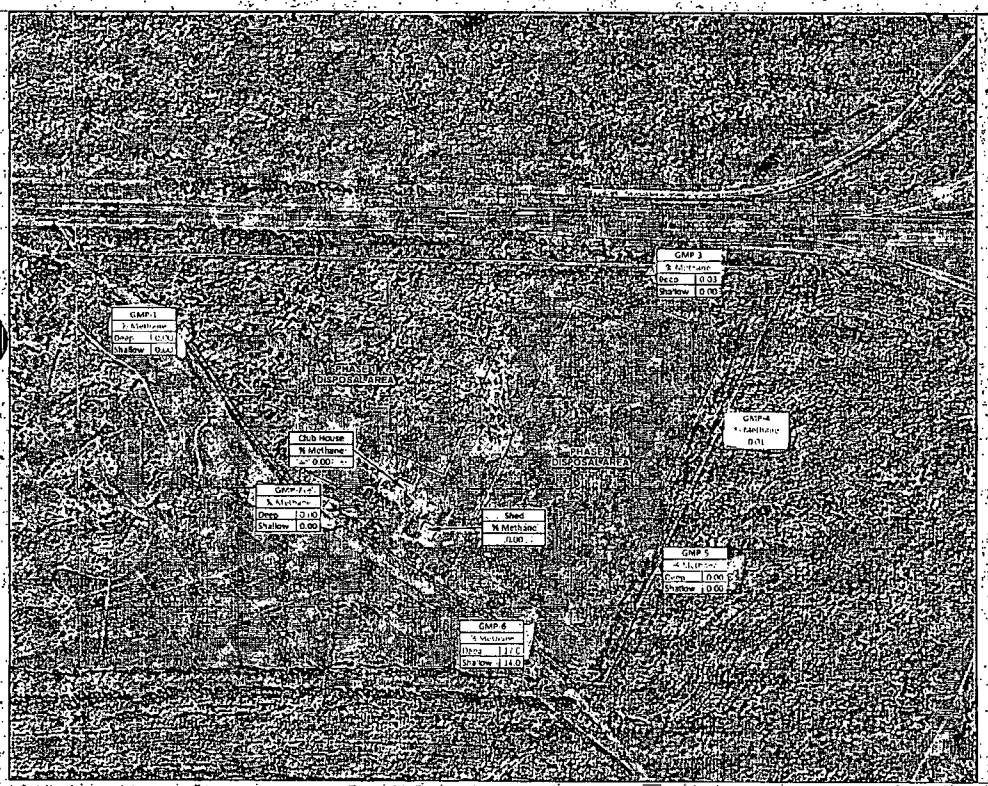
2.3 METHANE MONITORING

Rogers & Callcott monitored methane concentrations at the six gas monitoring points (GMP-1 and GMP-3 through GMP-7) and two structures (the clubhouse and shed) on July 28, 2015 in accordance with the *Sampling and Analysis Plan* (Rogers & Callcott, October 2014). In addition, monthly monitoring of GMP-3, GMP-4, GMP-5, and GMP-6 was performed on August 7, 2015 in accordance with the *Operation, Maintenance, and Monitoring Plan* (SCS Engineers, May 2015). Sampling locations are illustrated on **Figure 2** and **Figure 5**. With the exception of GMP-4, the GMP locations consist of nested wells to monitor shallow and deep zones of the subsurface. GMP-4 was installed to monitor the shallow zone only. Monitoring was performed in July using a Bacharach Gas Pup® natural gas detection instrument, which measures combustible gas in parts per million (ppm) at low concentrations (0–2,500 ppm) and as a percentage by volume at mid to high concentrations (0.2–100 percent). August monitoring was performed using a Landtech Gem 2000 Plus, which displays measurements as a percentage by volume only.

GMP-6 (shallow and deep) was the only location containing methane concentrations exceeding the lower explosive limit (LEL) action level of 5 percent in air. Operating the soil gas extraction system has had a significant impact at GMP-3, GMP-4, and GMP-5, where methane concentrations have decreased from exceeding the LEL (as high as 37 percent methane in GMP-4 in February 2015) to trace or undetectable levels. Results of methane monitoring during this semi-annual event are summarized in **Table 5** and illustrated on **Figure 5**. Results of monthly monitoring are also included in **Table 5**. Historical methane monitoring data is provided as **Appendix C**, and a copy of the methane monitoring field form is included as **Appendix D**.

2.4 GAS EXTRACTION SYSTEM O&M

Construction of the gas extraction system was completed on May 8, 2015. Start-up monitoring was completed during the first 3 months of operation by SCS Engineers. In August 2015, Rogers & Callcott began monthly monitoring of the system. Monthly monitoring includes inspecting system components; measuring and recording flow, vacuum, pressures, and concentration data of specific system components; and measuring and recording the methane gas concentrations and static pressure at monitoring points GMP-3, GMP-4, GMP-5, and GMP-6.



