# Assessment of Corrective Measures

*Prepared for*

City of Albemarle Landfill - Permit #84-01
Albemarle, Stanly County, North Carolina

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**TABLE OF CONTENTS**

**1 INTRODUCTION 1**

1.1 Site Background ..... 1
1.1.1 Site History ..... 1
1.1.2 Sampling History ..... 1
1.2 Site Characteristics ..... 2
1.2.1 Site Description ..... 2
1.2.2 Geology ..... 2
1.2.3 Hydrogeology ..... 4
1.2.4 Hydrology ..... 5
Potable Sources ..... 5
Groundwater Regime ..... 5
Groundwater Flow Components ..... 6
1.3 Site Conceptual Model ..... 7
Boundaries ..... 7
Model Calibration ..... 8

**2 CONTAMINATION CHARACTERIZATION 8**

2.1 Contamination of Concern ..... 8
2.1.1 Inorganic Constituents ..... 8
2.1.2 Organic Constituents ..... 10
2.2 Contamination Distribution ..... 11
2.3 Source Control Measures ..... 12
2.3.1 MT3D96 Modeling ..... 13
2.3.2 Stream Dilution ..... 13
2.4 Groundwater End Use ..... 14
2.5 Exposure Pathways ..... 14
2.6 Human Health Risk Assessment ..... 14
2.6.1 Carcinogenic ..... 15
2.6.2 Non-Carcinogenic ..... 15
2.7 Adult Risk ..... 16
2.8 Child Risk ..... 16
2.9 Sensitivity Receptor Pathways ..... 17

**3 CORRECTIVE MEASURES SCREENING AND EVALUATION 17**

3.1 Overview ..... 17
3.2 Institutional Controls ..... 17
3.3 Infiltration Controls ..... 17
3.4 Landfill Gas Controls ..... 18
3.5 Groundwater Technologies ..... 18
3.5.1 Monitored Natural Attenuation ..... 18
3.5.2 Vapor Extraction System/Bioventing ..... 18
3.5.3 Air Sparging ..... 19
3.5.4 Enhanced Bioremediation ..... 19
3.5.5 Phytoremediation ..... 19
3.5.6 Constructed Wetland ..... 20

**4 SUMMARY CONCLUSIONS 20**

4.1 Conclusions ..... 20
4.2 Public Meeting ..... 21

**REFERENCES 22**

**TABLES**

Table 1 ..... Well Construction Details
Table 2 ..... Historical Groundwater Elevations
Table 3 ..... Summary of Slug Test Results
Table 4 ..... Summary of Soil Geologic Properties
Table 5 ..... Summary of Field Parameters
Table 6 ..... Historical Inorganic Groundwater Results
Table 7 ..... Historical Inorganic Surface Water Results
Table 8 ..... Statistically Significant Inorganics
Table 9 ..... Historical Organic Groundwater Results
Table 10 ..... Statistically Significant Organics
Table 11 ..... Current Groundwater Sample Results
Table 12 ..... Carcinogenic Toxicity Values for Oral Ingestion
Table 13 ..... Carcinogenic Toxicity Values for Inhalation Exposure

Table 14 ..... Carcinogenic Toxicity Values for Dermal Exposure
Table 15 ..... Non-Carcinogenic Toxicity Values for Oral Ingestion
Table 16 ..... Non-Carcinogenic Toxicity Values for Inhalation Exposure
Table 17 ..... Non-Carcinogenic Toxicity Values for Dermal Exposure
Table 18 ..... Flow Rate Calculations
Table 19 ..... Remediation Alternatives
Table 20 ..... Stream Dilution Calculation

**PLATES**

Plate 1 ..... Topographical Map with Site Location
Plate 2 ..... Facility Map
Plate 3 ..... Site Map with Sampling Locations
Plate 4 ..... Regional Characterization Map
Plate 5 ..... Stream Trace Analysis with Rose Diagram
Plate 6 ..... Average Potentiometric Groundwater Map
Plate 7 ..... Cross-sections
Plate 8 ..... Isoconcentration Map Total VOC's
Plate 9 ..... Estimated Top of Competent Rock
Plate ..... Water Supply Wells

**APPENDIX**

Appendix A ..... Boring Logs and Monitoring Well Construction Diagrams
Appendix B ..... Sampling History
Appendix C ..... Groundwater Modeling
Appendix D ..... Sampling and Analysis Plan

# 1 INTRODUCTION

## 1.1 Site Background

### 1.1.1 Site History

The City of Albemarle landfill is located off Stony Gap Road (SR 1720), in Stanly County, North Carolina. A topographical map showing the location of the site is included as Plate 1. The City of Albemarle landfill operates under permit #84-01. Prior to operating as a C&D landfill the site operated as a Municipal Solid Waste (MSW) unlined sanitary landfill that consisted of two units. One unit was closed prior to October 1991; this unit was closed with a 24 inch final soil cover. The second unit was closed with a cohesive cap of 18 inches of soil with a permeability of 1 x $10^{-5}$ cm/sec, and 18 inches of erosive layer. This unit was closed by June 1999 as part of the transition plan.[17] The C&D landfill is constructed and operating on top of the MSW landfill. Adjacent to the C&D landfill, across the unnamed tributary of Jacobs Creek, and utilizing the same scale house is the existing Subtitle D MSW landfill, which operates under permit #84-01. A facility map showing the locations of both permitted facilities is included as Plate 2.

### 1.1.2 Sampling History

Four monitoring wells (MW-1, MW-2, MW-3, and MW-4) were installed in March 1991. Initial sampling of these monitoring wells occurred on May 13, 1991 and included pH, Biological Oxygen Demand, Chemical Oxygen Demand, Nitrate as Nitrogen, Total Organic Carbon, Chloride, Fluoride, Total Dissolved Solids, Arsenic, Barium, Cadmium, Copper, Total Chromium, Iron, Lead, Manganese, Mercury, Selenium, Silver, Zinc, Total Organic Halides, Sulfate, Conductivity, Temperature, and Static Water Level. Additional sampling occurred on June 26, 1992. Sample results for these events are available in the Transition Plan.

The Ground and Surface Water Monitoring System (SAP) was prepared in April 1994 and submitted as part of the Transition Plan.[17] As part of the SAP, monitoring wells MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11 and MW-12 were installed in September 1994. Appendix I sampling was initiated in September 1994 with background sampling occurring on September 15, 1994, November 29, 1994, February 6, 1995 and February 27, 1995. Monitoring well MW-8D was installed on June 25, 2007 to replace MW-8, which has been dry since installation. Monitoring wells MW-24 and MW-25 were installed at the property line on July 4, 2007. These wells were installed in response to the January 2007 sampling event that had detected constituents in MW-7. Well construction records and boring logs are provided in Appendix A. Appendix II sampling was performed on selected wells (MW-1, MW-2, MW-3, MW-6, MW-7, and MW-9) on August 22, 2007. Appendix II sampling was initiated based on July 2007 sampling results. A sampling history table is included in Appendix B.

## 1.2 Site Characteristics

### 1.2.1 Site Description

The site lies within the Carolina Slate Belt of the Piedmont geologic and physiographic province. The Carolina Slate Belt is characterized by low, generally rolling hills with gentle to moderately steep slopes. The facility is divided by an unnamed tributary of Jacobs Creek. The C&D landfill is located west of the unnamed creek while the lined Subtitle D landfill is to the east of the creek. The unnamed creek flows southeast and joins an unnamed tributary south of the Subtitle D landfill. These tributaries join Jacobs Creek in the south before exiting the property. Jacobs Creek empties into Lake Tillery (Pee Dee River) southeast of the landfill. Landfill drainage flows southeast towards the unnamed creek. Relief of the landfill is roughly 110 feet. Natural vegetation of disturbed lowland with pine and hardwood trees line the unnamed drainage features. Pine and hardwood forest exist beyond the extent of the landfill operation.

### 1.2.2 Geology

The geology, as addressed in the SAP, identifies the site as being part of the Carolina Slate Belt within the Piedmont geologic and physiographic province. The Carolina Slate Belt is composed of volcanic and sedimentary rock, from the Late Proterozoic into the Cambrian, which experienced greenschist facies metamorphism and pluton intrusion. According to Conley (1962), the regional joint systems are N 45 – 60$^{o}$E, N 60$^{o}$W, N 10 – 20$^{o}$W, and N 30$^{o}$E. The N 45 – 60$^{o}$E direction reflects the strike of the rock, bedding plane cleavage, and the axial plane cleavage; while the N 10 – 20$^{o}$W could reflect fracture systems caused or followed by the intrusion of the Triassic age dikes. The bedding strikes 30-50$^{o}$ east and dips 30-45$^{o}$ to the Northwest.[18]

The stratigraphic sequence in the Albemarle-Asheboro region is essentially a thick, primarily felsic volcanic unit (Uwharrie Formation) overlain by a dominantly volcanic-sedimentary package (Albemarle Group), with various intrusions[3] of metagabbro and metabasalt dikes.[4] This sequence represents a period of sedimentary deposition interrupted by periods of pulsed volcanic activity consisting of ash and lava flows.

The Uwharrie Formation is the bottommost layer in the known sequence of the Carolina Slate Belt. It consists largely of felsic metavolcanic rocks with subordinate amounts of mafic tuffs and layered beds of reworked volcanic debris, including lava flows, domes and possibly pillows. The Uwharrie Formation was deposited in a high-energy environment of explosive volcanism.[3]

The Tillery Formation overlies the Uwharrie, and consists of laminated to thinly bedded meta-mudstone in 1-meter thick beds. The total thickness is estimated between 1,500 feet and 4,500 feet. The Tillery and

Uwharrie contact grades over a few hundred feet [4] and is noticeable in outcrops by a change in soil and saprolite color from white to red. The Tillery primarily represents a change in the environment of deposition, becoming a low energy terrain producing fine-grained debris.[2]

The Cid Formation is a sedimentary sequence with beds 10 to 40 centimeters thick, ripple-marks, cross-stratified siltstone and laminated siltstone-mudstone units.[14][3] The geology of the study area primarily identified the lithology as being part of the Cid Formation. The Flat Swamp Member is a felsic volcanic intrusion containing devitrified glass and possible andesitic basalt mudflows.[3] The Flat Swamp Member can be traced for 150 Kilometers and makes a conspicuous marker bed.[14] The Cid Formation also contains several volcanic sills as well as an additional intrusion of Badin Greenstone.[3]

Locally, the facility is on the southeast limb of the New London Syncline, bearing and axial trend of North 30 - 45$^{o}$ East with the axial plane dipping to the southeast at 75$^{o}$. The best evidence of the axial and bedding plane cleavage is apparent in the siltstone units.[4] The bedding strikes 30-50$^{o}$ East and dips 30-45$^{o}$ to the Northwest.[19] The geology of the study area primarily identified the lithology as being part of the Cid Formation, as can be seen on Plate 4.

Well construction records for monitoring wells are included in Appendix A. Lithologies are fairly uniform, and consisted of brown to gray sandy silt/sandy clay transitioning into a sandy silt/sandy clay layer with gravel and finally the highly fractured gray to greenish argillite of the Cid Formation. Generalized geological cross sections are shown on Plate 7. Encountered lithologies were compared to those from the Subtitle D Site Hydrogeologic Report[13], Phase 1 Design Hydrogeologic Study[18] and Phase 2 Design Hydrogeologic Study.[19] Lithologies were found to be consistent with those from the Subtitle D studies except those of the dark gabbro sill and the light colored Metatuff of the cid formation were not encountered. This is due to the location of the site being up geological section from these features. The sandy silt/sandy clay layer with gravel is analogous to the partially weathered rock (PWR) as observed and described in the Phase 2 Design Hydrogeologic Report.

The Cid formation that occurs in the site consists of highly fractured, gray, thinly bedded, argillitic, mudstone and siltstone. Rock cores were not taken from monitoring wells installed for the sanitary landfill. Rock cores collected as part of the Phase 2 Hydrogeologic Design study identified rock quality designation values (RQD) for the Argillite as having an average value of 24.7%, indicating a highly fractured nature. The highly fractured nature of the Argillite was observed in outcrop as part of the Phase 2 Hydrogeologic Design and is expressed in the photograph below.

*Fractured Argillite of the Cid formation*

### 1.2.3 Hydrogeology

Hydrogeological properties of the monitoring wells were reported in Response to Review Comments dated April 28, 1995 and prepared by GAI Consultants. Slug tests were performed on the monitoring wells and are provided in Appendix A. A summary of slug test results are provided as Table 3. Values ranged from 3.40 x $10^{-4}$ cm/sec in MW-3, to 6.02 x $10^{-7}$ cm/sec in MW-8D, and an average of 8.39 x $10^{-5}$ cm/sec. Extensive Hydrogeological investigations have been performed on the adjacent Subtitle D MSW landfill. Hydraulic conductivities were reviewed from these reports and were found to be consistent with SAP reported hydraulic conductivity values. Average hydraulic conductivity, from monitoring wells, for PWR is 1.09 x $10^{-4}$ cm/sec and 7.79 x $10^{-5}$ cm/sec for Argillite.

Porosities were reported in Response to Review Comments and summarized in Table 4. Values of total porosity ranged from a high of 42.8% in MW-10, and MW-11 to a low of 20.0% in MW-5. Effective porosity values, as reported in the Response to Review Comments, were taken from published values for soil and rocks. Effective porosity ranges from 5-20% for monitoring wells. A more detailed investigation of porosities was performed as part of the Phase 1 and Phase 2 Design Hydrogeolgical Studies, which included hydraulic

characteristics of lithological units.[18][19] Included in Appendix A is a summary table from the Hydrogeologic Studies.

### 1.2.4 Hydrology

**Potable Sources**

A receptor survey was performed as part of the Transition Plan. The receptor survey identified 44 private water supply wells within 2000 feet of the facility. The majority of the water supply wells are located up gradient of the sanitary landfill along Stony Gap Road. The private water supply located nearest the sanitary landfill is located approximately 1500 feet west of the waste limit. A best available copy of the water supply well locations, from the Transition Plan, is included in the Plates.

A non-potable water supply well is located at the shop immediately north of the sanitary landfill. A well tag indicated that the well was installed in 1974 by Whitley Well Drilling. The well is cased to 47 feet with a total depth of 305 feet. The well is used as a non-potable source of water for toilets and machine washing. Community water is not available to the surrounding area.

**Groundwater Regime**

Regionally, Albemarle is located in the Piedmont groundwater region of the United States.[15] This area typically has the characteristics of two hydrogeologic units: the overlying regolith comprised of unconsolidated sediments/saprolitic soils and fractured crystalline bedrock. The two units are hydrogeologically connected by fractures and faults in the bedrock.

Groundwater exhibits flow dynamics that are primarily controlled by the topographical high and local drainage features. Groundwater elevations have been recorded during sampling events. A summary of Historical Groundwater Elevation Data is included in Table 2. On average, groundwater in MW-9, MW-10 and MW-11 is 2-4 feet below ground surface (bgs). MW-1, MW-2, MW-5, MW-5R and MW-7 are about 6 feet bgs, groundwater in MW-3 and MW-12 is around 11 feet bgs and groundwater in MW-4R and MW-6 is 17-20 feet bgs. Groundwater flow is generally east/southeast toward the unnamed creek. The drainage feature south of MW-4 and MW-5R results in a more easterly shift of groundwater flow, as expressed on the potentiometric map. A third feature controlling groundwater flow is located off the property. This is an unnamed drainage toward Jacobs Creek and is exhibited on Plate 1. This feature controls the southern direction of flow in and around MW-7, MW-2 and MW-6. A potentiometric map expressing flow dynamics is shown as Plate 6. Groundwater flow is opposite the direction of bedding dip. This implies that bedding is not a controlling factor in groundwater flow.

A stream trace analysis was performed on a 2.5-mile radius of the facility. Structurally controlled features were traced from USGS 7.5 min. Albemarle and Morrow Mountain quadrangles. The Rose diagrams (Plate 5) display both in symmetric (directionally independent) and asymmetric (directional dependent) forms. The symmetric mode expresses the bedding dip of N40$^o$ - 50$^o$E. Groundwater flow is opposite the direction of the bedding dip, which implies that bedding is not a controlling factor in groundwater flow. The asymmetric form expresses the local drainage features S20$^o$ - 30$^o$E, which corresponds to the regional joint system of N 10$^o$ - 20$^o$W. Drainage features are fracture dependent.

Recharge to the groundwater occurs near the topographical high northwest of the sanitary landfill. Discharge occurs into the drainage features. The recharge area appears to be limited to a 0.25 mile$^2$ area, as seen on Plate 1. Due to the limited recharge area, groundwater is typically observed in the PWR and the fractured Argillite.

The nature of the Argillite being highly fractured, groundwater flow opposite bedding dip, and groundwater flow direction being toward the discharge features implies that preferential groundwater flow is not fracture dependent. Rock masses can act as isotropic porous medium. It has been shown that "(p)arallel fractures impart a strong anisotropy to the rock mass; on the other hand a greater number of more interconnected fractures tends to reduce the anisotropy."[24][page 14] The Argillite is acting as a porous medium.

**Groundwater Flow Components**

The potentiometeric map was used to calculate the average linear velocity defined as:

$$v_x = \frac{K}{n_e}\frac{dh}{dl}$$

where

$v_x$ is the average linear velocity

K is the hydraulic conductivity

$n_e$ is the effective porosity

$\frac{dh}{dl}$ is the hydraulic gradient

The hydraulic gradient was calculated graphically by first drawing a line from each monitoring well to a perpendicular of the equipotential line. The elevations of the hydraulic head (*dh*) were calculated by subtracting the elevation equipotential from the groundwater elevation for the corresponding monitoring well. The lateral distance (*dl*) is the horizontal length of the line. *dl* values are further denoted on Plate 6. Calculation of the hydraulic gradient at a given piezometer location was determined by dividing *dh* by *dl*. Table 18 shows the results of the flow rate calculations in units of feet per year and the parameters used in the calculations.

### 1.3 Site Conceptual Model

A conceptual model of the site was developed with Visual MODFLOW designed by Waterloo Hydrogeologic, Inc. The visual MODFLOW package includes the USGS developed MODFLOW, the accompanying particle tracking program, MODPATH, as well as the contamination transport package MT3D[96] developed by Papadopulos and Associates, Inc.

The model grid consisted of an area 3200 feet x 4900 feet. The area was divided into 128 rows, 196 columns and 3 layers. To approximate the aquifer characteristics each layer was defined with distinct hydraulic properties.

Layer 1 – Sandy Silt/Sandy Clay
Layer 2 – PWR
Layer 3 – Argillite

Estimated hydraulic properties for each lithology were obtained from monitoring well data and the Design Hydrogeologic Study Phase 2[19].

| | **Hydraulic Conductivity cm/sec** | **Total Porosity** | **Effective Porosity** |
|---|---|---|---|
| Layer 1 | $5.30 \times 10^{-5}$ | 49 | 6 |
| Layer 2 | $1.09 \times 10^{-4}$ | 30 | 20 |
| Layer 3 | $7.79 \times 10^{-5}$ | 35 | 12 |

Hydraulic properties of the waste and cohesive cap were not applied as they are addressed in boundary conditions.

**Boundaries**

The integrity of Visual MODFLOW depends largely on the accurate definition of boundary conditions. The model was developed to simulate the observed hydrologic conditions. As a generalized hydrologic cycle, groundwater recharge is the result of precipitation, total runoff, evapotranspiration, and change in aquifer storage.

Precipitation data at the *Albemarle* station were reviewed on the State Climate Office of North Carolina web site.[25] The *Albemarle* station is located approximately 7 miles from the site. Annually the *Albemarle* station receives an average of 48.7 inches. Total runoff is comprised of two parts: the water lost to creeks and streams through overland runoff and water gained through groundwater recharge or base flow. Total run off is estimated to be 17.2 inches per year where overland runoff accounts for 6.8 inches and base flow accounts for

10.3 inches. Evapotranspiration is estimated at 31.0 inches per year. Aquifer "storativity S were developed primarily for the analysis of well hydraulics in confined aquifers."[11] [page 61] Change in aquifer storage in an unconfined aquifer system results in an increase/decrease in water level.[12] Change in aquifer storage is considered negligible due to the unconfined nature of the system and the assumption that the system is under steady state conditions.[11][page 205] Values of the water budget were derived in Hydrogeology and Simulation of Ground-Water Flow in the Thick Regolith-Fractured Crystalline Rock Aquifer System of Indian Creek Basin, North Carolina.[5] Based on these estimations groundwater recharge is estimated at 10.3 inches per year. Recharge area is limited due to landfill activities, structures, and roads and was applied to areas that have limited impact.

Drainage features which act as constant head features were simulated as rivers. River stage and bed elevations were estimated from topographical and potentiometric maps. Conductance was calculated from parameters in Visual MODFLOW.

**Model Calibration**

Calibration of the model was a trial and adjustment procedure. Alternative model parameters were run utilizing varied model input and multiple layers. The process was repeated to minimize the difference between the computed and observed values. These models could not be accurately calibrated due to limitations in the MODFLOW program, in part due to the thickness of the fractured rock and interaction groundsurface. The process was repeated to minimize the difference between the computed and observed values. The site conceptual model represents the most accurate conceptual model.

A graph of simulated heads versus observed heads is included in Appendix C. The calibration for the model is believed to be successful for the conditions at this site. Head variation was limited to a root mean square of 3.57. The low root mean square indicates that the model has been calibrated accurately to observed values.

# 2 CONTAMINATION CHARACTERIZATION

## 2.1 Contamination of Concern

### 2.1.1 Inorganic Constituents

Inorganic constituents Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Thallium, Vanadium, and Zinc, have all been detected in groundwater samples. Included in Table 6 is a summary of Historical Inorganic Groundwater Results. Constituents that have been identified as being statistically significant included Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead,

Nickel, Vanadium, and Manganese. While these constituents have been detected as statistically significant at least one time, no constituents have been detected with any consistency and there is no regularity with which monitoring wells are identified as being statistically significant. A summary of statistically significant inorganics is provided in Table 8. Inorganic constituents detected above 2L include Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel and Zinc. Inorganic constituents Antimony, Arsenic, Barium, Beryllium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Vanadium, and Zinc have been detected in surface water samples. A summary of Historical Surface Water Inorganics is provided in Table 7.

These results are used to identify if the detected inorganics are the result of the waste disposal activities. Ground and surface water samples are collected as unfiltered samples. Unfiltered samples represent the total concentration of inorganics. Often times "(s)tatistical analysis of total metal concentrations may not provide an accurate representation of contamination at the facility."[22][page 79] In addition, sampling techniques play a role in the detection of inorganic constituents. Too high a purge velocity can increase the turbidity of the sample, which can over estimate sampling results.[6]

Background sampling detected Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Vanadium and Zinc with Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, and Zinc being detected above 2L levels. A summary of background sampling results is provided in Appendix B. Sampling results from the Subtitle D landfill were reviewed. Inorganic constituents Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Vanadium, and Zinc have been detected in multiple wells including the background well. Historical inorganic detections for the Subtitle D landfill are provided in Appendix B. Manganese was the only constituent detected in the C&D landfill not detected in the Subtitle D landfill.

Geochemistry of sediments for the USGS Albemarle Quadrangle were retrieved from the USGS National Uranium Resources Evaluation (NURE)[26] database. The presence of metals in NURE soil samples included, but are not limited to, Barium, Beryllium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Thallium, Tin, Vanadium and Zinc. Arsenic, Cadmium, and Lead were not detected in the NURE soil sample.

The presence of metals occurring in background samples, surface water samples, Subtitle D landfill samples, and NURE sediment samples indicate that Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Thallium, Vanadium, and Zinc are falsely reported, or naturally occurring and don't represent contamination associated with the landfill. All of the constituents detected can be attributed to turbidity (falsely reported) or natural occurrence.

### 2.1.2 Organic Constituents

Organic constituents have been detected in the groundwater from recent sampling events. A sampling history is provided in Appendix B. A summary of detected Historical Organic Groundwater Results is included as Table 9. Table 10 shows constituents which have been historically detected as statistically significant. They are Chlorobenzene, cis-1,2-Dichloroethene, Benzene, Vinyl Chloride, Trichlorofluoromethane, Methylene Chloride, Dichloromethane. Organic constituents detected above 2L include Benzene, Chloroethene, Methylene Chloride, and Tetrachloroethene. Organic constituents have not been detected in surface water samples.

Recent sampling has observed an increase in statistically significant organic constituents. The increase, particularly in MW-7, can be attributed to the lowering of the Solid Waste Section detection limits for certain compounds. Provided in Table 11 is the July 2007 groundwater sample results. Detected organics include Benzene, Methylbenzene, Methylene chloride, p-Dichlorobenzene, Tetrachloroethene, Trichloroethene, and Trichlorofluoromethane. Only three organics were detected above 2L: Benzene, Methylene chloride, and Tetrachloroethene. Included below is a summary of detected organic constituents.

Appendix II sampling was performed on selected wells (MW-1, MW-2, MW-3, MW-6, MW-7, and MW-9), on August 22, 2007. The only non-Appendix I constituent detected was Bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate was detected with a J qualifier, just above the Method Detection Limits but below the Soild Waste Section Limit, in background well MW-1 and monitoring wells MW-6 and MW-9. Bis(2-ethylhexyl)phthalate is a widely used plasticizer in PVC. The presence of Bis(2-ethylhexyl)phthalate in the background well, its wide use, and the low detection limits indicate that this was a false positive detection and is not attributed to contamination associated with the landfill. A summary of Appendix II sampling is included in Appendix B.

*Detected Organic Constituents*

| Constituent | Number of Sampling Events | Number of Sampling Events with Detections | Total Number Detects | Last date of Detect | Monitoring Wells Constituent Detected In |
|---|---|---|---|---|---|
| **APPENDIX I VOC'S** | | | | | |
| Chlorobenzene | 29 | 11 | 15 | 1/25/2007 | MW-2, MW-3, MW-7, MW-10 |
| Methylene chloride | 29 | 5 | 6 | 7/03/2007 | MW-1, MW-3, MW-6, MW-7 |
| p-Dichlorobenzene | 29 | 2 | 4 | 7/03/2007 | MW-2, MW-3, MW-7 |
| Carbon disulfide | 29 | 5 | 14 | 1/9/2002 | MW-2, MW-3, MW-4R, MW-5R, MW-6, MW-7, MW-10, MW-11, MW-12 |
| 1,1-Dichloroethane | 29 | 6 | 9 | 1/25/2007 | MW-3, MW-7, MW-9, MW-11 |
| Methyl ethyl ketone | 29 | 1 | 1 | 4/14/1999 | MW-5R |
| Chloroethene (Vinyl Chloride) | 29 | 1 | 1 | 1/25/2007 | MW-7 |
| Chloroethane | 29 | 1 | 1 | 1/25/2007 | MW-12 |
| Tetrachloroethene | 29 | 2 | 4 | 7/03/2007 | MW-3, MW-7 |
| Benzene | 29 | 3 | 3 | 7/03/2007 | MW-7, MW-10 |
| cis-1,2-Dichloroethylene | 29 | 2 | 3 | 1/25/2007 | MW-3, MW-7, MW-9 |
| Trichloroethene | 29 | 2 | 3 | 7/03/2007 | MW-3, MW-9, SHOP |
| Methylbenzene (Toluene) | 29 | 4 | 5 | 7/13/2006 | MW-9, MW-10, MW-12 |
| Trichlorofloromethane | 29 | 8 | 10 | 7/03/2007 | MW-6, MW-7 |

Constituents of concern are identified as being statistically significant or above 2L levels. The constituents of concern are Benzene, Methylene Chloride, Tetrachloroethene, Chlorobenzene, cis 1,2-Dichloroethylene, and Trichlorofloromethane.

## 2.2 Contamination Distribution

Contamination consists of Benzene, Methylene Chloride, Tetrachloroethene, Chlorobenzene, cis 1,2-Dichloroethylene, and Trichlorofloromethane. The source of contamination appears to be the first unit of the sanitary landfill that was closed with a 24 inch final soil cover. The contamination appears to consist of two plume fronts. The eastern plume is concentrated near MW-9, MW-10, and MW-3. The western plume is concentrated near MW-2, MW-6, and MW-7. The current extent of VOC contamination is shown on Plate 8 and in the cross section on Plate 7.

Dissolved Phase VOC contamination appears to be limited to shallow contamination. While the shop well, having a total depth of 305 feet, does have contamination, it is not a representative sample of deep groundwater. Records indicate the shop well, with a 47 foot casing depth, was drilled as an open boring. Standard drilling practice would have been to install a casing on top of or just into rock. The depth of the

casing corresponds to where rock would have been encountered. Estimated top of competent rock in shown on Plate 9.

The most likely source of deep groundwater contamination comes from the dense nonaqueous phase liquid (DNAPL) which implies a pure source area. It is highly unlikely that free phase DNAPL exists since landfill leachate is due to percolation of precipitation through the waste. If DNAPL were to exist, the most likely pathway way for contamination flow would be along the observed fracture feature associated with the bedding dip. Monitoring well MW-8D was installed in an up dip location. Contamination has not detected in MW-8D. In addition the low level of contamination from the shop well, which is also installed in an up dip location and in close proximity to the waste limit, implies that free phase DNAPL is not present. The lack of free phase DNAPL indicates that the dissolved contamination would have similar flow characteristics of groundwater and would be toward the groundwater discharge features of the drainages.

Benzene is an aromatic hydrocarbon. Chlorobezene is halogentated aromantic. Methylene chloride, Tetrachoroethene, cis 1,2-Dichloroethylene, and Trichlorofloromethane are halogenated aliphatics.[23]

*Physical Characteristics of Constituents of Concern*

| **Constituent** | **Density[1] ($g/cm^3$ at 20°C)** | **Henry's Constant[1] ($atm\text{-}m^3/mol$ 20°C)** | **Water Solubility[1] (mg/l at 20°C)** | **Octanol - Water Partitioning Coefficient[1] (log $K_{ow}$)** | **Soil - Water Partitioning Coefficient[2] $K_{oc}$ (mL/g)** | **Mobility Class[2]** |
|---|---|---|---|---|---|---|
| Benzene | 0.88 | 0.0055 | 1,780 | 2.13 | 97 | High |
| Methylene Chloride | 1.33 | 0.002 | 20,000 | 1.26 | 25 | Very High |
| Tetrachloroethene | 1.623 | 0.012 | 200 | 2.88 | 303 | Moderate |
| Chlorobenzene | 1.11 | 0.0037 | 500 | 2.84 | 318 | Moderate |
| cis 1,2-Dichloroethylene | 1.284 | 0.0029 | - | - | - | - |
| Trichlorofloromethane | 1.48 | 0.126 | 1,240 | 2.53 | 476 | Moderate |

[1] *Data obtained from Environmental Biotechnology: Principles and Applications*[23]

[2] *Data obtained from Applied hydrogeology 3rd ed.*[11]

## 2.3 Source Control Measures

The first unit of the landfill stopped receiving MSW by October 1991 and was closed with a 24 inch final soil cover. The second unit was closed with a cohesive cap of 18 inches of soil liner with permeability of $1 \times 10^{-5}$ cm/sec, and 18 inches of erosive layer. The surrounding property is owned and controlled by the City of Albemarle or Stanly County and is used as the Subtitle D Landfill or current/future borrow site for daily cover in the Subtitle D landfill. The property southwest of the landfill is currently being negotiated for purchase.

A gas venting system for methane extraction/collection was installed as part of the transition plan. The permanent probes were to be installed by October 1994, and are monitored quarterly.

### 2.3.1 MT3D[96] Modeling

MODPATH with transport package MT3D[96] was used to simulate a release. Modeling parameters assume leakage occurred to prior installation of the cap systems. Calibration of the model was a trial and adjustment procedure. The plume model was calibrated to time periods 1998, 2004, 2005, 2006 and 2007. The initial simulation period was selected to begin in 1990. Target step periods of 8 years (1998), 14 years (2004), 15 years (2005), 16 years (2006), 17 years (2007), 25 years (2015), 35 years (2025) and 50 years (2040) were simulated.

MT3D[96] modeling does not allow for remediation implementation at specified time periods during the modeling simulation, nor does it allow for enhanced biological or radioactive decay at specified time periods. Included in Appendix C is the estimated extent of the plume for the simulated time periods that would have resulted from groundwater movement without enhanced remediation, biological or radiometric decay. Modeling indicates that through advection flow contamination remains on the currently owned property through 2015 with an estimated VOC contamination of 1 ppb reaching the property by 2025.

### 2.3.2 Stream Dilution

The dilution factor of the surface water was determined using the following surface water mixing formula utilized by the NCDENR UST Section for G3CTM modeling.[20]

$$C_{sw} = C_{gs}\left[\frac{Q_{gw}}{\left(Q_{gw} + Q_{sw}\right)}\right]$$

where:

$C_{sw}$ = surface water contaminant concentration

$C_{gs}$ = groundwater contaminant concentration at the groundwater/surface water boundary

$Q_{gw}$ = groundwater flux into surface water body: $KA\left(\frac{dh}{dl}\right)$

where:

K = hydraulic conductivity (ft/sec)

A = cross sectional area of groundwater discharge ($ft^2$)

$\frac{dh}{dl}$ = hydraulic gradient (unitless)

$Q_{sw}$ = minimum average discharge of a stream ($ft^3$/sec).

Contaminant concentrations of the highest observed concentration as well as the most recent concentration were calculated. $Q_{sw}$ flow was obtained by identifying the size of the local drainage area using stream trace techniques. The local drainage area size was compared to published drainage areas of equal size with known discharge rates.[5] The discharge rates were averaged to attain the $Q_{sw}$ flow value of 2.35 $ft^3$/sec. As a conservative estimate, a plume length of 1500 feet (the entire length of the stream from SW-1 to MW-3) with a plume depth of 15 feet was used to calculate the cross sectional area of discharge of 22500 $feet^2$. Results of the stream dilution calculation are shown on Table 20.

### 2.4 Groundwater End Use

Groundwater flow is toward the discharge features: the unnamed tributary of Jacobs Creek and the off site drainage feature. Both these features eventually flow into Jacobs Creek which empties into Lake Tillery.

### 2.5 Exposure Pathways

Evaluation of exposure pathways is designed to establish how a population is at risk of contamination exposure. If there is no method of exposure, there is no risk for adverse effects. There are four components that comprise the exposure pathways: (1) source and mechanism of constituent release into the environment, (2) retention and transport system, (3) exposure point and (4) route of exposure to receptor at determined exposure point.

(1) Source of release has been identified as the landfill site. Mechanism of the release was the result of water percolating through the waste, thus picking up contamination and encountering the groundwater.
(2) Mechanism for transport of the contamination includes groundwater flow and vapor migration.
(3) Exposure points are the pathways in which contamination can be contacted - water supply wells, surface water, and vapor contact.
(4) Route of exposure is the method of contact at the exposure points – ingestion, inhalation and dermal.

Possible exposure pathways are assessed based on completeness, plausibility, and importance in relation to human health and the environment. The pathways for population exposure are limited to ingestion of contaminated groundwater through drinking, absorption of contaminated groundwater through dermal contact and inhalation of vapors. Source control measures limit direct contact with the contamination.

### 2.6 Human Health Risk Assessment

Human health was assessed for possible risk factors for contamination associated with the landfill. An evaluation of toxicity levels, presence of carcinogenic vs. non-carcinogenic constituents, as well as lifetime average daily dose calculations were preformed for the constituents of concern. The primary purpose of toxicity assessment is to identify susceptible populations and lifestyles.

### 2.6.1 Carcinogenic

Cancer is caused through a complex series of reactions and processes, that may produce tumors at the point of contact or throughout the body in other tissues once they have been dispersed throughout the system of the host.[7] Various chemicals elicit different responses and different doses of the same chemical can create different responses. The USEPA has five recommended hazard descriptors, "Carcinogenic to humans", "Likely to be carcinogenic to humans", "Suggestive evidence of Carcinogenic Potential", "Inadequate information to assess carcinogenic potential", "Not likely to be carcinogenic to humans".[7] For the purpose of this report focus will be placed on the first two descriptors.

The current guidelines approach the situation with the assumption that any exposure to a known carcinogen has a possibility of causing cancer. The EPA's Integrated Risk Information System (IRIS) was queried to evaluate carcinogenic risks for the constituents of concern, Benzene, Methylene Chloride, Tetrachloroethene, Chlorobenzene, cis 1,2-Dichloroethylene and Trichlorofloromethane.[6] Chlorobenzene and cis-1,2-dichloroethylene are reported as "not classifiable as to human carcinogenicity". Dichloromethane and Tetrachloroethene have 'inadequate information to assess carcinogenic potential'. Benzene is considered "carcinogenic to humans" by any route of exposure. Trichlorofluoromethane "has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential".[6]

Results for Benzene were compared with the Carcinogenic Slope factor (Sfo or Sfi) found in the Section 9 tables from the EPA. Hazard index values were assessed and are shown on Table 12, Table 13, and Table 14. Carcinogenic hazard index is significantly less than 1 for Oral, Inhalation and Dermal exposure for observed concentration of contamination.

### 2.6.2 Non-Carcinogenic

The non-carcinogenic effects typically require overcoming the body's ability of resistance; therefore creating a threshold below which effects will not occur. Similarly to carcinogenic effects constituents may enduce adverse effects based on dose, exposure rate, duration, and the individual susceptibility. Also like cancer, they can show up at the point of contact or spread throughout the system affecting tissue sporadically. Most chemicals can produce a range of effects depending on the aforementioned variables.

Human health risk assessment for non-carcinogenic effects was developed by the USEPA based on a series of toxicity studies to calculate the risk for non-carcinogenic effects. These constituent specific reference dose (RfD) values represent daily exposure levels that are not harmful to human health over a lifetime. These values for constituents of concern are shown on Table 13 for oral ingestion, Table 14 for inhalation, and Table 15 for dermal exposure.

## 2.7 Adult Risk

Adults can potentially be exposed to contaminations of concern through consumption of contaminated water, bathing in contaminated water or inhalation of vapors arising from contaminated groundwater. Risk assessments were performed assuming adults would consume 2 liters of water each day with an exposure duration of 30 years.* Dermal exposure risks assumed contact through bathing based on one 15 minute bath per day. Inhalation exposure assumed 20 cubic meters of air per day.∂ Risk assessment is based on worst case scenario, where exposure is to the maximum observed concentrations and the current concentrations for the comtaminant of concern.

Non-carcinogenic, Lifetime Average Daily Dose (LADD), values were calculated for the constituents of concern and then compared to RfD values by generating hazard index values. If a hazard index is greater than 1, there may be a concern for remedial action. Hazard index values for adults were shown on Table 13, Table 14, and Table 15 to be less than 1. Risk associated with contact with the contamination is considered minimal based on historic and current concentrations and the contamination limited to within the facilities boundaries.

