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Annual Groundwater Monitoring Report

for the

Newton Landfill

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Solid Waste
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Catawba County North Carolina
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Permit #18-01
2nd Semi-Annual Monitoring 2006

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REIC

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Improving the environment, one client at a time...

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West Virginia Oil Marketers & Grocers Association

In preparing this report, the professional services of REI Consultants, Inc. have been performed, findings obtained, and conclusions reached in accordance with present State and Federal regulations, and generally accepted review principles and practices. Questions regarding any of the information presented in this report should be directed to REIC headquarters at (304) 255-2500.

Respectfully submitted,

NORTH CAROLINA PROFESSIONAL SEAL 028029 12-29-06 ENGINEER MICHAEL P. HOFE

12-29-06

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Executive Summary

REI Consultants, Inc., (REIC) has performed the 2nd Semi-Annual 2006 monitoring program for the closed ***Newton Landfill*** operated by Catawba County, North Carolina. The procedural aspects of this monitoring program were determined after a review of historical records, site specific geology, consultations with the North Carolina Department of the Environment and Natural Resources (NCDENR) regulations, orders as formulated from ***15A NCAC 13B***, and communications from North Carolina agency officials. During those communications it was determined that Monitoring Wells MW-1, MW-3, MW-9, MW-10A, MW-10B, MW-11, MW-13, MW-14, MW-14A, MW-15, MW-15A, MW-16, MW-16A, MW-20, MW-21, MW-23, MW-24, MW-24D, OW-1, and OW-3 were to be evaluated twice a year for particular constituents and reported in semi-annual reports relative to North Carolina groundwater standards. In addition, wells MW-7A and MW-18 are to be sampled every 18 months. NCDENR issued a letter to Catawba County dated June 3, 2004 with approval of the above monitoring network.

In September 2006, groundwater samples were obtained by REIC's environmental field technicians, utilizing the protocols established by NCDENR. Summaries of the field sampling activities are enclosed in ***Appendix C*** of this report. No other anomalies were experienced during this sampling with the exception of significant levels of suspended solids (***see Appendix B: "Summary of Dissolved Metals and TSS Analyses"***) contained in several groundwater specimens. The groundwater hydraulic gradients and velocities estimated from the current study are of the same magnitudes of previous investigations.

As with previous monitoring events, water levels were recorded from all monitoring wells during the 2nd Semi-Annual event of 2006, as well as any existing monitoring points within the ***Newton Landfill*** boundaries. This information was utilized to generate the groundwater potentiometric maps for the Newton Facility. The potentiometric maps are included in ***Appendix F***, and a summary of the static water level data is included as ***"A Summary of Static Water Levels and %LEL"***, found in ***Appendix D***. An additional map indicating topographic contours and all wells at the facility is included in ***Appendix E***.

Results from the 2nd semi-annual 2006 event were composed for North Carolina groundwater standards. Components determined to be above North Carolina groundwater standards are as follows:

Component/Parameter	Monitoring Point
Acetone	MW-1
Benzene	MW-1, MW-3, MW-9, MW-10A, MW-14, MW-15, MW-16, MW-20, OW-1
Chloromethane	MW-1
1,4-Dichlorobenzene	MW-9, MW-14
1,1-Dichloroethane	MW-1, MW-9, MW-10A, MW-14, MW-15, MW-16, MW-20
1,2-Dichloroethane	MW-9, MW-10A, MW-11
1,1-Dichloroethene	MW-10A, MW-20
cis-1,2-Dichloroethene	MW-9, MW-10A, MW-14, MW-15, MW-20
1,2-Dichloropropane	MW-1, MW-9, MW-10A, MW-10B, MW-14, MW-15, MW-20
Methylene chloride	MW-9, MW-14, MW-15, MW-20, OW-1
Tetrachloroethene	MW-3, MW-9, MW-10A, MW-14, MW-14A, MW-15, MW-20
Trichloroethene	MW-3, MW-9, MW-10A, MW-10B, MW-13, MW-14, MW-14A, MW-15, MW-16, MW-16A, MW-20
Vinyl Chloride	MW-1, MW-9, MW-10A, MW-10B, MW-13, MW-14, MW-15, MW-16, MW-20, OW-1
Nickel	MW-9

These findings are summarized specifically in ***Appendix A*** as ***"Summary of 2nd Semi-Annual 2006 Detections by Monitoring Well"***.