Rogers & Callcott
ENVIRONMENTAL

FIGURE 5
METHANE MONITORING RESULTS
JULY 2015

FORMER NEWBERRY COUNTY LANDFILL
NEWBERRY, SOUTH CAROLINA

Gas Monitoring Wells
Disposal Area
Approximate Parcel Boundary

NOTES:
Highlighted results exceed the lower explosive limit of 5 percent.

REFERENCE:
Site features from Site Plan drawing by SCS Engineers, May 22, 2014
2013 Aerial photograph from NRCS.

DRAWN BY: CM 8/18/2015
CHECKED BY: MMG
APPROVED BY: CMM

0 200 400 800
Feet

Tuesday, August 18, 2015, 10:57:17 AM
C:\NCV\PRO_RCM\Newberry\071\Graphics\Monitoring & Methane.mxd

Table 5: Methane Monitoring Results

Monitoring Point	Date	Gas Vent	Percent Methane	Percent of the LEL
GMP-1	7/28/2015	Deep	0.0	0.0
		Shallow	0.0	0.0
	8/7/2015	Deep	NM	NM
		Shallow	NM	NM
GMP-3	7/28/2015	Deep	0.0	0
		Shallow	0.03	0.5
	8/7/2015	Deep	0.0	0
		Shallow	0.0	0
GMP-4	7/28/2015	Shallow	0.01	0.2
	8/7/2015	Shallow	0.0	0
GMP-5	7/28/2015	Deep	0.0	0
		Shallow	0.0	0
	8/7/2015	Deep	0.0	0
		Shallow	0.0	0
GMP-6	7/28/2015	Deep	**17.0**	**>100**
		Shallow	**14.0**	**>100**
	8/7/2015	Deep	**46.3**	**>100**
		Shallow	**38.4**	**>100**
GMP-7	7/28/2015	Deep	0.0	0
		Shallow	0.0	0
	8/7/2015	Deep	NM	NM
		Shallow	NM	NM
Club House	7/28/2015	Building	0.00	0.0
	8/7/2015	Building	NM	NM
Shed	7/28/2015	Building	0.00	0.0
	8/7/2015	Building	NM	NM

Notes:
LEL lower explosive limit
Bold and shaded readings exceed the LEL for methane in air of 5 percent.

Rogers & Callcott completed the first monthly O&M Site visit on August 7, 2015. Monitoring forms documenting component conditions and system operational parameters are included in **Appendix E**. Data collected at the extraction wellheads are also provided in **Appendix E**. Operational data will be assessed in the context of additional data from the initial startup period, as well as data to be collected in September and October 2015, in an upcoming Quarterly Gas Extraction System O&M Report to be submitted in November 2015.

3.0 STATISTICAL ANALYSIS

The data sets of groundwater monitoring results were evaluated for each inorganic constituent. Those sets with less than 15 percent non-detects were analyzed using a parametric ANOVA analysis. Data sets with 15 percent to 85 percent non-detects were analyzed using the Kruskal-Wallis test. Data sets with 85 percent or greater non-detects were analyzed using the Wilcoxon Rank-Sum

method. Additionally, EPA guidance (1992) recommends samples with greater than 90 percent non-detects be analyzed using one of the Poisson methods. The Poisson Tolerance Limit analysis was conducted on sample sets with greater than 90 percent non-detects (in addition to the Wilcoxon method). **Table 6** summarizes the total number of samples, percent of non-detects, and the statistical analysis methods used for each parameter.

Table 6: Percent Non-Detects and Statistical Methods

Parameter	Total Number of Samples	% Non-Detect for Data Set	Statistical Analysis Method
Antimony	98	98	Wilcoxon Rank-Sum/Poisson Tolerance Limit
Arsenic	98	95	Wilcoxon Rank-Sum/Poisson Tolerance Limit
Barium	98	0	Parametric ANOVA
Beryllium	98	72	Kruskal-Wallis Test
Lead	98	63	Kruskal-Wallis Test
Mercury	98	57	Kruskal-Wallis Test

Statistical analyses are used to determine if concentrations of a specific constituent data set observed in the downgradient wells vary significantly from levels of the same constituent observed in the upgradient well data set. The ChemStat computer program by Starpoint Software was used to perform the statistical evaluation of the data. **Table 7** is a summary of the results of these analyses.