## 2.8 Child Risk

Children can potentially be exposed to contaminations of concern through consumption of contaminated water, bathing in contaminated water or inhalation of vapors arising from contaminated groundwater. Risk assessments were performed assuming children would consume 1 liter of water each day with an exposure duration of 8 years. Dermal exposure risks assumed contact through bathing based on one 15 minute bath per day. Inhalation exposure assumed 12 cubic meters of air per day.∂ Risk assessment is based on worst case scenario, where exposure is to the maximum observed concentrations and the current concentrations for the contaminant of concern.

Non-carcinogenic, LADD, values were calculated for the constituents of concern and then compared to RfD values by generating hazard index values. If a hazard index is greater than 1, there may be a concern for remedial action. Hazard index values for children were shown on Table 13, Table 14, and Table 15 to be less than 1. Risk associated with contact with the contamination is considered minimal based on historic and current concentrations and the contamination limited to within the facilities boundaries.

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* Non-Carcinogenic values assume a 30 year exposure. Carcinogenic values assume a 70 year exposure.

∂ Assumed values based on EPA published values.[7][8][9][10]

### 2.9 Sensitivity Receptor Pathways

Current human exposure to the contamination at the site is very minimal. Institutional controls, as discussed in Section 3.2, limit access to the site. The nearest potable groundwater user is located approximately 1500 feet west of the waste limit. The use of the contaminated shop well as a non-potable source of water is cause for concern. Access to shop and shop well is limited to facility personnel. Signs throughout the shop indicated that the water is not for potable consumption. Contamination is contained on the property. Contamination of the western plume is just at the relevant point of compliance of 50 feet from the property line. Contamination has not reached the property line as shown in Monitoring wells MW-24 and MW-25.

## 3 CORRECTIVE MEASURES SCREENING AND EVALUATION

### 3.1 Overview

A remediation system needs to be designed that will be both cost effective and efficient to properly clean up the contamination. Contamination of concern is made up of aromatic hydrocarbon, halogentated aromatic, and halogentated aliphatics. Aromatic hydrocarbons tend to decompose under aerobic conditions while the halogenated aliphantics and aromatics tend to decompose under anaerobic conditions.[23] Due to the nature of the contamination a single treatment method may be effective.

### 3.2 Institutional Controls

Several institutional control measures have been implemented to restrict access and control to the site and possible contact with contamination. Public access to the site is limited during operation hours. A chain link fence runs the length of Stony Gap Road. Heavy vegetation limits access from other areas.

### 3.3 Infiltration Controls

Prior to becoming a C&D landfill, one unit of the MSW sanitary landfill was closed with a 24 inch final soil cover while the second unit of the MSW sanitary landfill was closed with a cohesive cap of 18 inches with a soil permeability of 1 x $10^{-5}$ cm/sec, and 18 inches of erosive layer. A grass vegetative cover has been established on the MSW sanitary landfill which is currently not receiving C&D waste. The vegetative cover acts as both an erosion control measure and also aids in the evapotranspiration process to reduce infiltration. "(T)he natural evapotranspiration process of vegetation has been recognized and harnessed as an alternative cover method to reduce landfill infiltration."[21][page 392]

### 3.4 Landfill Gas Controls

Currently the first unit of the sanitary landfill does not have measures in place to control landfill gas. Methane gas in monitored quarterly in 13 methane gas probes. Probe 12, which is located near MW-2, had a recent detection of methane in 2007. A passive horizontal gas venting system for methane extraction/collection was installed as part of the transition plan on the second unit of the sanitary landfill.

### 3.5 Groundwater Technologies

Various methods are available for remediation of contaminated groundwater. These methods include:

- Removal processes that physically remove the contamination or contamination medium.
- Extraction processes that remove the contamination for the impacted medium.
- Destructive processes that chemically or biologically destroy the contaminant.
- Encapsulation processes that prevent the contamination from migrating.

Each type of remediation process has specific advantages and disadvantages. The process should be tailored to meet the site specific requirements. Corrective measures need to be such that compliance is achieved by 250 feet from the waste limit or within 50 feet of the property line, whichever is less. A number of corrective measures will be examined herein. Several common methods were not addressed due to their limitations. Physical removal of the contaminated medium through the measure of pump and treat was not addressed. Pump and treat is limited in that it utilizes water as a carrier and is not affective at totally removing the contamination.[21] Permeable Treatment Barriers, which require groundwater to flow past the barrier, were not addressed due to the low velocity of the groundwater.

#### 3.5.1 Monitored Natural Attenuation

Monitored Natural Attenuation (MNA) consists of monitoring the natural attenuation process to demonstrate that contamination is degrading prior to reaching the relevant point of compliance. While MNA passively treats the contamination, it does not provide containment of contamination, nor does it address the source area of contamination. In addition, MNA is not appropriate as a remediation alternative if there is a threat to human health. Natural Attenuation is achieved through processes of dilution, sorption, volatilization, dispersion and degradation of contamination.

#### 3.5.2 Vapor Extraction System/Bioventing

Vapor Extraction (VE) and Bioventing induce air flow into the subsurface to volatilize the contamination. Vapor Extraction actively treats the contamination medium. This type of remediation more readily addresses contaminated soil and vadose contamination. To adequately strip contamination from the groundwater, the constituents of concern need to be susceptible to volatilization. A low Henry's Constant is favorable. In

addition, site soil conditions must be favorable to allow for air flow. Air flow can be limited in clayey soils. Implementation of the system requires pilot testing to adequately engineer an effective system.

### 3.5.3 Air Sparging

Air Sparging directly volatilizes the contamination *in situ* and provides oxygen for biodegradation. Air sparging is performed by forcing air into the groundwater through injection wells. Typically much of the mass removal of contamination occurs within the initial weeks/months of operation with biodegradation becoming more significant during long-term operation. As with VE systems, contamination and site soil conditions need to be favorable for sparging to be an adequate treatment alternative. Contamination of concern needs to readily volatilize and degrade under aerobic conditions. High clay content and tightly packed soils limit the effectiveness of air sparging requiring more air injection wells. The system needs to be finely tuned to achieve break out pressure in wells and control air flow. Implementation of the system requires a pilot testing to adequately engineer an effective system.

### 3.5.4 Enhanced Bioremediation

Enhanced Bioremediation (EB) is a unique, evolving, *in situ* treatment technology. EB introduces chemical compounds and/or organisms to stimulate and enhance the biodegradation process. The uniqueness of EB is that it can be tailored to the constituent of concern. Typical application is with injection of the chemical into the substrate. Application can use single injection points or permanent injection points.

Typically injected compounds include HRC®, ORC®, emulsified edible oils (soy bean oil, molasses, EOS®), and hydrogen peroxide. As with VE and AS, site conditions need to be favorable for proper application. A dense formation limits the injection density and may require multiple closely spaced injection points. The life expectancy of compounds is generally less than a year and periodic re-injections may be required to achieve desired results. Implementation of the system requires state regulation permitting prior to injection of chemicals.

### 3.5.5 Phytoremediation

Phytoremediation is the use of plants to remediate the contamination. Remediation is addressed through rizosphere biodegradation, phytoextraction, phytodegradation and phytostabilization. Rizosphere biodegradation is the microbiological breakdown of organic contamination in the soil. Phytoextraction is the uptake of organics and inorganics into the roots and above ground portions of the plants. Phytodegradation occurs within the plant where the contamination is either degraded within or volitalized from the plant. Phytostabilization immobilizes organic and inorganic contamination through adsorption and accumulation of roots and precipitation in the rhizosphere Direct uptake of the plants is dependent on the relationship of the

octanol-water partition coefficent ($K_{ow}$), where uptake is achieved when the log of $K_{ow}$ ranges from 0.5 to 3.5.[21]

### 3.5.6 Constructed Wetland

Constructed wetlands have been used for treatment of municipal waste water, industrial waste water, agricultural waste water and stormwaters. While constructed wetlands can be used for treatment of contaminated groundwater water, the groundwater must be shallow or channeled into the wetland. Constructed wetlands passively purify contamination through enhancement of the natural processes of degradation, sorption, and phytoremediation.

# 4 SUMMARY CONCLUSIONS

## 4.1 Conclusions

Remediation alternatives are shown on Table 19. A number of factors influence the selection of remediation alternatives

- Two plumes exist.
- Contamination is below risk exposure levels.
- There are no potable water supply wells within 1500 feet of the waste limit.
- The western plume has the potential to migrate off site.
- Modeling shows that migration of contamination is minimal.
- The recent detection of the western plume is the result of the Solid Waste Section Reporting Limit changes.
- Phytoremediation and stream dilution is occurring on the eastern plume under natural conditions.

A two fold remediation plan is needed to address the contamination.

**Eastern Plume**

Stream dilution calculations and phytoremediation is actively controlling the eastern plume. The conservative estimations of groundwater contamination levels needed to exceed surface water standards will very likely never be reached. As part of the Subtitle D sampling, surface water is monitored downstream at SW-6. Organic constituents have <u>not</u> been detected in SW-6. Thus the most cost effective and minimally invasive approach for remediation of the eastern plume is to allow natural conditions to continue.

**Western Plume**

Based on the above observations the most cost effective and practical approach for remediation is to purchase the property where the western plume is migrating. Upon purchase of the property, the relevant point of compliance then becomes 250 feet from the waste limit. Modeling indicates that through pure advection flow, without natural decay, the western plume may reach the relevant point of compliance by 2025. Since low levels of contamination exist, expensive remediation systems that focus on high levels of contamination aren't practical. A cost effective approach will be to plant Hybrid Willow trees in the existing open areas located between the waste and the property line. The Hybrid Willow trees will act as a hydrological control. The low $K_{ow}$ for the constituents of concern indicate that pytoremediation is a viable remediation method.

**Additional Measures**

To limit the exposure potential to contamination, abandonment of the shop well is needed. Attention needs to be placed on the methane detection system, due to the recent detection of methane gas in Probe 12. If methane is continues to be detected, implementation of a passive methane trench may be warranted. Finally, an investigation of the cap system needs to be performed to ensure water is not ponding on the landfill and settling has not occurred. A time frame for implementation of the proposed actions will be addressed in the Corrective Action Plan.

## 4.2 Public Meeting

Upon acceptance of the remediation alternative, a public meeting will be conducted to discuss the results of the Assessment of Corrective Measures. Prior to the meeting the ACM report will be made available for public review.

Respectfully submitted
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**Table 1:** Well Construction Details

| Monitoring Well | Date Installed | Ground Elevation | Datum Elevation | Northing | Easting | Well Diameter | Boring Diameter | Screen Interval (BGS) | TOR | Status |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 03/20/1991 | 445.60 | 447.21 | 569161.7600 | 1655967.3800 | 2 | 6 | 3-18 | 430.10 | Sampling Plan |
| MW-2 | 03/21/1991 | 429.87 | 431.85 | 567560.0300 | 1655560.0000 | 2 | 6 | 2.5-17.5 | 413.87 | Sampling Plan |
| MW-3 | 03/20/1991 | 393.93 | 396.11 | 568269.0500 | 1657132.7400 | 2 | 6 | 7.5-22.5 | 382.43 | Sampling Plan |
| MW-4 | 03/25/1991 | 394.27 | 396.19 | 566897.9510 | 1657520.6150 | 2 | 6 | 3.5-18.5 | 377.77 | Decomissioned |
| MW-4R | 09/08/1994 | 412.83 | 415.36 | 566905.2600 | 1657249.8300 | 2 | 6 | 19.4-34.4 | 409.83 | Replaced MW-4 |
| MW-5 | 09/08/1994 | 413.13 | 415.73 | 566907.2600 | 1657250.8300 | 2 | 6 | 4.9-19.9 | - | Abandoned |
| MW-5R | 02/24/1999 | 413.13 | 416.06 | 566701.8300 | 1656958.2800 | 2 | 6 | 15-25 | - | Replaced MW-5 |
| MW-6 | 09/08/1994 | 437.65 | 439.63 | 567044.7000 | 1655827.7700 | 2 | 6 | 20.5-35.5 | 430.65 | Sampling Plan |
| MW-7 | 09/08/1994 | 429.42 | 431.30 | 567967.4500 | 1655267.8800 | 2 | 6 | 12.92-27.92 | 411.42 | Sampling Plan |
| MW-8 | 09/08/1994 | 484.79 | 486.34 | 568832.1400 | 1655475.7600 | 2 | 6 | 20.5-35.5 | - | Sampling Plan |
| MW-8D | 06/25/2007 | 488.81* | 491.38* | 568820.5800 | 1655494.2092 | 2 | 6 | 60.9-75.9 | 488.81* | Monitoring Point |
| MW-9 | 09/08/1994 | 389.11 | 392.64 | 569199.1700 | 1656883.0200 | 2 | 6 | 1.1-16.1 | 386.11 | Sampling Plan |
| MW-10 | 09/08/1994 | 385.38 | 388.01 | 568679.6600 | 1657073.4700 | 2 | 6 | 2.1-17.7 | 382.38 | Sampling Plan |
| MW-11 | 09/08/1994 | 384.40 | 386.78 | 567971.5200 | 1657356.3600 | 2 | 6 | 2.24-17.24 | 374.90 | Sampling Plan |
| MW-12 | 09/08/1994 | 398.07 | 399.47 | 567474.4220 | 1657534.6800 | 2 | 8 | 6.96-21.96 | - | Sampling Plan |
| MW-24 | 07/04/2007 | 429.19* | 432.19* | 567922.4680 | 1655228.8793 | 2 | 6 | 6.25-21.25 | 423.44* | Monitoring Point |
| MW-25 | 07/04/2007 | 422.32* | 425.22* | 567504.0292 | 1655499.7712 | 2 | 6 | 6.2-18.2 | 417.32* | Monitoring Point |

NOTE:
1. Ground, datum and TOR elevation are in units of feet, well and boring diameter are in units of inches.
2. * Survey data suspect due to differences in elevations of adjacent monitoring wells.

**Table 2:** Historical Groundwater Elevations

| WELL | 9/15/1994 | 11/29/1994 | 2/25/1995 | 10/30/1995 | 4/29/1996 | 10/24/1996 | 5/28/1997 | 10/23/1997 | 4/22/1998 | 10/27/1998 |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 438.71 | 444.51 | 444.08 | 442.61 | 442.06 | 441.21 | 439.72 | 442.11 | 442.28 | 433.20 |
| MW-2 | 419.85 | 429.55 | 428.82 | 426.13 | 426.60 | 424.20 | 424.53 | 423.90 | 427.13 | 420.27 |
| MW-3 | 384.91 | 385.26 | 385.21 | 383.11 | 383.74 | 382.41 | 382.47 | 382.63 | 383.13 | 382.01 |
| MW-4R | 398.56 | 396.98 | 400.42 | 398.76 | 396.63 | 395.96 | 394.81 | 394.76 | 398.78 | 391.51 |
| MW-5 | 401.26 | 398.71 | 412.88 | 410.81 | 409.28 | 408.91 | 408.31 | 409.96 | 410.91 | - |
| MW-5R | - | - | - | - | - | - | - | - | - | - |
| MW-6 | 417.96 | 417.61 | 420.53 | 418.43 | 419.48 | 417.33 | 417.57 | 415.06 | 421.12 | 414.29 |
| MW-7 | 421.15 | 423.30 | 428.50 | 426.35 | 427.02 | 425.30 | 424.10 | 421.44 | 427.30 | 416.58 |
| MW-9 | 378.34 | 391.29 | 390.54 | 388.09 | - | 386.39 | 386.37 | 387.14 | 387.20 | 385.72 |
| MW-10 | 372.41 | 386.81 | 386.41 | 384.18 | 384.76 | 384.01 | 383.74 | 383.59 | 384.03 | 382.66 |
| MW-11 | 374.78 | 382.88 | 383.88 | 380.73 | 381.18 | 379.92 | 379.92 | 380.01 | 381.60 | 379.62 |
| MW-12 | 378.97 | 389.97 | 392.54 | 390.45 | 387.69 | 386.87 | 386.19 | 385.27 | 389.22 | 384.29 |

| WELL | 4/14/1999 | 2/7/2000 | 6/2/2000 | 12/5/2000 | 7/11/2001 | 1/9/2002 | 6/25/2002 | 12/16/2002 | 6/18/2003 | 1/6/2004 |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 440.86 | 443.13 | - | - | 434.16 | 429.30 | - | 442.76 | 442.25 | 441.76 |
| MW-2 | 424.49 | 427.70 | 421.90 | 419.87 | 422.14 | 416.51 | 416.48 | 426.85 | 427.23 | 425.02 |
| MW-3 | 382.57 | 383.52 | 381.74 | 382.04 | 382.11 | 382.23 | 380.96 | 383.63 | 383.73 | 382.73 |
| MW-4R | 393.65 | 397.95 | 392.21 | 390.65 | 392.39 | 389.51 | 389.48 | 399.10 | 400.11 | 396.41 |
| MW-5 | - | - | - | - | - | - | - | - | - | - |
| MW-5R | 407.50 | 409.47 | 405.92 | 406.19 | 406.90 | 405.81 | 401.58 | 409.61 | 410.21 | 408.41 |
| MW-6 | 417.61 | 418.31 | 415.63 | 413.21 | 414.93 | 411.85 | 412.48 | 417.80 | 420.82 | 418.58 |
| MW-7 | 425.82 | 426.77 | 419.98 | 417.27 | 419.73 | 414.11 | 414.88 | 425.97 | 426.58 | 427.20 |
| MW-9 | 386.35 | 387.51 | 385.79 | 386.13 | 386.06 | 386.91 | 383.23 | 387.64 | 387.55 | 386.70 |
| MW-10 | 383.05 | 384.11 | 382.11 | 383.19 | 382.59 | 383.58 | 381.09 | 384.22 | 384.13 | 383.71 |
| MW-11 | 380.27 | 381.82 | 379.00 | 379.53 | 379.33 | 379.78 | 378.43 | 381.74 | 381.67 | 380.41 |
| MW-12 | 384.11 | 389.37 | 387.42 | - | 383.94 | 383.53 | 381.49 | 388.72 | 389.16 | 385.16 |

| WELL | 6/23/2004 | 1/6/2005 | 6/16/2005 | 1/26/2006 | 1/25/2007 | Observed High | Observed Low | Difference | Average |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 431.71 | 436.89 | 437.22 | 442.84 | 442.90 | 444.51 | 429.30 | 15.21 | 439.83 |
| MW-2 | 419.74 | 423.14 | 424.00 | 426.91 | 426.66 | 429.55 | 416.48 | 13.07 | 423.98 |
| MW-3 | 381.92 | 382.64 | 382.45 | 383.66 | 383.61 | 385.26 | 380.96 | 4.30 | 382.98 |
| MW-4R | 392.91 | 394.48 | 397.12 | 399.38 | 399.81 | 400.42 | 389.48 | 10.94 | 395.69 |
| MW-5 | - | - | - | - | - | 412.88 | 398.71 | 14.17 | 407.89 |
| MW-5R | 406.27 | 407.42 | 408.54 | 409.45 | 409.91 | 410.21 | 401.58 | 8.63 | 407.55 |
| MW-6 | 415.61 | 417.49 | 418.13 | 419.49 | 419.89 | 421.12 | 411.85 | 9.27 | 417.25 |
| MW-7 | 418.78 | 426.90 | 424.60 | 427.13 | 427.58 | 428.50 | 414.11 | 14.39 | 423.37 |
| MW-9 | 385.37 | 386.61 | 385.85 | 387.47 | 387.33 | 391.29 | 378.34 | 12.95 | 386.57 |
| MW-10 | 382.39 | 383.99 | 382.79 | 384.26 | 384.43 | 386.81 | 372.41 | 14.40 | 383.29 |
| MW-11 | 379.26 | 380.27 | 379.97 | 382.23 | 382.30 | 383.88 | 374.78 | 9.10 | 380.42 |
| MW-12 | 383.98 | 384.26 | 385.06 | 389.18 | 389.09 | 392.54 | 378.97 | 13.57 | 386.50 |

**Table 3:** Summary of Slug Test Results

| | Screen Interval (BGS) | Initial DTW (BTOP) | Initial Head Change | K (cm/sec) | Lithology |
|---|---|---|---|---|---|
| MW-1 | 3-18 | 15.10 | 15.10 | 1.40E-04 | Argillite |
| MW-2 | 2.5-17.5 | 9.00 | 9.00 | 6.60E-05 | Sandy Silt with Gravel |
| MW-3 | 7.5-22.5 | 14.40 | 14.40 | 3.40E-04 | Argillite |
| MW-4R | 19.4-34.4 | 23.05 | 23.05 | 1.40E-05 | Argillite |
| MW-5 | 4.9-19.9 | 9.30 | 9.30 | 5.05E-05 | Argillite |
| MW-6 | 20.5-35.5 | 24.20 | 24.20 | 4.15E-05 | Argillite |
| MW-7 | 12.92-27.92 | 13.00 | 13.00 | 2.20E-05 | Silty Clay with Gravel |
| MW-8 | 20.5-35.5 | 37.60 | 37.60 | 1.00E-04 | Argillite |
| MW-8D | 60.9-75.9 | 51.90 | 9.90 | 6.02E-07 | Argillite |
| MW-9 | 1.1-16.1 | 6.90 | 6.90 | 8.30E-05 | Argillite |
| MW-10 | 2.1-17.7 | 5.40 | 5.40 | 7.10E-05 | Argillite |
| MW-11 | 2.24-17.24 | 7.55 | 7.55 | 2.40E-04 | Sandy Clay with Gravel |
| MW-12 | 6.96-21.96 | 15.20 | 15.20 | 7.40E-05 | Sandy Silt |
| MW-24 | 6.25-21.25 | 12.98 | 5.51 | 1.32E-05 | Argillite |
| MW-25 | 6.2-18.2 | 10.92 | 5.85 | 2.82E-06 | Argillite |

| Summary Statistics | | | |
|---|---|---|---|
| Mean | 8.39E-05 | Maximum | 3.40E-04 |
| Median | 6.60E-05 | Minimum | 6.02E-07 |
| Sandard Deviation | 9.41E-05 | Count | 15 |

Information obtained from Responses to Review Comments dated April 28, 1995

**Table 4:** Summary of Soil Geologic Properties

| | Lithology | Effective Porosity (%) | Total Porosity (%) |
|---|---|---|---|
| MW-1 | Argillite | 20% | 35.2 |
| MW-2 | Sandy Silt with Gravel | 5% | 37.7 |
| MW-3 | Argillite | 20% | 35.2 |
| MW-4 | Argillite | 5% | - |
| MW-4R | Argillite | 5% | 40.2 |
| MW-5 | Argillite | 5% | 20.0 |
| MW-5R | Argillite | - | - |
| MW-6 | Silty Clay with Gravel | 5% | 20.0 |
| MW-7 | Argillite | 5% | 40.2 |
| MW-8 | Argillite | 5% | 20.0 |
| MW-9 | Argillite | 5% | 37.7 |
| MW-10 | Argillite | 5% | 42.8 |
| MW-11 | Sandy Clay with Gravel | 15% | 42.8 |
| MW-12 | Sandy Silt | 15% | 40.7 |

Information obtained from Responses to Review Comments dated April 28, 1995

**Table 5:** Summary of Field Parameters

| | Name | 9/15/1994 | 11/29/1994 | 2/25/1995 | 10/30/1995 | 4/29/1996 | 10/24/1996 | 5/28/1997 |
|---|---|---|---|---|---|---|---|---|
| MW-1 | pH | 5.6 | 5.9 | 7.1 | 6.5 | 7.4 | 6.6 | 6.6 |
| | Temperature | 17 | 12.2 | 12.9 | 17.8 | 16.5 | 18.5 | 14.2 |
| | Conductivity | 650 | 256 | 93 | 418 | 215 | 1150 | 322 |
| MW-2 | pH | 5.6 | 6.4 | 7 | 6.9 | 7.3 | 6.6 | 6.26 |
| | Temperature | 15.5 | 15.1 | 15.3 | 18.2 | 13.5 | 18.5 | 14.5 |
| | Conductivity | 740 | 417 | 420 | 324 | 614 | 397 | 483 |
| MW-3 | pH | 4.9 | 5.8 | 6.4 | 6.8 | 7.5 | 6.3 | 7.21 |
| | Temperature | 16.6 | 14.9 | 14.1 | 17.4 | 12.5 | 17.1 | 14.7 |
| | Conductivity | 350 | 212 | 60 | 276 | 235 | 183 | 578 |
| MW-4R | pH | 5.6 | 6.5 | 6.5 | 6.9 | 7.5 | 6.8 | 6.13 |
| | Temperature | 17.2 | 15.1 | 17 | 17.8 | 12.5 | 18.4 | 15.6 |
| | Conductivity | 160 | 146 | 69 | 126 | 179 | 116 | 163 |
| MW-5 | pH | 7.1 | 6.87 | 6.5 | 6.8 | 7.4 | 6.8 | 5.86 |
| | Temperature | 17.2 | 12.8 | 14.3 | 18.3 | 15.5 | 18.7 | 14.2 |
| | Conductivity | 550 | 576 | 67 | 173 | 162 | 154 | 184 |
| MW-5R | pH | - | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - | - |
| MW-6 | pH | 5.5 | 6.4 | 6.9 | 6.5 | 7.2 | 6.6 | 5.92 |
| | Temperature | 13 | 13.8 | 16.9 | 16.5 | 13.7 | 16.6 | 14.7 |
| | Conductivity | 240 | 530 | 91 | 188 | 153 | 154 | 190 |
| MW-7 | pH | 6.6 | 6.9 | 7.8 | 6.8 | 7.3 | 6.9 | 7.26 |
| | Temperature | 13.8 | 12.5 | 17.5 | 16.6 | 15 | 16.4 | 15.2 |
| | Conductivity | 240 | 172 | 109 | 208 | 253 | 187 | 275 |
| MW-9 | pH | 6.5 | 6.4 | 6.9 | 7.3 | - | 7.1 | 6.27 |
| | Temperature | 16.6 | 13.8 | 13.5 | 17.1 | - | 17.3 | 15.2 |
| | Conductivity | 550 | 164 | 193 | 325 | - | 238 | 321 |
| MW-10 | pH | 5.8 | 6.7 | 7.4 | 7.6 | 6.76 | 7 | 6.86 |
| | Temperature | 17.7 | 14 | 12.8 | 17.2 | - | 17.8 | 15.9 |
| | Conductivity | 235 | 1458 | 532 | 1406 | 2270 | 1433 | 3170 |
| MW-11 | pH | 6.2 | 6.88 | 5.9 | 7.4 | 7.3 | 6.5 | 6.1 |
| | Temperature | 15.5 | 12 | 13.4 | 16.6 | | 16.1 | 14.1 |
| | Conductivity | 340 | 400 | 49 | 234 | 158 | 2.36 | 159 |
| MW-12 | pH | 5.6 | 6.3 | 5.9 | 6.5 | 7.3 | 7 | 6.12 |
| | Temperature | 16.6 | 14 | 15.8 | 18.3 | 13.4 | 17 | 16.2 |
| | Conductivity | 150 | 104 | 47 | 112 | 121 | 75 | 114 |
| SW-1 | pH | 6 | 7.3 | 7.3 | 7.9 | 7.4 | 7.8 | 6.98 |
| | Temperature | 20 | 6.5 | 13.4 | 15.5 | 8.2 | 14.8 | 17.2 |
| | Conductivity | 140 | 48 | 21 | 59 | 82.9 | 81 | 169 |
| SW-2 | pH | 6.1 | 7.1 | 8.4 | 7.9 | 7.4 | 7.9 | 7.56 |
| | Temperature | 17 | 14.4 | 15.6 | 14.1 | 10.7 | 13.4 | 15.9 |
| | Conductivity | 140 | 57 | 34 | 90 | 108 | 95 | 151 |
| SW-3 | pH | 6.4 | 7.5 | 8.4 | 7.7 | 7.2 | 8.1 | 7.48 |
| | Temperature | 17 | 10.1 | 14.2 | 14 | 6.8 | 13.4 | 17.7 |
| | Conductivity | 150 | 80 | 32 | 73 | 117 | 74 | 120 |
| SW-4 | pH | 6.4 | 7 | 7.5 | 7.9 | 7.1 | 7.8 | 7 |
| | Temperature | 17 | 13.4 | 14.7 | 14.2 | 13.2 | 13.8 | 17.1 |
| | Conductivity | 120 | 44 | 34 | 67 | 129 | 81 | 127 |
| SW-5 | pH | - | 6.5 | 8.6 | 7.1 | 6.66 | 7.5 | 5.85 |
| | Temperature | - | 10.5 | 15 | 13.3 | - | 12.9 | 14.3 |
| | Conductivity | - | 87 | 43 | 98 | 185 | 305 | 716 |

**Table 5:** Summary of Field Parameters

| | Name | 10/23/1997 | 4/22/1998 | 10/27/1998 | 4/14/1999 | 2/7/2000 | 6/2/2000 | 12/5/2000 |
|---|---|---|---|---|---|---|---|---|
| MW-1 | pH | 5 | 6.54 | 6.17 | 5.7 | 5.69 | - | - |
| | Temperature | 18 | 17.2 | 19 | 16.3 | 9 | - | - |
| | Conductivity | 210 | 120 | 403 | 107.1 | 53 | - | - |
| MW-2 | pH | 6.31 | 6.49 | 5.93 | 6.14 | 6.42 | 6.42 | - |
| | Temperature | 16.8 | 14.1 | 17.1 | 15.6 | 14.3 | 15.9 | - |
| | Conductivity | 360 | 3.11 | 15.03 | 670 | 328 | 330 | - |
| MW-3 | pH | 6.14 | 6.06 | 7.15 | 7.05 | 5.96 | 6.5 | - |
| | Temperature | 18.6 | 16.7 | 17.3 | 20.9 | 13.8 | 15.8 | - |
| | Conductivity | 260 | 251 | 647 | 584 | 283 | 500 | - |
| MW-4R | pH | 6.56 | 6.13 | 6.04 | 6.33 | 5.9 | 6.67 | - |
| | Temperature | 16.6 | 16.1 | 17.4 | 19.3 | 16.7 | 16.5 | - |
| | Conductivity | 160 | 141 | 168.2 | 159.1 | 159 | 130 | - |
| MW-5 | pH | 6.58 | 6.12 | - | - | - | - | - |
| | Temperature | 17.7 | 14.3 | - | - | - | - | - |
| | Conductivity | 240 | 179 | - | - | - | - | - |
| MW-5R | pH | - | - | - | 7.29 | 8 | 7.19 | - |
| | Temperature | - | - | - | 16.4 | 16.2 | 16.2 | - |
| | Conductivity | - | - | - | 632 | 707 | 370 | - |
| MW-6 | pH | 6.92 | 5.65 | 6.01 | 5.84 | 5.53 | 6.75 | - |
| | Temperature | 15.7 | 15.9 | 16.1 | 17 | 15.8 | 16.3 | - |
| | Conductivity | 180 | 117 | 296 | 197.5 | 339 | 160 | - |
| MW-7 | pH | 6.49 | 7.35 | 6.62 | 7.28 | 7.14 | 7.15 | - |
| | Temperature | 15.6 | 15.3 | 15.3 | 15.8 | 16.1 | 16.3 | - |
| | Conductivity | 350 | 270 | 381 | 401 | 519 | 530 | - |
| MW-9 | pH | 6.89 | 6.63 | 6.43 | 6.26 | 6.16 | 5.85 | - |
| | Temperature | 16.8 | 15 | 16.6 | 20.9 | 10.3 | 17.1 | - |
| | Conductivity | 370 | 363 | 334 | 282 | 186 | 230 | - |
| MW-10 | pH | 6.14 | 6.47 | 6.53 | 6.89 | 6.92 | 6.92 | - |
| | Temperature | 17.4 | 18.1 | 18.2 | 22.2 | 13.3 | 16.1 | - |
| | Conductivity | 2150 | 2.93 | 1830 | 2490 | 1601 | 1500 | - |
| MW-11 | pH | 6.18 | 5.67 | 6.14 | 6.05 | 5.74 | 5.71 | - |
| | Temperature | 17.7 | 15.6 | 15.9 | 19.8 | 12.1 | 16 | - |
| | Conductivity | 130 | 146 | 203 | 101.5 | 83 | 150 | - |
| MW-12 | pH | 5.76 | 6.15 | 6.32 | 6.21 | 6.14 | 6.14 | - |
| | Temperature | 17.2 | 18.1 | 18.4 | 20 | 16.9 | 16.9 | - |
| | Conductivity | 180 | 599 | 504 | 338 | 273 | 270 | - |
| SW-1 | pH | 7.1 | 7.16 | 6.9 | 7.62 | 7.38 | 7.06 | - |
| | Temperature | 14.6 | 17.3 | 15.7 | 15 | 7.3 | 16.2 | - |
| | Conductivity | 210 | 104 | 204 | 97.4 | 70 | 120 | - |
| SW-2 | pH | 6.42 | 7.24 | 7.13 | 7.75 | 7.57 | - | - |
| | Temperature | 16.5 | 19.4 | 14.3 | 15.4 | 8.7 | - | - |
| | Conductivity | 130 | 93 | 156.4 | 132.2 | 83 | - | - |
| SW-3 | pH | 6.99 | 7.24 | 6.97 | 7.97 | 7.55 | - | - |
| | Temperature | 14.4 | 17.1 | 16.4 | 14.9 | 9.2 | - | - |
| | Conductivity | 100 | 97 | 263 | 116.3 | 87 | - | - |
| SW-4 | pH | 6.77 | 6.82 | 7.22 | 8.01 | 7.33 | - | - |
| | Temperature | 14.6 | 18.6 | 15.2 | 15.3 | 8.6 | - | - |
| | Conductivity | 130 | 88 | 176.7 | 119 | 90 | - | - |
| SW-5 | pH | 3.72 | 6.86 | - | 6.11 | 6.6 | - | - |
| | Temperature | 11.8 | 17.2 | - | 14.9 | 8 | - | - |
| | Conductivity | 350 | 126 | - | 692 | 99 | - | - |

**Table 5:** Summary of Field Parameters

| | Name | 7/11/2001 | 1/9/2002 | 6/25/2002 | 12/16/2002 | 6/18/2003 | 1/6/2004 |
|---|---|---|---|---|---|---|---|
| MW-1 | pH | 6.38 | 7.11 | - | 6.93 | 6.31 | 6.93 |
| | Temperature | 16.1 | | - | 17 | 16.2 | 16.7 |
| | Conductivity | 130 | 190 | - | 230 | 110 | 100 |
| MW-2 | pH | 6.52 | 6.4 | 6.36 | 6.81 | 6.71 | 6.86 |
| | Temperature | 15.8 | - | 16.7 | 16.7 | 15.9 | 16.1 |
| | Conductivity | 310 | 320 | 300 | 280 | 300 | 160 |
| MW-3 | pH | 6.42 | 6.44 | 6.28 | 6.21 | 6.81 | 6.85 |
| | Temperature | 15.7 | - | 17.3 | 17.1 | 16.1 | 16.3 |
| | Conductivity | 490 | 500 | 210 | 210 | 460 | 100 |
| MW-4R | pH | 6.63 | 6.62 | 6.61 | 6.6 | 6.62 | 6.93 |
| | Temperature | 16.2 | - | 16.3 | 16.2 | 16.3 | 16.3 |
| | Conductivity | 110 | 130 | 160 | 150 | 120 | 100 |
| MW-5 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| MW-5R | pH | 7.23 | 7.15 | 7.11 | 7.05 | 7.21 | 7.36 |
| | Temperature | 16.1 | - | 16.7 | 16.6 | 16.2 | 16.4 |
| | Conductivity | 380 | 160 | 170 | 160 | 310 | 160 |
| MW-6 | pH | 6.72 | 6.63 | 6.68 | 6.93 | 6.91 | 7.03 |
| | Temperature | 16.2 | - | 17 | 16.8 | 16.3 | 16.1 |
| | Conductivity | 140 | 170 | 160 | 170 | 160 | 180 |
| MW-7 | pH | 7.1 | 7.11 | 7.12 | 7.11 | 7.11 | 6.93 |
| | Temperature | 16.1 | - | 17.1 | 17 | 16.4 | 16.2 |
| | Conductivity | 510 | 520 | 510 | 500 | 210 | 200 |
| MW-9 | pH | 5.83 | 5.79 | 5.99 | 6.11 | 6.71 | 6.26 |
| | Temperature | 17.1 | - | 16.8 | 16.8 | 16.2 | 16.7 |
| | Conductivity | 230 | 210 | 200 | 200 | 170 | 170 |
| MW-10 | pH | 6.81 | 6.88 | 6.81 | 6.8 | 6.83 | 6.86 |
| | Temperature | 16.2 | - | 17 | 17 | 16.2 | 16.3 |
| | Conductivity | 100 | 290 | 280 | 250 | 110 | 105 |
| MW-11 | pH | 5.82 | 5.76 | 5.99 | 5.88 | 5.89 | 7.01 |
| | Temperature | 16 | - | 16.8 | 16.9 | 16 | 16.6 |
| | Conductivity | 140 | 150 | 130 | 110 | 140 | 150 |
| MW-12 | pH | 6.11 | 6.17 | 6.11 | 6.1 | 6.11 | 6.36 |
| | Temperature | 16.3 | - | 17.2 | 17.1 | 16.3 | 18.1 |
| | Conductivity | 290 | 360 | 310 | 300 | 280 | 380 |
| SW-1 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-2 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-3 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-4 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-5 | pH | 7.23 | 5.99 | - | - | 6.23 | - |
| | Temperature | 24.6 | - | - | - | 25.3 | - |
| | Conductivity | 260 | 180 | - | - | 130 | - |