Based upon the results of the current groundwater monitoring event, and pursuant to NCDENR policy and directives, it is recommended that the ***Newton Landfill*** continue monitoring the modified Appendix I listing, which includes Appendix I volatiles and chromium, lead, and nickel, during the 1st Semi-Annual Event of 2007.

Introduction

In July of 1998, REI Consultants, Inc., was contracted by Catawba County Solid Waste Authority to conduct a complete groundwater monitoring program for the closed landfill denoted as the "***Newton Landfill***", and registered with the NCDENR as Permit #18-01. REIC met with Mr. Larry Rose and Mr. Mark Poindexter of the NCDENR in August 1998, then again with Mr. Poindexter in March 1999, and discussed the requirements of the permit and subsequent Agency directives that have occurred during the past several years. Additionally, REIC reviewed records both from Catawba County's internal files and those stored at the NCDENR's Department of Records Facility in Raleigh, North Carolina. From these historical files REIC collated and generated a historical summary of the collected data for the monitoring points selected for monitoring consideration. Following the 2nd Semi-Annual monitoring event of 1998, monitoring wells MW-18, MW-19, MW-20, MW-21 and MW-22 were installed. In addition, after the 1st semi-annual 2004 event, monitoring wells MW-23, MW-24, and MW-24D were added to the program. All data from the approved monitoring network are incorporated within this report and represent what is believed to be a comprehensive collection of the groundwater quality profile for the Newton Facility.

Continuing the program in September 2006, REI Consultants, Inc. collected groundwater samples from 19 monitoring wells and two surface water sites located at the facility. The sampling was conducted to satisfy compliance with the groundwater monitoring program for the 2nd Semi-Annual 2006 monitoring event.

Additionally, the groundwater potentiometric surface has been modeled and is presented in the form of a static groundwater level contour map. This map identifies the general subsurface water movement and assists in determining potential, as well as identifiable, contaminant movement. As agreed, groundwater constituent levels (relative to NC groundwater standards), the potentiometric surface, and groundwater flow rates are presented in this report.

Investigation

The groundwater and surface water monitoring points were sampled in accordance with State and Federal guidelines. Static water levels were measured prior to and during well purging to ascertain groundwater elevations and generate data to later produce a valid potentiometric map. The monitoring wells were purged using laboratory decontaminated Teflon™ bailers before sampling, and field analytical testing was employed to assure adequate purging. Copies of the field sampling reports have been provided to Catawba County in a separate report (summaries of these logs are enclosed with this report in ***Appendix C***). Groundwater samples were taken as specified in REIC's Standard Operating Procedures (SOPs) that satisfy NCDENR Solid Waste regulations and guidance.

Groundwater samples were stored in pre-cleaned, preserved containers, transported in iced coolers, and delivered to the laboratory in good condition by REIC field personnel. The samples were analyzed in the laboratory referencing current EPA and NCDENR approved methodologies.

Methane measurements, as percent Lower Explosion Limit (% LEL), were recorded at each monitoring well prior to purging. Initial readings were taken at the top of casing as soon as the well caps (where installed) were removed. A second measurement was obtained after sufficient time had elapsed to allow for the equalization of any pressure differential between the well casing and the ambient surface. The methane measurements are documented in ***Appendix D: "Summary of All Static Water Levels and %LEL".***

The groundwater data are presented within this report relative to NC groundwater quality standards. Per instructions of the NCDENR Solid Waste Section representatives, the data have not been processed in a statistical manner to distinguish significant down-gradient elevations of constituents. However, constituents exceeding NC groundwater quality standards are noted in the ***"2nd Semi Annual 2006 Summary of Detections"*** in Appendix A.

The laboratory Quality Assurance Program included all appropriate, method specific Quality Controls. All laboratory data met the required QC criteria and were subjected to stringent REIC acceptance review prior to approval for inclusion in this report. Copies of the individual laboratory reports have been provided to Catawba County in a separate report.

Investigation Results

A. HYDROLOGICAL POTENTIOMETRIC SUMMARY

Models of two potentiometric surfaces have been prepared from the field data collected during the 2nd Semi-Annual 2006 groundwater sampling event. One model has been created to depict the upper-most or Shallow Aquifer and another has been produced to portray a deeper or Bedrock Aquifer.