Table 7: Summary of Statistical Analysis Results

Analyte	MW-2RR	MW-3	MW-4R	MW-5	MW-6	MW-7R	MW-8	TMW-9	TMW-10	TMW-13
Antimony	NO	NS	NO	NO	NS	NO	NO	NO	NO	NO
Arsenic	NO	NS	NO	NO	NS	NO	NO	NO	NO	NO
Barium	YES	NS	YES	NO	NS	NO	NO	YES	NO	YES
Beryllium	NO	NS	NO	NO	NS	NO	NO	NO	NO	NO
Lead	NO	NS	NO	NO	NS	NO	NO	NO	NO	NO
Mercury	NO	NS	NO	NO	NS	NO	YES	NO	YES	YES

NOTES:
- YES — indicates a statistically significant variation from the background well (MW-1R)
- NS — indicates well was not sampled in 2015
- shaded cell indicates an MCL exceedance

The upgradient monitoring well, MW-1R, serves as the background well, and all other wells serve as the downgradient, compliance monitoring wells. A "Yes" in **Table 7** indicates a statistically significant variation of the downgradient well data set when compared to the MW-1R data set.

Statistical analysis was performed using all available groundwater quality data for six inorganic parameters that were analyzed for the Site during the 1st and 3rd quarters of 2015 (**Appendix A**). All of the constituents tested have the minimum of six sampling events required for statistically significant data sets. The statistical analysis datasets and worksheets for each of the statistically evaluated constituents are included as **Appendix F**. Note there was insufficient groundwater volume to

collect samples from wells MW-3 and MW-6 during 2015; hence, statistical analysis of those data sets was not performed.

As shown in the statistical analysis results (**Table 7**), the data indicate a statistically significant variance from the background well for barium at MW-2RR, MW-4R, TMW-9, and TMW-13 and for mercury at MW-8, TMW-10, and TMW-13. Barium in well MW-2RR was reported equal to the MCL of 2.0 mg/L in July 2015. Mercury was not detected in wells TMW-10 and TMW-13 during the July 2015 sampling event, and no other statistically significant variances equal or exceed their respective MCL. Although lead was reported slightly above its MCL of 0.015 mg/L in well MW-5 in July 2015, this data set does not show a statistically significant variation from the background well.

4.0 CONCLUSIONS

Rogers & Callcott completed semi-annual groundwater, surface water, and methane monitoring at the Site on July 27 and 28, 2015. A total of 12 groundwater samples and 1 surface water sample were collected, and methane gas concentrations were measured at 6 gas monitoring points and 2 structures located on-Site. In addition, Rogers & Callcott completed the first monthly gas extraction system O&M site visit on August 7, 2015.

Analytical results are generally consistent with historical data. No analytes were detected at or above their respective MCLs in 4 of the 12 groundwater monitoring wells sampled. No organochlorine pesticides were detected at or above laboratory reporting limits in any of the groundwater samples collected. Low concentrations of 1,1-DCA and dichlorodifluoromethane were detected in some Site wells; however, no MCL has been established for these constituents.

In general, detected constituent concentrations are low even when MCLs are exceeded. Benzene, a petroleum-related constituent, as well as methylene chloride and vinyl chloride were reported at concentrations slightly greater than their respective MCLs in MW-2RR. Vinyl chloride was the only analyte reported above its MCL in MW-3. Lead was reported just above its MCL in well MW-5, and vinyl chloride was reported just above its MCL in MW-6. Chlorinated compounds and their degradation constituents were reported at concentrations greater than their respective MCLs in wells MW-8, TMW-9, and TMW-10.

With the exception of barium, no analytes were detected at or above laboratory reporting limits in the surface water sample collected from Cannons Creek.

Organochlorine pesticides have not been reported above the MCL since February 2013 and have not been detected at or above the laboratory reporting limit since February 2014. With the exceptions of low concentrations of barium in MW-2RR and lead in MW-3 and MW-5, no metals have been reported above their respective MCLs since February 2014. Note there has been insufficient groundwater volume to sample for metals in MW-3 since February 2015. Based on a review of historical data and the most recent analytical results, pesticides and metals do not appear to be significant contaminants of concern at the Site. However, due to recent detections of barium and lead above their respective MCLs, samples should be collected for barium and lead only on an annual basis. Organochlorine pesticides and the remaining metals should be eliminated from the sampling requirements for the Site.

GMP-6 (shallow and deep) was the only location containing methane concentrations exceeding the LEL action level of 5 percent in air. Operating the soil gas extraction system has had a significant impact at GMP-3, GMP-4, and GMP-5, where methane concentrations have decreased from exceeding the LEL to trace or undetectable levels.

Site monitoring shall continue in accordance with the solid waste permit for the Site, the SCDHEC-approved *Sampling and Analysis Plan* (Rogers & Callcott, October 2014), and the *Operation, Maintenance, and Monitoring Plan* (SCS Engineers, May 2015).

5.0 SCHEDULE

Gas extraction system O&M will be performed monthly. A quarterly Gas Extraction System Report will be submitted to SCDHEC in November 2015. Semi-annual groundwater, surface water, and methane monitoring will be performed in the first quarter 2016. A semi-annual report will be submitted within 45 days of the end of the first quarter.