**Table 5:** Summary of Field Parameters

| | Name | 6/23/2004 | 1/6/2005 | 6/16/2005 | 1/26/2006 | 7/13/2006 | 1/25/2007 |
|---|---|---|---|---|---|---|---|
| MW-1 | pH | 6.89 | 6.98 | 5.4 | 6.9 | 7.1 | 6.6 |
| | Temperature | 14.6 | 13.8 | 15.5 | 14.9 | 16.7 | 15.1 |
| | Conductivity | 180 | 130 | 70 | 100 | 50 | 90 |
| MW-2 | pH | 7.01 | 7.01 | 6.8 | 6.9 | 6.6 | 6.9 |
| | Temperature | 14.2 | 13.9 | 16.3 | 15.1 | 16.3 | 14.8 |
| | Conductivity | 100 | 100 | 110 | 190 | 90 | 70 |
| MW-3 | pH | 6.93 | 6.99 | 6.6 | 6.6 | 6.9 | 6.8 |
| | Temperature | 14.1 | 13.9 | 15.6 | 15.1 | 16.5 | 14.8 |
| | Conductivity | 110 | 140 | 1080 | 720 | 50 | 60 |
| MW-4R | pH | 7.03 | 7.02 | 5.9 | 6.7 | 6.6 | 6.6 |
| | Temperature | 14.2 | 14 | 15.9 | 14.9 | 16.3 | 15.2 |
| | Conductivity | 160 | 170 | 210 | 200 | 60 | 110 |
| MW-5 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| MW-5R | pH | 6.88 | 6.93 | 6.8 | 6.6 | 6.9 | 6.3 |
| | Temperature | 13.9 | 13.8 | 15.8 | 14.9 | 16.1 | 14.8 |
| | Conductivity | 100 | 100 | 160 | 190 | 110 | 100 |
| MW-6 | pH | 7.07 | 6.98 | 7 | 6.6 | 6.7 | 6.6 |
| | Temperature | 14.3 | 14.1 | 16.2 | 14.6 | 16.2 | 15.1 |
| | Conductivity | 80 | 380 | 130 | 70 | 80 | 100 |
| MW-7 | pH | 7.06 | 7.04 | 7.1 | 7.1 | 6.5 | 6.8 |
| | Temperature | 14.7 | 13.9 | 16.2 | 16.1 | 16.1 | 15.1 |
| | Conductivity | 200 | 190 | 100 | 130 | 110 | 60 |
| MW-9 | pH | 7.03 | 6.93 | 5.9 | 6.8 | 6.8 | 6.9 |
| | Temperature | 14.7 | 13.6 | 15.9 | 14.3 | 16.2 | 15 |
| | Conductivity | 200 | 161 | 260 | 60 | 100 | 70 |
| MW-10 | pH | 7 | 6.92 | 6.6 | 6.8 | 6.8 | 7 |
| | Temperature | 13.8 | 13.5 | 15.9 | 14.8 | 16.3 | 14.9 |
| | Conductivity | 160 | 130 | 310 | 190 | 60 | 110 |
| MW-11 | pH | 5.99 | 5.82 | 7.2 | 6.8 | 6.6 | 6.9 |
| | Temperature | 14.1 | 14.2 | 16.2 | 15.2 | 16.7 | 15.2 |
| | Conductivity | 190 | 180 | 130 | 220 | 100 | 90 |
| MW-12 | pH | 6.86 | 6.92 | 5.9 | 6.6 | 6.6 | 6.2 |
| | Temperature | 14.8 | 13.8 | 17.8 | 4.8 | 16.3 | 14.8 |
| | Conductivity | 410 | 400 | 340 | 310 | 190 | 310 |
| SW-1 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-2 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-3 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-4 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |
| SW-5 | pH | - | - | - | - | - | - |
| | Temperature | - | - | - | - | - | - |
| | Conductivity | - | - | - | - | - | - |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-6 | Antimony | 01/25/2007 | 1.43 | ug/l | 0.58 | | |
| MW-1 | Arsenic | 09/16/1994 | 0.025 | mg/l | 0.01 | 0.05 | |
| MW-1 | Arsenic | 05/28/1997 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-1 | Arsenic | 10/27/1998 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-1 | Arsenic | 01/25/2007 | 4.1 | ug/l | 2 | 50 | |
| MW-10 | Arsenic | 09/16/1994 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-10 | Arsenic | 11/29/1994 | 0.016 | mg/l | 0.01 | 0.05 | |
| MW-10 | Arsenic | 02/07/1995 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-10 | Arsenic | 10/24/1996 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-10 | Arsenic | 05/28/1997 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-10 | Arsenic | 04/22/1998 | 0.015 | mg/l | 0.005 | 0.05 | |
| MW-10 | Arsenic | 10/27/1998 | 0.0066 | mg/l | 0.005 | 0.05 | |
| MW-10 | Arsenic | 12/05/2000 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-10 | Arsenic | 07/12/2001 | 0.0054 | mg/l | 0.005 | 0.05 | |
| MW-11 | Arsenic | 10/31/1995 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-11 | Arsenic | 01/25/2007 | 2.1 | ug/l | 2 | 50 | |
| MW-12 | Arsenic | 04/22/1998 | 0.01 | mg/l | 0.005 | 0.05 | |
| MW-12 | Arsenic | 10/27/1998 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-12 | Arsenic | 07/12/2001 | 0.037 | mg/l | 0.005 | 0.05 | |
| MW-12 | Arsenic | 01/10/2002 | 0.0065 | mg/l | 0.005 | 0.05 | |
| MW-12 | Arsenic | 06/18/2003 | 0.0076 | mg/l | 0.005 | 0.05 | |
| MW-12 | Arsenic | 06/23/2004 | 0.016 | mg/l | 0.01 | 0.05 | |
| MW-12 | Arsenic | 06/17/2005 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-12 | Arsenic | 07/13/2006 | 0.0136 | mg/l | 0.01 | 0.05 | |
| MW-12 | Arsenic | 01/25/2007 | 3.9 | ug/l | 2 | 50 | |
| MW-2 | Arsenic | 09/16/1994 | 0.02 | mg/l | 0.01 | 0.05 | |
| MW-2 | Arsenic | 10/24/1996 | 0.006 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 05/28/1997 | 0.009 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 10/23/1997 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 04/22/1998 | 0.008 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 10/27/1998 | 0.027 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 12/05/2000 | 0.0073 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 07/11/2001 | 0.0075 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 01/09/2002 | 0.03 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 06/25/2002 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 06/18/2003 | 0.0074 | mg/l | 0.005 | 0.05 | |
| MW-2 | Arsenic | 01/25/2007 | 2.7 | ug/l | 2 | 50 | |
| MW-3 | Arsenic | 09/16/1994 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 05/28/1997 | 0.005 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 10/27/1998 | 0.015 | mg/l | 0.015 | 0.05 | |
| MW-3 | Arsenic | 04/14/1999 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 06/05/2000 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 12/05/2000 | 0.026 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 07/12/2001 | 0.017 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 01/09/2002 | 0.015 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 06/25/2002 | 0.033 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 12/16/2002 | 0.0076 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 06/18/2003 | 0.03 | mg/l | 0.005 | 0.05 | |
| MW-3 | Arsenic | 01/06/2004 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 06/23/2004 | 0.026 | mg/l | 0.01 | 0.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-3 | Arsenic | 01/06/2005 | 0.028 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 06/17/2005 | 0.02 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 01/26/2006 | 0.0117 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 07/13/2006 | 0.0236 | mg/l | 0.01 | 0.05 | |
| MW-3 | Arsenic | 01/25/2007 | 12.6 | ug/l | 2 | 50 | |
| MW-4R | Arsenic | 05/28/1997 | 0.027 | mg/l | 0.005 | 0.05 | |
| MW-4R | Arsenic | 10/23/1997 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-4R | Arsenic | 04/22/1998 | 0.019 | mg/l | 0.005 | 0.05 | |
| MW-4R | Arsenic | 10/27/1998 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-4R | Arsenic | 01/25/2007 | 4.3 | ug/l | 2 | 50 | |
| MW-5 | Arsenic | 02/07/1995 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-5 | Arsenic | 05/28/1997 | 0.022 | mg/l | 0.005 | 0.05 | |
| MW-5 | Arsenic | 10/23/1997 | 0.025 | mg/l | 0.01 | 0.05 | |
| MW-5 | Arsenic | 04/22/1998 | 0.02 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 04/14/1999 | 0.02 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 02/07/2000 | 0.046 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 06/02/2000 | 0.022 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 12/05/2000 | 0.01 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 07/12/2001 | 0.017 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 01/09/2002 | 0.017 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 06/25/2002 | 0.034 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 12/16/2002 | 0.0058 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 06/18/2003 | 0.0054 | mg/l | 0.005 | 0.05 | |
| MW-5R | Arsenic | 06/23/2004 | 0.017 | mg/l | 0.01 | 0.05 | |
| MW-5R | Arsenic | 01/06/2005 | 0.028 | mg/l | 0.01 | 0.05 | |
| MW-5R | Arsenic | 06/16/2005 | 0.021 | mg/l | 0.01 | 0.05 | |
| MW-5R | Arsenic | 01/26/2006 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-5R | Arsenic | 07/13/2006 | 0.0257 | mg/l | 0.01 | 0.05 | |
| MW-5R | Arsenic | 01/25/2007 | 7.3 | ug/l | 2 | 50 | |
| MW-6 | Arsenic | 04/22/1998 | 0.005 | mg/l | 0.005 | 0.05 | |
| MW-6 | Arsenic | 10/27/1998 | 0.0056 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 09/15/1994 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 11/29/1994 | 0.017 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 02/07/1995 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 02/27/1995 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 10/30/1995 | 0.023 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 04/29/1996 | 0.013 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 10/24/1996 | 0.016 | mg/l | 0.005 | 0.05 | |
| **MW-7** | **Arsenic** | **05/28/1997** | **0.071** | **mg/l** | **0.01** | **0.05** | **0.021** |
| MW-7 | Arsenic | 10/23/1997 | 0.021 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 04/22/1998 | 0.034 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 10/27/1998 | 0.038 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 04/14/1999 | 0.016 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 02/07/2000 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-7 | Arsenic | 06/02/2000 | 0.0054 | mg/l | 0.005 | 0.05 | |
| **MW-9** | **Arsenic** | **09/16/1994** | **0.051** | **mg/l** | **0.01** | **0.05** | **0.001** |
| **MW-9** | **Arsenic** | **11/29/1994** | **0.071** | **mg/l** | **0.01** | **0.05** | **0.021** |
| MW-9 | Arsenic | 02/07/1995 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-9 | Arsenic | 10/24/1996 | 0.006 | mg/l | 0.005 | 0.05 | |
| **MW-9** | **Arsenic** | **05/28/1997** | **0.081** | **mg/l** | **0.01** | **0.05** | **0.031** |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-9 | Arsenic | 10/23/1997 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 04/22/1998 | 0.047 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 10/28/1998 | 0.036 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 04/14/1999 | 0.045 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 02/09/2000 | 0.0052 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 12/05/2000 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 07/12/2001 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 06/25/2002 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 12/16/2002 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 06/18/2003 | 0.0075 | mg/l | 0.005 | 0.05 | |
| MW-9 | Arsenic | 01/25/2007 | 10.2 | ug/l | 2 | 50 | |
| MW-1 | Barium, total | 09/16/1994 | 0.25 | mg/l | 0.1 | 2 | |
| MW-1 | Barium, total | 10/24/1996 | 0.043 | mg/l | 0.01 | 2 | |
| MW-1 | Barium, total | 05/28/1997 | 0.064 | mg/l | 0.01 | 2 | |
| MW-1 | Barium, total | 10/23/1997 | 0.045 | mg/l | 0.01 | 2 | |
| MW-1 | Barium, total | 04/22/1998 | 0.026 | mg/l | 0.01 | 2 | |
| MW-1 | Barium, total | 10/27/1998 | 0.13 | mg/l | 0.01 | 2 | |
| MW-1 | Barium, total | 04/14/1999 | 0.032 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 02/07/2000 | 0.029 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 07/13/2001 | 0.061 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 01/10/2002 | 0.16 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 12/16/2002 | 0.046 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 06/18/2003 | 0.067 | mg/l | 0.005 | 2 | |
| MW-1 | Barium, total | 01/25/2007 | 34 | ug/l | 0.2 | 2000 | |
| MW-1 | Barium, total | 07/03/2007 | 124 | ug/l | 100 | 2000 | |
| MW-10 | Barium, total | 09/16/1994 | 0.19 | mg/l | 0.1 | 2 | |
| MW-10 | Barium, total | 10/24/1996 | 0.19 | mg/l | 0.01 | 2 | |
| MW-10 | Barium, total | 05/28/1997 | 0.16 | mg/l | 0.01 | 2 | |
| MW-10 | Barium, total | 10/23/1997 | 0.12 | mg/l | 0.01 | 2 | |
| MW-10 | Barium, total | 04/22/1998 | 0.16 | mg/l | 0.01 | 2 | |
| MW-10 | Barium, total | 10/27/1998 | 0.14 | mg/l | 0.01 | 2 | |
| MW-10 | Barium, total | 04/14/1999 | 0.14 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 02/08/2000 | 0.059 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 06/02/2000 | 0.1 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 12/05/2000 | 0.072 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 07/12/2001 | 0.069 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 01/09/2002 | 0.044 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 06/25/2002 | 0.066 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 12/16/2002 | 0.08 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 06/18/2003 | 0.08 | mg/l | 0.005 | 2 | |
| MW-10 | Barium, total | 01/25/2007 | 48.4 | ug/l | 0.2 | 2000 | |
| MW-11 | Barium, total | 09/15/1994 | 0.22 | mg/l | 0.1 | 2 | |
| MW-11 | Barium, total | 10/24/1996 | 0.017 | mg/l | 0.01 | 2 | |
| MW-11 | Barium, total | 05/28/1997 | 0.13 | mg/l | 0.01 | 2 | |
| MW-11 | Barium, total | 10/23/1997 | 0.12 | mg/l | 0.01 | 2 | |
| MW-11 | Barium, total | 04/22/1998 | 0.28 | mg/l | 0.01 | 2 | |
| MW-11 | Barium, total | 10/28/1998 | 0.034 | mg/l | 0.01 | 2 | |
| MW-11 | Barium, total | 04/14/1999 | 0.093 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 02/08/2000 | 0.05 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 06/02/2000 | 0.12 | mg/l | 0.005 | 2 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-11 | Barium, total | 12/05/2000 | 0.095 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 07/12/2001 | 0.079 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 01/09/2002 | 0.052 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 06/25/2002 | 0.06 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 12/16/2002 | 0.077 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 06/18/2003 | 0.08 | mg/l | 0.005 | 2 | |
| MW-11 | Barium, total | 01/25/2007 | 46 | ug/l | 0.2 | 2000 | |
| MW-12 | Barium, total | 09/15/1994 | 0.1 | mg/l | 0.1 | 2 | |
| MW-12 | Barium, total | 10/24/1996 | 0.016 | mg/l | 0.01 | 2 | |
| MW-12 | Barium, total | 05/28/1997 | 0.042 | mg/l | 0.01 | 2 | |
| MW-12 | Barium, total | 10/23/1997 | 0.057 | mg/l | 0.01 | 2 | |
| MW-12 | Barium, total | 04/22/1998 | 0.22 | mg/l | 0.01 | 2 | |
| MW-12 | Barium, total | 10/27/1998 | 0.2 | mg/l | 0.01 | 2 | |
| MW-12 | Barium, total | 04/14/1999 | 0.08 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 02/07/2000 | 0.063 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 06/05/2000 | 0.088 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 07/12/2001 | 0.21 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 01/10/2002 | 0.097 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 06/25/2002 | 0.039 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 12/17/2002 | 0.047 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 06/18/2003 | 0.059 | mg/l | 0.005 | 2 | |
| MW-12 | Barium, total | 01/25/2007 | 68.7 | ug/l | 0.2 | 2000 | |
| **MW-2** | **Barium, total** | **09/16/1994** | **2.32** | **mg/l** | **0.1** | **2** | **0.32** |
| MW-2 | Barium, total | 10/24/1996 | 0.029 | mg/l | 0.01 | 2 | |
| MW-2 | Barium, total | 05/28/1997 | 0.05 | mg/l | 0.01 | 2 | |
| MW-2 | Barium, total | 10/23/1997 | 0.11 | mg/l | 0.01 | 2 | |
| MW-2 | Barium, total | 04/22/1998 | 0.072 | mg/l | 0.01 | 2 | |
| MW-2 | Barium, total | 10/27/1998 | 0.3 | mg/l | 0.05 | 2 | |
| MW-2 | Barium, total | 04/14/1999 | 0.052 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 02/07/2000 | 0.025 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 06/02/2000 | 0.083 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 12/05/2000 | 0.18 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 07/11/2001 | 0.11 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 01/09/2002 | 0.36 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 06/25/2002 | 0.097 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 12/16/2002 | 0.039 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 06/18/2003 | 0.043 | mg/l | 0.005 | 2 | |
| MW-2 | Barium, total | 01/25/2007 | 22.5 | ug/l | 0.2 | 2000 | |
| MW-3 | Barium, total | 05/28/1997 | 0.015 | mg/l | 0.01 | 2 | |
| MW-3 | Barium, total | 10/23/1997 | 0.017 | mg/l | 0.01 | 2 | |
| MW-3 | Barium, total | 04/22/1998 | 0.016 | mg/l | 0.01 | 2 | |
| MW-3 | Barium, total | 04/14/1999 | 0.011 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 02/08/2000 | 0.012 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 06/05/2000 | 0.012 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 12/05/2000 | 0.01 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 07/12/2001 | 0.011 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 01/09/2002 | 0.0083 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 06/25/2002 | 0.0088 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 12/16/2002 | 0.019 | mg/l | 0.005 | 2 | |
| MW-3 | Barium, total | 06/18/2003 | 0.017 | mg/l | 0.005 | 2 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-3 | Barium, total | 01/25/2007 | 7.7 | ug/l | 0.2 | 2000 | |
| MW-4R | Barium, total | 05/28/1997 | 0.043 | mg/l | 0.01 | 2 | |
| MW-4R | Barium, total | 10/23/1997 | 0.013 | mg/l | 0.01 | 2 | |
| MW-4R | Barium, total | 04/22/1998 | 0.028 | mg/l | 0.01 | 2 | |
| MW-4R | Barium, total | 10/27/1998 | 0.03 | mg/l | 0.02 | 2 | |
| MW-4R | Barium, total | 04/14/1999 | 0.0066 | mg/l | 0.005 | 2 | |
| MW-4R | Barium, total | 12/05/2000 | 0.015 | mg/l | 0.005 | 2 | |
| MW-4R | Barium, total | 07/12/2001 | 0.0082 | mg/l | 0.005 | 2 | |
| MW-4R | Barium, total | 01/09/2002 | 0.0057 | mg/l | 0.005 | 2 | |
| MW-4R | Barium, total | 01/25/2007 | 2 | ug/l | 0.2 | 2000 | |
| MW-5 | Barium, total | 05/28/1997 | 0.24 | mg/l | 0.01 | 2 | |
| MW-5 | Barium, total | 10/23/1997 | 0.38 | mg/l | 0.01 | 2 | |
| MW-5 | Barium, total | 04/22/1998 | 0.19 | mg/l | 0.01 | 2 | |
| MW-5R | Barium, total | 04/14/1999 | 0.16 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 02/07/2000 | 0.13 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 06/02/2000 | 0.064 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 12/05/2000 | 0.032 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 07/12/2001 | 0.063 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 01/09/2002 | 0.056 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 06/25/2002 | 0.13 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 12/16/2002 | 0.016 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 06/18/2003 | 0.016 | mg/l | 0.005 | 2 | |
| MW-5R | Barium, total | 01/25/2007 | 14.8 | ug/l | 0.2 | 2000 | |
| MW-6 | Barium, total | 10/23/1997 | 0.013 | mg/l | 0.01 | 2 | |
| MW-6 | Barium, total | 04/22/1998 | 0.029 | mg/l | 0.01 | 2 | |
| MW-6 | Barium, total | 10/27/1998 | 0.095 | mg/l | 0.05 | 2 | |
| MW-6 | Barium, total | 04/14/1999 | 0.0058 | mg/l | 0.005 | 2 | |
| MW-6 | Barium, total | 02/07/2000 | 0.0099 | mg/l | 0.005 | 2 | |
| MW-6 | Barium, total | 12/05/2000 | 0.011 | mg/l | 0.005 | 2 | |
| MW-6 | Barium, total | 06/25/2002 | 0.0053 | mg/l | 0.005 | 2 | |
| MW-6 | Barium, total | 01/25/2007 | 6 | ug/l | 0.2 | 2000 | |
| MW-7 | Barium, total | 05/28/1997 | 0.079 | mg/l | 0.01 | 2 | |
| MW-7 | Barium, total | 10/23/1997 | 0.022 | mg/l | 0.01 | 2 | |
| MW-7 | Barium, total | 04/22/1998 | 0.03 | mg/l | 0.01 | 2 | |
| MW-7 | Barium, total | 10/27/1998 | 0.059 | mg/l | 0.01 | 2 | |
| MW-7 | Barium, total | 04/14/1999 | 0.013 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 06/02/2000 | 0.0097 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 12/05/2000 | 0.029 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 07/11/2001 | 0.031 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 01/09/2002 | 0.021 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 06/25/2002 | 0.021 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 12/16/2002 | 0.019 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 06/18/2003 | 0.017 | mg/l | 0.005 | 2 | |
| MW-7 | Barium, total | 01/25/2007 | 21 | ug/l | 0.2 | 2000 | |
| MW-9 | Barium, total | 09/16/1994 | 0.28 | mg/l | 0.1 | 2 | |
| MW-9 | Barium, total | 05/28/1997 | 0.12 | mg/l | 0.01 | 2 | |
| MW-9 | Barium, total | 10/23/1997 | 0.044 | mg/l | 0.01 | 2 | |
| MW-9 | Barium, total | 04/22/1998 | 0.1 | mg/l | 0.01 | 2 | |
| **MW-9** | **Barium, total** | **10/28/1998** | **2.3** | **mg/l** | **0.01** | **2** | **0.3** |
| MW-9 | Barium, total | 04/14/1999 | 0.072 | mg/l | 0.005 | 2 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-9 | Barium, total | 02/09/2000 | 0.012 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 06/05/2000 | 0.012 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 12/05/2000 | 0.053 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 07/12/2001 | 0.061 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 01/09/2002 | 0.019 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 06/25/2002 | 0.039 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 12/16/2002 | 0.079 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 06/18/2003 | 0.05 | mg/l | 0.005 | 2 | |
| MW-9 | Barium, total | 01/25/2007 | 14 | ug/l | 0.2 | 2000 | |
| MW-1 | Beryllium, total | 10/27/1998 | 0.0024 | mg/l | 0.002 | | |
| MW-1 | Beryllium, total | 01/10/2002 | 0.0012 | mg/l | 0.001 | | |
| MW-10 | Beryllium, total | 10/27/1998 | 0.0012 | mg/l | 0.001 | | |
| MW-12 | Beryllium, total | 07/12/2001 | 0.0019 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 09/16/1994 | 0.034 | mg/l | 0.025 | | |
| MW-2 | Beryllium, total | 02/07/1995 | 0.002 | mg/l | 0.002 | | |
| MW-2 | Beryllium, total | 10/24/1996 | 0.001 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 10/23/1997 | 0.003 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 04/22/1998 | 0.001 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 10/27/1998 | 0.0054 | mg/l | 0.002 | | |
| MW-2 | Beryllium, total | 12/05/2000 | 0.0013 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 07/11/2001 | 0.001 | mg/l | 0.001 | | |
| MW-2 | Beryllium, total | 01/09/2002 | 0.0045 | mg/l | 0.001 | | |
| MW-4R | Beryllium, total | 05/28/1997 | 0.001 | mg/l | 0.001 | | |
| MW-5 | Beryllium, total | 05/28/1997 | 0.004 | mg/l | 0.001 | | |
| MW-5 | Beryllium, total | 10/23/1997 | 0.01 | mg/l | 0.002 | | |
| MW-5 | Beryllium, total | 04/22/1998 | 0.003 | mg/l | 0.001 | | |
| MW-5R | Beryllium, total | 04/14/1999 | 0.0018 | mg/l | 0.001 | | |
| MW-5R | Beryllium, total | 07/12/2001 | 0.0021 | mg/l | 0.001 | | |
| MW-5R | Beryllium, total | 01/09/2002 | 0.0018 | mg/l | 0.001 | | |
| MW-5R | Beryllium, total | 06/25/2002 | 0.0025 | mg/l | 0.001 | | |
| MW-6 | Beryllium, total | 04/22/1998 | 0.001 | mg/l | 0.001 | | |
| MW-6 | Beryllium, total | 10/27/1998 | 0.0016 | mg/l | 0.001 | | |
| MW-6 | Beryllium, total | 06/25/2002 | 0.0013 | mg/l | 0.001 | | |
| MW-7 | Beryllium, total | 05/28/1997 | 0.001 | mg/l | 0.001 | | |
| MW-9 | Beryllium, total | 11/29/1994 | 0.004 | mg/l | 0.002 | | |
| MW-9 | Beryllium, total | 05/28/1997 | 0.006 | mg/l | 0.002 | | |
| MW-9 | Beryllium, total | 10/23/1997 | 0.001 | mg/l | 0.001 | | |
| MW-9 | Beryllium, total | 04/22/1998 | 0.005 | mg/l | 0.001 | | |
| MW-9 | Beryllium, total | 04/14/1999 | 0.0016 | mg/l | 0.001 | | |
| MW-1 | Cadmium, total | 09/16/1994 | 0.001 | mg/l | 0.001 | 0.0018 | |
| MW-1 | Cadmium, total | 04/29/1996 | 0.001 | mg/l | 0.001 | 0.0018 | |
| **MW-10** | **Cadmium, total** | **10/24/1996** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| **MW-11** | **Cadmium, total** | **12/05/2000** | **0.01** | **mg/l** | **0.001** | **0.0018** | **0.0083** |
| MW-12 | Cadmium, total | 07/12/2001 | 0.0012 | mg/l | 0.001 | 0.0018 | |
| **MW-12** | **Cadmium, total** | **01/10/2002** | **0.018** | **mg/l** | **0.001** | **0.0018** | **0.0163** |
| **MW-12** | **Cadmium, total** | **06/23/2004** | **0.0031** | **mg/l** | **0.001** | **0.0018** | **0.0014** |
| **MW-12** | **Cadmium, total** | **06/17/2005** | **0.012** | **mg/l** | **0.001** | **0.0018** | **0.0103** |
| **MW-12** | **Cadmium, total** | **01/26/2006** | **0.0031** | **mg/l** | **0.001** | **0.0018** | **0.0014** |
| **MW-12** | **Cadmium, total** | **01/25/2007** | **3.1** | **ug/l** | **0.5** | **1.75** | **1.35** |
| **MW-2** | **Cadmium, total** | **09/16/1994** | **0.008** | **mg/l** | **0.001** | **0.0018** | **0.0063** |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-2 | Cadmium, total | 06/23/2004 | 0.001 | mg/l | 0.001 | 0.0018 | |
| **MW-4R** | **Cadmium, total** | **01/06/2005** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| MW-4R | Cadmium, total | 06/16/2005 | 0.0012 | mg/l | 0.001 | 0.0018 | |
| **MW-5** | **Cadmium, total** | **10/30/1995** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| MW-6 | Cadmium, total | 01/25/2007 | 0.7 | ug/l | 0.5 | 1.75 | |
| MW-8D | Cadmium, total | 07/03/2007 | 1.2 | ug/l | 1 | 1.75 | |
| MW-9 | Cadmium, total | 09/16/1994 | 0.001 | mg/l | 0.001 | 0.0018 | |
| **MW-9** | **Cadmium, total** | **05/28/1997** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| **MW-9** | **Cadmium, total** | **04/22/1998** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| **MW-1** | **Chromium, total** | **09/16/1994** | **0.06** | **mg/l** | **0.005** | **0.05** | **0.01** |
| MW-1 | Chromium, total | 05/28/1997 | 0.006 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 10/23/1997 | 0.004 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 04/22/1998 | 0.011 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 10/27/1998 | 0.024 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 07/13/2001 | 0.003 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 01/10/2002 | 0.0061 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 12/16/2002 | 0.002 | mg/l | 0.002 | 0.05 | |
| MW-1 | Chromium, total | 06/18/2003 | 0.0021 | mg/l | 0.002 | 0.05 | |
| **MW-10** | **Chromium, total** | **09/16/1994** | **0.062** | **mg/l** | **0.005** | **0.05** | **0.012** |
| **MW-10** | **Chromium, total** | **11/29/1994** | **0.054** | **mg/l** | **0.01** | **0.05** | **0.004** |
| MW-10 | Chromium, total | 02/07/1995 | 0.027 | mg/l | 0.01 | 0.05 | |
| MW-10 | Chromium, total | 02/28/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-10 | Chromium, total | 10/24/1996 | 0.004 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 10/23/1997 | 0.006 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 04/22/1998 | 0.005 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 10/27/1998 | 0.04 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 04/14/1999 | 0.014 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 02/08/2000 | 0.0025 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 12/05/2000 | 0.013 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 07/12/2001 | 0.0084 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 12/16/2002 | 0.0044 | mg/l | 0.002 | 0.05 | |
| MW-10 | Chromium, total | 06/18/2003 | 0.0038 | mg/l | 0.002 | 0.05 | |
| **MW-11** | **Chromium, total** | **09/15/1994** | **0.249** | **mg/l** | **0.005** | **0.05** | **0.199** |
| **MW-11** | **Chromium, total** | **11/29/1994** | **0.177** | **mg/l** | **0.01** | **0.05** | **0.127** |
| **MW-11** | **Chromium, total** | **02/07/1995** | **0.173** | **mg/l** | **0.01** | **0.05** | **0.123** |
| **MW-11** | **Chromium, total** | **02/28/1995** | **0.15** | **mg/l** | **0.01** | **0.05** | **0.1** |
| **MW-11** | **Chromium, total** | **10/31/1995** | **0.196** | **mg/l** | **0.01** | **0.05** | **0.146** |
| **MW-11** | **Chromium, total** | **04/30/1996** | **0.086** | **mg/l** | **0.01** | **0.05** | **0.036** |
| **MW-11** | **Chromium, total** | **05/28/1997** | **0.083** | **mg/l** | **0.01** | **0.05** | **0.033** |
| **MW-11** | **Chromium, total** | **10/23/1997** | **0.08** | **mg/l** | **0.008** | **0.05** | **0.03** |
| **MW-11** | **Chromium, total** | **04/22/1998** | **0.23** | **mg/l** | **0.01** | **0.05** | **0.18** |
| MW-11 | Chromium, total | 10/28/1998 | 0.0053 | mg/l | 0.002 | 0.05 | |
| **MW-11** | **Chromium, total** | **04/14/1999** | **0.078** | **mg/l** | **0.002** | **0.05** | **0.028** |
| MW-11 | Chromium, total | 02/08/2000 | 0.0082 | mg/l | 0.002 | 0.05 | |
| MW-11 | Chromium, total | 06/02/2000 | 0.0032 | mg/l | 0.002 | 0.05 | |
| **MW-11** | **Chromium, total** | **12/05/2000** | **0.059** | **mg/l** | **0.002** | **0.05** | **0.009** |
| MW-11 | Chromium, total | 07/12/2001 | 0.037 | mg/l | 0.002 | 0.05 | |
| MW-11 | Chromium, total | 01/09/2002 | 0.022 | mg/l | 0.002 | 0.05 | |
| MW-11 | Chromium, total | 06/25/2002 | 0.019 | mg/l | 0.002 | 0.05 | |
| MW-11 | Chromium, total | 12/16/2002 | 0.03 | mg/l | 0.002 | 0.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-11 | Chromium, total | 06/18/2003 | 0.03 | mg/l | 0.002 | 0.05 | |
| **MW-12** | **Chromium, total** | **09/15/1994** | **0.054** | **mg/l** | **0.005** | **0.05** | **0.004** |
| MW-12 | Chromium, total | 11/30/1994 | 0.039 | mg/l | 0.01 | 0.05 | |
| **MW-12** | **Chromium, total** | **02/07/1995** | **0.051** | **mg/l** | **0.01** | **0.05** | **0.001** |
| MW-12 | Chromium, total | 02/28/1995 | 0.026 | mg/l | 0.01 | 0.05 | |
| MW-12 | Chromium, total | 10/30/1995 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-12 | Chromium, total | 05/28/1997 | 0.006 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 10/23/1997 | 0.01 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 04/22/1998 | 0.013 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 10/27/1998 | 0.031 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 04/14/1999 | 0.0062 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 02/07/2000 | 0.0026 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 06/05/2000 | 0.0026 | mg/l | 0.002 | 0.05 | |
| **MW-12** | **Chromium, total** | **07/12/2001** | **0.17** | **mg/l** | **0.002** | **0.05** | **0.12** |
| MW-12 | Chromium, total | 01/10/2002 | 0.03 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 12/17/2002 | 0.0075 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 06/18/2003 | 0.013 | mg/l | 0.002 | 0.05 | |
| MW-12 | Chromium, total | 06/23/2004 | 0.013 | mg/l | 0.01 | 0.05 | |
| MW-12 | Chromium, total | 07/13/2006 | 0.0191 | mg/l | 0.01 | 0.05 | |
| **MW-2** | **Chromium, total** | **09/16/1994** | **0.46** | **mg/l** | **0.005** | **0.05** | **0.41** |
| MW-2 | Chromium, total | 11/30/1994 | 0.012 | mg/l | 0.01 | 0.05 | |
| **MW-2** | **Chromium, total** | **02/07/1995** | **0.054** | **mg/l** | **0.01** | **0.05** | **0.004** |
| MW-2 | Chromium, total | 02/27/1995 | 0.019 | mg/l | 0.01 | 0.05 | |
| MW-2 | Chromium, total | 10/24/1996 | 0.002 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 05/28/1997 | 0.009 | mg/l | 0.002 | 0.05 | |
| **MW-2** | **Chromium, total** | **10/23/1997** | **0.052** | **mg/l** | **0.008** | **0.05** | **0.002** |
| MW-2 | Chromium, total | 04/22/1998 | 0.02 | mg/l | 0.002 | 0.05 | |
| **MW-2** | **Chromium, total** | **10/27/1998** | **0.07** | **mg/l** | **0.01** | **0.05** | **0.02** |
| MW-2 | Chromium, total | 04/14/1999 | 0.01 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 02/07/2000 | 0.0057 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 12/05/2000 | 0.025 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 07/11/2001 | 0.015 | mg/l | 0.002 | 0.05 | |
| **MW-2** | **Chromium, total** | **01/09/2002** | **0.13** | **mg/l** | **0.002** | **0.05** | **0.08** |
| MW-2 | Chromium, total | 06/25/2002 | 0.016 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 12/16/2002 | 0.0054 | mg/l | 0.002 | 0.05 | |
| MW-2 | Chromium, total | 06/18/2003 | 0.006 | mg/l | 0.002 | 0.05 | |
| MW-25 | Chromium, total | 07/13/2007 | 24.7 | ug/l | 1.7 | 50 | |
| MW-3 | Chromium, total | 09/16/1994 | 0.037 | mg/l | 0.005 | 0.05 | |
| MW-3 | Chromium, total | 11/29/1994 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-3 | Chromium, total | 10/23/1997 | 0.008 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 04/22/1998 | 0.002 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 04/14/1999 | 0.0026 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 12/05/2000 | 0.0048 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 07/12/2001 | 0.0035 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 01/09/2002 | 0.0027 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 12/16/2002 | 0.0074 | mg/l | 0.002 | 0.05 | |
| MW-3 | Chromium, total | 06/18/2003 | 0.013 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 09/15/1994 | 0.01 | mg/l | 0.005 | 0.05 | |
| MW-4R | Chromium, total | 05/28/1997 | 0.042 | mg/l | 0.01 | 0.05 | |
| MW-4R | Chromium, total | 10/23/1997 | 0.014 | mg/l | 0.002 | 0.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-4R | Chromium, total | 04/22/1998 | 0.027 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 10/27/1998 | 0.021 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 04/14/1999 | 0.0043 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 02/07/2000 | 0.0021 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 12/05/2000 | 0.0073 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 07/12/2001 | 0.0048 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 01/09/2002 | 0.0025 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 12/16/2002 | 0.0021 | mg/l | 0.002 | 0.05 | |
| MW-4R | Chromium, total | 06/18/2003 | 0.0026 | mg/l | 0.002 | 0.05 | |
| MW-5 | Chromium, total | 09/15/1994 | 0.032 | mg/l | 0.005 | 0.05 | |
| MW-5 | Chromium, total | 11/29/1994 | 0.019 | mg/l | 0.01 | 0.05 | |
| MW-5 | Chromium, total | 02/07/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-5 | Chromium, total | 02/27/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-5 | Chromium, total | 10/30/1995 | 0.016 | mg/l | 0.01 | 0.05 | |
| **MW-5** | **Chromium, total** | **05/28/1997** | **0.055** | **mg/l** | **0.01** | **0.05** | **0.005** |
| **MW-5** | **Chromium, total** | **10/23/1997** | **0.12** | **mg/l** | **0.08** | **0.05** | **0.07** |
| **MW-5** | **Chromium, total** | **04/22/1998** | **0.063** | **mg/l** | **0.004** | **0.05** | **0.013** |
| **MW-5R** | **Chromium, total** | **04/14/1999** | **0.091** | **mg/l** | **0.002** | **0.05** | **0.041** |
| **MW-5R** | **Chromium, total** | **02/07/2000** | **0.1** | **mg/l** | **0.002** | **0.05** | **0.05** |
| MW-5R | Chromium, total | 06/02/2000 | 0.01 | mg/l | 0.002 | 0.05 | |
| MW-5R | Chromium, total | 12/05/2000 | 0.02 | mg/l | 0.002 | 0.05 | |
| MW-5R | Chromium, total | 07/12/2001 | 0.043 | mg/l | 0.002 | 0.05 | |
| **MW-5R** | **Chromium, total** | **01/09/2002** | **0.06** | **mg/l** | **0.002** | **0.05** | **0.01** |
| **MW-5R** | **Chromium, total** | **06/25/2002** | **0.1** | **mg/l** | **0.002** | **0.05** | **0.05** |
| MW-5R | Chromium, total | 12/16/2002 | 0.0036 | mg/l | 0.002 | 0.05 | |
| MW-5R | Chromium, total | 06/18/2003 | 0.0048 | mg/l | 0.002 | 0.05 | |
| MW-5R | Chromium, total | 07/13/2006 | 0.0179 | mg/l | 0.01 | 0.05 | |
| MW-6 | Chromium, total | 09/15/1994 | 0.016 | mg/l | 0.005 | 0.05 | |
| MW-6 | Chromium, total | 11/29/1994 | 0.015 | mg/l | 0.01 | 0.05 | |
| MW-6 | Chromium, total | 02/07/1995 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-6 | Chromium, total | 05/28/1997 | 0.005 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 10/23/1997 | 0.008 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 04/22/1998 | 0.031 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 10/27/1998 | 0.03 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 04/14/1999 | 0.0044 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 02/07/2000 | 0.0057 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 12/05/2000 | 0.0074 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 07/11/2001 | 0.0028 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 01/09/2002 | 0.0024 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 12/16/2002 | 0.0041 | mg/l | 0.002 | 0.05 | |
| MW-6 | Chromium, total | 06/18/2003 | 0.0049 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 09/15/1994 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-7 | Chromium, total | 11/29/1994 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-7 | Chromium, total | 02/27/1995 | 0.011 | mg/l | 0.01 | 0.05 | |
| **MW-7** | **Chromium, total** | **05/28/1997** | **0.051** | **mg/l** | **0.01** | **0.05** | **0.001** |
| MW-7 | Chromium, total | 10/23/1997 | 0.006 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 04/22/1998 | 0.015 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 10/27/1998 | 0.025 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 04/14/1999 | 0.0049 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 12/05/2000 | 0.005 | mg/l | 0.002 | 0.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-7 | Chromium, total | 07/11/2001 | 0.0051 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 01/09/2002 | 0.0046 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 12/16/2002 | 0.0025 | mg/l | 0.002 | 0.05 | |
| MW-7 | Chromium, total | 06/18/2003 | 0.0029 | mg/l | 0.002 | 0.05 | |
| **MW-9** | **Chromium, total** | **09/16/1994** | **0.124** | **mg/l** | **0.005** | **0.05** | **0.074** |
| **MW-9** | **Chromium, total** | **11/29/1994** | **0.142** | **mg/l** | **0.01** | **0.05** | **0.092** |
| MW-9 | Chromium, total | 02/07/1995 | 0.033 | mg/l | 0.01 | 0.05 | |
| MW-9 | Chromium, total | 02/27/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-9 | Chromium, total | 10/31/1995 | 0.014 | mg/l | 0.01 | 0.05 | |
| **MW-9** | **Chromium, total** | **05/28/1997** | **0.17** | **mg/l** | **0.02** | **0.05** | **0.12** |
| MW-9 | Chromium, total | 10/23/1997 | 0.047 | mg/l | 0.008 | 0.05 | |
| **MW-9** | **Chromium, total** | **04/22/1998** | **0.24** | **mg/l** | **0.01** | **0.05** | **0.19** |
| **MW-9** | **Chromium, total** | **10/28/1998** | **0.11** | **mg/l** | **0.005** | **0.05** | **0.06** |
| **MW-9** | **Chromium, total** | **04/14/1999** | **0.1** | **mg/l** | **0.002** | **0.05** | **0.05** |
| MW-9 | Chromium, total | 02/09/2000 | 0.0086 | mg/l | 0.002 | 0.05 | |
| MW-9 | Chromium, total | 12/05/2000 | 0.036 | mg/l | 0.002 | 0.05 | |
| MW-9 | Chromium, total | 07/12/2001 | 0.028 | mg/l | 0.002 | 0.05 | |
| MW-9 | Chromium, total | 01/09/2002 | 0.016 | mg/l | 0.002 | 0.05 | |
| MW-9 | Chromium, total | 06/25/2002 | 0.027 | mg/l | 0.002 | 0.05 | |
| **MW-9** | **Chromium, total** | **12/16/2002** | **0.057** | **mg/l** | **0.002** | **0.05** | **0.007** |
| MW-9 | Chromium, total | 06/18/2003 | 0.043 | mg/l | 0.002 | 0.05 | |
| MW-9 | Chromium, total | 07/13/2006 | 0.0258 | mg/l | 0.01 | 0.05 | |
| MW-9 | Chromium, total | 01/25/2007 | 8.3 | ug/l | 2 | 50 | |
| MW-1 | Cobalt, total | 02/07/1995 | 0.018 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 02/27/1995 | 0.018 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 10/30/1995 | 0.01 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 04/29/1996 | 0.015 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 10/24/1996 | 0.005 | mg/l | 0.002 | | |
| MW-1 | Cobalt, total | 05/28/1997 | 0.015 | mg/l | 0.003 | | |
| MW-1 | Cobalt, total | 10/23/1997 | 0.017 | mg/l | 0.003 | | |
| MW-1 | Cobalt, total | 04/22/1998 | 0.008 | mg/l | 0.002 | | |
| MW-1 | Cobalt, total | 10/27/1998 | 0.042 | mg/l | 0.002 | | |
| MW-1 | Cobalt, total | 04/14/1999 | 0.013 | mg/l | 0.005 | | |
| MW-1 | Cobalt, total | 07/13/2001 | 0.0096 | mg/l | 0.005 | | |
| MW-1 | Cobalt, total | 01/10/2002 | 0.05 | mg/l | 0.005 | | |
| MW-1 | Cobalt, total | 06/18/2003 | 0.01 | mg/l | 0.005 | | |
| MW-1 | Cobalt, total | 01/06/2004 | 0.018 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 06/23/2004 | 0.014 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 01/06/2005 | 0.017 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 06/17/2005 | 0.012 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 01/26/2006 | 0.0128 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 07/13/2006 | 0.0151 | mg/l | 0.01 | | |
| MW-1 | Cobalt, total | 01/25/2007 | 8.9 | ug/l | 2 | | |
| MW-1 | Cobalt, total | 07/03/2007 | 16.1 | ug/l | 10 | | |
| MW-10 | Cobalt, total | 11/29/1994 | 0.015 | mg/l | 0.01 | | |
| MW-10 | Cobalt, total | 02/07/1995 | 0.018 | mg/l | 0.01 | | |
| MW-10 | Cobalt, total | 02/28/1995 | 0.018 | mg/l | 0.01 | | |
| MW-10 | Cobalt, total | 10/31/1995 | 0.012 | mg/l | 0.01 | | |
| MW-10 | Cobalt, total | 04/30/1996 | 0.021 | mg/l | 0.01 | | |
| MW-10 | Cobalt, total | 10/24/1996 | 0.014 | mg/l | 0.002 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-10 | Cobalt, total | 05/28/1997 | 0.018 | mg/l | 0.003 | | |
| MW-10 | Cobalt, total | 10/23/1997 | 0.007 | mg/l | 0.003 | | |
| MW-10 | Cobalt, total | 04/22/1998 | 0.015 | mg/l | 0.002 | | |
| MW-10 | Cobalt, total | 10/27/1998 | 0.018 | mg/l | 0.002 | | |
| MW-10 | Cobalt, total | 04/14/1999 | 0.015 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 02/08/2000 | 0.005 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 06/02/2000 | 0.012 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 12/05/2000 | 0.0064 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 07/12/2001 | 0.011 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 06/25/2002 | 0.0056 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 12/16/2002 | 0.0058 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 06/18/2003 | 0.0063 | mg/l | 0.005 | | |
| MW-10 | Cobalt, total | 01/25/2007 | 3.8 | ug/l | 2 | | |
| MW-11 | Cobalt, total | 11/29/1994 | 0.022 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 02/07/1995 | 0.045 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 02/28/1995 | 0.041 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 10/31/1995 | 0.041 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 04/30/1996 | 0.035 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 10/24/1996 | 0.01 | mg/l | 0.002 | | |
| MW-11 | Cobalt, total | 05/28/1997 | 0.022 | mg/l | 0.01 | | |
| MW-11 | Cobalt, total | 10/23/1997 | 0.011 | mg/l | 0.003 | | |
| MW-11 | Cobalt, total | 04/22/1998 | 0.023 | mg/l | 0.002 | | |
| MW-11 | Cobalt, total | 10/28/1998 | 0.011 | mg/l | 0.002 | | |
| MW-11 | Cobalt, total | 04/14/1999 | 0.011 | mg/l | 0.005 | | |
| MW-11 | Cobalt, total | 06/02/2000 | 0.0059 | mg/l | 0.005 | | |
| MW-11 | Cobalt, total | 12/05/2000 | 0.014 | mg/l | 0.005 | | |
| MW-11 | Cobalt, total | 07/12/2001 | 0.0089 | mg/l | 0.005 | | |
| MW-11 | Cobalt, total | 01/09/2002 | 0.0084 | mg/l | 0.005 | | |
| MW-11 | Cobalt, total | 06/25/2002 | 0.0081 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 02/07/1995 | 0.015 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 02/28/1995 | 0.013 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 10/24/1996 | 0.003 | mg/l | 0.002 | | |
| MW-12 | Cobalt, total | 05/28/1997 | 0.003 | mg/l | 0.003 | | |
| MW-12 | Cobalt, total | 10/23/1997 | 0.004 | mg/l | 0.003 | | |
| MW-12 | Cobalt, total | 04/22/1998 | 0.098 | mg/l | 0.004 | | |
| MW-12 | Cobalt, total | 10/27/1998 | 0.21 | mg/l | 0.008 | | |
| MW-12 | Cobalt, total | 04/14/1999 | 0.015 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 02/07/2000 | 0.024 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 06/05/2000 | 0.022 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 07/12/2001 | 0.1 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 01/10/2002 | 0.065 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 06/25/2002 | 0.0079 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 12/17/2002 | 0.028 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 06/18/2003 | 0.037 | mg/l | 0.005 | | |
| MW-12 | Cobalt, total | 01/06/2004 | 0.015 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 06/23/2004 | 0.051 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 01/06/2005 | 0.047 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 06/17/2005 | 0.03 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 01/26/2006 | 0.0931 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 07/13/2006 | 0.0555 | mg/l | 0.01 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-12 | Cobalt, total | 01/25/2007 | 43.9 | ug/l | 2 | | |
| MW-12 | Cobalt, total | 07/03/2007 | 43.8 | ug/l | 10 | | |
| MW-2 | Cobalt, total | 09/16/1994 | 0.97 | mg/l | 0.1 | | |
| MW-2 | Cobalt, total | 11/30/1994 | 0.017 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 02/07/1995 | 0.062 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 02/27/1995 | 0.055 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 04/29/1996 | 0.02 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 10/24/1996 | 0.018 | mg/l | 0.002 | | |
| MW-2 | Cobalt, total | 05/28/1997 | 0.021 | mg/l | 0.003 | | |
| MW-2 | Cobalt, total | 10/23/1997 | 0.054 | mg/l | 0.012 | | |
| MW-2 | Cobalt, total | 04/22/1998 | 0.028 | mg/l | 0.002 | | |
| MW-2 | Cobalt, total | 10/27/1998 | 0.13 | mg/l | 0.008 | | |
| MW-2 | Cobalt, total | 04/14/1999 | 0.032 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 02/07/2000 | 0.012 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 06/02/2000 | 0.032 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 12/05/2000 | 0.12 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 07/11/2001 | 0.1 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 01/09/2002 | 0.38 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 06/25/2002 | 0.087 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 12/16/2002 | 0.023 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 06/18/2003 | 0.037 | mg/l | 0.005 | | |
| MW-2 | Cobalt, total | 01/06/2004 | 0.071 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 06/23/2004 | 0.061 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 01/06/2005 | 0.08 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 06/16/2005 | 0.028 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 01/26/2006 | 0.0593 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 07/13/2006 | 0.0469 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 01/25/2007 | 53.2 | ug/l | 2 | | |
| MW-2 | Cobalt, total | 07/03/2007 | 36.9 | ug/l | 10 | | |
| MW-25 | Cobalt, total | 07/13/2007 | 12.3 | ug/l | 2.5 | | |
| MW-3 | Cobalt, total | 10/31/1995 | 0.015 | mg/l | 0.01 | | |
| MW-3 | Cobalt, total | 04/30/1996 | 0.013 | mg/l | 0.01 | | |
| MW-3 | Cobalt, total | 10/24/1996 | 0.006 | mg/l | 0.002 | | |
| MW-3 | Cobalt, total | 05/28/1997 | 0.005 | mg/l | 0.003 | | |
| MW-3 | Cobalt, total | 10/23/1997 | 0.004 | mg/l | 0.003 | | |
| MW-3 | Cobalt, total | 04/22/1998 | 0.002 | mg/l | 0.002 | | |
| MW-3 | Cobalt, total | 01/09/2002 | 0.0087 | mg/l | 0.005 | | |
| MW-3 | Cobalt, total | 06/25/2002 | 0.01 | mg/l | 0.005 | | |
| MW-3 | Cobalt, total | 12/16/2002 | 0.0086 | mg/l | 0.005 | | |
| MW-3 | Cobalt, total | 06/18/2003 | 0.028 | mg/l | 0.005 | | |
| MW-3 | Cobalt, total | 01/06/2004 | 0.01 | mg/l | 0.01 | | |
| MW-3 | Cobalt, total | 06/23/2004 | 0.012 | mg/l | 0.01 | | |
| MW-3 | Cobalt, total | 01/25/2007 | 7.6 | ug/l | 2 | | |
| MW-3 | Cobalt, total | 07/03/2007 | 13.9 | ug/l | 10 | | |
| MW-4R | Cobalt, total | 05/28/1997 | 0.019 | mg/l | 0.003 | | |
| MW-4R | Cobalt, total | 10/23/1997 | 0.01 | mg/l | 0.003 | | |
| MW-4R | Cobalt, total | 04/22/1998 | 0.015 | mg/l | 0.002 | | |
| MW-4R | Cobalt, total | 10/27/1998 | 0.017 | mg/l | 0.002 | | |
| MW-4R | Cobalt, total | 06/02/2000 | 0.0053 | mg/l | 0.005 | | |
| MW-4R | Cobalt, total | 06/23/2004 | 0.01 | mg/l | 0.01 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-4R | Cobalt, total | 07/13/2006 | 0.0115 | mg/l | 0.01 | | |
| MW-5 | Cobalt, total | 02/07/1995 | 0.026 | mg/l | 0.01 | | |
| MW-5 | Cobalt, total | 02/27/1995 | 0.032 | mg/l | 0.01 | | |
| MW-5 | Cobalt, total | 10/30/1995 | 0.014 | mg/l | 0.01 | | |
| MW-5 | Cobalt, total | 10/24/1996 | 0.004 | mg/l | 0.002 | | |
| MW-5 | Cobalt, total | 05/28/1997 | 0.058 | mg/l | 0.012 | | |
| MW-5 | Cobalt, total | 10/23/1997 | 0.058 | mg/l | 0.012 | | |
| MW-5 | Cobalt, total | 04/22/1998 | 0.049 | mg/l | 0.002 | | |
| MW-5R | Cobalt, total | 04/14/1999 | 0.12 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 02/07/2000 | 0.17 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 06/02/2000 | 0.072 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 12/05/2000 | 0.017 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 07/12/2001 | 0.064 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 01/09/2002 | 0.076 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 06/25/2002 | 0.14 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 12/16/2002 | 0.01 | mg/l | 0.005 | | |
| MW-5R | Cobalt, total | 01/06/2004 | 0.012 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 06/23/2004 | 0.013 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 01/06/2005 | 0.014 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 06/16/2005 | 0.024 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 01/26/2006 | 0.0406 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 07/13/2006 | 0.0881 | mg/l | 0.01 | | |
| MW-5R | Cobalt, total | 01/25/2007 | 12.7 | ug/l | 2 | | |
| MW-5R | Cobalt, total | 07/03/2007 | 25.7 | ug/l | 10 | | |
| MW-6 | Cobalt, total | 10/23/1997 | 0.009 | mg/l | 0.003 | | |
| MW-6 | Cobalt, total | 04/22/1998 | 0.037 | mg/l | 0.002 | | |
| MW-6 | Cobalt, total | 10/27/1998 | 0.051 | mg/l | 0.002 | | |
| MW-6 | Cobalt, total | 04/14/1999 | 0.0074 | mg/l | 0.005 | | |
| MW-6 | Cobalt, total | 02/07/2000 | 0.0094 | mg/l | 0.005 | | |
| MW-6 | Cobalt, total | 07/13/2006 | 0.0111 | mg/l | 0.01 | | |
| MW-6 | Cobalt, total | 01/25/2007 | 3.6 | ug/l | 2 | | |
| MW-7 | Cobalt, total | 05/28/1997 | 0.012 | mg/l | 0.003 | | |