Both models were developed from groundwater elevation data calculated from the static water levels measured during the fall 2006 sampling event. The groundwater depth measurements were obtained in the monitoring wells by REIC field personnel, prior to the execution of the purging and sampling procedures. Horizontal and vertical control for the field data was established from mapping based on NC State Plane coordinates, as provided by J. Mike Honeycutt Surveying.

Digital, grid-cell models were developed from the elevation data through the application of algorithms. The mapping area was divided into gridding cells and the algorithms were applied to determine the projected groundwater elevation at each cell node. Contour lines representing the potentiometric surfaces have been drawn between the grid-cells of discrete, integral elevation values to produce maps for the Shallow Aquifer and the Bedrock Aquifer that are contained in this report.

The potentiometric maps for each aquifer include the waste disposal area boundaries, landfill gas collection system, and streams. These features were transcribed from drawings provided by McGill Associates, P.A. An additional map that includes all wells at the facility as well as topographic contours is included in Appendix E: "Sampling Locations and Topographic Contours". Topographic contours were also provided by drawings from McGill Associates, P.A.

The Shallow Aquifer is the upper-most water-bearing zone of the Newton Landfill site. While some of the geologic material of the zone may be eluvial in origin, the lithology is essentially unconsolidated sediment of silt and sand sizes. It has been determined that 20 wells have screens set in this zone, although actual drill logs are not available for confirmation for a few of the wells at the site. The grid map for this aquifer was modeled with an inverse-distance algorithm and enhanced with a third-order polynomial equation to emphasize trend directions. With further regard to the

trends, 39 stream elevation points, in addition to the water elevations in the wells, were used in the preparation of the Shallow Aquifer potentiometric map. A copy of this drawing is included in ***Appendix F: "Potentiometric Contour Maps"***.

The Bedrock Aquifer is the deeper groundwater zone monitored at the landfill site. The lithology of this aquifer has typically been described as a weathered, biotite gneiss. While the Shallow and Bedrock Aquifers were analyzed separately and are shown on two different potentiometric drawings, no continuous aquitard can be distinguished between the two zones in the drilling information. Groundwater elevations from 16 deeper-screened wells were utilized to create the Bedrock Aquifer model. No stream water elevations were included in this analysis. The databases for the Shallow and Bedrock Aquifers contained separate measurement points. The wells in the deeper database were shown by drill logs to have screens set in the bedrock or are of a sufficient depth to logically be screened in the referenced zone. All of the deep wells identified in the available drill logs have screens that are set fully in the weathered rock except for two partially penetrating wells that have screens with tops exposed to sediment. A hybrid algorithm was applied to the Bedrock Aquifer data that consisted of three parts inverse-distance and one part multiple linear regression. A copy of the resulting potentiometric drawing is contained in ***Appendix F: "Potentiometric Contour Maps"***.

The horizontal component of hydraulic gradient has been estimated graphically for the Shallow and Bedrock Aquifers. In each case, flow paths were chosen which traverse the central portions of the main waste disposal area of the ***Newton Landfill***. The paths were drawn on the respective potentiometric maps, following traces that are approximately normal to the hydrostatic contours, from the up-gradient western portion of the waste area to the locale of the stream along the eastern border. Other flow routes could have been chosen with varying results for the measured hydraulic gradient. The flow paths utilized in the calculation of the hydraulic gradients for the two aquifers are illustrated on drawings included in ***Appendix F: "Potentiometric Contour Maps."***

Vertical gradient calculations have been prepared for seven sets of clustered wells at the Newton Facility. These calculations generally indicate discharge conditions in the vicinity of the streams and recharge in upland areas of the site. A copy of the vertical gradient analysis is included in ***Appendix G***.

Lateral groundwater flow velocities have been estimated for the two aquifers using a form of Darcy's Law, as follows:

Shallow Aquifer:

$$V = \frac{KI}{n} = \frac{40\ \text{ft}}{\text{yr}}$$

where:

V = Groundwater Seepage Velocity in ft/yr.
K = Average Hydraulic Conductivity = 2.8×10^{-4} cm/sec
(Averaged from data previously provided by others).
I = Hydraulic Gradient = 0.029 ft/ft.
Following a path normal to the groundwater potentiometric contours across the main waste disposal area.
n = Effective Porosity = 0.20 (unitless).
(Typical textbook value).