| MW-7 | Cobalt, total | 10/23/1997 | 0.006 | mg/l | 0.003 | | |
| MW-7 | Cobalt, total | 04/22/1998 | 0.009 | mg/l | 0.002 | | |
| MW-7 | Cobalt, total | 10/27/1998 | 0.015 | mg/l | 0.002 | | |
| MW-9 | Cobalt, total | 11/29/1994 | 0.027 | mg/l | 0.01 | | |
| MW-9 | Cobalt, total | 02/07/1995 | 0.011 | mg/l | 0.01 | | |
| MW-9 | Cobalt, total | 02/27/1995 | 0.012 | mg/l | 0.01 | | |
| MW-9 | Cobalt, total | 10/24/1996 | 0.003 | mg/l | 0.002 | | |
| MW-9 | Cobalt, total | 05/28/1997 | 0.036 | mg/l | 0.006 | | |
| MW-9 | Cobalt, total | 10/23/1997 | 0.006 | mg/l | 0.003 | | |
| MW-9 | Cobalt, total | 04/22/1998 | 0.028 | mg/l | 0.002 | | |
| MW-9 | Cobalt, total | 10/28/1998 | 0.016 | mg/l | 0.002 | | |
| MW-9 | Cobalt, total | 04/14/1999 | 0.024 | mg/l | 0.005 | | |
| MW-9 | Cobalt, total | 06/25/2002 | 0.0056 | mg/l | 0.005 | | |
| MW-9 | Cobalt, total | 12/16/2002 | 0.0071 | mg/l | 0.005 | | |
| MW-1 | Copper | 09/16/1994 | 0.2 | mg/l | 0.01 | 1 | |
| MW-1 | Copper | 10/24/1996 | 0.024 | mg/l | 0.01 | 1 | |
| MW-1 | Copper | 05/28/1997 | 0.045 | mg/l | 0.01 | 1 | |
| MW-1 | Copper | 10/23/1997 | 0.027 | mg/l | 0.01 | 1 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-1 | Copper | 04/22/1998 | 0.024 | mg/l | 0.01 | 1 | |
| MW-1 | Copper | 10/27/1998 | 0.12 | mg/l | 0.01 | 1 | |
| MW-1 | Copper | 04/14/1999 | 0.029 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 02/07/2000 | 0.0034 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 07/13/2001 | 0.017 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 01/10/2002 | 0.038 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 12/16/2002 | 0.0064 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 06/18/2003 | 0.0064 | mg/l | 0.002 | 1 | |
| MW-1 | Copper | 01/25/2007 | 8.5 | ug/l | 0.6 | 1000 | |
| MW-1 | Copper | 07/03/2007 | 42.5 | ug/l | 10 | 1000 | |
| MW-10 | Copper | 10/24/1996 | 0.019 | mg/l | 0.01 | 1 | |
| MW-10 | Copper | 10/23/1997 | 0.013 | mg/l | 0.01 | 1 | |
| MW-10 | Copper | 04/22/1998 | 0.012 | mg/l | 0.01 | 1 | |
| MW-10 | Copper | 10/27/1998 | 0.038 | mg/l | 0.01 | 1 | |
| MW-10 | Copper | 04/14/1999 | 0.044 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 02/08/2000 | 0.0059 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 12/05/2000 | 0.016 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 07/12/2001 | 0.0076 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 06/25/2002 | 0.0097 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 12/16/2002 | 0.0072 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 06/18/2003 | 0.0043 | mg/l | 0.002 | 1 | |
| MW-10 | Copper | 01/25/2007 | 18.5 | ug/l | 0.6 | 1000 | |
| MW-11 | Copper | 09/15/1994 | 0.18 | mg/l | 0.1 | 1 | |
| MW-11 | Copper | 02/07/1995 | 0.203 | mg/l | 0.2 | 1 | |
| MW-11 | Copper | 05/28/1997 | 0.03 | mg/l | 0.01 | 1 | |
| MW-11 | Copper | 10/23/1997 | 0.029 | mg/l | 0.01 | 1 | |
| MW-11 | Copper | 04/22/1998 | 0.054 | mg/l | 0.01 | 1 | |
| MW-11 | Copper | 04/14/1999 | 0.019 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 02/08/2000 | 0.0032 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 06/02/2000 | 0.0025 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 12/05/2000 | 0.024 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 07/12/2001 | 0.02 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 01/09/2002 | 0.0074 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 06/25/2002 | 0.012 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 12/16/2002 | 0.0094 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 06/18/2003 | 0.0084 | mg/l | 0.002 | 1 | |
| MW-11 | Copper | 01/25/2007 | 8.7 | ug/l | 0.6 | 1000 | |
| MW-12 | Copper | 04/22/1998 | 0.051 | mg/l | 0.01 | 1 | |
| MW-12 | Copper | 10/27/1998 | 0.026 | mg/l | 0.01 | 1 | |
| MW-12 | Copper | 04/14/1999 | 0.0077 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 02/07/2000 | 0.022 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 07/12/2001 | 0.18 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 01/10/2002 | 0.025 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 06/25/2002 | 0.0055 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 12/17/2002 | 0.0082 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 06/18/2003 | 0.011 | mg/l | 0.002 | 1 | |
| MW-12 | Copper | 01/25/2007 | 62.8 | ug/l | 0.6 | 1000 | |
| **MW-2** | **Copper** | **09/16/1994** | **1.4** | **mg/l** | **0.1** | **1** | **0.4** |
| MW-2 | Copper | 10/24/1996 | 0.04 | mg/l | 0.01 | 1 | |
| MW-2 | Copper | 05/28/1997 | 0.04 | mg/l | 0.01 | 1 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-2 | Copper | 10/23/1997 | 0.12 | mg/l | 0.01 | 1 | |
| MW-2 | Copper | 04/22/1998 | 0.071 | mg/l | 0.01 | 1 | |
| MW-2 | Copper | 10/27/1998 | 0.18 | mg/l | 0.05 | 1 | |
| MW-2 | Copper | 04/14/1999 | 0.043 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 02/07/2000 | 0.02 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 06/02/2000 | 0.059 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 12/05/2000 | 0.06 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 07/11/2001 | 0.072 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 01/09/2002 | 0.25 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 06/25/2002 | 0.044 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 12/16/2002 | 0.023 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 06/18/2003 | 0.029 | mg/l | 0.002 | 1 | |
| MW-2 | Copper | 01/25/2007 | 1.7 | ug/l | 0.6 | 1000 | |
| MW-24 | Copper | 07/13/2007 | 18 | ug/l | 1.8 | 1000 | |
| MW-25 | Copper | 07/13/2007 | 32.8 | ug/l | 1.8 | 1000 | |
| MW-3 | Copper | 10/23/1997 | 0.018 | mg/l | 0.01 | 1 | |
| MW-3 | Copper | 04/22/1998 | 0.012 | mg/l | 0.01 | 1 | |
| MW-3 | Copper | 04/14/1999 | 0.0073 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 02/08/2000 | 0.0025 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 12/05/2000 | 0.0073 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 01/09/2002 | 0.004 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 06/25/2002 | 0.006 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 12/16/2002 | 0.011 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 06/18/2003 | 0.018 | mg/l | 0.002 | 1 | |
| MW-3 | Copper | 01/25/2007 | 1.8 | ug/l | 0.6 | 1000 | |
| MW-4R | Copper | 05/28/1997 | 0.054 | mg/l | 0.01 | 1 | |
| MW-4R | Copper | 10/23/1997 | 0.025 | mg/l | 0.01 | 1 | |
| MW-4R | Copper | 04/22/1998 | 0.049 | mg/l | 0.01 | 1 | |
| MW-4R | Copper | 10/27/1998 | 0.03 | mg/l | 0.02 | 1 | |
| MW-4R | Copper | 04/14/1999 | 0.0068 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 02/07/2000 | 0.006 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 12/05/2000 | 0.0083 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 07/12/2001 | 0.0071 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 01/09/2002 | 0.0022 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 06/25/2002 | 0.0061 | mg/l | 0.002 | 1 | |
| MW-4R | Copper | 01/25/2007 | 58.9 | ug/l | 0.6 | 1000 | |
| MW-5 | Copper | 10/24/1996 | 0.013 | mg/l | 0.01 | 1 | |
| MW-5 | Copper | 05/28/1997 | 0.17 | mg/l | 0.01 | 1 | |
| MW-5 | Copper | 10/23/1997 | 0.29 | mg/l | 0.01 | 1 | |
| MW-5 | Copper | 04/22/1998 | 0.15 | mg/l | 0.01 | 1 | |
| MW-5R | Copper | 04/14/1999 | 0.37 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 02/07/2000 | 0.45 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 12/05/2000 | 0.046 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 07/12/2001 | 0.18 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 01/09/2002 | 0.2 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 06/25/2002 | 0.39 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 12/16/2002 | 0.0035 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 06/18/2003 | 0.0049 | mg/l | 0.002 | 1 | |
| MW-5R | Copper | 01/25/2007 | 128 | ug/l | 0.6 | 1000 | |
| MW-5R | Copper | 07/03/2007 | 16.7 | ug/l | 10 | 1000 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-6 | Copper | 10/23/1997 | 0.017 | mg/l | 0.01 | 1 | |
| MW-6 | Copper | 04/22/1998 | 0.045 | mg/l | 0.01 | 1 | |
| MW-6 | Copper | 10/27/1998 | 0.1 | mg/l | 0.05 | 1 | |
| MW-6 | Copper | 04/14/1999 | 0.0071 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 02/07/2000 | 0.01 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 12/05/2000 | 0.011 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 07/11/2001 | 0.0032 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 06/25/2002 | 0.0063 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 12/16/2002 | 0.0051 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 06/18/2003 | 0.0024 | mg/l | 0.002 | 1 | |
| MW-6 | Copper | 01/25/2007 | 174 | ug/l | 0.6 | 1000 | |
| MW-7 | Copper | 05/28/1997 | 0.032 | mg/l | 0.01 | 1 | |
| MW-7 | Copper | 04/22/1998 | 0.018 | mg/l | 0.01 | 1 | |
| MW-7 | Copper | 10/27/1998 | 0.013 | mg/l | 0.01 | 1 | |
| MW-7 | Copper | 12/05/2000 | 0.0067 | mg/l | 0.002 | 1 | |
| MW-7 | Copper | 07/11/2001 | 0.0042 | mg/l | 0.002 | 1 | |
| MW-7 | Copper | 06/25/2002 | 0.0046 | mg/l | 0.002 | 1 | |
| MW-7 | Copper | 12/16/2002 | 0.002 | mg/l | 0.002 | 1 | |
| MW-7 | Copper | 01/25/2007 | 13.8 | ug/l | 0.6 | 1000 | |
| MW-9 | Copper | 09/16/1994 | 0.11 | mg/l | 0.1 | 1 | |
| MW-9 | Copper | 05/28/1997 | 0.17 | mg/l | 0.01 | 1 | |
| MW-9 | Copper | 10/23/1997 | 0.035 | mg/l | 0.01 | 1 | |
| MW-9 | Copper | 04/22/1998 | 0.16 | mg/l | 0.01 | 1 | |
| MW-9 | Copper | 10/28/1998 | 0.097 | mg/l | 0.01 | 1 | |
| MW-9 | Copper | 04/14/1999 | 0.068 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 02/09/2000 | 0.0045 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 12/05/2000 | 0.03 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 07/12/2001 | 0.022 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 01/09/2002 | 0.0085 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 06/25/2002 | 0.024 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 12/16/2002 | 0.033 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 06/18/2003 | 0.023 | mg/l | 0.002 | 1 | |
| MW-9 | Copper | 01/25/2007 | 67.9 | ug/l | 0.6 | 1000 | |
| SHOP | Copper | 07/03/2007 | 66.2 | ug/l | 10 | 1000 | |
| **MW-1** | **Lead, total** | **09/16/1994** | **0.093** | **mg/l** | **0.01** | **0.015** | **0.078** |
| **MW-1** | **Lead, total** | **02/07/1995** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| **MW-1** | **Lead, total** | **05/28/1997** | **0.2** | **mg/l** | **0.005** | **0.015** | **0.185** |
| MW-1 | Lead, total | 10/23/1997 | 0.013 | mg/l | 0.005 | 0.015 | |
| MW-1 | Lead, total | 04/22/1998 | 0.007 | mg/l | 0.005 | 0.015 | |
| **MW-1** | **Lead, total** | **10/27/1998** | **0.074** | **mg/l** | **0.005** | **0.015** | **0.059** |
| MW-1 | Lead, total | 04/14/1999 | 0.008 | mg/l | 0.005 | 0.015 | |
| MW-1 | Lead, total | 07/13/2001 | 0.0077 | mg/l | 0.003 | 0.015 | |
| **MW-1** | **Lead, total** | **01/10/2002** | **0.016** | **mg/l** | **0.003** | **0.015** | **0.001** |
| MW-1 | Lead, total | 06/23/2004 | 0.011 | mg/l | 0.01 | 0.015 | |
| MW-1 | Lead, total | 06/17/2005 | 0.012 | mg/l | 0.01 | 0.015 | |
| **MW-1** | **Lead, total** | **07/03/2007** | **31.3** | **ug/l** | **10** | **15** | **16.3** |
| **MW-10** | **Lead, total** | **09/16/1994** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| MW-10 | Lead, total | 11/29/1994 | 0.01 | mg/l | 0.01 | 0.015 | |
| MW-10 | Lead, total | 02/07/1995 | 0.011 | mg/l | 0.01 | 0.015 | |
| **MW-10** | **Lead, total** | **10/24/1996** | **0.018** | **mg/l** | **0.005** | **0.015** | **0.003** |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-10 | Lead, total | 10/23/1997 | 0.012 | mg/l | 0.005 | 0.015 | |
| **MW-10** | **Lead, total** | **10/27/1998** | **0.021** | **mg/l** | **0.005** | **0.015** | **0.006** |
| MW-10 | Lead, total | 04/14/1999 | 0.0096 | mg/l | 0.005 | 0.015 | |
| MW-10 | Lead, total | 07/12/2001 | 0.0036 | mg/l | 0.003 | 0.015 | |
| MW-10 | Lead, total | 01/26/2006 | 0.01 | mg/l | 0.01 | 0.015 | |
| MW-11 | Lead, total | 09/15/1994 | 0.012 | mg/l | 0.01 | 0.015 | |
| **MW-11** | **Lead, total** | **02/07/1995** | **0.021** | **mg/l** | **0.01** | **0.015** | **0.006** |
| **MW-11** | **Lead, total** | **02/28/1995** | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| **MW-11** | **Lead, total** | **10/23/1997** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| MW-11 | Lead, total | 04/22/1998 | 0.011 | mg/l | 0.005 | 0.015 | |
| **MW-12** | **Lead, total** | **09/15/1994** | **0.022** | **mg/l** | **0.01** | **0.015** | **0.007** |
| **MW-12** | **Lead, total** | **02/07/1995** | **0.02** | **mg/l** | **0.01** | **0.015** | **0.005** |
| MW-12 | Lead, total | 10/23/1997 | 0.011 | mg/l | 0.005 | 0.015 | |
| MW-12 | Lead, total | 10/27/1998 | 0.0058 | mg/l | 0.005 | 0.015 | |
| MW-12 | Lead, total | 07/12/2001 | 0.014 | mg/l | 0.003 | 0.015 | |
| MW-12 | Lead, total | 01/10/2002 | 0.0047 | mg/l | 0.003 | 0.015 | |
| MW-12 | Lead, total | 01/25/2007 | 2.6 | ug/l | 2 | 15 | |
| **MW-2** | **Lead, total** | **09/16/1994** | **0.63** | **mg/l** | **0.01** | **0.015** | **0.615** |
| **MW-2** | **Lead, total** | **02/07/1995** | **0.047** | **mg/l** | **0.01** | **0.015** | **0.032** |
| MW-2 | Lead, total | 02/27/1995 | 0.015 | mg/l | 0.01 | 0.015 | |
| MW-2 | Lead, total | 05/28/1997 | 0.013 | mg/l | 0.005 | 0.015 | |
| **MW-2** | **Lead, total** | **10/23/1997** | **0.082** | **mg/l** | **0.01** | **0.015** | **0.067** |
| **MW-2** | **Lead, total** | **04/22/1998** | **0.03** | **mg/l** | **0.005** | **0.015** | **0.015** |
| **MW-2** | **Lead, total** | **10/27/1998** | **0.16** | **mg/l** | **0.01** | **0.015** | **0.145** |
| **MW-2** | **Lead, total** | **04/14/1999** | **0.018** | **mg/l** | **0.005** | **0.015** | **0.003** |
| **MW-2** | **Lead, total** | **06/02/2000** | **0.02** | **mg/l** | **0.005** | **0.015** | **0.005** |
| **MW-2** | **Lead, total** | **12/05/2000** | **0.021** | **mg/l** | **0.005** | **0.015** | **0.006** |
| **MW-2** | **Lead, total** | **07/11/2001** | **0.02** | **mg/l** | **0.003** | **0.015** | **0.005** |
| **MW-2** | **Lead, total** | **01/09/2002** | **0.098** | **mg/l** | **0.003** | **0.015** | **0.083** |
| **MW-2** | **Lead, total** | **06/25/2002** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| MW-2 | Lead, total | 12/16/2002 | 0.0053 | mg/l | 0.005 | 0.015 | |
| MW-2 | Lead, total | 06/18/2003 | 0.0066 | mg/l | 0.005 | 0.015 | |
| **MW-2** | **Lead, total** | **01/06/2004** | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| **MW-2** | **Lead, total** | **01/06/2005** | **0.024** | **mg/l** | **0.01** | **0.015** | **0.009** |
| MW-2 | Lead, total | 07/13/2006 | 0.0133 | mg/l | 0.01 | 0.015 | |
| **MW-25** | **Lead, total** | **07/13/2007** | **16.7** | **ug/l** | **3.1** | **15** | **1.7** |
| **MW-3** | **Lead, total** | **09/16/1994** | **0.02** | **mg/l** | **0.01** | **0.015** | **0.005** |
| MW-3 | Lead, total | 10/23/1997 | 0.007 | mg/l | 0.005 | 0.015 | |
| MW-3 | Lead, total | 10/27/1998 | 0.0063 | mg/l | 0.005 | 0.015 | |
| MW-3 | Lead, total | 04/14/1999 | 0.006 | mg/l | 0.005 | 0.015 | |
| MW-4R | Lead, total | 02/07/1995 | 0.015 | mg/l | 0.01 | 0.015 | |
| MW-4R | Lead, total | 05/28/1997 | 0.009 | mg/l | 0.005 | 0.015 | |
| MW-4R | Lead, total | 10/23/1997 | 0.015 | mg/l | 0.005 | 0.015 | |
| MW-4R | Lead, total | 04/22/1998 | 0.013 | mg/l | 0.005 | 0.015 | |
| MW-4R | Lead, total | 10/27/1998 | 0.013 | mg/l | 0.005 | 0.015 | |
| **MW-5** | **Lead, total** | **09/15/1994** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| MW-5 | Lead, total | 11/29/1994 | 0.011 | mg/l | 0.01 | 0.015 | |
| **MW-5** | **Lead, total** | **02/07/1995** | **0.04** | **mg/l** | **0.01** | **0.015** | **0.025** |
| **MW-5** | **Lead, total** | **02/27/1995** | **0.028** | **mg/l** | **0.01** | **0.015** | **0.013** |
| MW-5 | Lead, total | 10/30/1995 | 0.013 | mg/l | 0.01 | 0.015 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-5** | **Lead, total** | **05/28/1997** | **0.05** | **mg/l** | **0.005** | **0.015** | **0.035** |
| **MW-5** | **Lead, total** | **10/23/1997** | **0.14** | **mg/l** | **0.02** | **0.015** | **0.125** |
| **MW-5** | **Lead, total** | **04/22/1998** | **0.057** | **mg/l** | **0.005** | **0.015** | **0.042** |
| **MW-5R** | **Lead, total** | **04/14/1999** | **0.068** | **mg/l** | **0.005** | **0.015** | **0.053** |
| **MW-5R** | **Lead, total** | **02/07/2000** | **0.1** | **mg/l** | **0.005** | **0.015** | **0.085** |
| **MW-5R** | **Lead, total** | **06/02/2000** | **0.033** | **mg/l** | **0.005** | **0.015** | **0.018** |
| MW-5R | Lead, total | 12/05/2000 | 0.0056 | mg/l | 0.005 | 0.015 | |
| **MW-5R** | **Lead, total** | **07/12/2001** | **0.037** | **mg/l** | **0.003** | **0.015** | **0.022** |
| **MW-5R** | **Lead, total** | **01/09/2002** | **0.041** | **mg/l** | **0.003** | **0.015** | **0.026** |
| **MW-5R** | **Lead, total** | **06/25/2002** | **0.1** | **mg/l** | **0.005** | **0.015** | **0.085** |
| MW-5R | Lead, total | 01/06/2004 | 0.01 | mg/l | 0.01 | 0.015 | |
| MW-5R | Lead, total | 06/16/2005 | 0.011 | mg/l | 0.01 | 0.015 | |
| **MW-5R** | **Lead, total** | **01/26/2006** | **0.0326** | **mg/l** | **0.01** | **0.015** | **0.0176** |
| **MW-5R** | **Lead, total** | **07/13/2006** | **0.0319** | **mg/l** | **0.01** | **0.015** | **0.0169** |
| MW-6 | Lead, total | 02/07/1995 | 0.012 | mg/l | 0.01 | 0.015 | |
| **MW-6** | **Lead, total** | **10/23/1997** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| **MW-6** | **Lead, total** | **04/22/1998** | **0.021** | **mg/l** | **0.005** | **0.015** | **0.006** |
| **MW-6** | **Lead, total** | **10/27/1998** | **0.048** | **mg/l** | **0.005** | **0.015** | **0.033** |
| MW-6 | Lead, total | 04/14/1999 | 0.0061 | mg/l | 0.005 | 0.015 | |
| MW-6 | Lead, total | 06/23/2004 | 0.011 | mg/l | 0.01 | 0.015 | |
| **MW-6** | **Lead, total** | **07/13/2006** | **0.0228** | **mg/l** | **0.01** | **0.015** | **0.0078** |
| MW-6 | Lead, total | 01/25/2007 | 2.6 | ug/l | 2 | 15 | |
| MW-7 | Lead, total | 09/15/1994 | 0.01 | mg/l | 0.01 | 0.015 | |
| MW-7 | Lead, total | 02/07/1995 | 0.014 | mg/l | 0.01 | 0.015 | |
| MW-7 | Lead, total | 04/29/1996 | 0.012 | mg/l | 0.01 | 0.015 | |
| MW-7 | Lead, total | 05/28/1997 | 0.011 | mg/l | 0.005 | 0.015 | |
| MW-7 | Lead, total | 10/23/1997 | 0.014 | mg/l | 0.005 | 0.015 | |
| MW-7 | Lead, total | 04/22/1998 | 0.01 | mg/l | 0.005 | 0.015 | |
| MW-7 | Lead, total | 10/27/1998 | 0.015 | mg/l | 0.005 | 0.015 | |
| **MW-9** | **Lead, total** | **09/16/1994** | **0.064** | **mg/l** | **0.01** | **0.015** | **0.049** |
| **MW-9** | **Lead, total** | **02/07/1995** | **0.025** | **mg/l** | **0.01** | **0.015** | **0.01** |
| **MW-9** | **Lead, total** | **02/27/1995** | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| **MW-9** | **Lead, total** | **05/28/1997** | **0.049** | **mg/l** | **0.005** | **0.015** | **0.034** |
| **MW-9** | **Lead, total** | **10/23/1997** | **0.025** | **mg/l** | **0.005** | **0.015** | **0.01** |
| **MW-9** | **Lead, total** | **04/22/1998** | **0.055** | **mg/l** | **0.005** | **0.015** | **0.04** |
| **MW-9** | **Lead, total** | **10/28/1998** | **0.061** | **mg/l** | **0.005** | **0.015** | **0.046** |
| **MW-9** | **Lead, total** | **04/14/1999** | **0.023** | **mg/l** | **0.005** | **0.015** | **0.008** |
| MW-9 | Lead, total | 07/12/2001 | 0.0092 | mg/l | 0.003 | 0.015 | |
| MW-9 | Lead, total | 06/25/2002 | 0.011 | mg/l | 0.005 | 0.015 | |
| **MW-9** | **Lead, total** | **12/16/2002** | **0.017** | **mg/l** | **0.005** | **0.015** | **0.002** |
| MW-9 | Lead, total | 06/18/2003 | 0.0066 | mg/l | 0.005 | 0.015 | |
| MW-9 | Lead, total | 07/13/2006 | 0.0142 | mg/l | 0.01 | 0.015 | |
| **MW-1** | **Manganese** | **01/25/2007** | **407** | **ug/l** | **1.4** | **50** | **357** |
| **MW-10** | **Manganese** | **01/25/2007** | **143** | **ug/l** | **1.4** | **50** | **93** |
| **MW-10** | **Manganese** | **07/03/2007** | **375** | **ug/l** | **50** | **50** | **325** |
| MW-11 | Manganese | 01/25/2007 | 16.9 | ug/l | 1.4 | 50 | |
| **MW-12** | **Manganese** | **01/25/2007** | **5960** | **ug/l** | **1.4** | **50** | **5910** |
| **MW-2** | **Manganese** | **01/25/2007** | **2640** | **ug/l** | **1.4** | **50** | **2590** |
| **MW-2** | **Manganese** | **07/03/2007** | **4630** | **ug/l** | **50** | **50** | **4580** |
| **MW-24** | **Manganese** | **07/13/2007** | **118** | **ug/l** | **1.4** | **50** | **68** |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-25** | **Manganese** | **07/13/2007** | **303** | **ug/l** | **1.4** | **50** | **253** |
| **MW-3** | **Manganese** | **01/25/2007** | **524** | **ug/l** | **1.4** | **50** | **474** |
| **MW-3** | **Manganese** | **07/03/2007** | **3120** | **ug/l** | **50** | **50** | **3070** |
| **MW-6** | **Manganese** | **01/25/2007** | **165** | **ug/l** | **1.4** | **50** | **115** |
| **MW-7** | **Manganese** | **01/25/2007** | **81.4** | **ug/l** | **1.4** | **50** | **31.4** |
| **MW-7** | **Manganese** | **07/03/2007** | **511** | **ug/l** | **50** | **50** | **461** |
| **MW-9** | **Manganese** | **01/25/2007** | **84.3** | **ug/l** | **1.4** | **50** | **34.3** |
| **MW-9** | **Manganese** | **07/03/2007** | **148** | **ug/l** | **50** | **50** | **98** |
| **MW-1** | **Nickel, total** | **09/16/1994** | **0.14** | **mg/l** | **0.1** | **0.1** | **0.04** |
| MW-1 | Nickel, total | 11/30/1994 | 0.057 | mg/l | 0.05 | 0.1 | |
| MW-1 | Nickel, total | 10/27/1998 | 0.096 | mg/l | 0.05 | 0.1 | |
| MW-1 | Nickel, total | 04/14/1999 | 0.015 | mg/l | 0.005 | 0.1 | |
| MW-1 | Nickel, total | 07/13/2001 | 0.014 | mg/l | 0.005 | 0.1 | |
| **MW-1** | **Nickel, total** | **01/10/2002** | **0.17** | **mg/l** | **0.005** | **0.1** | **0.07** |
| MW-1 | Nickel, total | 06/18/2003 | 0.0059 | mg/l | 0.005 | 0.1 | |
| MW-1 | Nickel, total | 01/25/2007 | 4.8 | ug/l | 2 | 100 | |
| MW-10 | Nickel, total | 11/29/1994 | 0.065 | mg/l | 0.05 | 0.1 | |
| MW-10 | Nickel, total | 04/30/1996 | 0.06 | mg/l | 0.05 | 0.1 | |
| MW-10 | Nickel, total | 05/28/1997 | 0.053 | mg/l | 0.05 | 0.1 | |
| MW-10 | Nickel, total | 04/22/1998 | 0.069 | mg/l | 0.05 | 0.1 | |
| MW-10 | Nickel, total | 04/14/1999 | 0.046 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 02/08/2000 | 0.019 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 06/02/2000 | 0.031 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 12/05/2000 | 0.023 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 07/12/2001 | 0.017 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 01/09/2002 | 0.011 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 06/25/2002 | 0.02 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 12/16/2002 | 0.022 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 06/18/2003 | 0.027 | mg/l | 0.005 | 0.1 | |
| MW-10 | Nickel, total | 01/25/2007 | 13.7 | ug/l | 2 | 100 | |
| **MW-11** | **Nickel, total** | **09/15/1994** | **0.28** | **mg/l** | **0.1** | **0.1** | **0.18** |
| **MW-11** | **Nickel, total** | **11/29/1994** | **0.131** | **mg/l** | **0.05** | **0.1** | **0.031** |
| **MW-11** | **Nickel, total** | **02/07/1995** | **0.347** | **mg/l** | **0.05** | **0.1** | **0.247** |
| **MW-11** | **Nickel, total** | **02/28/1995** | **0.262** | **mg/l** | **0.05** | **0.1** | **0.162** |
| **MW-11** | **Nickel, total** | **10/31/1995** | **0.171** | **mg/l** | **0.05** | **0.1** | **0.071** |
| **MW-11** | **Nickel, total** | **04/30/1996** | **0.149** | **mg/l** | **0.05** | **0.1** | **0.049** |
| MW-11 | Nickel, total | 05/28/1997 | 0.1 | mg/l | 0.05 | 0.1 | |
| MW-11 | Nickel, total | 10/23/1997 | 0.073 | mg/l | 0.05 | 0.1 | |
| MW-11 | Nickel, total | 04/22/1998 | 0.1 | mg/l | 0.05 | 0.1 | |
| MW-11 | Nickel, total | 10/28/1998 | 0.05 | mg/l | 0.05 | 0.1 | |
| MW-11 | Nickel, total | 04/14/1999 | 0.062 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 02/08/2000 | 0.0099 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 06/02/2000 | 0.016 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 12/05/2000 | 0.086 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 07/12/2001 | 0.033 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 01/09/2002 | 0.051 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 06/25/2002 | 0.027 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 12/16/2002 | 0.019 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 06/18/2003 | 0.02 | mg/l | 0.005 | 0.1 | |
| MW-11 | Nickel, total | 01/25/2007 | 5.8 | ug/l | 2 | 100 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-12 | Nickel, total | 11/30/1994 | 0.06 | mg/l | 0.05 | 0.1 | |
| **MW-12** | **Nickel, total** | **02/07/1995** | **0.117** | **mg/l** | **0.05** | **0.1** | **0.017** |
| MW-12 | Nickel, total | 04/29/1996 | 0.076 | mg/l | 0.05 | 0.1 | |
| MW-12 | Nickel, total | 10/23/1997 | 0.08 | mg/l | 0.05 | 0.1 | |
| **MW-12** | **Nickel, total** | **04/22/1998** | **0.15** | **mg/l** | **0.05** | **0.1** | **0.05** |
| **MW-12** | **Nickel, total** | **10/27/1998** | **0.29** | **mg/l** | **0.05** | **0.1** | **0.19** |
| MW-12 | Nickel, total | 04/14/1999 | 0.031 | mg/l | 0.005 | 0.1 | |
| MW-12 | Nickel, total | 02/07/2000 | 0.015 | mg/l | 0.005 | 0.1 | |
| MW-12 | Nickel, total | 06/05/2000 | 0.031 | mg/l | 0.005 | 0.1 | |
| **MW-12** | **Nickel, total** | **07/12/2001** | **0.16** | **mg/l** | **0.005** | **0.1** | **0.06** |
| **MW-12** | **Nickel, total** | **01/10/2002** | **0.11** | **mg/l** | **0.005** | **0.1** | **0.01** |
| MW-12 | Nickel, total | 06/25/2002 | 0.012 | mg/l | 0.005 | 0.1 | |
| MW-12 | Nickel, total | 12/17/2002 | 0.025 | mg/l | 0.005 | 0.1 | |
| MW-12 | Nickel, total | 06/18/2003 | 0.039 | mg/l | 0.005 | 0.1 | |
| MW-12 | Nickel, total | 06/23/2004 | 0.05 | mg/l | 0.05 | 0.1 | |
| MW-12 | Nickel, total | 07/13/2006 | 0.0548 | mg/l | 0.05 | 0.1 | |
| MW-12 | Nickel, total | 01/25/2007 | 34.2 | ug/l | 2 | 100 | |
| **MW-2** | **Nickel, total** | **09/16/1994** | **1.69** | **mg/l** | **0.1** | **0.1** | **1.59** |
| **MW-2** | **Nickel, total** | **02/07/1995** | **0.108** | **mg/l** | **0.05** | **0.1** | **0.008** |
| MW-2 | Nickel, total | 02/27/1995 | 0.07 | mg/l | 0.05 | 0.1 | |
| **MW-2** | **Nickel, total** | **10/23/1997** | **0.11** | **mg/l** | **0.05** | **0.1** | **0.01** |
| **MW-2** | **Nickel, total** | **10/27/1998** | **0.26** | **mg/l** | **0.25** | **0.1** | **0.16** |
| MW-2 | Nickel, total | 04/14/1999 | 0.048 | mg/l | 0.005 | 0.1 | |
| MW-2 | Nickel, total | 02/07/2000 | 0.024 | mg/l | 0.005 | 0.1 | |
| MW-2 | Nickel, total | 06/02/2000 | 0.039 | mg/l | 0.005 | 0.1 | |
| **MW-2** | **Nickel, total** | **12/05/2000** | **0.27** | **mg/l** | **0.005** | **0.1** | **0.17** |
| MW-2 | Nickel, total | 07/11/2001 | 0.079 | mg/l | 0.005 | 0.1 | |
| **MW-2** | **Nickel, total** | **01/09/2002** | **0.71** | **mg/l** | **0.005** | **0.1** | **0.61** |
| **MW-2** | **Nickel, total** | **06/25/2002** | **0.12** | **mg/l** | **0.005** | **0.1** | **0.02** |
| MW-2 | Nickel, total | 12/16/2002 | 0.054 | mg/l | 0.005 | 0.1 | |
| MW-2 | Nickel, total | 06/18/2003 | 0.037 | mg/l | 0.005 | 0.1 | |
| MW-2 | Nickel, total | 01/06/2004 | 0.052 | mg/l | 0.05 | 0.1 | |
| MW-2 | Nickel, total | 01/06/2005 | 0.054 | mg/l | 0.05 | 0.1 | |
| MW-2 | Nickel, total | 01/25/2007 | 26.9 | ug/l | 2 | 100 | |
| MW-3 | Nickel, total | 12/05/2000 | 0.005 | mg/l | 0.005 | 0.1 | |
| MW-3 | Nickel, total | 06/18/2003 | 0.0082 | mg/l | 0.005 | 0.1 | |
| MW-3 | Nickel, total | 01/25/2007 | 2.5 | ug/l | 2 | 100 | |
| MW-4R | Nickel, total | 04/14/1999 | 0.0075 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 02/07/2000 | 0.0062 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 06/02/2000 | 0.0067 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 12/05/2000 | 0.0098 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 07/12/2001 | 0.0076 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 01/09/2002 | 0.0068 | mg/l | 0.005 | 0.1 | |
| MW-4R | Nickel, total | 01/25/2007 | 4.4 | ug/l | 2 | 100 | |
| MW-5 | Nickel, total | 05/28/1997 | 0.069 | mg/l | 0.05 | 0.1 | |
| MW-5 | Nickel, total | 10/23/1997 | 0.1 | mg/l | 0.05 | 0.1 | |
| MW-5 | Nickel, total | 04/22/1998 | 0.058 | mg/l | 0.05 | 0.1 | |
| MW-5R | Nickel, total | 04/14/1999 | 0.1 | mg/l | 0.005 | 0.1 | |
| MW-5R | Nickel, total | 02/07/2000 | 0.1 | mg/l | 0.005 | 0.1 | |
| MW-5R | Nickel, total | 06/02/2000 | 0.013 | mg/l | 0.005 | 0.1 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-5R | Nickel, total | 12/05/2000 | 0.018 | mg/l | 0.005 | 0.1 | |
| MW-5R | Nickel, total | 07/12/2001 | 0.045 | mg/l | 0.005 | 0.1 | |
| MW-5R | Nickel, total | 01/09/2002 | 0.064 | mg/l | 0.005 | 0.1 | |
| **MW-5R** | **Nickel, total** | **06/25/2002** | **0.12** | **mg/l** | **0.005** | **0.1** | **0.02** |
| MW-6 | Nickel, total | 04/14/1999 | 0.0064 | mg/l | 0.005 | 0.1 | |
| MW-6 | Nickel, total | 02/07/2000 | 0.0093 | mg/l | 0.005 | 0.1 | |
| MW-6 | Nickel, total | 12/05/2000 | 0.0083 | mg/l | 0.005 | 0.1 | |
| MW-6 | Nickel, total | 12/16/2002 | 0.0098 | mg/l | 0.005 | 0.1 | |
| MW-6 | Nickel, total | 06/18/2003 | 0.005 | mg/l | 0.005 | 0.1 | |
| MW-6 | Nickel, total | 01/25/2007 | 5 | ug/l | 2 | 100 | |
| MW-7 | Nickel, total | 12/05/2000 | 0.014 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 07/11/2001 | 0.012 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 01/09/2002 | 0.01 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 06/25/2002 | 0.01 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 12/16/2002 | 0.013 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 06/18/2003 | 0.012 | mg/l | 0.005 | 0.1 | |
| MW-7 | Nickel, total | 01/25/2007 | 12.8 | ug/l | 2 | 100 | |
| MW-9 | Nickel, total | 11/29/1994 | 0.05 | mg/l | 0.05 | 0.1 | |
| MW-9 | Nickel, total | 05/28/1997 | 0.074 | mg/l | 0.05 | 0.1 | |
| MW-9 | Nickel, total | 04/22/1998 | 0.066 | mg/l | 0.05 | 0.1 | |
| MW-9 | Nickel, total | 04/14/1999 | 0.045 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 02/09/2000 | 0.0064 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 06/05/2000 | 0.0071 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 12/05/2000 | 0.024 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 07/12/2001 | 0.015 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 01/09/2002 | 0.0092 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 06/25/2002 | 0.015 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 12/16/2002 | 0.027 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 06/18/2003 | 0.022 | mg/l | 0.005 | 0.1 | |
| MW-9 | Nickel, total | 01/25/2007 | 5.6 | ug/l | 2 | 100 | |
| MW-10 | Selenium, total | 06/02/2000 | 0.0057 | mg/l | 0.005 | 0.05 | |
| MW-12 | Selenium, total | 12/17/2002 | 0.0054 | mg/l | 0.005 | 0.05 | |
| MW-9 | Selenium, total | 01/25/2007 | 4.6 | ug/l | 2 | 50 | |
| MW-12 | Thallium | 02/07/2000 | 0.0022 | mg/l | 0.002 | | |
| MW-12 | Thallium | 06/17/2005 | 0.014 | mg/l | 0.01 | | |
| MW-12 | Thallium | 07/13/2006 | 0.0104 | mg/l | 0.01 | | |
| MW-2 | Thallium | 06/16/2005 | 0.011 | mg/l | 0.01 | | |
| MW-9 | Thallium | 07/12/2001 | 0.002 | mg/l | 0.002 | | |
| MW-1 | Vanadium | 09/16/1994 | 0.07 | mg/l | 0.05 | | |
| MW-1 | Vanadium | 05/28/1997 | 0.019 | mg/l | 0.005 | | |
| MW-1 | Vanadium | 10/27/1998 | 0.046 | mg/l | 0.005 | | |
| MW-1 | Vanadium | 01/10/2002 | 0.0074 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 09/16/1994 | 0.07 | mg/l | 0.05 | | |
| MW-10 | Vanadium | 11/29/1994 | 0.081 | mg/l | 0.04 | | |
| MW-10 | Vanadium | 10/24/1996 | 0.01 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 05/28/1997 | 0.008 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 10/23/1997 | 0.012 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 04/22/1998 | 0.012 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 10/27/1998 | 0.052 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 04/14/1999 | 0.015 | mg/l | 0.005 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-10 | Vanadium | 12/05/2000 | 0.015 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 07/12/2001 | 0.013 | mg/l | 0.005 | | |
| MW-10 | Vanadium | 06/25/2002 | 0.0057 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 09/15/1994 | 0.16 | mg/l | 0.05 | | |
| MW-11 | Vanadium | 11/29/1994 | 0.093 | mg/l | 0.04 | | |
| MW-11 | Vanadium | 02/07/1995 | 0.099 | mg/l | 0.04 | | |
| MW-11 | Vanadium | 02/28/1995 | 0.128 | mg/l | 0.04 | | |
| MW-11 | Vanadium | 10/31/1995 | 0.166 | mg/l | 0.04 | | |
| MW-11 | Vanadium | 04/30/1996 | 0.048 | mg/l | 0.04 | | |
| MW-11 | Vanadium | 05/28/1997 | 0.073 | mg/l | 0.05 | | |
| MW-11 | Vanadium | 10/23/1997 | 0.038 | mg/l | 0.01 | | |
| MW-11 | Vanadium | 04/22/1998 | 0.079 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 10/28/1998 | 0.0087 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 04/14/1999 | 0.034 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 06/02/2000 | 0.0067 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 12/05/2000 | 0.032 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 07/12/2001 | 0.026 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 01/09/2002 | 0.013 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 06/25/2002 | 0.014 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 12/16/2002 | 0.014 | mg/l | 0.005 | | |
| MW-11 | Vanadium | 06/18/2003 | 0.013 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 05/28/1997 | 0.007 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 10/23/1997 | 0.006 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 04/22/1998 | 0.013 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 10/27/1998 | 0.033 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 04/14/1999 | 0.0062 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 06/05/2000 | 0.0077 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 07/12/2001 | 0.18 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 01/10/2002 | 0.034 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 06/25/2002 | 0.0065 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 12/17/2002 | 0.0083 | mg/l | 0.005 | | |
| MW-12 | Vanadium | 06/18/2003 | 0.015 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 09/16/1994 | 1.51 | mg/l | 0.05 | | |
| MW-2 | Vanadium | 02/07/1995 | 0.083 | mg/l | 0.04 | | |
| MW-2 | Vanadium | 02/27/1995 | 0.064 | mg/l | 0.04 | | |
| MW-2 | Vanadium | 10/24/1996 | 0.011 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 05/28/1997 | 0.022 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 10/23/1997 | 0.062 | mg/l | 0.015 | | |
| MW-2 | Vanadium | 04/22/1998 | 0.033 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 10/27/1998 | 0.13 | mg/l | 0.02 | | |
| MW-2 | Vanadium | 04/14/1999 | 0.011 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 02/07/2000 | 0.0064 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 06/02/2000 | 0.0097 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 12/05/2000 | 0.024 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 07/11/2001 | 0.018 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 01/09/2002 | 0.13 | mg/l | 0.005 | | |
| MW-2 | Vanadium | 06/25/2002 | 0.016 | mg/l | 0.005 | | |
| MW-25 | Vanadium | 07/13/2007 | 26.7 | ug/l | 1.7 | | |
| MW-3 | Vanadium | 09/16/1994 | 0.07 | mg/l | 0.05 | | |
| MW-3 | Vanadium | 05/28/1997 | 0.006 | mg/l | 0.005 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-3 | Vanadium | 10/23/1997 | 0.016 | mg/l | 0.005 | | |
| MW-3 | Vanadium | 04/22/1998 | 0.006 | mg/l | 0.005 | | |
| MW-3 | Vanadium | 04/14/1999 | 0.0052 | mg/l | 0.005 | | |
| MW-3 | Vanadium | 12/05/2000 | 0.0064 | mg/l | 0.005 | | |
| MW-3 | Vanadium | 12/16/2002 | 0.0077 | mg/l | 0.005 | | |
| MW-3 | Vanadium | 06/18/2003 | 0.015 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 05/28/1997 | 0.078 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 10/23/1997 | 0.019 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 04/22/1998 | 0.035 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 10/27/1998 | 0.034 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 04/14/1999 | 0.0067 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 12/05/2000 | 0.0069 | mg/l | 0.005 | | |
| MW-4R | Vanadium | 07/12/2001 | 0.0058 | mg/l | 0.005 | | |
| MW-5 | Vanadium | 05/28/1997 | 0.11 | mg/l | 0.005 | | |
| MW-5 | Vanadium | 10/23/1997 | 0.15 | mg/l | 0.05 | | |
| MW-5 | Vanadium | 04/22/1998 | 0.062 | mg/l | 0.01 | | |
| MW-5R | Vanadium | 04/14/1999 | 0.091 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 02/07/2000 | 0.12 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 06/02/2000 | 0.012 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 12/05/2000 | 0.016 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 07/12/2001 | 0.051 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 01/09/2002 | 0.055 | mg/l | 0.005 | | |
| MW-5R | Vanadium | 06/25/2002 | 0.096 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 05/28/1997 | 0.006 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 10/23/1997 | 0.015 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 04/22/1998 | 0.033 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 10/27/1998 | 0.042 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 04/14/1999 | 0.0059 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 02/07/2000 | 0.0075 | mg/l | 0.005 | | |
| MW-6 | Vanadium | 12/05/2000 | 0.0067 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 10/24/1996 | 0.005 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 05/28/1997 | 0.1 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 10/23/1997 | 0.017 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 04/22/1998 | 0.026 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 10/27/1998 | 0.047 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 04/14/1999 | 0.0085 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 12/05/2000 | 0.0057 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 07/11/2001 | 0.008 | mg/l | 0.005 | | |
| MW-7 | Vanadium | 01/09/2002 | 0.0067 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 09/16/1994 | 0.26 | mg/l | 0.05 | | |
| MW-9 | Vanadium | 11/29/1994 | 0.155 | mg/l | 0.04 | | |
| MW-9 | Vanadium | 02/07/1995 | 0.043 | mg/l | 0.04 | | |
| MW-9 | Vanadium | 02/27/1995 | 0.046 | mg/l | 0.04 | | |
| MW-9 | Vanadium | 05/28/1997 | 0.34 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 10/23/1997 | 0.1 | mg/l | 0.025 | | |
| MW-9 | Vanadium | 04/22/1998 | 0.25 | mg/l | 0.025 | | |
| MW-9 | Vanadium | 10/28/1998 | 0.21 | mg/l | 0.02 | | |
| MW-9 | Vanadium | 04/14/1999 | 0.12 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 02/09/2000 | 0.0087 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 06/05/2000 | 0.022 | mg/l | 0.005 | | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-9 | Vanadium | 12/05/2000 | 0.047 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 07/12/2001 | 0.046 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 01/09/2002 | 0.023 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 06/25/2002 | 0.046 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 12/16/2002 | 0.055 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 06/18/2003 | 0.034 | mg/l | 0.005 | | |
| MW-9 | Vanadium | 01/25/2007 | 7.2 | ug/l | 1 | | |
| MW-1 | Zinc | 09/16/1994 | 0.36 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 11/30/1994 | 0.076 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 02/27/1995 | 0.089 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 04/29/1996 | 0.078 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 10/24/1996 | 0.045 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 05/28/1997 | 0.081 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 10/23/1997 | 0.093 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 04/22/1998 | 0.033 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 10/27/1998 | 0.21 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 04/14/1999 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 02/07/2000 | 0.017 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 07/13/2001 | 0.042 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 01/10/2002 | 0.22 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 12/16/2002 | 0.036 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 06/18/2003 | 0.057 | mg/l | 0.01 | 1.05 | |
| MW-1 | Zinc | 06/23/2004 | 0.05 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 06/17/2005 | 0.05 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 01/25/2007 | 21.7 | ug/l | 1 | 1050 | |
| MW-1 | Zinc | 07/03/2007 | 88.3 | ug/l | 10 | 1050 | |
| MW-10 | Zinc | 09/16/1994 | 0.09 | mg/l | 0.05 | 1.05 | |
| MW-10 | Zinc | 11/29/1994 | 0.111 | mg/l | 0.05 | 1.05 | |
| MW-10 | Zinc | 10/24/1996 | 0.05 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 10/23/1997 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 04/22/1998 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 10/27/1998 | 0.062 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 04/14/1999 | 0.024 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 06/02/2000 | 0.023 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 12/05/2000 | 0.042 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 07/12/2001 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 01/09/2002 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 06/25/2002 | 0.017 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 12/16/2002 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 06/18/2003 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-10 | Zinc | 01/25/2007 | 5.3 | ug/l | 1 | 1050 | |
| MW-11 | Zinc | 09/15/1994 | 0.12 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 11/29/1994 | 0.083 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 02/07/1995 | 0.141 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 02/28/1995 | 0.145 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 10/31/1995 | 0.101 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 04/30/1996 | 0.148 | mg/l | 0.05 | 1.05 | |
| MW-11 | Zinc | 10/24/1996 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 05/28/1997 | 0.035 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 10/23/1997 | 0.041 | mg/l | 0.01 | 1.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-11 | Zinc | 04/22/1998 | 0.063 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 04/14/1999 | 0.019 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 06/02/2000 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 12/05/2000 | 0.044 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 07/12/2001 | 0.027 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 01/09/2002 | 0.026 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 06/25/2002 | 0.027 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 12/16/2002 | 0.026 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 06/18/2003 | 0.03 | mg/l | 0.01 | 1.05 | |
| MW-11 | Zinc | 01/25/2007 | 3.3 | ug/l | 1 | 1050 | |
| MW-12 | Zinc | 11/30/1994 | 0.059 | mg/l | 0.05 | 1.05 | |
| MW-12 | Zinc | 02/07/1995 | 0.107 | mg/l | 0.05 | 1.05 | |
| MW-12 | Zinc | 10/24/1996 | 0.025 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 05/28/1997 | 0.015 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 10/23/1997 | 0.025 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 04/22/1998 | 0.044 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 10/27/1998 | 0.045 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 06/05/2000 | 0.019 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 07/12/2001 | 0.17 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 01/10/2002 | 0.04 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 12/17/2002 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 06/18/2003 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-12 | Zinc | 01/26/2006 | 0.0556 | mg/l | 0.05 | 1.05 | |
| MW-12 | Zinc | 01/25/2007 | 31 | ug/l | 1 | 1050 | |
| **MW-2** | **Zinc** | **09/16/1994** | **4** | **mg/l** | **0.05** | **1.05** | **2.95** |
| MW-2 | Zinc | 02/07/1995 | 0.193 | mg/l | 0.05 | 1.05 | |
| MW-2 | Zinc | 02/27/1995 | 0.096 | mg/l | 0.05 | 1.05 | |
| MW-2 | Zinc | 10/24/1996 | 0.052 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 05/28/1997 | 0.058 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 10/23/1997 | 0.18 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 04/22/1998 | 0.096 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 10/27/1998 | 0.29 | mg/l | 0.05 | 1.05 | |
| MW-2 | Zinc | 04/14/1999 | 0.035 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 02/07/2000 | 0.015 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 06/02/2000 | 0.055 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 12/05/2000 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 07/11/2001 | 0.1 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 01/09/2002 | 0.48 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 06/25/2002 | 0.088 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 12/16/2002 | 0.044 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 06/18/2003 | 0.048 | mg/l | 0.01 | 1.05 | |
| MW-2 | Zinc | 01/06/2005 | 0.055 | mg/l | 0.05 | 1.05 | |
| MW-2 | Zinc | 01/25/2007 | 13.8 | ug/l | 1 | 1050 | |
| MW-24 | Zinc | 07/13/2007 | 10.3 | ug/l | 3.4 | 1050 | |
| MW-25 | Zinc | 07/13/2007 | 30.1 | ug/l | 3.4 | 1050 | |
| MW-3 | Zinc | 02/27/1995 | 0.062 | mg/l | 0.05 | 1.05 | |
| MW-3 | Zinc | 10/24/1996 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 05/28/1997 | 0.01 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 10/23/1997 | 0.041 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 04/22/1998 | 0.018 | mg/l | 0.01 | 1.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-3 | Zinc | 06/05/2000 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 12/05/2000 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 07/12/2001 | 0.014 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 01/09/2002 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 06/25/2002 | 0.012 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 12/16/2002 | 0.023 | mg/l | 0.01 | 1.05 | |
| MW-3 | Zinc | 06/18/2003 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 11/29/1994 | 0.082 | mg/l | 0.05 | 1.05 | |
| MW-4R | Zinc | 02/07/1995 | 0.11 | mg/l | 0.05 | 1.05 | |
| MW-4R | Zinc | 02/27/1995 | 0.158 | mg/l | 0.05 | 1.05 | |
| MW-4R | Zinc | 10/24/1996 | 0.028 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 05/28/1997 | 0.078 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 10/23/1997 | 0.062 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 04/22/1998 | 0.066 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 10/27/1998 | 0.072 | mg/l | 0.02 | 1.05 | |
| MW-4R | Zinc | 06/02/2000 | 0.04 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 12/05/2000 | 0.06 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 07/12/2001 | 0.024 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 01/09/2002 | 0.028 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 06/25/2002 | 0.018 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 12/16/2002 | 0.014 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 06/18/2003 | 0.011 | mg/l | 0.01 | 1.05 | |
| MW-4R | Zinc | 01/25/2007 | 10.2 | ug/l | 1 | 1050 | |
| MW-5 | Zinc | 09/15/1994 | 0.008 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 11/29/1994 | 0.073 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 02/07/1995 | 0.183 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 02/27/1995 | 0.104 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 10/30/1995 | 0.067 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 10/24/1996 | 0.031 | mg/l | 0.01 | 1.05 | |
| MW-5 | Zinc | 05/28/1997 | 0.2 | mg/l | 0.01 | 1.05 | |
| MW-5 | Zinc | 10/23/1997 | 0.42 | mg/l | 0.01 | 1.05 | |
| MW-5 | Zinc | 04/22/1998 | 0.19 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 04/14/1999 | 0.2 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 02/07/2000 | 0.23 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 06/02/2000 | 0.054 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 12/05/2000 | 0.082 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 07/12/2001 | 0.13 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 01/09/2002 | 0.16 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 06/25/2002 | 0.28 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 12/16/2002 | 0.027 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 06/18/2003 | 0.028 | mg/l | 0.01 | 1.05 | |
| MW-5R | Zinc | 07/13/2006 | 0.0765 | mg/l | 0.05 | 1.05 | |
| MW-5R | Zinc | 01/25/2007 | 12 | ug/l | 1 | 1050 | |
| MW-5R | Zinc | 07/03/2007 | 11.6 | ug/l | 10 | 1050 | |
| MW-6 | Zinc | 11/29/1994 | 0.076 | mg/l | 0.05 | 1.05 | |
| MW-6 | Zinc | 10/24/1996 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 05/28/1997 | 0.015 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 10/23/1997 | 0.069 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 04/22/1998 | 0.075 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 10/27/1998 | 0.27 | mg/l | 0.05 | 1.05 | |

**Table 6:** Historical Inorganic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-6 | Zinc | 02/07/2000 | 0.012 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 06/02/2000 | 0.036 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 12/05/2000 | 0.039 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 07/11/2001 | 0.033 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 01/09/2002 | 0.037 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 06/25/2002 | 0.021 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 12/16/2002 | 0.023 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 06/18/2003 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-6 | Zinc | 01/25/2007 | 35.9 | ug/l | 1 | 1050 | |
| MW-7 | Zinc | 02/27/1995 | 0.07 | mg/l | 0.05 | 1.05 | |
| MW-7 | Zinc | 10/24/1996 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 05/28/1997 | 0.065 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 10/23/1997 | 0.033 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 04/22/1998 | 0.037 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 10/27/1998 | 0.041 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 06/02/2000 | 0.047 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 12/05/2000 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 07/11/2001 | 0.039 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 01/09/2002 | 0.035 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 06/25/2002 | 0.018 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 12/16/2002 | 0.04 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 06/18/2003 | 0.072 | mg/l | 0.01 | 1.05 | |
| MW-7 | Zinc | 01/25/2007 | 5.5 | ug/l | 1 | 1050 | |
| MW-9 | Zinc | 09/16/1994 | 0.2 | mg/l | 0.05 | 1.05 | |
| MW-9 | Zinc | 11/29/1994 | 0.136 | mg/l | 0.05 | 1.05 | |
| MW-9 | Zinc | 02/07/1995 | 0.058 | mg/l | 0.05 | 1.05 | |
| MW-9 | Zinc | 10/24/1996 | 0.021 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 05/28/1997 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 10/23/1997 | 0.047 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 04/22/1998 | 0.13 | mg/l | 0.01 | 1.05 | |
| **MW-9** | **Zinc** | **10/28/1998** | **1.2** | **mg/l** | **0.01** | **1.05** | **0.15** |
| MW-9 | Zinc | 04/14/1999 | 0.057 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 06/05/2000 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 12/05/2000 | 0.044 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 07/12/2001 | 0.047 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 01/09/2002 | 0.021 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 06/25/2002 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 12/16/2002 | 0.069 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 06/18/2003 | 0.058 | mg/l | 0.01 | 1.05 | |
| MW-9 | Zinc | 01/25/2007 | 23.9 | ug/l | 1 | 1050 | |
| SHOP | Zinc | 07/03/2007 | 20.8 | ug/l | 10 | 1050 | |

[1] Table only contains detected constituents.
[2] PQL = Practical Quantitation Limit
[3] NCGW2L = North Carolina Ground Water 2L Standard

**Table 7:** Historical Inorganic Surface Water Results

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | SWSTD [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| SW-5 | Antimony | 06/07/2000 | 0.0066 | mg/l | 0.005 | | |
| SW-5 | Antimony | 07/12/2001 | 0.0056 | mg/l | 0.005 | | |
| SW-5 | Antimony | 01/09/2002 | 0.0079 | mg/l | 0.005 | | |
| **SW-5** | **Arsenic** | **06/07/2000** | **0.013** | **mg/l** | **0.005** | **0.01** | **0.003** |
| SW-5 | Arsenic | 12/05/2000 | 0.0053 | mg/l | 0.005 | 0.01 | |
| **SW-5** | **Arsenic** | **07/12/2001** | **0.035** | **mg/l** | **0.005** | **0.01** | **0.025** |
| **SW-5** | **Arsenic** | **01/09/2002** | **0.011** | **mg/l** | **0.005** | **0.01** | **0.001** |
| SW-3 | Barium, total | 10/24/1996 | 0.015 | mg/l | 0.01 | 1 | |
| SW-3 | Barium, total | 05/28/1997 | 0.012 | mg/l | 0.01 | 1 | |
| SW-3 | Barium, total | 10/23/1997 | 0.011 | mg/l | 0.01 | 1 | |
| SW-3 | Barium, total | 04/22/1998 | 0.011 | mg/l | 0.01 | 1 | |
| SW-3 | Barium, total | 10/28/1998 | 0.017 | mg/l | 0.01 | 1 | |
| SW-3 | Barium, total | 04/15/1999 | 0.01 | mg/l | 0.005 | 1 | |
| SW-3 | Barium, total | 02/09/2000 | 0.012 | mg/l | 0.005 | 1 | |
| SW-4 | Barium, total | 10/24/1996 | 0.015 | mg/l | 0.01 | 1 | |
| SW-4 | Barium, total | 05/28/1997 | 0.017 | mg/l | 0.01 | 1 | |
| SW-4 | Barium, total | 10/23/1997 | 0.013 | mg/l | 0.01 | 1 | |
| SW-4 | Barium, total | 04/22/1998 | 0.02 | mg/l | 0.01 | 1 | |
| SW-4 | Barium, total | 04/15/1999 | 0.011 | mg/l | 0.005 | 1 | |
| SW-4 | Barium, total | 02/09/2000 | 0.0099 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 10/24/1996 | 0.071 | mg/l | 0.01 | 1 | |
| SW-5 | Barium, total | 05/28/1997 | 0.056 | mg/l | 0.01 | 1 | |
| SW-5 | Barium, total | 10/23/1997 | 0.028 | mg/l | 0.01 | 1 | |
| SW-5 | Barium, total | 04/22/1998 | 0.02 | mg/l | 0.01 | 1 | |
| SW-5 | Barium, total | 04/15/1999 | 0.053 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 02/09/2000 | 0.014 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 06/07/2000 | 0.15 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 12/05/2000 | 0.086 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 07/12/2001 | 0.12 | mg/l | 0.005 | 1 | |
| SW-5 | Barium, total | 01/09/2002 | 0.042 | mg/l | 0.005 | 1 | |
| **SW-4** | **Beryllium, total** | **10/28/1998** | **0.0045** | **mg/l** | **0.001** | **0** | **0.0045** |
| SW-4 | Chromium, total | 04/22/1998 | 0.004 | mg/l | 0.002 | 0.05 | |
| SW-5 | Chromium, total | 10/23/1997 | 0.003 | mg/l | 0.002 | 0.05 | |
| SW-5 | Chromium, total | 06/07/2000 | 0.01 | mg/l | 0.002 | 0.05 | |
| SW-5 | Chromium, total | 12/05/2000 | 0.004 | mg/l | 0.002 | 0.05 | |
| SW-5 | Chromium, total | 07/12/2001 | 0.015 | mg/l | 0.002 | 0.05 | |
| SW-5 | Chromium, total | 01/09/2002 | 0.011 | mg/l | 0.002 | 0.05 | |
| SW-4 | Cobalt, total | 04/22/1998 | 0.002 | mg/l | 0.002 | | |
| SW-5 | Cobalt, total | 10/24/1996 | 0.006 | mg/l | 0.002 | | |
| SW-5 | Cobalt, total | 05/28/1997 | 0.065 | mg/l | 0.012 | | |
| SW-5 | Cobalt, total | 04/22/1998 | 0.004 | mg/l | 0.002 | | |
| SW-5 | Cobalt, total | 04/15/1999 | 0.033 | mg/l | 0.005 | | |
| SW-5 | Cobalt, total | 06/07/2000 | 0.0056 | mg/l | 0.005 | | |
| SW-5 | Cobalt, total | 12/05/2000 | 0.0071 | mg/l | 0.005 | | |
| SW-5 | Cobalt, total | 07/12/2001 | 0.045 | mg/l | 0.005 | | |
| SW-5 | Cobalt, total | 01/09/2002 | 0.011 | mg/l | 0.005 | | |
| **SW-4** | **Copper** | **04/22/1998** | **0.01** | **mg/l** | **0.01** | **0.007** | **0.003** |
| **SW-5** | **Copper** | **10/23/1997** | **0.016** | **mg/l** | **0.01** | **0.007** | **0.009** |
| **SW-5** | **Copper** | **04/22/1998** | **0.01** | **mg/l** | **0.01** | **0.007** | **0.003** |
| SW-5 | Copper | 04/15/1999 | 0.002 | mg/l | 0.002 | 0.007 | |
| **SW-5** | **Copper** | **06/07/2000** | **0.072** | **mg/l** | **0.002** | **0.007** | **0.065** |