Bedrock Aquifer:

$$V = \frac{KI}{n} = \frac{1000\ \text{ft}}{\text{yr}}$$

where:

V = Groundwater Seepage Velocity in ft/yr.
K = Average Hydraulic Conductivity = 2.5×10^{-3} cm/ sec.
(Averaged from data previously provided by others).
I = Hydraulic Gradient = 0.039 ft/ft.
Following a path normal to the groundwater potentiometric contours across the main waste disposal area.
n = Effective Porosity = 0.10 (unitless).
(Typical textbook value).

B. ANALYTICAL SUMMARY

Analytical parameters which were detected to be above the minimum laboratory Practical Quantitation Limits are summarized in ***Appendix A***, a ***"Summary of Detections by Monitoring Well"***, which is included on the following pages. Values greater than the North Carolina groundwater standards are shown in red print.

All available analytical results of previous sampling events are included as a separate document under the section: ***"Historical Data Summary"***. Components determined to be above North Carolina groundwater standards for the 2nd Semi-Annual 2006 groundwater sampling event are as follows:

Component/Parameter	**Monitoring Point**
Acetone	MW-1
Benzene	MW-1, MW-3, MW-9, MW-10A, MW-14, MW-15, MW-16, MW-20, OW-1
Chloromethane	MW-1
1,4-Dichlorobenzene	MW-9, MW-14
1,1-Dichloroethane	MW-1, MW-9, MW-10A, MW-14, MW-15, MW-16, MW-20
1,2-Dichloroethane	MW-9, MW-10A, MW-11
1,1-Dichloroethene	MW-10A, MW-20
cis-1,2-Dichloroethene	MW-9, MW-10A, MW-14, MW-15, MW-20
1,2-Dichloropropane	MW-1, MW-9, MW-10A, MW-10B, MW-14, MW-15, MW-20
Methylene chloride	MW-9, MW-14, MW-15, MW-20, OW-1
Tetrachloroethene	MW-3, MW-9, MW-10A, MW-14, MW-14A, MW-15, MW-20
Trichloroethene	MW-3, MW-9, MW-10A, MW-10B, MW-13, MW-14, MW-14A, MW-15, MW-16, MW-16A, MW-20
Vinyl Chloride	MW-1, MW-9, MW-10A, MW-10B, MW-13, MW-14, MW-15, MW-16, MW-20, OW-1
Nickel	MW-9

These findings are summarized specifically in ***Appendix A*** as ***"Summary of 2nd Semi-Annual 2006 Detections by Monitoring Well"***.

General Conclusions and Recommendations

Based upon the results of the current groundwater monitoring event, and pursuant to NCDENR policy and directives, it is recommended that the ***Newton Landfill*** continue in its current monitoring mode, with analysis of the modified Appendix I list, during the 1st Semi-Annual Event of 2007.

APPENDIX A

Newton Landfill

2nd Semi-Annual 2006 Summary of Detections

The following summary is a complete listing of concentrations detected above laboratory Practical Quantitation Limits (PQLs) during the 2nd Semi-Annual monitoring event of 2006. Concentrations detected at levels above established North Carolina groundwater standards (as denoted in bold print) are highlighted in red. Monitoring wells having specimens containing less than PQL quantities of respective analytes are noted as blank entries.