**Table 7:** Historical Inorganic Surface Water Results

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | SWSTD [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| SW-5 | Antimony | 06/07/2000 | 0.0066 | mg/l | 0.005 | | |
| **SW-5** | **Copper** | **12/05/2000** | **0.033** | **mg/l** | **0.002** | **0.007** | **0.026** |
| **SW-5** | **Copper** | **07/12/2001** | **0.082** | **mg/l** | **0.002** | **0.007** | **0.075** |
| **SW-5** | **Copper** | **01/09/2002** | **0.096** | **mg/l** | **0.002** | **0.007** | **0.089** |
| SW-4 | Lead, total | 04/22/1998 | 0.006 | mg/l | 0.005 | 0.025 | |
| SW-5 | Nickel, total | 04/15/1999 | 0.012 | mg/l | 0.005 | 0.025 | |
| SW-5 | Nickel, total | 06/07/2000 | 0.014 | mg/l | 0.005 | 0.025 | |
| SW-5 | Nickel, total | 12/05/2000 | 0.012 | mg/l | 0.005 | 0.025 | |
| SW-5 | Nickel, total | 07/12/2001 | 0.022 | mg/l | 0.005 | 0.025 | |
| SW-5 | Nickel, total | 01/09/2002 | 0.0098 | mg/l | 0.005 | 0.025 | |
| **SW-5** | **Selenium, total** | **07/12/2001** | **0.0056** | **mg/l** | **0.005** | **0.005** | **0.0006** |
| **SW-5** | **Silver, total** | **06/07/2000** | **0.0029** | **mg/l** | **0.002** | **0.0001** | **0.0028** |
| SW-4 | Vanadium | 04/22/1998 | 0.006 | mg/l | 0.005 | | |
| SW-5 | Vanadium | 07/12/2001 | 0.0072 | mg/l | 0.005 | | |
| SW-5 | Vanadium | 01/09/2002 | 0.0081 | mg/l | 0.005 | | |
| **SW-3** | **Zinc** | **02/06/1995** | **0.063** | **mg/l** | **0.05** | **0.05** | **0.013** |
| **SW-3** | **Zinc** | **02/27/1995** | **0.09** | **mg/l** | **0.05** | **0.05** | **0.04** |
| SW-3 | Zinc | 10/24/1996 | 0.021 | mg/l | 0.01 | 0.05 | |
| SW-3 | Zinc | 04/22/1998 | 0.015 | mg/l | 0.01 | 0.05 | |
| SW-4 | Zinc | 10/24/1996 | 0.018 | mg/l | 0.01 | 0.05 | |
| SW-4 | Zinc | 10/23/1997 | 0.023 | mg/l | 0.01 | 0.05 | |
| SW-4 | Zinc | 04/22/1998 | 0.022 | mg/l | 0.01 | 0.05 | |
| **SW-5** | **Zinc** | **04/29/1996** | **0.062** | **mg/l** | **0.05** | **0.05** | **0.012** |
| SW-5 | Zinc | 10/24/1996 | 0.02 | mg/l | 0.01 | 0.05 | |
| SW-5 | Zinc | 05/28/1997 | 0.021 | mg/l | 0.01 | 0.05 | |
| SW-5 | Zinc | 10/23/1997 | 0.025 | mg/l | 0.01 | 0.05 | |
| SW-5 | Zinc | 04/22/1998 | 0.013 | mg/l | 0.01 | 0.05 | |
| SW-5 | Zinc | 06/07/2000 | 0.04 | mg/l | 0.01 | 0.05 | |
| SW-5 | Zinc | 12/05/2000 | 0.041 | mg/l | 0.01 | 0.05 | |
| **SW-5** | **Zinc** | **07/12/2001** | **0.092** | **mg/l** | **0.01** | **0.05** | **0.042** |
| **SW-5** | **Zinc** | **01/09/2002** | **0.11** | **mg/l** | **0.01** | **0.05** | **0.06** |

[1] Table only contains detected constituents.
[2] PQL = Practical Quantitation Limit
[3] SWSTD = North Carolina Surface Water Standard Class C or Class IV as appropriate

**Table 8:** Statistically Significant Inorganics

| Sampling Event | Well | Statistically Significant Constituents | | | | |
|---|---|---|---|---|---|---|
| Jan-07 | MW-1 | Manganese | | | | |
| | MW-2 | Manganese | | | | |
| | MW-3 | Manganese | | | | |
| | MW-6 | Manganese | | | | |
| | MW-7 | Manganese | | | | |
| | MW-9 | Manganese | | | | |
| | MW-10 | Manganese | | | | |
| | MW-12 | Manganese | | | | |
| Jul-06 | MW-5R | Lead | | | | |
| | MW-6 | Lead | | | | |
| Jan-06 | MW-5R | Lead | | | | |
| Jun-05 | MW-12 | Cadmium | | | | |
| Jan-05 | MW-3 | Arsenic | | | | |
| Jun-02 | MW-2 | Lead | | Nickel | | |
| | MW-5R | Chromium | Lead | | Nickel | |
| Jan-02 | MW-2 | Cobalt | | | | |
| | MW-3 | Arsenic | | | | |
| | MW-5R | Arsenic | Chromium | Cobalt | Copper | Vanadium |
| | MW-12 | Barium | | | | |
| Jul-01 | MW-12 | Chromium | Cobalt | | Vanadium | |
| Dec-00 | MW-2 | Cobalt | | Nickel | | |
| | MW-3 | Arsenic | | | | |
| Jun-00 | MW-2 | Cobalt | | | | |
| | MW-5R | Cobalt | | | | |
| | MW-10 | Cobalt | | | | |
| | MW-12 | Cobalt | | | | |
| Feb-00 | MW-2 | Cobalt | | | | |
| | MW-5R | Arsenic | Chromium | Cobalt | Copper | Vanadium |
| | MW-6 | Cobalt | | | | |
| | MW-12 | Cobalt | | | | |

**Table 9:** Historical Organic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-11 | 1,1-Dichloroethane | 01/09/2002 | 1.7 | ug/l | 1 | 70 | |
| MW-3 | 1,1-Dichloroethane | 01/09/2002 | 1.5 | ug/l | 1 | 70 | |
| MW-3 | 1,1-Dichloroethane | 01/25/2007 | 1.7 | ug/l | 0.09 | 70 | |
| MW-7 | 1,1-Dichloroethane | 02/07/2000 | 5.8 | ug/l | 5 | 70 | |
| MW-7 | 1,1-Dichloroethane | 06/02/2000 | 6.4 | ug/l | 5 | 70 | |
| MW-7 | 1,1-Dichloroethane | 07/11/2001 | 5.2 | ug/l | 5 | 70 | |
| MW-7 | 1,1-Dichloroethane | 06/25/2002 | 5.2 | ug/l | 5 | 70 | |
| MW-7 | 1,1-Dichloroethane | 01/25/2007 | 2.9 | ug/l | 0.09 | 70 | |
| MW-9 | 1,1-Dichloroethane | 01/09/2002 | 1.7 | ug/l | 1 | 70 | |
| **MW-10** | **Benzene** | **05/28/1997** | **5.5** | **ug/l** | **5** | **1** | **4.5** |
| **MW-7** | **Benzene** | **01/25/2007** | **1.3** | **ug/l** | **0.12** | **1** | **0.3** |
| **MW-7** | **Benzene** | **07/03/2007** | **2.7** | **ug/l** | **1** | **1** | **1.7** |
| MW-10 | Carbon disulfide | 06/02/2000 | 14 | ug/l | 5 | | |
| MW-10 | Carbon disulfide | 12/05/2000 | 75 | ug/l | 5 | | |
| MW-10 | Carbon disulfide | 01/09/2002 | 1 | ug/l | 1 | | |
| MW-11 | Carbon disulfide | 01/09/2002 | 1.4 | ug/l | 1 | | |
| MW-12 | Carbon disulfide | 07/12/2001 | 6.4 | ug/l | 5 | | |
| MW-3 | Carbon disulfide | 12/05/2000 | 9.1 | ug/l | 5 | | |
| MW-4R | Carbon disulfide | 12/05/2000 | 12 | ug/l | 5 | | |
| MW-4R | Carbon disulfide | 01/09/2002 | 1.4 | ug/l | 1 | | |
| MW-5R | Carbon disulfide | 12/05/2000 | 20 | ug/l | 5 | | |
| MW-5R | Carbon disulfide | 01/09/2002 | 8.2 | ug/l | 1 | | |
| MW-6 | Carbon disulfide | 10/23/1997 | 9.1 | ug/l | 5 | | |
| MW-6 | Carbon disulfide | 01/09/2002 | 1.6 | ug/l | 1 | | |
| MW-7 | Carbon disulfide | 12/05/2000 | 5.6 | ug/l | 5 | | |
| MW-7 | Carbon disulfide | 07/11/2001 | 6.3 | ug/l | 5 | | |
| MW-10 | Chlorobenzene | 04/30/1996 | 6 | ug/l | 5 | 50 | |
| MW-10 | Chlorobenzene | 10/24/1996 | 6.3 | ug/l | 5 | 50 | |
| MW-10 | Chlorobenzene | 05/28/1997 | 11 | ug/l | 5 | 50 | |
| MW-10 | Chlorobenzene | 10/23/1997 | 5.3 | ug/l | 5 | 50 | |
| MW-10 | Chlorobenzene | 04/22/1998 | 8.1 | ug/l | 5 | 50 | |
| MW-2 | Chlorobenzene | 01/25/2007 | 0.42 | ug/l | 0.16 | 50 | |
| MW-3 | Chlorobenzene | 01/09/2002 | 2.1 | ug/l | 1 | 50 | |
| MW-3 | Chlorobenzene | 06/18/2003 | 5.2 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 01/06/2004 | 5.2 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 06/23/2004 | 5.9 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 01/06/2005 | 6 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 06/17/2005 | 7 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 07/13/2006 | 7.8 | ug/l | 5 | 50 | |
| MW-3 | Chlorobenzene | 01/25/2007 | 3.5 | ug/l | 0.16 | 50 | |
| MW-7 | Chlorobenzene | 01/25/2007 | 2.1 | ug/l | 0.16 | 50 | |
| MW-12 | Chloroethane | 01/25/2007 | 1.5 | ug/l | 0.4 | | |
| **MW-7** | **Chloroethene** | **01/25/2007** | **0.31** | **ug/l** | **0.15** | **0.015** | **0.295** |
| MW-3 | cis-1,2-Dichloroethylene | 01/25/2007 | 0.63 | ug/l | 0.14 | 70 | |
| MW-7 | cis-1,2-Dichloroethylene | 01/25/2007 | 1.3 | ug/l | 0.14 | 70 | |
| MW-9 | cis-1,2-Dichloroethylene | 01/09/2002 | 1.3 | ug/l | 1 | 70 | |
| MW-5R | Methyl ethyl ketone | 04/14/1999 | 510 | ug/l | 100 | 4200 | |
| MW-1 | Methylbenzene | 07/03/2007 | 3.1 | ug/l | 1 | 1000 | |
| MW-10 | Methylbenzene | 07/12/2001 | 12 | ug/l | 5 | 1000 | |
| MW-12 | Methylbenzene | 07/12/2001 | 74 | ug/l | 5 | 1000 | |
| MW-12 | Methylbenzene | 01/10/2002 | 1.5 | ug/l | 1 | 1000 | |

**Table 9:** Historical Organic Groundwater Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-12 | Methylbenzene | 07/13/2006 | 6.7 | ug/l | 5 | 1000 | |
| MW-9 | Methylbenzene | 06/05/2000 | 23 | ug/l | 5 | 1000 | |
| **MW-1** | **Methylene chloride** | **04/22/1998** | **5.3** | **ug/l** | **5** | **4.6** | **0.7** |
| **MW-3** | **Methylene chloride** | **04/14/1999** | **11** | **ug/l** | **5** | **4.6** | **6.4** |
| **MW-6** | **Methylene chloride** | **01/06/2005** | **12** | **ug/l** | **10** | **4.6** | **7.4** |
| **MW-6** | **Methylene chloride** | **07/13/2006** | **13.1** | **ug/l** | **10** | **4.6** | **8.5** |
| **MW-6** | **Methylene chloride** | **07/03/2007** | **8.7** | **ug/l** | **1** | **4.6** | **4.1** |
| **MW-7** | **Methylene chloride** | **04/22/1998** | **8.1** | **ug/l** | **5** | **4.6** | **3.5** |
| MW-2 | p-Dichlorobenzene | 01/25/2007 | 0.35 | ug/l | 0.15 | 1.4 | |
| MW-3 | p-Dichlorobenzene | 01/25/2007 | 0.84 | ug/l | 0.15 | 1.4 | |
| MW-7 | p-Dichlorobenzene | 01/25/2007 | 0.98 | ug/l | 0.15 | 1.4 | |
| MW-7 | p-Dichlorobenzene | 07/03/2007 | 1 | ug/l | 1 | 1.4 | |
| MW-3 | Tetrachloroethene | 01/25/2007 | 0.43 | ug/l | 0.25 | 0.7 | |
| MW-7 | Tetrachloroethene | 01/25/2007 | 0.6 | ug/l | 0.25 | 0.7 | |
| **MW-9** | **Tetrachloroethene** | **07/03/2007** | **1.1** | **ug/l** | **1** | **0.7** | **0.4** |
| **SHOP** | **Tetrachloroethene** | **07/03/2007** | **1.5** | **ug/l** | **1** | **0.7** | **0.8** |
| MW-3 | Trichloroethene | 01/25/2007 | 0.45 | ug/l | 0.23 | 2.8 | |
| MW-9 | Trichloroethene | 07/03/2007 | 1.5 | ug/l | 1 | 2.8 | |
| SHOP | Trichloroethene | 07/03/2007 | 2.2 | ug/l | 1 | 2.8 | |
| MW-6 | Trichlorofluoromethane | 01/09/2002 | 2.5 | ug/l | 1 | 2100 | |
| MW-6 | Trichlorofluoromethane | 01/06/2004 | 7.4 | ug/l | 5 | 2100 | |
| MW-6 | Trichlorofluoromethane | 06/23/2004 | 8.1 | ug/l | 5 | 2100 | |
| MW-6 | Trichlorofluoromethane | 01/06/2005 | 10 | ug/l | 5 | 2100 | |
| MW-6 | Trichlorofluoromethane | 06/16/2005 | 5 | ug/l | 5 | 2100 | |
| MW-6 | Trichlorofluoromethane | 07/13/2006 | 26.1 | ug/l | 5 | 2100 | |
| MW-6 | Trichlorofluoromethane | 01/25/2007 | 0.41 | ug/l | 0.16 | 2100 | |
| MW-6 | Trichlorofluoromethane | 07/03/2007 | 9.2 | ug/l | 1 | 2100 | |
| MW-7 | Trichlorofluoromethane | 01/25/2007 | 0.36 | ug/l | 0.16 | 2100 | |
| MW-7 | Trichlorofluoromethane | 07/03/2007 | 1.1 | ug/l | 1 | 2100 | |

[1] Table only contains detected constituents.

[2] PQL = Practical Quantitation Limit

[3] NCGW2L = North Carolina Ground Water 2L Standard

**Table 10:** Statistically Significant Organics

| Sampling Event | Well | Statistically Significant Constituents | |
|---|---|---|---|
| Jan-07 | MW-3 | Chlorobenzene | cis-1,2-Dichloroethylene |
| | MW-7 | Benzene | Vinyl Chloride |
| Jul-06 | MW-3 | Chlorobenzene | |
| | MW-6 | Trichlorofluoromethane | Methylene Chloride |
| Jun-05 | MW-3 | Chlorobenzene | |
| | MW-6 | Trichlorofluoromethane | |
| Jan-05 | MW-3 | Chlorobenzene | |
| | MW-6 | Trichlorofluoromethane | Dichloromethane |

**Table 11:** Current Groundwater Sample Results

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-1 | Barium, total | 07/03/2007 | 124 | ug/l | 100 | 2000 | |
| **MW-7** | **Benzene** | **07/03/2007** | **2.7** | **ug/l** | **1** | **1** | **1.7** |
| MW-8D | Cadmium, total | 07/03/2007 | 1.2 | ug/l | 1 | 1.75 | |
| MW-25 | Chromium, total | 07/13/2007 | 24.7 | ug/l | 1.7 | 50 | |
| MW-1 | Cobalt, total | 07/03/2007 | 16.1 | ug/l | 10 | | |
| MW-12 | Cobalt, total | 07/03/2007 | 43.8 | ug/l | 10 | | |
| MW-2 | Cobalt, total | 07/03/2007 | 36.9 | ug/l | 10 | | |
| MW-25 | Cobalt, total | 07/13/2007 | 12.3 | ug/l | 2.5 | | |
| MW-3 | Cobalt, total | 07/03/2007 | 13.9 | ug/l | 10 | | |
| MW-5R | Cobalt, total | 07/03/2007 | 25.7 | ug/l | 10 | | |
| MW-1 | Copper | 07/03/2007 | 42.5 | ug/l | 10 | 1000 | |
| MW-24 | Copper | 07/13/2007 | 18 | ug/l | 1.8 | 1000 | |
| MW-25 | Copper | 07/13/2007 | 32.8 | ug/l | 1.8 | 1000 | |
| MW-5R | Copper | 07/03/2007 | 16.7 | ug/l | 10 | 1000 | |
| SHOP | Copper | 07/03/2007 | 66.2 | ug/l | 10 | 1000 | |
| **MW-1** | **Lead, total** | **07/03/2007** | **31.3** | **ug/l** | **10** | **15** | **16.3** |
| **MW-25** | **Lead, total** | **07/13/2007** | **16.7** | **ug/l** | **3.1** | **15** | **1.7** |
| **MW-10** | **Manganese** | **07/03/2007** | **375** | **ug/l** | **50** | **50** | **325** |
| **MW-2** | **Manganese** | **07/03/2007** | **4630** | **ug/l** | **50** | **50** | **4580** |
| **MW-24** | **Manganese** | **07/13/2007** | **118** | **ug/l** | **1.4** | **50** | **68** |
| **MW-25** | **Manganese** | **07/13/2007** | **303** | **ug/l** | **1.4** | **50** | **253** |
| **MW-3** | **Manganese** | **07/03/2007** | **3120** | **ug/l** | **50** | **50** | **3070** |
| **MW-7** | **Manganese** | **07/03/2007** | **511** | **ug/l** | **50** | **50** | **461** |
| **MW-9** | **Manganese** | **07/03/2007** | **148** | **ug/l** | **50** | **50** | **98** |
| MW-1 | Methylbenzene | 07/03/2007 | 3.1 | ug/l | 1 | 1000 | |
| **MW-6** | **Methylene chloride** | **07/03/2007** | **8.7** | **ug/l** | **1** | **4.6** | **4.1** |
| MW-7 | p-Dichlorobenzene | 07/03/2007 | 1 | ug/l | 1 | 1.4 | |
| **MW-9** | **Tetrachloroethene** | **07/03/2007** | **1.1** | **ug/l** | **1** | **0.7** | **0.4** |
| **SHOP** | **Tetrachloroethene** | **07/03/2007** | **1.5** | **ug/l** | **1** | **0.7** | **0.8** |
| MW-9 | Trichloroethene | 07/03/2007 | 1.5 | ug/l | 1 | 2.8 | |
| SHOP | Trichloroethene | 07/03/2007 | 2.2 | ug/l | 1 | 2.8 | |
| MW-6 | Trichlorofluoromethane | 07/03/2007 | 9.2 | ug/l | 1 | 2100 | |
| MW-7 | Trichlorofluoromethane | 07/03/2007 | 1.1 | ug/l | 1 | 2100 | |
| MW-25 | Vanadium | 07/13/2007 | 26.7 | ug/l | 1.7 | | |
| MW-1 | Zinc | 07/03/2007 | 88.3 | ug/l | 10 | 1050 | |
| MW-24 | Zinc | 07/13/2007 | 10.3 | ug/l | 3.4 | 1050 | |
| MW-25 | Zinc | 07/13/2007 | 30.1 | ug/l | 3.4 | 1050 | |
| MW-5R | Zinc | 07/03/2007 | 11.6 | ug/l | 10 | 1050 | |
| SHOP | Zinc | 07/03/2007 | 20.8 | ug/l | 10 | 1050 | |

[1] Table only contains detected constituents.

[2] PQL = Practical Quantitation Limit

[3] NCGW2L = North Carolina Ground Water 2L Standard

**Table 12:** Carcinogenic Toxicity Values for Oral Ingestion

| Contaminant | Well | Reference Dose | Maximum Concentration (ug/L) | LADD Maximum | | Concentration July 2007 (ug/L) | LADD July 2007 | | HI Risk Maximum | | Hi Risk July 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral Sfo (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | Adult | Child | Adult | Child |
| Benzene | MW-7 | 55 | 2.70 | 0.03 | 0.01 | 2.70 | 0.03 | 0.01 | 6.01E-04 | 1.99E-04 | 6.01E-04 | 1.99E-04 |
| | MW-10 | 55 | 5.50 | 0.07 | 0.02 | - | - | - | 1.22E-03 | 4.05E-04 | - | - |

NOTE:
1. LADD is lifetime average daily dose from ingested groundwater at the specified concentration.
2. Sfo values taken from the Region 9 Risk Based Concentration Table. These values represent a cancer slope factor.
3. During July 2007 sampling "-" designates none of this constituent was detected.
4. Formula used for calculations:

LADD = (C*IR*ED)/(BW*AT)

C = constituent concentration (ug/L)

| | |
|---|---|
| IR = Ingestion Rate (L/day) | An ingestion rate of 2L/day was used for adults 1L/day for children |
| ED = Exposure Duration (days) | An exposure duration of 30 years was used for adults, 8 for children |
| BW = Body weight (kg) | An average weight of 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | A time of 70 years for adults and children was used |

**Table 13:** Carcinogenic Toxicity Values for Inhalation Exposure

| Contaminant | Well | Reference Dose | Maximum Concentration | LADD Maximum | | Concentration July 2007 | LADD July 2007 | | HI Risk Maximum | | HI Risk July 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inhalation Sfi (ug/kg-day) | (ug/m$^3$) | Adult (ug/kg-day) | Child (ug/kg-day) | (ug/m$^3$) | Adult (ug/kg-day) | Child (ug/kg-day) | Adult | Child | Adult | Child |
| Benzene | MW-7 | 27 | 2.70 | 0.17 | 0.07 | 2.70 | 0.17 | 0.07 | 6.12E-03 | 2.43E-03 | 6.12E-03 | 2.43E-03 |
| | MW-10 | 27 | 5.50 | 0.34 | 0.13 | - | - | - | 0.01 | 0.00 | - | - |

NOTE:
1. LADD is lifetime average daily dose inhaled at the specified concentration.
2. Sfi values taken from the Region 9 Risk Based Concentration Table. These values represent a cancer slope factor.
3. During July 2007 sampling "-" designates none of this constituent was detected.
4. HI is the Hazzard Index Risk = LADD/RfD
5. Formula used for calculations:

LADD = (C*IR*ED*K)/(BW*AT)

C = constituent concentration (ug/m$^3$)

| | |
|---|---|
| K = Volatilization factor (L/m$^3$) | A Volatilization factor of 0.5 L/m$^3$ was used based on EPA published values |
| IR = Inhalation Rate (m$^3$/day) | An inhalation rate of 20 m$^3$/day was used for adults and 12m$^3$/day for children |
| ED = Exposure Duration (days) | An exposure duration of 30 years was used for adults, 8 for children |
| BW = Body weight (kg) | An average weight of 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | A times of 70 years for adults and children was used |

**Table 14:** Carcinogenic Toxicity Values from Dermal Exposure

| Contaminant | Well | Reference Dose | Maximum Concentration (ug/L) | LADD Maximum | | Concentration 2007 (ug/L) | LADD 2007 | | HI Risk Maximum | | HI Risk 1/25/2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral Sfo (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | Adult | Child | Adult | Child |
| Benzene | MW-7 | 55 | 2.70 | 1.73E-04 | 5.37E-05 | 2.70 | 1.73E-04 | 5.37E-05 | 3.15E-06 | 9.76E-07 | 3.15E-06 | 9.76E-07 |
| | MW-10 | 55 | 5.50 | 3.53E-04 | 1.09E-04 | - | - | - | 6.42E-06 | 1.99E-06 | - | - |

NOTE:
1. LADD is lifetime average daily dose from dermal contact with contaminated groundwater at the specified concentration.
2. Sfo values taken from the Region 9 Risk Based Concentration Table. These values represent a cancer slope factor.
3. During July2007 sampling "-" designates none of this constituent was detected.
4. Dermal Values used the same RfD values as those used for Oral.
5. HI is the Hazard Index Risk = LADD/RfD
6. Formula used for calculations:

LADD = (C*K*EV*ED*EF*SA)/(BW*AT)

| | |
|---|---|
| C = constituent concentration (ug/L) | |
| K = permeability coefficient (cm/day) | contaminant dependent |
| EV = event frequency | 15 min/day |
| ED = Exposure Duration (years) | 30 years for an adult, 8 years for a child |
| EF = Exposure Frequency (days/year) | 365 days per year |
| SA = skin surface area ($cm^2$) | 20,000$cm^2$ for adults and 9360 $cm^2$ for children |
| BW = Body weight (kg) | 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | 70 years for adults and children |

**Table 15:** Non-Carcinogenic Toxicity Values for Oral Ingestion

| Contaminant | Well | Reference Dose | Maximum Concentration (ug/L) | LADD Maximum | | Concentration July 2007 (ug/L) | LADD July 2007 | | HI Risk Maximum | | Hi Risk July 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral RfD (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | Adult | Child | Adult | Child |
| Chlorobenzene | MW-2 | 20 | 0.42 | 0.01 | 0.01 | - | - | - | 6.00E-04 | 7.45E-04 | - | - |
| | MW-3 | 20 | 7.80 | 0.22 | 0.28 | - | - | - | 1.11E-02 | 1.38E-02 | - | - |
| | MW-7 | 20 | 2.10 | 0.06 | 0.07 | - | - | - | 3.00E-03 | 3.72E-03 | - | - |
| | MW-10 | 20 | 11.00 | 0.31 | 0.39 | - | - | - | 1.57E-02 | 1.95E-02 | - | - |
| cis-1,2-dichloroethylene | MW-3 | 10 | 0.63 | 0.02 | 0.02 | - | - | - | 1.80E-03 | 2.23E-03 | - | - |
| | MW-7 | 10 | 1.30 | 0.04 | 0.05 | - | - | - | 3.71E-03 | 4.61E-03 | - | - |
| | MW-9 | 10 | 1.30 | 0.04 | 0.05 | - | - | - | 3.71E-03 | 4.61E-03 | - | - |
| Trichlorofluoromethane | MW-6 | 300 | 26.10 | 0.75 | 0.93 | 9.20 | 0.26 | 0.33 | 2.49E-03 | 3.09E-03 | 8.76E-04 | 1.09E-03 |
| | MW-7 | 300 | 1.10 | 0.03 | 0.04 | 1.10 | 0.03 | 0.04 | 1.05E-04 | 1.30E-04 | 1.05E-04 | 1.30E-04 |
| Benzene | MW-7 | 4 | 2.70 | 0.08 | 0.10 | 2.70 | 0.08 | 0.10 | 0.02 | 0.02 | 0.02 | 0.02 |
| | MW-10 | 4 | 5.50 | 0.16 | 0.20 | - | - | - | 0.04 | 0.05 | - | - |
| Methylene Chloride | MW-1 | 60 | 5.30 | 0.15 | 0.19 | - | - | - | 2.52E-03 | 3.13E-03 | - | - |
| | MW-3 | 60 | 11.00 | 0.31 | 0.39 | - | - | - | 0.01 | 0.01 | - | - |
| | MW-6 | 60 | 13.10 | 0.37 | 0.46 | 8.70 | 0.25 | 0.31 | 0.01 | 0.01 | 4.14E-03 | 0.01 |
| | MW-7 | 60 | 8.10 | 0.23 | 0.29 | - | - | - | 3.86E-03 | 4.79E-03 | - | - |
| Tetrachloroethene | MW-3 | 10 | 0.43 | 0.01 | 0.02 | - | - | - | 1.23E-03 | 1.52E-03 | - | - |
| | MW-7 | 10 | 0.60 | 0.02 | 0.02 | - | - | - | 1.71E-03 | 2.13E-03 | - | - |
| | MW-9 | 10 | 1.10 | 0.03 | 0.04 | 1.10 | 0.03 | 0.04 | 3.14E-03 | 3.90E-03 | 3.14E-03 | 3.90E-03 |
| | SHOP | 10 | 1.50 | 0.04 | 0.05 | 1.50 | 0.04 | 0.05 | 4.29E-03 | 0.01 | 4.29E-03 | 0.01 |

NOTE:
1. LADD is lifetime average daily dose from ingested groundwater at the specified concentration.
2. RfD values taken from the Region 9 Risk Based Concentration Table. These values represent a daily exposure level that is not harmful to human health, over a lifetime.
3. During July 2007 sampling "-" designates none of this constituent was detected.
4. Formula used for calculations:

LADD = (C*IR*ED)/(BW*AT)

C = constituent concentration (ug/L)

| | |
|---|---|
| IR = Ingestion Rate (L/day) | An ingestion rate of 2L/day was used for adults 1L/day for children |
| ED = Exposure Duration (days) | An exposure duration of 30 years was used for adults, 8 for children |
| BW = Body weight (kg) | An average weight of 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | Times of 30 years for adults and 8 for children were used |

**Table 16:** Non-Carcinogenic Toxicity Values for Inhalation Exposure

| Contaminant | Well | Reference Dose Inhalation RfD (ug/kg-day) | Maximum Concentration (ug/L) | LADD Maximum Adult (ug/kg-day) | LADD Maximum Child (ug/kg-day) | Concentration July 2007 (ug/L) | LADD July 2007 Adult (ug/kg-day) | LADD July 2007 Child (ug/kg-day) | HI Risk Maximum Adult | HI Risk Maximum Child | HI Risk July 2007 Adult | HI Risk July 2007 Child |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorobenzene | MW-2 | 17 | 0.42 | 0.06 | 0.09 | - | - | - | 3.53E-03 | 0.01 | - | - |
| | MW-3 | 17 | 7.80 | 1.11 | 1.66 | - | - | - | 0.07 | 0.10 | - | - |
| | MW-7 | 17 | 2.10 | 0.30 | 0.45 | - | - | - | 0.02 | 0.03 | - | - |
| | MW-10 | 17 | 11.00 | 1.57 | 2.34 | - | - | - | 0.09 | 0.14 | - | - |
| cis-1,2-dichloroethylene | MW-3 | 10 | 0.63 | 0.09 | 0.13 | - | - | - | 0.01 | 0.01 | - | - |
| | MW-7 | 10 | 1.30 | 0.19 | 0.28 | - | - | - | 0.02 | 0.03 | - | - |
| | MW-9 | 10 | 1.30 | 0.19 | 0.28 | - | - | - | 0.02 | 0.03 | - | - |
| Trichlorofluoromethane | MW-6 | 200 | 26.10 | 3.73 | 5.55 | 9.20 | 1.31 | 1.96 | 0.02 | 0.03 | 6.57E-03 | 9.79E-03 |
| | MW-7 | 200 | 1.10 | 0.16 | 0.23 | 1.10 | 0.16 | 0.23 | 7.86E-04 | 1.17E-03 | 7.86E-04 | 1.17E-03 |
| Benzene | MW-7 | 8.6 | 2.70 | 0.39 | 0.57 | 2.70 | 0.39 | 0.57 | 0.04 | 0.07 | 0.04 | 0.07 |
| | MW-10 | 8.6 | 5.50 | 0.79 | 1.17 | - | - | - | 0.09 | 0.14 | - | - |
| Methylene Chloride | MW-1 | 860 | 5.30 | 0.76 | 1.13 | - | - | - | 8.80E-04 | 1.31E-03 | - | - |
| | MW-3 | 860 | 11.00 | 1.57 | 2.34 | - | - | - | 1.83E-03 | 2.72E-03 | - | - |
| | MW-6 | 860 | 13.10 | 1.87 | 2.79 | 8.70 | 1.24 | 1.85 | 2.18E-03 | 3.24E-03 | 1.45E-03 | 2.15E-03 |
| | MW-7 | 860 | 8.10 | 1.16 | 1.72 | - | - | - | 1.35E-03 | 2.00E-03 | - | - |
| Tetrachloroethene | MW-3 | 10 | 0.43 | 0.06 | 0.09 | - | - | - | 0.01 | 0.01 | - | - |
| | MW-7 | 10 | 0.60 | 0.09 | 0.13 | - | - | - | 0.01 | 0.01 | - | - |
| | MW-9 | 10 | 1.10 | 0.16 | 0.23 | 1.10 | 0.16 | 0.23 | 0.02 | 0.02 | 0.02 | 0.02 |
| | SHOP | 10 | 1.50 | 0.21 | 0.32 | 1.50 | 0.21 | 0.32 | 0.02 | 0.03 | 0.02 | 0.03 |

NOTE:
1. LADD is lifetime average daily dose inhaled at the specified concentration.
2. RfD values taken from the Region 9 Risk Based Concentration Table. These values represent a daily exposure level that is not harmful to human health, over a lifetime.
3. During July 2007 sampling "-" designates none of this constituent was detected.
4. HI is the Hazzard Index Risk = LADD/RfD
5. Formula used for calculations:

LADD = (C*IR*ED*K)/(BW*AT)

| | |
|---|---|
| C = constituent concentration (ug/L) | |
| K = Volatilization factor ($L/m^3$) | A Volatilization factor of 0.5 $L/m^3$ was used based on EPA published values |
| IR = Inhalation Rate ($m^3$/day) | An inhalation rate of 20 $m^3$/day was used for adults and 12$m^3$/day for children |
| ED = Exposure Duration (days) | An exposure duration of 30 years was used for adults, 8 for children |
| BW = Body weight (kg) | An average weight of 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | Times of 30 years for adults and 8 for children were used |

**Table 17:** Non-Carcinogenic Toxicity Values from Dermal Exposure

| Contaminant | Well | Reference Dose | Maximum Concentration (ug/L) | LADD Maximum | | Concentration July 2007 (ug/L) | LADD July 2007 | | HI Risk Maximum | | HI Risk July 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral RfD (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | | Adult (ug/kg-day) | Child (ug/kg-day) | Adult | Child | Adult | Child |
| Chlorobenzene | MW-2 | 20 | 0.42 | 1.23E-04 | 1.43E-04 | - | - | - | 6.14E-06 | 7.13E-06 | - | - |
| | MW-3 | 20 | 7.80 | 2.28E-03 | 2.65E-03 | - | - | - | 1.14E-04 | 1.32E-04 | - | - |
| | MW-7 | 20 | 2.10 | 6.14E-04 | 7.13E-04 | - | - | - | 3.07E-05 | 3.57E-05 | - | - |
| | MW-10 | 20 | 11.00 | 3.22E-03 | 3.74E-03 | - | - | - | 1.61E-04 | 1.87E-04 | - | - |
| cis-1,2-dichloroethylene | MW-3 | 10 | 0.63 | 4.49E-05 | 5.22E-05 | - | - | - | 4.49E-06 | 5.22E-06 | - | - |
| | MW-7 | 10 | 1.30 | 9.27E-05 | 1.08E-04 | - | - | - | 9.27E-06 | 1.08E-05 | - | - |
| | MW-9 | 10 | 1.30 | 9.27E-05 | 1.08E-04 | - | - | - | 9.27E-06 | 1.08E-05 | - | - |
| Trichlorofluoromethane | MW-6 | 300 | 26.10 | 3.16E-03 | 3.68E-03 | 9.20 | 1.12E-03 | 1.30E-03 | 1.05E-05 | 1.23E-05 | 3.72E-06 | 4.32E-06 |
| | MW-7 | 300 | 1.10 | 1.33E-04 | 1.55E-04 | 1.10 | 1.33E-04 | 1.55E-04 | 4.45E-07 | 5.16E-07 | 4.45E-07 | 5.16E-07 |
| Benzene | MW-7 | 4 | 2.70 | 4.04E-04 | 4.70E-04 | 2.70 | 4.04E-04 | 4.70E-04 | 1.01E-04 | 1.17E-04 | 1.01E-04 | 1.17E-04 |
| | MW-10 | 4 | 5.50 | 8.24E-04 | 9.57E-04 | - | - | - | 2.06E-04 | 2.39E-04 | - | - |
| Methylene Chloride | MW-1 | 60 | 5.30 | 1.70E-04 | 1.98E-04 | - | - | - | 2.83E-06 | 3.29E-06 | - | - |
| | MW-3 | 60 | 11.00 | 3.53E-04 | 4.10E-04 | - | - | - | 5.88E-06 | 6.83E-06 | - | - |
| | MW-6 | 60 | 13.10 | 4.20E-04 | 4.88E-04 | 8.70 | 2.79E-04 | 3.24E-04 | 7.01E-06 | 8.14E-06 | 4.65E-06 | 5.41E-06 |
| | MW-7 | 60 | 8.10 | 2.60E-04 | 3.02E-04 | - | - | - | 4.33E-06 | 5.03E-06 | - | - |
| Tetrachloroethene | MW-3 | 10 | 0.43 | 1.47E-04 | 1.71E-04 | - | - | - | 1.47E-05 | 1.71E-05 | - | - |
| | MW-7 | 10 | 0.60 | 2.05E-04 | 2.39E-04 | - | - | - | 2.05E-05 | 2.39E-05 | - | - |
| | MW-9 | 10 | 1.10 | 3.77E-04 | 4.37E-04 | 1.10 | 3.77E-04 | 4.37E-04 | 3.77E-05 | 4.37E-05 | 3.77E-05 | 4.37E-05 |
| | SHOP | 10 | 1.50 | 5.13E-04 | 5.96E-04 | 1.50 | 5.13E-04 | 5.96E-04 | 5.13E-05 | 5.96E-05 | 5.13E-05 | 5.96E-05 |

NOTE:
1. LADD is lifetime average daily dose from dermal contact with contaminated groundwater at the specified concentration.
2. RfD values taken from the Region 9 Risk Based Concentration Table. These values represent a daily exposure level that is not harmful to human health, over a lifetime.
3. During July 2007 sampling "-" designates none of this constituent was detected.
4. Dermal Values used the same RfD values as those used for Oral.
5. HI is the Hazard Index Risk = LADD/RfD
6. Formula used for calculations:

LADD = (C*K*EV*ED*EF*SA)/(BW*AT)

| | |
|---|---|
| C = constituent concentration (ug/L) | |
| K = permeability coefficient (cm/day) | contaminant dependent |
| EV = event frequency | 15 min/day |
| ED = Exposure Duration (years) | 30 years for an adult, 8 years for a child |
| EF = Exposure Frequency (days/year) | 365 days per year |
| SA = skin surface area ($cm^2$) | 20,000$cm^2$ for adults and 9360 $cm^2$ for children |
| BW = Body weight (kg) | 70 kg was used for adults, 28.2 kg for children |
| AT = Average Time (days) | 30 years for adults and 8 for children |

**Table 18:** Flow rate calculations

| Well | $h_1$ (ft) | $h_2$ (ft) | dh (ft) | dl (ft) | i | K (cm/sec) | $n_e$ (%) | v (ft/yr) | Lithology |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 439.83 | 430.00 | 9.83 | 163.40 | 0.0602 | 1.40E-04 | 20% | 43.57 | Argillite |
| MW-2 | 423.98 | 420.00 | 3.98 | 197.81 | 0.0201 | 6.60E-05 | 5% | 27.48 | Sandy Silt with Gravel |
| MW-3 | 382.98 | 390.00 | 7.02 | 210.22 | 0.0334 | 3.40E-04 | 20% | 58.74 | Argillite |
| MW-4R | 395.69 | 390.00 | 5.69 | 390.28 | 0.0146 | 1.40E-05 | 5% | 4.22 | Argillite |
| MW-5 | 407.89 | 400.00 | 7.89 | 209.20 | 0.0377 | 5.05E-05 | 5% | 39.41 | Argillite |
| MW-5R | 407.54 | 400.00 | 7.54 | 235.70 | 0.0320 | | - | - | Argillite |
| MW-6 | 417.25 | 410.00 | 7.25 | 382.72 | 0.0189 | 4.15E-05 | 5% | 16.27 | Argillite |
| MW-7 | 423.27 | 420.00 | 3.27 | 596.05 | 0.0055 | 2.20E-05 | 5% | 2.50 | Silty Clay with Gravel |
| MW-9 | 386.57 | 390.00 | 3.43 | 58.54 | 0.0586 | 8.30E-05 | 5% | 100.63 | Argillite |
| MW-10 | 383.29 | 390.00 | 6.71 | 132.41 | 0.0507 | 7.10E-05 | 5% | 74.45 | Argillite |
| MW-11 | 380.42 | 390.00 | 9.58 | 434.69 | 0.0220 | 2.40E-04 | 5% | 109.45 | Sandy Clay with Gravel |
| MW-12 | 386.5 | 390.00 | 3.50 | 272.11 | 0.0129 | 7.40E-05 | 15% | 6.57 | Sandy Silt |

NOTES:

1. Parameters *dh* and *dl* denote the difference in the hydraulic head and the horizontal distance, respectively, between two measurement points. A line is constructed from a piezometers to a perpendicular of the potentiometric contour in Plate 4 *Average day potentiometric map with flow directions.* The hydraulic head is the absolute value of the difference in the groundwater elevation at the piezometer, $h_1$, and the elevation of the corresponding potentiometric contour, $h_2$. The horizontal distance, *dl,* is the length of the line.
2. Parameter *i* denotes the hydraulic gradient associate with the line, and is defined by the equation:

$$i = \frac{dh}{dl}$$

3. Parameter $n_e$ denotes the effective porosity.
4. *K* denotes the hydraulic conductivity determined from field slug tests.
5. Parameter *v* denotes the average linear velocity. The average linear velocity, denoted by *v*, is defined by the equation:

$$v = -\frac{K}{n_e}\frac{dh}{dl}$$

**Table 20:** Stream Dilution Calculations

| Constituent of Concern | Well | K (ft/sec) | dh/dl | $Q_{gw}$ ($ft^3$/sec) | Max GW Concentration (ug/L) | Max $C_{sw}$ (ug/l) | 2007 Concentration (ug/L) | 2007 $C_{sw}$ (ug/l) | SWSTD[1] (ug/L) | Maximum Concentration needed in GW to exceed SWSTD (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | MW-10 | 2.33E-06 | 5.08E-02 | 2.66E-03 | 5.50 | 6.22E-03 | - | - | 1.19 | 1.05E+03 |
| Chlorobenzene | MW-10 | 2.33E-06 | 5.08E-02 | 2.66E-03 | 11.00 | 1.24E-02 | - | - | 488 | 4.32E+05 |
| cis-1,2-dichloroethylene | MW-9 | 2.72E-06 | 5.89E-02 | 3.61E-03 | 2.50 | 3.84E-03 | 2.5 | 3.84E-03 | - | - |
| Tetrachloroethene | MW-9 | 2.72E-06 | 5.89E-02 | 3.61E-03 | 1.10 | 1.69E-03 | 1.1 | 1.69E-03 | 0.8 | 5.21E+02 |

[1] SWSTD = North Carolina Surface Water Standard Class C or Class IV as appropriate

Formula Used for Calculations:

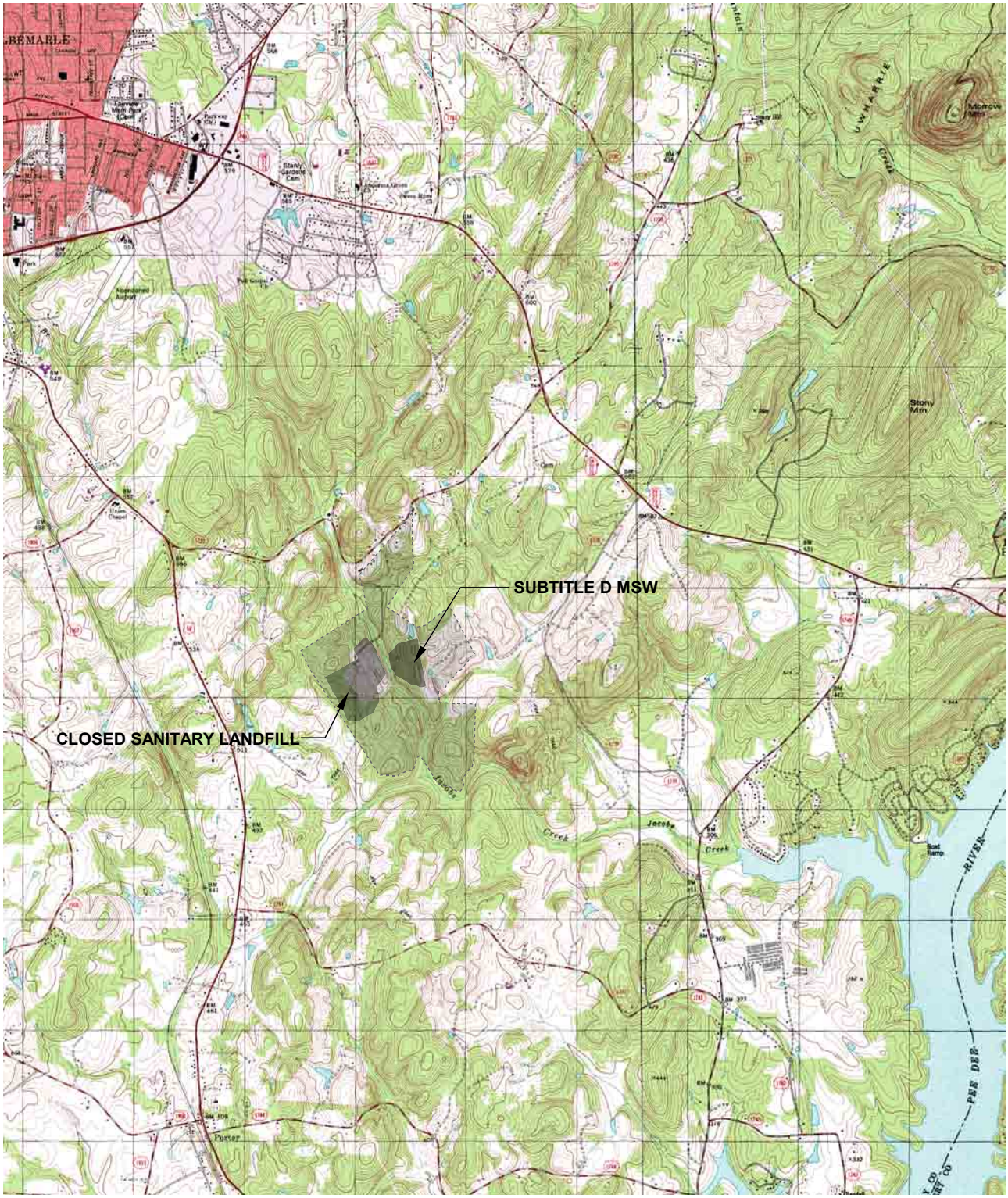
$C_{sw} = C_{gs}[Q_{gw}/(Q_{gw}+Q_{sw})]$

$C_{sw}$ = potential surface water contaminant concentration
$C_{gs}$ = groundwater contaminant
$Q_{sw}$ = 2.35 $ft^3$/sec
$Q_{gw}$ = groundwater flux (KA[dh/dl])
K = hydraulic conductivity
A = cross sectional area of groundwater discharge - Estimated to be 22500 $ft^2$
(dh/dl) = hydraulic gradient as calculated on Table 18

# Topographic Map with Landfill Location

# PLATE 1

## Assessment of Corrective Measures




**QUADRANGLE LEGEND**

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route

U. S. Route

State Route

*NOTE: Topographical map assembled from corresponding USGS 7.5-min. quadrangles of the subject region.*

| | |
|---|---|
| Date Completed | 06/14/2007 |
| Created By | M. Clement |
| Project Name | Assessment of Corrective Measures |
| Site Name | City of Albemarle Landfill |
| Project Number | G07059.0 |

Municipal Engineering Services Company, PA

1 0 1 MILE

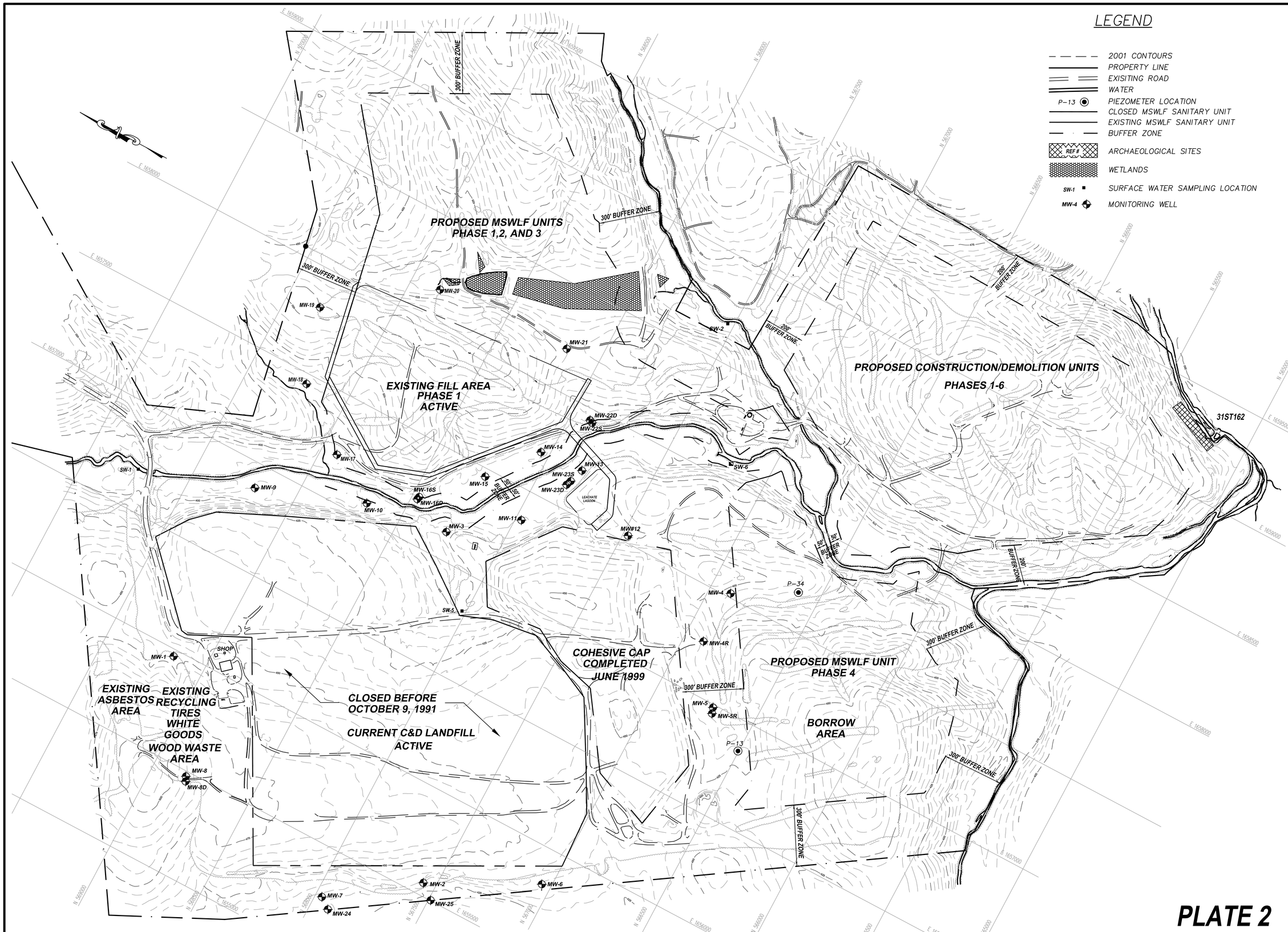



PLATE 2

Municipal Engineering Services Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767

# CLOSED MSWLF AND ACTIVE C&D LANDFILL FACILITY
## CITY OF ALBEMARLE NORTH CAROLINA

| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

FACILITY MAP

| | |
|---|---|
| SCALE: | 1"=200' |
| DATE: | 5/25/2001 |
| DRWN. BY: | L. HAMPTON |
| CHKD. BY: | E. CALDWELL |
| PROJECT NUMBER | G07059.0 |
| DRAWING NO. | PLATE 2 |
| SHEET NO. | 1 of 1 |

## LEGEND

- 2001 CONTOURS
- PROPERTY LINE
- EXISITING ROAD
- WATER
- P-13 PIEZOMETER LOCATION
- CLOSED MSWLF SANITARY UNIT
- EXISTING MSWLF SANITARY UNIT
- BUFFER ZONE
- SW-1 SURFACE WATER SAMPLING LOCATION
- MW-5 MONITORING WELL

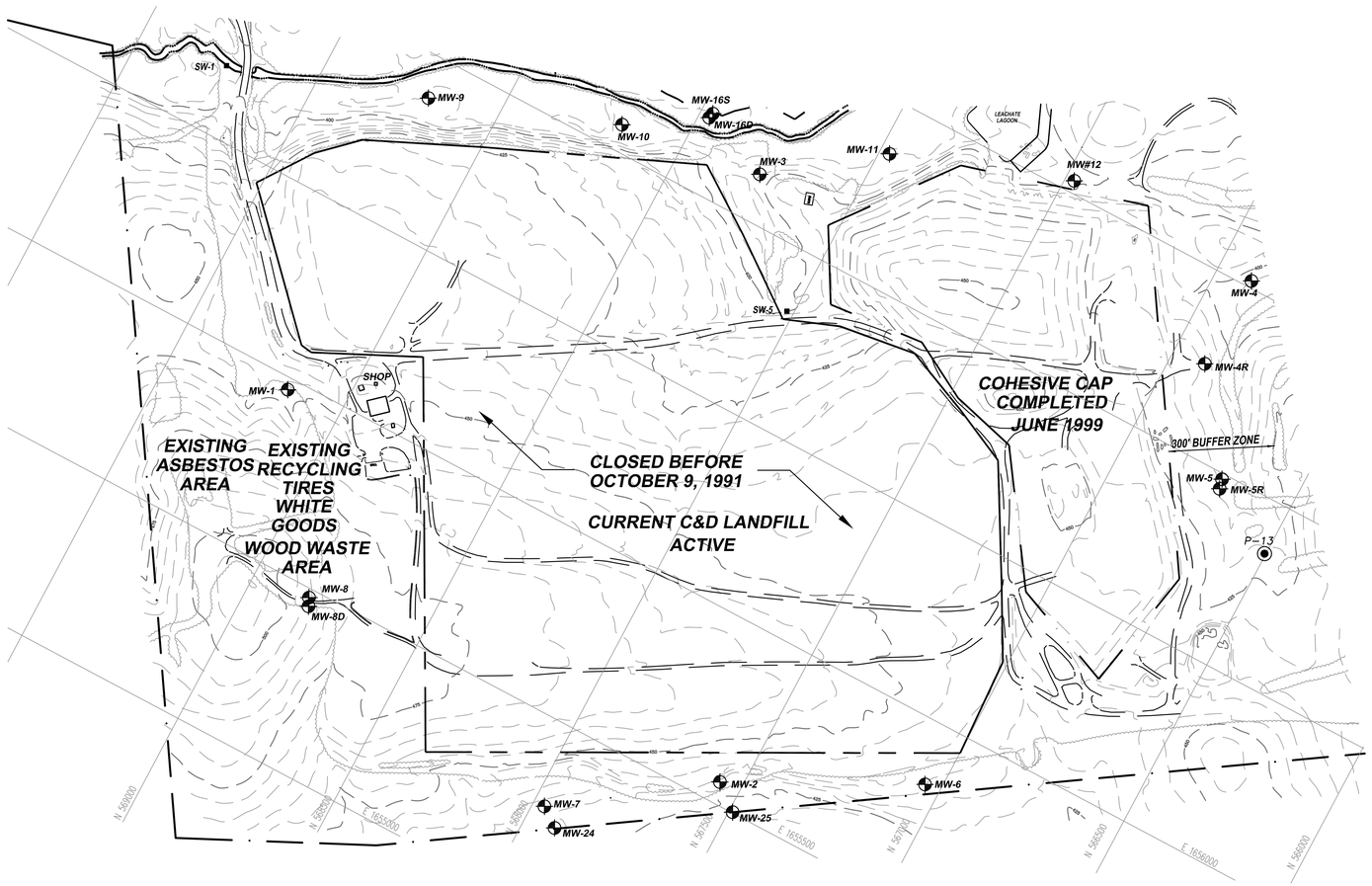



PLATE 3


Municipal Engineering Services Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767


CLOSED MSWLF AND ACTIVE C&D LANDFILL FACILITY
CITY OF ALBEMARLE
NORTH CAROLINA

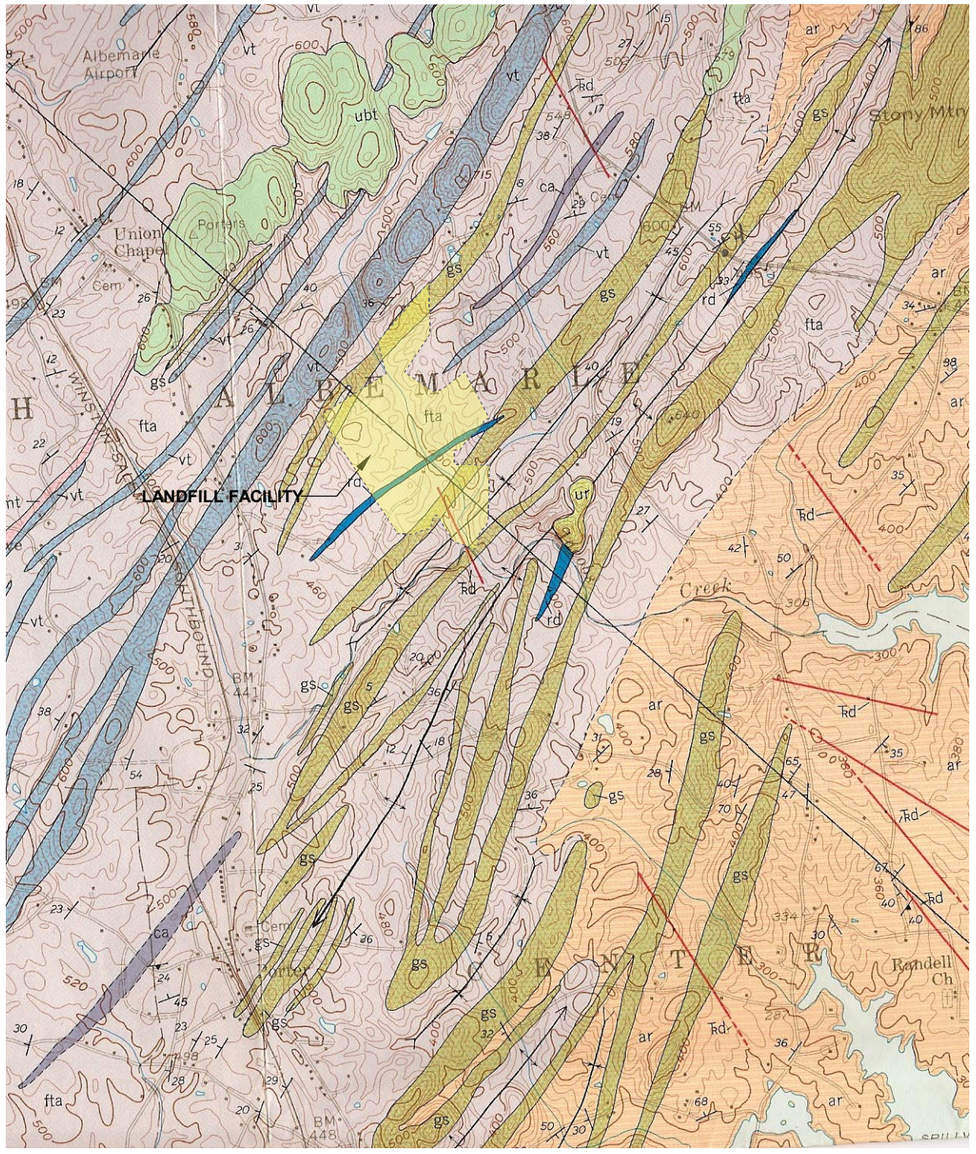
| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

SITE MAP
WITH SAMPLING LOCATIONS

| | |
|---|---|
| SCALE: | 1"=200' |
| DATE: | 9/11/2007 |
| DRWN. BY: | M. CLEMENT |
| CHKD. BY: | E. CALDWELL |
| PROJECT NUMBER | G07059.0 |
| DRAWING NO. | PLATE 3 |
| SHEET NO. | 1 of 1 |

# Regional Characterization Map

## Assessment of Corrective Measures - City of Albemarle Landfill




## FORMATION DESCRIPTION

**UPPER VOLCANIC SEQUENCE:** The Upper Volcanic sequence is approximately 450' thick comprised of andesitic tuff, basaltic tuff, and rhyolite (from base to top) and unconformibly lies on both the Lower Volcanic sequence and the Volcanic Sedimentary sequence.

- **ur: Rhyollite-**Rhyollite and porphyritic rhyollite containing prominent flow banding with basal lithic tuff occasionally present. 200' thick and appears to only cap the highest hills.
- **ubt: Basaltic Tuffs** –Overlying unit to the argillite and the tuffaceous argillite approximately 200' thick. Very well jointed containing rare basaltic flows and lithic and lithic crystal tuffs exhibiting faint bedding. Chlorite, hornblende, feldspar, and pyroxene are present within the matrix and flow rock.

**VOLCANIC SEDIMENTARY SEQUENCE:** Composed of an argillite unit, a tuffaceous argillite unit and a greywacky unit, the entire sequence is thought to be 10,000 ' thick and Ordovician in age. Unconformibly overlain by the Upper Volcanic and conformibly overlays the Lower Volcanic.

**TUFFACEOUS ARGILLITE UNIT:** Separated from argillite unit by an arbitrary line based on predominance of thick bedded, water laid, fine grained tuffs over argillite exhibiting graded bedding. Variable thickness throughout the unit indicates volcanism's affect on sedimentation.

- **fta: Felsic Tuffaceous Argillite** – Major rock of the Tuffaceous Argillite Unit, well sorted, coarsely bedded, with beds ranging from 6"-24" thick. Water laid volcanic ash with interspersed crystal fragments and relic glass shards.
- **ca: Felsic Crystal Tuff-** Rounded crystal fragments in a matrix of felsic tuff.
- **vt : Vitric Tuff** – Devitrified felsic tuff exhibiting flow banding, indicating a welded flow tuff. Very resistant to erosion, forming northeast trending hills, key horizons traceable over wide areas.
- **mt: Mafic Tuff** – Lithic crystal tuffs of basaltic composition

**ARGILLITE UNIT:** Grades into the Tuffaceous Argillite unit, averaging 500' thick. Overlays the Lower Volcanic Sequence by a gradational boundary.

- **ar: Argillite** – Exhibits fine graded bedding composed of alternating silt and clay layers, well developed plane cleavage, and contains lithic fragmented beds near base, indicating volcanism at the time of deposition.

**INTRUSIVE ROCK**

- **trd: Triassic Dikes** - Diabase dikes composed predominantly of augite and calcic plagioclase, trending in the Northwest direction, ranging from 3'-10' thick, with narrow baked zones, not altering the country rock
- **rd: Rhyolite dikes-** Porphyritic rhyolite composed predominantly of phenocrysts of orthoclase, oglioclase, and beta quartz in an aphanitic groundmass.
- **gs: Gabbro Sills** - Northeastern trending, of variable grain size, and extent. The baked zones are comparable to sill size noticeable only when weathered. Composed of hornblende gabbro, sometimes amygdaloidal.

*Taken From: Conley, J.F., Geologic Map of the Albemarle Quadrangle, NC, & Geology of the Albemarle Quadrangle, NC, 1962.*

| | |
|---|---|
| Date Completed | 8/24/2006 |
| Created By | M. Clement |
| Project Name | Assessment of Corrective Measures |
| Site Name | City of Albemarle Landfill |
| Project Number | G07059.0 |

Municipal Engineering Services Company, PA

## GEOLOGIC MAP LEGEND

- 10 — Strike and dip of bedding (inclined)
- Formation boundary
- 40 — Strike and Dip of folliation
- Syncline
- Anticline

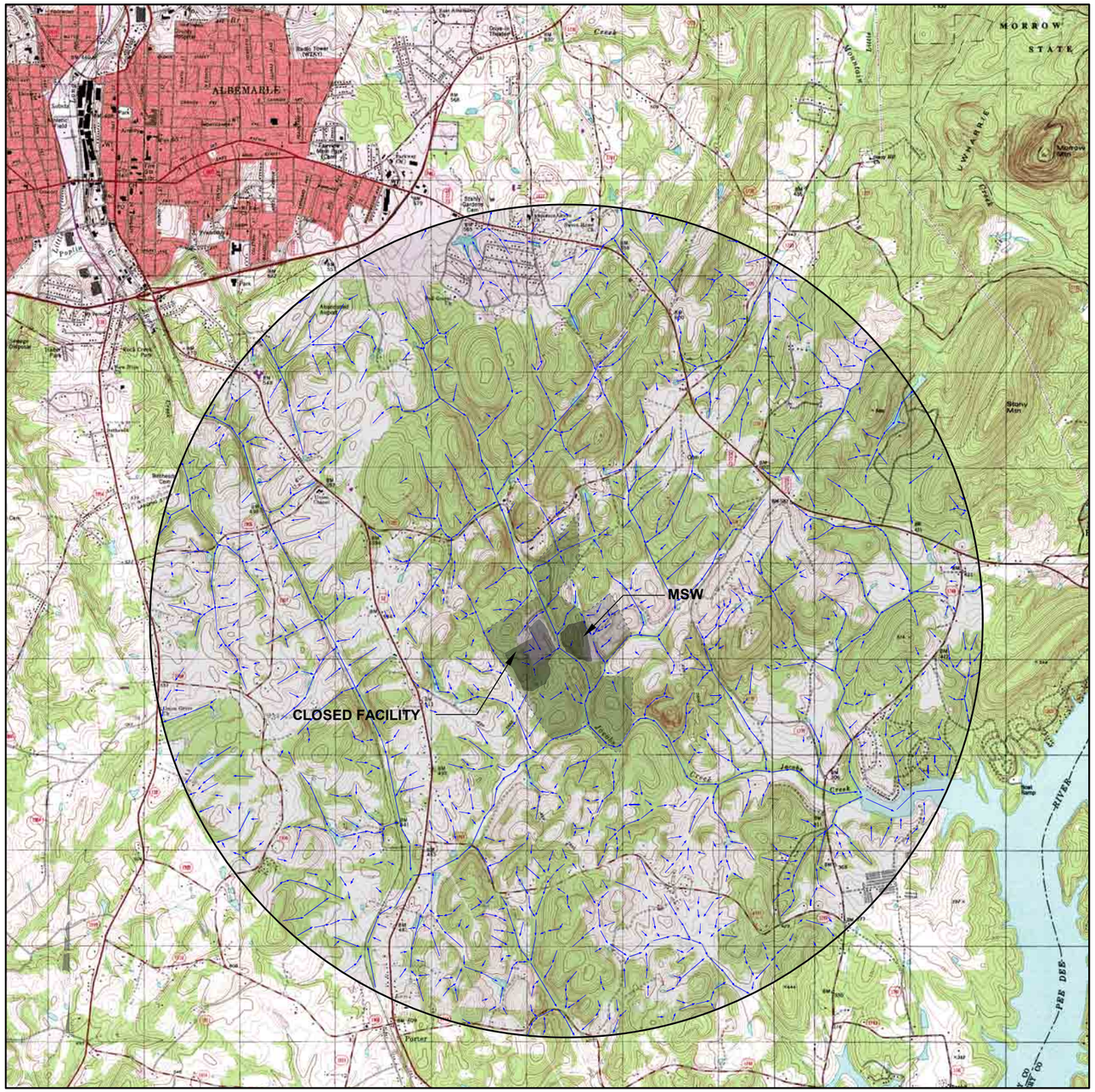
**PLATE 4**

# Stream Trace Analysis with Rose Diagram

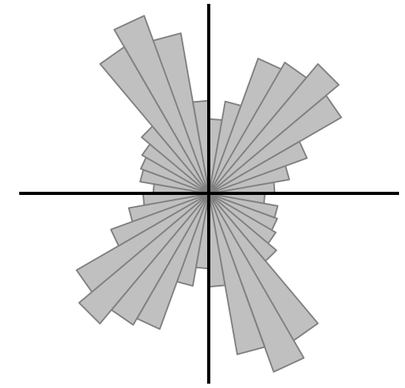
## Assessment of Corrective Measures - City of Albemarle Landfill

| | |
|---|---|
| Date Completed | 10/14/2004 |
| Created By | K. Yoshida |
| Project Name | Assessment of Corrective Measures |
| Site Name | City of Albemarle Landfill |
| Project Number | G07059.0 |

Municipal Engineering Services Company, PA




**Symmetric Mode**

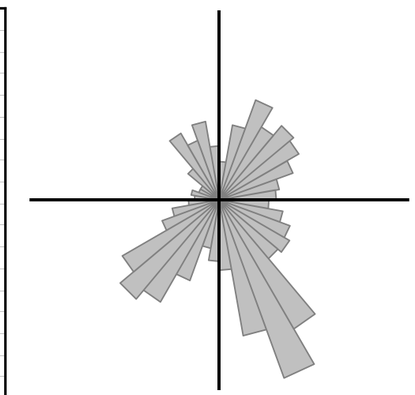


| Range | Score |
|---|---|
| N80-90W | 29% |
| N70-80W | 37% |
| N60-70W | 38% |
| N50-60W | 41% |
| N40-50W | 46% |
| N30-40W | 89% |
| N20-30W | 100% |
| N10-20W | 86% |
| N0-10W | 49% |
| N0-10E | 39% |
| N10-20E | 49% |
| N20-30E | 76% |
| N30-40E | 80% |
| N40-50E | 89% |
| N50-60E | 81% |
| N60-70E | 55% |
| N70-80E | 43% |
| N80-90E | 35% |

**Asymmetric Mode**

| Range | Score |
|---|---|
| N80-90W | 13% |
| N70-80W | 15% |
| N60-70W | 11% |
| N50-60W | 11% |
| N40-50W | 22% |
| N30-40W | 41% |
| N20-30W | 33% |
| N10-20W | 42% |
| N0-10W | 28% |
| N0-10E | 20% |
| N10-20E | 40% |
| N20-30E | 56% |
| N30-40E | 44% |
| N40-50E | 51% |
| N50-60E | 48% |
| N60-70E | 41% |
| N70-80E | 32% |
| N80-90E | 30% |

| Range | Score |
|---|---|
| S80-90E | 26% |
| S70-80E | 34% |
| S60-70E | 40% |
| S50-60E | 43% |
| S40-50E | 40% |
| S30-40E | 79% |
| S20-30E | 100% |
| S10-20E | 73% |
| S0-10E | 37% |
| S0-10W | 32% |
| S10-20W | 26% |
| S20-30W | 45% |
| S30-40W | 62% |
| S40-50W | 68% |
| S50-60W | 59% |
| S60-70W | 32% |
| S70-80W | 25% |
| S80-90W | 16% |



**QUADRANGLE LEGEND**

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route

U. S. Route

State Route

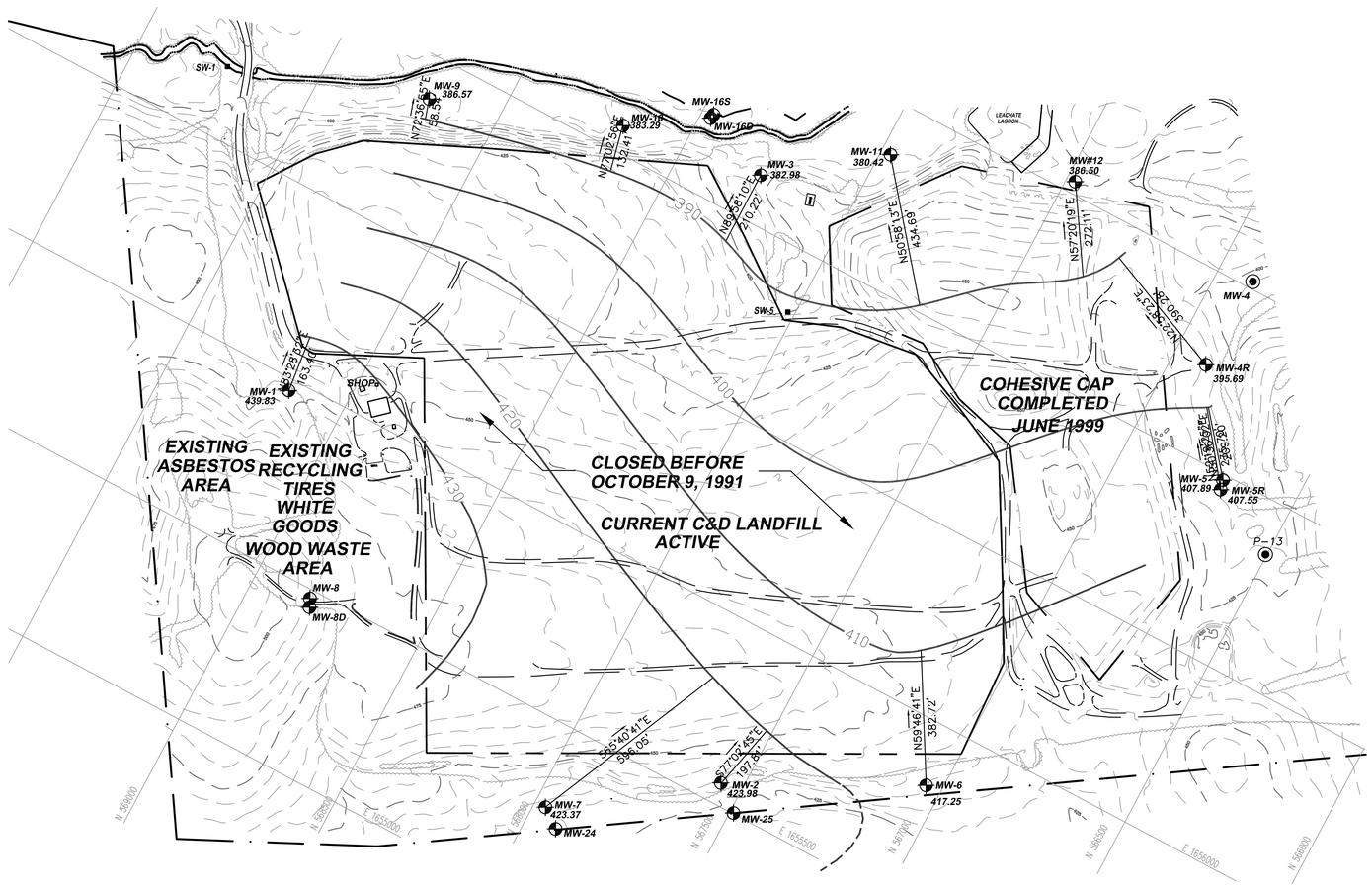
*NOTE: Topographical map assembled from corresponding USGS 7.5-min. quadrangles of the subject region.*

1 0 1 MILE

**PLATE 5**

## LEGEND

- 2001 CONTOURS
- PROPERTY LINE
- EXISITING ROAD
- WATER
- P-13 PIEZOMETER LOCATION
- CLOSED MSWLF SANITARY UNIT
- EXISTING MSWLF SANITARY UNIT
- BUFFER ZONE
- 410 GROUNDWATER CONTOUR
- SW-1 SURFACE WATER SAMPLING LOCATION
- MW-3 MONITORING WELL
- 386.46 AVERAGE GROUNDWATER ELEVATION




| WELL | AVERAGE GROUNDWATER ELEVATION (FEET) |
|---|---|
| MW-1 | 439.83 |
| MW-2 | 423.98 |
| MW-3 | 382.98 |
| MW-4R | 395.69 |
| MW-5 | 407.89 |
| MW-5R | 407.55 |
| MW-6 | 417.25 |
| MW-7 | 423.37 |
| MW-9 | 386.57 |
| MW-10 | 383.29 |
| MW-11 | 380.42 |
| MW-12 | 386.50 |