APPENDIX D

Newton Landfill

Static Water Levels and % LEL

Newton Landfill

Permit: #18-01
2nd Semi Annual 2006

Sampler(s): R. Farley/A. McBride
Weather Conditions: Cloudy 80°F

-Static Water Levels and %LEL-

Monitoring Point	Sampling Date	TOC (feet)	Depths to Water (feet)	Groundwater Elevation (feet)	% LEL Initial	% LEL Final
MW-1	9/17/2006	916.09	13.35	902.74	23	35
MW-3	9/17/2006	1021.81	29.45	992.36	0	0
MW-4	9/17/2006	912.82	10.97	901.85	7	14
MW-5	9/17/2006	933.54	9.58	923.96	0	0
MW-6	9/17/2006	922.26	18.09	904.17	0	0
MW-7A	9/17/2006	912.48	14.53	897.95	0	0
MW-9	9/17/2006	949.58	35.62	913.96	3	9
MW-10A	9/17/2006	944.11	35.21	908.90	0	0
MW-10B	9/17/2006	945.93	32.37	913.56	0	0
MW-11	9/17/2006	944.70	16.11	928.59	0	0
MW-13	9/17/2006	923.19	17.31	905.88	0	0
MW-14	9/17/2006	1003.63	29.43	974.20	100	100
MW-14A	9/17/2006	1004.46	30.44	974.02	0	0
MW-15	9/17/2006	979.88	22.65	957.23	0	0
MW-15A	9/17/2006	980.82	28.42	952.40	0	0
MW-16	9/17/2006	907.13	7.91	899.22	0	0
MW-16A	9/17/2006	906.14	4.78	901.36	0	0
MW-18	9/17/2006	921.45	14.88	906.57	0	0
MW-19	9/17/2006	913.67	15.92	897.75	0	0
MW-20	9/17/2006	966.19	31.34	934.85	0	0
MW-21	9/17/2006	980.61	23.00	957.61	0	0
MW-22	9/17/2006	1016.33	38.20	978.13	0	0
MW-23	9/17/2006	1016.50	19.74	996.76	0	0
MW-24	9/17/2006	954.14	22.60	931.54	0	0
MW-24D	9/17/2006	953.64	25.30	928.34	0	0
OW-1	9/17/2006	1004.76	29.35	975.41	100	100
OW-2	9/17/2006	1007.99	27.11	980.88	0	0
OW-3	9/17/2006	1010.24	30.75	979.49	78	32
			Miscellaneous			
RW-3	9/17/2006	911.24	9.78	901.46	65	53
MW-12	9/17/2006	924.55	15.54	909.01	0	0
MW-8	9/17/2006	905.49	11.36	894.13	0	0
RW-2	9/17/2006	918.78	15.58	903.20	0	0
MW-2A	9/17/2006	924.32	19.41	904.91	100	100
RW-1	9/17/2006	924.97	18.53	906.44	0	0
MW-17	9/17/2006	1005.41	23.25	982.16	0	0
MW-7	9/17/2006	913.21	17.15	896.06	0	0

TOC - Top of Casing

APPENDIX G

Newton Landfill

Vertical Gradient Calculations

Newton Landfill (Closed Facility) *2nd Semi-Annual Groundwater Monitoring Event 2006*

VERTICAL GRADIENT CALCULATIONS

Well ID	Easting (Feet)	Northing (Feet)	Sur. El. (Feet)	TOC (Feet)	Material Screened	GW Depth (from TOC) (Feet)	GW El. (Feet)	Top Scn. Elevation (Feet)	Bot. Scn. Elevation (Feet)	Saturated Screen Mid-Point Elevation (Feet)
MW-2A	1359171.20	699131.50	921.12	924.32	Sediment	19.41	904.91	911.12	901.12	906.12
MW-13	1359184.60	699134.60	921.69	923.19	Rock	17.31	905.88	856.69	846.69	851.69

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-2A TO MW-13	-0.97	54.43	-0.018	DISCHARGE

MW-7	1359605.50	699187.80	910.31	913.21	Sediment	17.15	896.06	897.01	887.01	892.01
MW-7A	1359601.00	699191.40	909.48	912.48	Rock	14.53	897.95	843.48	833.48	838.48
MW-19	1359617.60	699201.90	911.36	913.67	Rock? No Log	15.92	897.75	805.17	795.17	800.17

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-7 TO MW-7A	-1.89	53.53	-0.035	DISCHARGE
MW-7A TO MW-19	0.2	38.31	0.005	RECHARGE
MW-7 TO MW-19	-1.69	91.84	-0.018	DISCHARGE

MW-10A	1359040.10	699576.50	942.61	944.11	Sediment	35.21	908.90	904.61	894.61	899.61
MW-10B	1359041.30	699592.60	942.60	945.93	Rock	32.37	913.56	868.15	858.15	863.15

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-10A TO MW-10B	-4.66	36.46	-0.128	DISCHARGE

Abbreviations:

Well ID: Well Identification Number
Easting: Well Location East Coordinate
Northing: Well Location North Coordinate
Sur. El.: Ground Surface Elevation
TOC: Top Of Casing Elevation
Material Screened: Lithology Of Materials In Screened Zone
GW Depth: Measured Depth To Groundwater From TOC
GW El.: Elevation Of Groundwater
Top Scn. Elevation: Elevation Of Top Of Screen
Bot. Scn. Elevation: Elevation Of Bottom Of Screen
Saturated Screen Mid-Point Elevation: Mid-Point Elevation Of Wetted Portion Of Well Screen
DH: Difference In Groundwater Elevation (Head), Upper Screen Minus Lower Screen
DZ: Difference In Saturated Well Screen Mid-Point Elevations Upper Screen Minus Lower Screen
DH/DZ: DH Divided By DZ = Vertical Gradient

Newton Landfill (Closed Facility) *2nd Semi-Annual Groundwater Monitoring Event 2006*

VERTICAL GRADIENT CALCULATIONS

Well ID	Easting (Feet)	Northing (Feet)	Sur. El. (Feet)	TOC (Feet)	Material Screened	GW Depth (from TOC) (Feet)	GW El. (Feet)	Top Scn. Elevation (Feet)	Bot. Scn. Elevation (Feet)	Saturated Screen Mid-Point Elevation (Feet)
MW-14	1357834.90	698855.70	1002.13	1003.63	Sediment	29.43	974.20	979.13	969.13	971.67
MW-14A	1357821.20	698861.10	1002.46	1004.46	Rock? No Log	30.44	974.02	929.46	919.46	924.46

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-14 TO MW-14A	0.18	47.205	0.004	RECHARGE

MW-15	1358150.40	698848.20	977.60	979.88	Sediment	22.65	957.23	955.60	945.60	950.60
MW-15A	1358139.90	698840.70	978.54	980.82	Rock? No Log	28.42	952.40	908.54	898.54	903.54

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-15 TO MW-15A	4.83	47.06	0.103	RECHARGE

MW-16	1359385.20	699085.70	905.63	907.13	Sediment? No Log	7.91	899.22	897.63	887.63	892.63
MW-16A	1359395.60	699074.50	904.14	906.14	Rock	4.78	901.36	833.84	823.84	828.84

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-16 TO MW-16A	-2.14	63.79	-0.034	DISCHARGE

Abbreviations:

Well ID: Well Identification Number
Easting: Well Location East Coordinate
Northing: Well Location North Coordinate
Sur. El.: Ground Surface Elevation
TOC: Top Of Casing Elevation
Material Screened: Lithology Of Materials In Screened Zone
GW Depth: Measured Depth To Groundwater From TOC
GW El.: Elevation Of Groundwater
Top Scn. Elevation: Elevation Of Top Of Screen
Bot. Scn. Elevation: Elevation Of Bottom Of Screen
Saturated Screen Mid-Point Elevation: Mid-Point Elevation Of Wetted Portion Of Well Screen
DH: Difference In Groundwater Elevation (Head), Upper Screen Minus Lower Screen
DZ: Difference In Saturated Well Screen Mid-Point Elevations Upper Screen Minus Lower Screen
DH/DZ: DH Divided By DZ = Vertical Gradient

Newton Landfill (Closed Facility) *2nd Semi-Annual Groundwater Monitoring Event 2006*

VERTICAL GRADIENT CALCULATIONS

Well ID	Easting (Feet)	Northing (Feet)	Sur. El. (Feet)	TOC (Feet)	Material Screened	GW Depth (from TOC) (Feet)	GW El. (Feet)	Top Scn. Elevation (Feet)	Bot. Scn. Elevation (Feet)	Saturated Screen Mid-Point Elevation (Feet)
MW-24	1358715.00	698582.70	951.20	954.14	Sediment	22.60	931.54	927.70	917.70	922.70
MW-24D	1358722.10	698600.00	950.23	953.64	Rock? No Log	25.30	928.34	877.60	867.60	872.60

COMPARISON:	DH (Ft.):	DZ (Ft.):	DH/DZ (Ft./Ft.):	CONDITION:
MW-24 TO MW-24D	3.20	50.1	0.064	RECHARGE

Abbreviations:

Well ID: Well Identification Number
Easting: Well Location East Coordinate
Northing: Well Location North Coordinate
Sur. El.: Ground Surface Elevation
TOC: Top Of Casing Elevation
Material Screened: Lithology Of Materials In Screened Zone
GW Depth: Measured Depth To Groundwater From TOC
GW El.: Elevation Of Groundwater
Top Scn. Elevation: Elevation Of Top Of Screen
Bot. Scn. Elevation: Elevation Of Bottom Of Screen
Saturated Screen Mid-Point Elevation: Mid-Point Elevation Of Wetted Portion Of Well Screen
DH: Difference In Groundwater Elevation (Head), Upper Screen Minus Lower Screen
DZ: Difference In Saturated Well Screen Mid-Point Elevations Upper Screen Minus Lower Screen
DH/DZ: DH Divided By DZ = Vertical Gradient