# PLATE 6

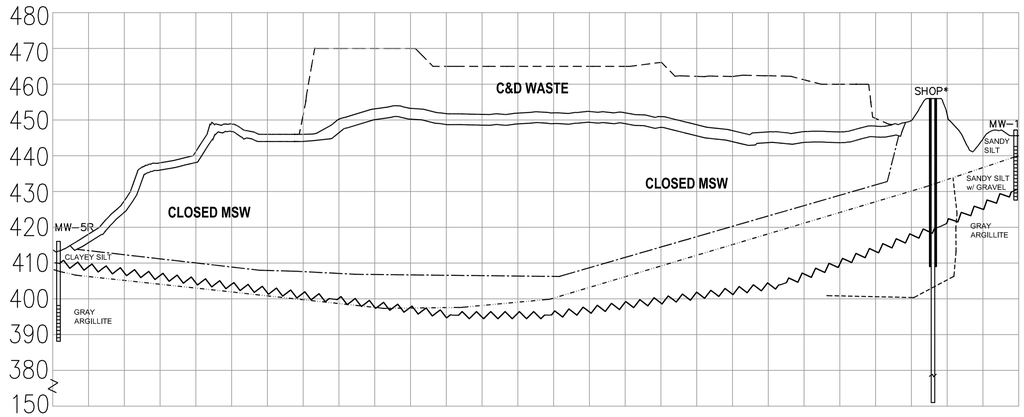

Municipal Engineering Services Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767


**CLOSED MSWLF AND ACTIVE C&D LANDFILL FACILITY**
**CITY OF ALBEMARLE NORTH CAROLINA**

| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

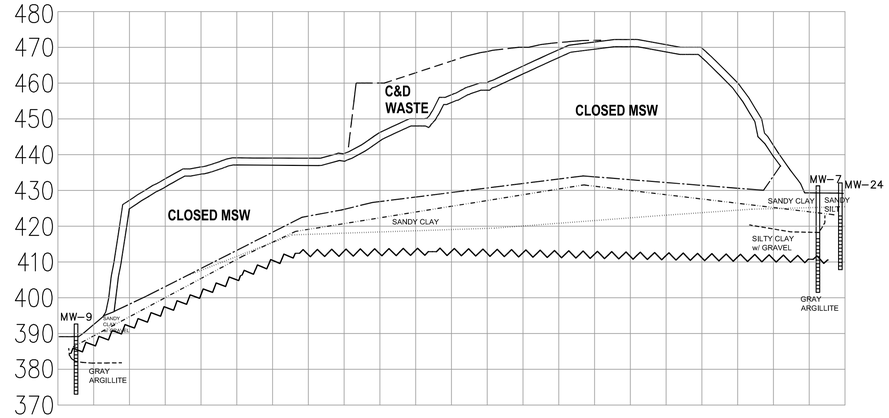
AVERAGE POTENTIOMETRIC GROUNDWATER MAP

SCALE: 1"=200'
DATE: 9/11/2007
DRWN. BY: M. CLEMENT
CHKD. BY: E. CALDWELL
PROJECT NUMBER G07059.0
DRAWING NO. PLATE 6
SHEET NO. 1 of 1



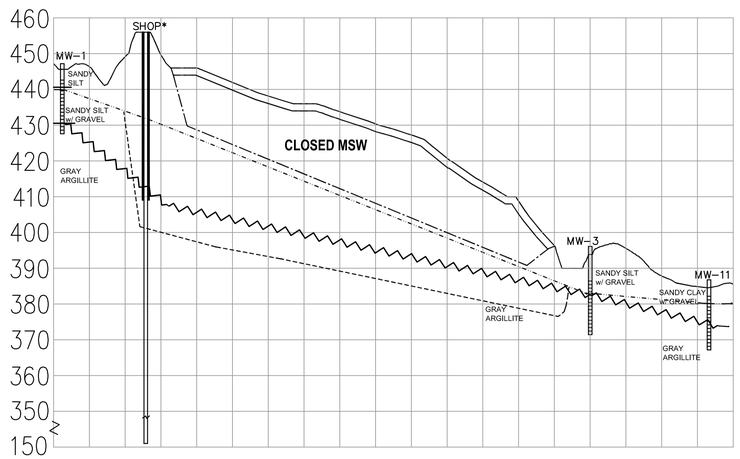

**SECTION A-A'**

APPROX. SCALE HORIZ. 1" = 200' VERT. 1" = 20'



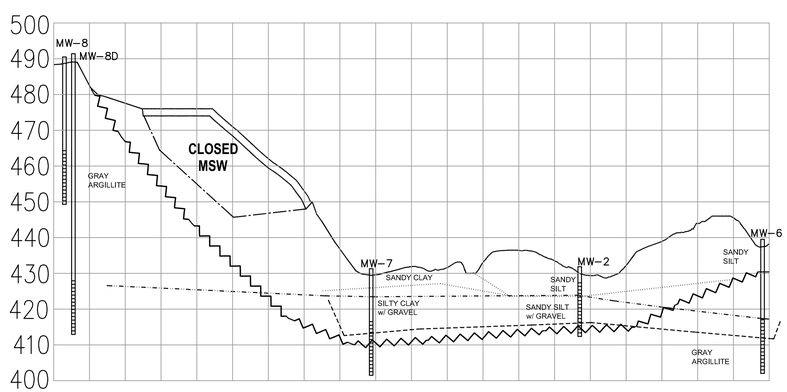

**SECTION D-D'**

APPROX. SCALE HORIZ. 1" = 200' VERT. 1" = 20'




**SECTION B-B'**

APPROX. SCALE HORIZ. 1" = 200' VERT. 1" = 20'




**SECTION C-C'**

APPROX. SCALE HORIZ. 1" = 200' VERT. 1" = 20'

## MAP LEGEND

- 400 — EXISTING CONTOURS
- PROPERTY LINE
- EXISITING ROAD
- WATER
- P13 — PIEZOMETER LOCATION
- CLOSED MSWLF SANITARY UNIT
- NEW MSWLF AND C/D UNITS
- MW-1 — MONITORING WELLS

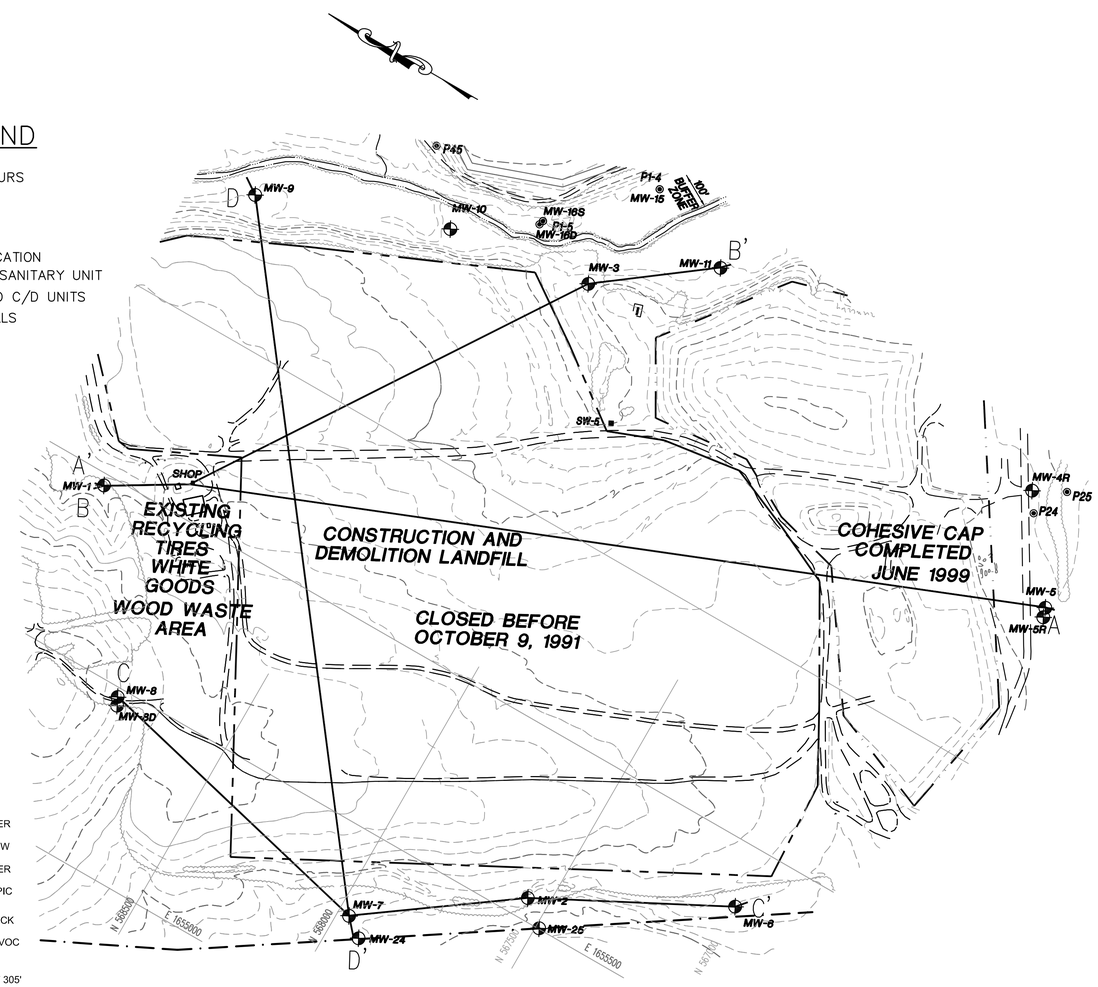
MW-1 — MONITORING WELL

SCREENED SECTION

CROSS-SECTION LEGEND:

- NEW C&D WASTE
- TOP OF MSW WITH COVER
- ESTIMATED BASE OF MSW
- AVERAGE GROUNDWATER
- ESTIMATED STRATIGRAPIC CONTACT
- TOP OF COMPETENT ROCK
- ESTIMATED EXTENT OF VOC CONTAMINATION

* NOTE: SHOP WELL EXTENDS TO A TOTAL DEPTH OF 305'




NOTE:
- NUMBERS SHOWN IN THIS PLATE ARE IN UNITS OF FEET UNLESS INDICATED OTHERWISE.
- SOIL PROFILES SHOWN HEREIN ARE INTERPOLATED FROM AVAILABLE BORING RECORDS.
- SOIL PROFILE BOUNDARIES DO NOT NECESSARILY INDICATE ABRUPT CHANGE IN SOIL TEXTURES.

PLATE 7


Municipal Services Engineering Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
P.O. BOX 278 MOREHEAD CITY, N.C. 28557 (252) 726-9481


MUNICIPAL SOLID WASTE LANDFILL FACILITY
CITY OF ALBEMARLE
NORTH CAROLINA

| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

CROSS-SECTIONS

| | |
|---|---|
| SCALE: | AS SHOWN |
| DATE: | 8/23/07 |
| DRWN. BY: | M. CLEMENT |
| CHKD. BY: | E. CALDWELL |
| PROJECT NUMBER | G07059.0 |
| DRAWING NO. | PLATE 7 |
| SHEET NO. | 1 OF 1 |

## LEGEND

- 2001 CONTOURS
- PROPERTY LINE
- EXISITING ROAD
- WATER
- P-13 PIEZOMETER LOCATION
- CLOSED MSWLF SANITARY UNIT
- EXISTING MSWLF SANITARY UNIT
- BUFFER ZONE
- SW-5 SURFACE WATER SAMPLING LOCATION
- MW-4 MONITORING WELL
- ESTIMATED LIMITS OF TOTAL VOC'S IN GROUNDWATER (JULY 2007)
- 3.80 TOTAL VOC CONCENTRATION (PPB)

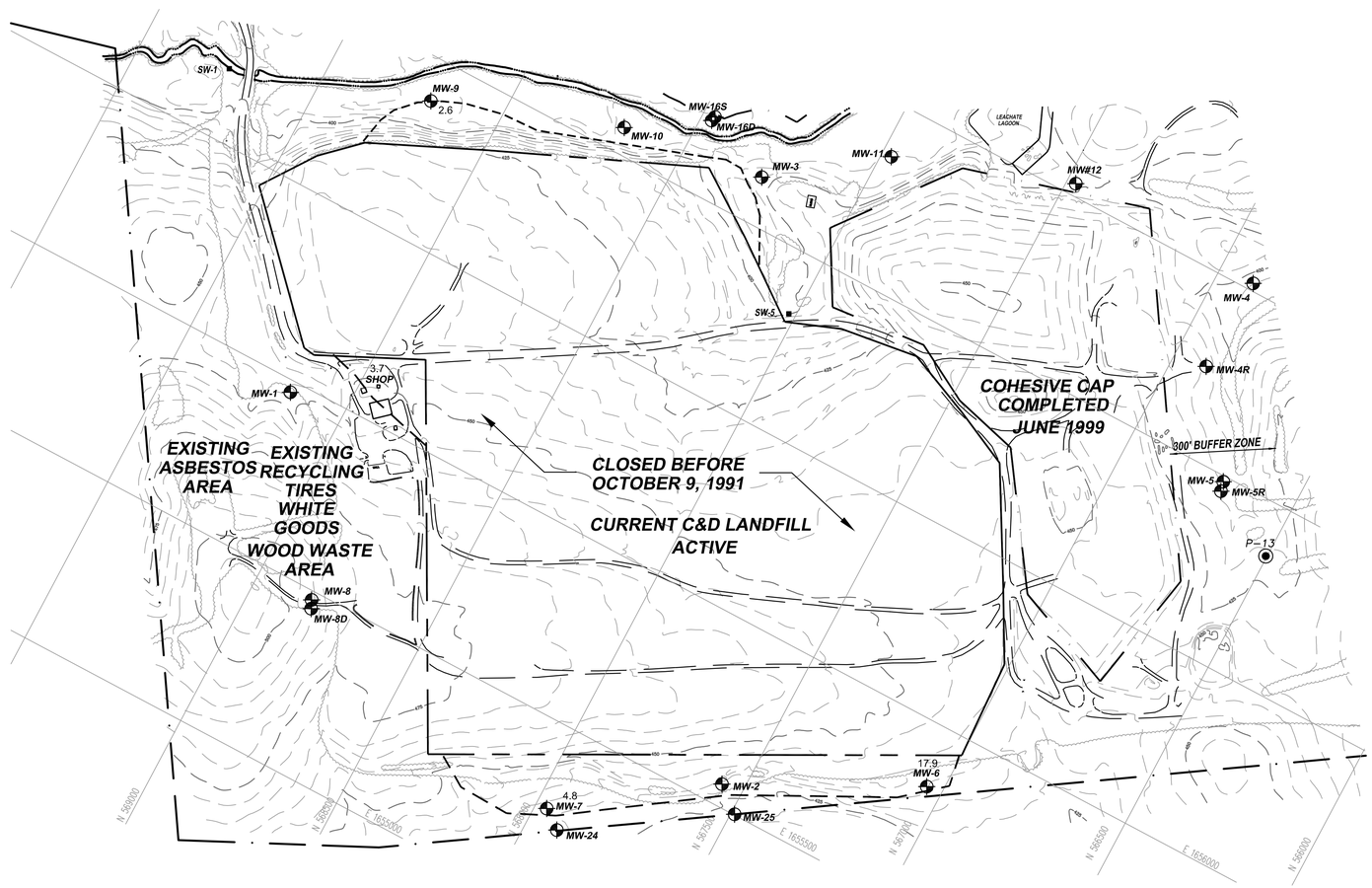



PLATE 8


Municipal Engineering Services Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767


CLOSED MSWLF AND ACTIVE C&D LANDFILL FACILITY
CITY OF ALBEMARLE
NORTH CAROLINA

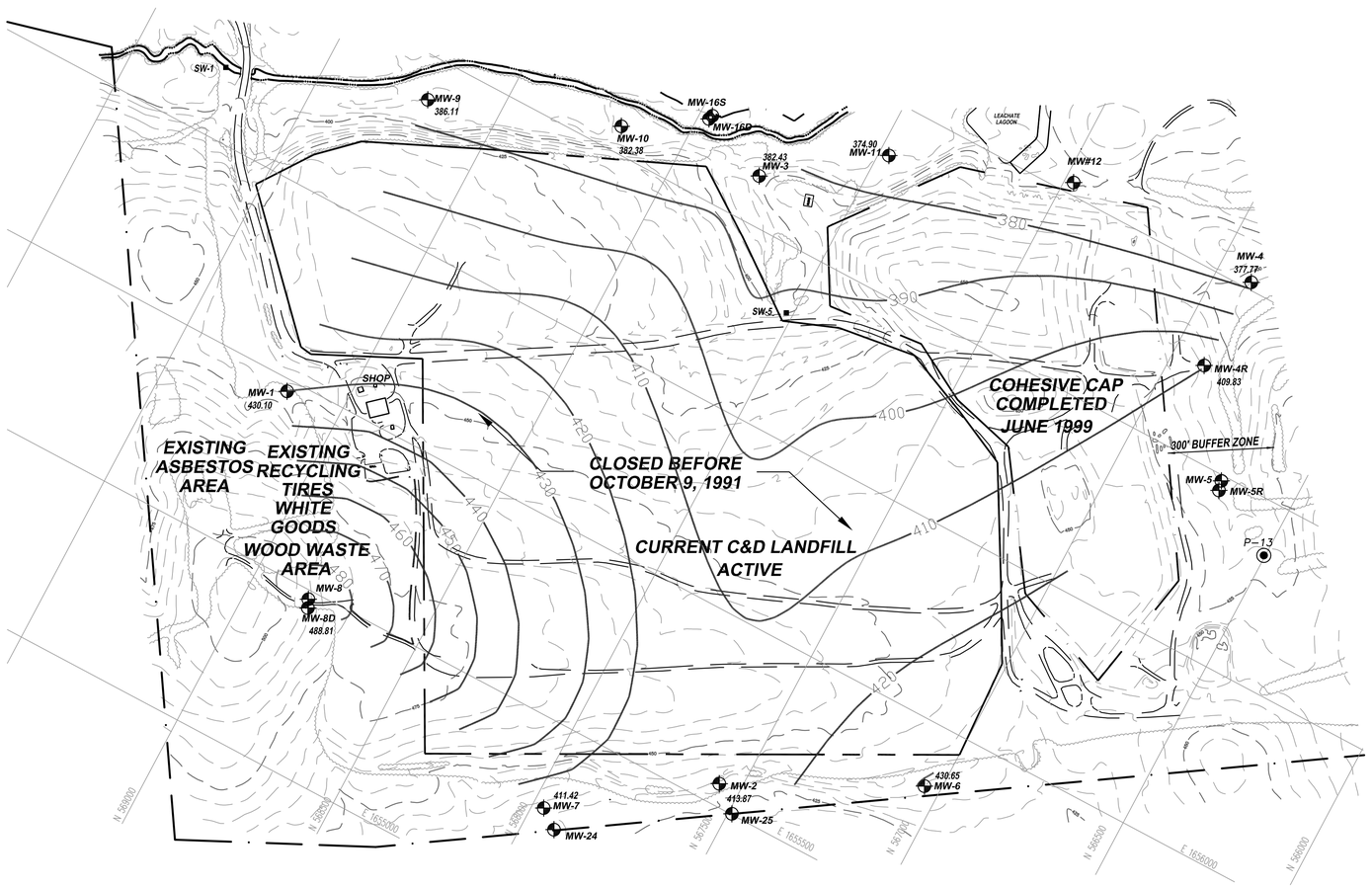
| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

ISOCONCENTRATION MAP
TOTAL VOC'S

| | |
|---|---|
| SCALE: | 1"=200' |
| DATE: | 9/11/2007 |
| DRWN. BY: | M. CLEMENT |
| CHKD. BY: | E. CALDWELL |
| PROJECT NUMBER | G07059.0 |
| DRAWING NO. | PLATE 8 |
| SHEET NO. | 1 of 1 |

## LEGEND

- 2001 CONTOURS
- PROPERTY LINE
- EXISITING ROAD
- WATER
- P-13 PIEZOMETER LOCATION
- CLOSED MSWLF SANITARY UNIT
- EXISTING MSWLF SANITARY UNIT
- BUFFER ZONE
- 380 TOP OF ROCK CONTOURS
- SW-5 SURFACE WATER SAMPLING LOCATION
- MW-11 MONITORING WELL
- 377.77 TOP OF ROCK ELEVATION




| WELL | TOP OF COMPETENT ROCK ELEVATION |
|---|---|
| MW-1 | 430.10 |
| MW-2 | 413.87 |
| MW-3 | 382.43 |
| MW-4 | 377.77 |
| MW-4R | 409.83 |
| MW-6 | 430.65 |
| MW-7 | 411.42 |
| MW-8D | 488.81 |
| MW-9 | 386.11 |
| MW-10 | 382.38 |
| MW-11 | 379.90 |

# PLATE 9


Municipal Services Engineering Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767


**CLOSED MSWLF AND ACTIVE C&D LANDFILL FACILITY**
**CITY OF ALBEMARLE**
**NORTH CAROLINA**

| DATE | BY | REV. | DESCRIPTION |
|---|---|---|---|

ESTIMATED TOP OF COMPETENT ROCK

| | |
|---|---|
| SCALE: | 1"=200' |
| DATE: | 9/11/2007 |
| DRWN. BY: | M. CLEMENT |
| CHKD. BY: | E. CALDWELL |
| PROJECT NUMBER | G07059.0 |
| DRAWING NO. | PLATE 9 |
| SHEET NO. | 1 of 1 |

# APPENDIX A

#: MW1

pg. 18

N. CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pg. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

# WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.
WELL REGISTRATION NUMBER: N.C. # 270

STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0034

WELL LOCATION: (Show sketch of the location below)
Target Town: Albemarle N.C.
Albemarle Landfill (Stoney Cuy Rd)
Road, Community, or Subdivision and Lot No.)
OWNER: City of Albemarle
ADDRESS: P.O. Box 190
(Street or Route No.)
Albemarle N.C. 28002-0190
City or Town State Zip Code

County: Stanly

DATE DRILLED: 3/20/91 TYPE OF WELL: Monitoring
TOTAL DEPTH: 18.0 CUTTINGS COLLECTED: [X] Yes [ ] No
DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No
STATIC WATER LEVEL: 5 FT. [ ] above [X] below TOP OF CASING
TOP OF CASING IS 2 FT. ABOVE LAND SURFACE
YIELD (gpm): NA METHOD OF TEST: N.A.
WATER ZONES (depth): -3 to -18 ft
CHLORINATION: Type NA Amount NA

CASING:

| | Depth | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|
| From +2 | to -3 ft | 2" | Sch 40 | PVC |
| From | to ft | | | |
| From | to ft | | | |

GROUT:

| | Depth | Material | Method |
|---|---|---|---|
| From +6" | to -1.5 ft | Type I Cement | |
| From -1.5 | to -2.5 ft | Bentonite | |

SCREEN:

| | Depth | Diameter | Slot Size | Material |
|---|---|---|---|---|
| From -3 | to -18 ft | 2" | .010 in. | PVC |
| From | to ft | in. | in. | |
| From | to ft | in. | in. | |

GRAVEL PACK:

| | Depth | Size | Material |
|---|---|---|---|
| From -2.5 | to -18 ft | 78M | Gravel |
| From | to ft | | |

REMARKS:

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Brown silty clay |
| 5 | 10 | Tan silty fine w/ rock |
| 10 | 15 | " " " |
| 15 | 18 | Gray fine grained rock |

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I (WE) HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett A. Higgins 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

E.E.T.L. LOG OF BORING PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-1 LOCATION: SEE PLAN

DATE: 3/20/91
JOB NO: CLT-1288
SURFACE ELEVATION: 442 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" 0 10 20 30 40 50 60 70 80 |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | LIGHT GRAY TO TAN SILT WITH FINE SAND AND SOME SMALL ROCK PARTICLES. (ML) | |
| | 3 | | | |
| | 4 | | WATER ENCOUNTERED @ 3.5 FT. | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | (ML) | |
| | 8 | | | |
| | 9 | | | |
| | 10 | | LIGHT GRAY TO TAN SILT WITH FINE SANDS AND GRAVEL. (ML) | |
| | 11 | | | |
| | 12 | | | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 17 | | | |
| | 18 | | BORING TERMINATED @ 18 FT. | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water: 3.5 FT. Time:13:50 Date: 3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

#MW2

N. CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT GROUNDWATER SECTION
P.O. BOX 27687 RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat _____ Long _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

# WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Whitley Drilling Co.

DRILLER REGISTRATION NUMBER N.C. # 270

STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-003

WELL LOCATION: (Show sketch of the location below)

County: _____

Nearest Town: Albemarle N.C.

Road, Community, or Subdivision and Lot No.: Albemarle Landfill (Stoney Gap Rd.)

OWNER: City of Albemarle

ADDRESS: P.O. Box 190 (Street or Route No.)

Albemarle N.C. 28002-0190
City or Town State Zip Code

DATE DRILLED 3/21/91 USE OF WELL MONITOR

TOTAL DEPTH 17.5 CUTTINGS COLLECTED [X] Yes [ ] No

DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No

STATIC WATER LEVEL 6.75 FT. [ ] above [X] below TOP OF CASING -4.25

TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE

YIELD (gpm) NA METHOD OF TEST NA

WATER ZONES (depth): -4.25 to -17.5 ft

CHLORINATION: Type NA Amount NA

CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| | +2.5 | -2.5 | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | +6" | -1.5 | Type I Cement | |
| | -1.5 | -2.0 | Bentonite | |

SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | -2.5 | -17.5 | 2" | .010 | PVC |
| | | | | | |
| | | | | | |

GRAVEL PACK:

| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | -2.0 | -17.5 | 18 M | Gravel |
| | | | | |

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Red clayey silt |
| 5 | 10 | Tan sandy silt |
| 10 | 15 | Tan silt |
| 15 | 17.5 | Tan sandy silt w/ rock |
| | | Bedrock |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Scott L. Higgins 3/28/91
SIGNATURE OF CONTRACTOR OR OWNER DATE

GW-1 Revised 6/90 Submit original to Division of Environmental Management and copy to owner

E.E.T.L. LOG OF BORING

PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-2 LOCATION: SEE PLAN

DATE: 3/21/91
JOB NO: CLT-1288
SURFACE ELEVATION: 421 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION |
|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. |
| | 2 | | |
| | 3 | | TAN TO LIGHT BROWN SILT WITH SOME FINE SAND. (ML) |
| | 4 | | |
| | 5 | | |
| | 6 | | WATER ENCOUNTERED @ 6 FT. |
| | 7 | | LIGHT GRAY TO TAN SILT WITH FINE SAND AND SMALL ROCK FRAGMENTS. (ML) |
| | 8 | | |
| | 9 | | |
| | 10 | | |
| | 11 | | |
| | 12 | | (ML) |
| | 13 | | |
| | 14 | | |
| | 15 | | |
| | 16 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. |
| | 17 | | |
| | 18 | | BORING TERMINATED @ 17.5 FT |
| | 19 | | |
| | 20 | | |
| | 21 | | |
| | 22 | | |
| | 23 | | |
| | 24 | | |
| | 25 | | |

STANDARD PENETRATION RESISTANCE
Blows/ft on 2" sampler - 140# @ 30"
0 10 20 30 40 50 60 70 80

Depth Ground Water: 6.0 FT. Time:11:30 Date: 3/21/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

# MW 3

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat _____ Long _____ Pg. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.
DRILLER REGISTRATION NUMBER: N.C. # 270
STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0034

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle N.C.
Albemarle Landfill (Stoney Gap Rd)
(Road, Community, or Subdivision and Lot No.)
County: _____
OWNER: City of Albemarle
ADDRESS: P.O. Box 190
(Street or Route No.)
Albemarle N.C. 28002-0190
City or Town State Zip Code
DATE DRILLED: 3/20/91 USE OF WELL: Monitoring
TOTAL DEPTH: 22.5 CUTTINGS COLLECTED: [X] Yes [ ] No
DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No
STATIC WATER LEVEL: 13.5 FT. [ ] above [X] below TOP OF CASING
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE
YIELD (gpm): NA METHOD OF TEST: NA
WATER ZONES (depth): -11 to -22.5 ft
CHLORINATION: Type: NA Amount: NA

CASING:

| | Depth | | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| From +2.5 | to -7.5 | FT. | 2" | Sch 40 | PVC |
| From | to | FT. | | | |
| From | to | FT. | | | |

GROUT:

| | Depth | | Material | Method |
|---|---|---|---|---|
| From +6" | to -5.5 | FT. | Type I Cement | |
| From -5.5 | to -6.5 | FT. | Bentonite | |

SCREEN:

| | Depth | | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| From -7.5 | to -22.5 | FT. | 2" in. | .010 in. | PVC |
| From | to | FT. | in. | in. | |
| From | to | FT. | in. | in. | |

GRAVEL PACK:

| | Depth | | Size | Material |
|---|---|---|---|---|
| From 6.5 | to 22.5 | FT. | Coarse | Sand pak |
| From | to | FT. | | |

REMARKS:

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Brown Sandy silt w/ rock |
| 5 | 10 | Brown/Gray silty sand w/ rock |
| 10 | 15 | " " " " " |
| 15 | 22.5 | Gray fine grained rock Bedrock |

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett L. Hilgrand 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 (Revised 6/88)

Submit original to Division of Environmental Management and copy to well owner.

E.E.T.L. LOG OF BORING PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-3 LOCATION: SEE PLAN

DATE: 3/20/91
JOB NO: CLT-1288
SURFACE ELEVATION: 396 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" (0 10 20 30 40 50 60 70 80) |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | | |
| | 3 | | | |
| | 4 | | GRAY TO DARK BROWN SILT-ROCK MIXTURE WITH SOME SAND AND ORGANICS. (ML) | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | (ML) | |
| | 9 | | | |
| | 10 | | | |
| | 11 | | WATER ENCOUNTERED @ 10.5 FT | |
| | 12 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | | |
| | 17 | | | |
| | 18 | | | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | BORING TERMINATED @ 22.5 FT | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water:10.5 FT. Time: 17:50 Date:3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 25.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

# MW4

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat _____ Long _____ Pc _____
Major Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.
WELL REGISTRATION NUMBER: N.C. # 2701
STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0034

WELL LOCATION (Show sketch of the location below)
Nearest Town: Albemarle N.C.
Albemarle Landfill (Stoney Gap Rd.)
Road, Community, or Subdivision and Lot No.)
OWNER: City of Albemarle
ADDRESS: P.O. Box 190 (Street or Route No.)
Albemarle N.C. 28002-0190
City or Town State Zip Code
County: Stanly

DATE DRILLED: 3/21/91 USE OF WELL: Monitoring
TOTAL DEPTH: 18.5 CUTTINGS COLLECTED: [X] Yes [ ] No
IS WELL REPLACE EXISTING WELL? [ ] Yes [X] No
STATIC WATER LEVEL: 6.35 FT. [ ] above [ ] below TOP OF CASING: -3.85
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE
YIELD (gpm): NA METHOD OF TEST: NA
HYDROFRACTURES (depth): -3.85 to -18.5 ft
TREATMENT: Type NA Amount NA

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Tan silt w/rock |
| 5 | 10 | Brown Clayey silt |
| 10 | 15 | Brown silt w/rock |
| 15 | 18.5 | Bedrock |

If additional space is needed use back of form.

CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft | Material |
|---|---|---|---|---|---|
| | +2.5 | -18.5 | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | +1.4" | -2 | Type I Cement | |
| | -2 | -3 | Bentonite | |

SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | -3.5 | -18.5 | 2" | .010 in | PVC |
| | | | | in | in |
| | | | | in | in |

GRAVEL PACK:

| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | -3 | -18.5 | 78 M | Gravel |
| | | | | |

REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett E. Hayward 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Director

Revised 1/88

E.E.T.L. LOG OF BORING

PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-4 LOCATION: SEE PLAN

DATE: 3/21/91
JOB NO: CLT-1288
SURFACE ELEVATION: 386 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" (0 10 20 30 40 50 60 70 80) |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | DARK BROWN CLAYEY, ORGANIC SILT WITH SOME SAND AND SMALL ROCK FRAGMENTS. (OL) | |
| | 3 | | | |
| | 4 | | WATER ENCOUNTERED @ 4 FT. | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | 9 | | (OL) | |
| | 10 | | | |
| | 11 | | | |
| | 12 | | | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | | |
| | 17 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 18 | | BORING TERMINATED @ 18.5 FT | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water:4.0 FT. Time: 13:50 Date: 3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. SERIAL NO.
Lat. Long. RO
Minor Basin
Basin Code
Header Ent. GW-1 Ent.

# WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
SR 1720
(Road, Community, or Subdivision and Lot No.)

2. OWNER City of Albemarle
ADDRESS Attn: James Coble PO Box 190
(Street or Route No.)
Albemarle NC 28001
City or Town State Zip Code

3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 35.7
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 21.00 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.92 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST
10. WATER ZONES (depth): 23 - 35.7

11. CHLORINATION: Type N/A Amount

12. CASING:

| | Depth From | Depth To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|---|
| | +2.92 | 19.4 | | 2" | Sch 40 | PVC |
| | | | | | | |
| | | | | | | |

13. GROUT:

| | Depth From | Depth To | Ft. | Material | Method |
|---|---|---|---|---|---|
| | 0 | 16.5 | | cement | tremie |
| | 16.5 | 18.0 | | bentonite | pellets |

14. SCREEN:

| | Depth From | Depth To | Ft | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|---|
| | 19.4 | 34.4 | | 2 | | .010 | | PVC |
| | | | | | | | | |
| | | | | | | | | |

15. SAND/GRAVEL PACK:

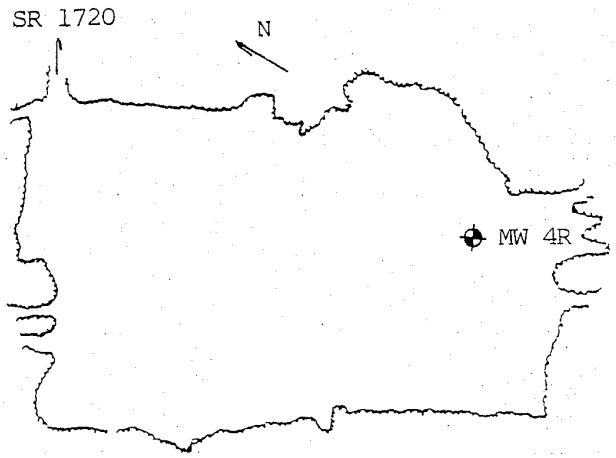
| | Depth From | Depth To | Ft. | Size | Material |
|---|---|---|---|---|---|
| | 18.0 | 35.7 | | filter | sand |
| | | | | | |

16. REMARKS: Monitoring Well 4R

| DEPTH From | DEPTH To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 3.0 | Mudstone saprolite |
| 3.0 | 7.5 | Mudstone weathered, fractured |
| 7.5 | 25.0 | Yellow brown silty clay with mudstone layers |
| 25.0 | 35.7 | Mudstone weathered fractured |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward A. Custer Jr. 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Environmental Management and copy to well owner.

1 REV. 9/91

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
SR 1720
(Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
ADDRESS Attn: James Coble PO Box 190
(Street or Route No.)
Albemarle NC 28001
City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 20.5
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 6.00 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.60 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 5.5 - 20.5
11. CHLORINATION: Type N/A Amount ____
12. CASING:

| | Depth From | Depth To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|---|
| | +2.60 | 4.9 | | 2" | Sch 40 | PVC |
| | | | | | | |
| | | | | | | |

13. GROUT:

| | Depth From | Depth To | Ft. | Material | Method |
|---|---|---|---|---|---|
| | 0 | 1.0 | | cement | pour |
| | 1.0 | 3.7 | | bentonite | pellets |

14. SCREEN:

| | Depth From | Depth To | Ft | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|---|
| | 4.9 | 19.9 | | 2 | | .010 | | PVC |
| | | | | | | | | |
| | | | | | | | | |

15. SAND/GRAVEL PACK:

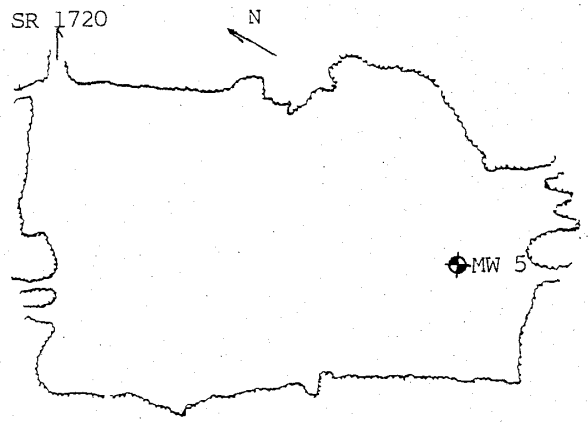
| | Depth From | Depth To | Ft. | Size | Material |
|---|---|---|---|---|---|
| | 3.7 | 20.5 | | filter | sand |
| | | | | | |

REMARKS: Monitoring Well 5

| DEPTH From | DEPTH To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 0.5 | Topsoil |
| 0.5 | 4.2 | Red brown silty clay, trace weathered mudstone |
| 4.2 | 20.50 | Green gray mudstone, slightly weathered, fractured |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward S Testro Jr 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Environmental Management and copy to well owner.

REV. 9/91

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
P.O. Box 29578 - Raleigh,N.C. 27626-0578-Phone (919) 733-3221

# WELL CONSTRUCTION RECORD

MW-5R

DRILLING CONTRACTOR: Engineering Tectonics
DRILLER REGISTRATION #: 835
STATE WELL CONSTRUCTION PERMIT#:

1. **WELL USE** (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☒
Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use:

2. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
City of Albemarle Solid Waste Facility
(Road, Community, or Subdivision and Lot No.)

3. OWNER City of Albemarle
ADDRESS 40592-B Stony Gap Road
(Street or Route No.)
Albemarle NC
City or Town State Zip Code

4. DATE DRILLED 2/24/99
5. TOTAL DEPTH 26'
6. CUTTINGS COLLECTED YES ☐ NO ☒
7. DOES WELL REPLACE EXISTING WELL? YES ☒ NO ☐
8. STATIC WATER LEVEL Below Top of Casing: 5.0 FT.
(Use "+" if Above Top of Casing)
9. TOP OF CASING IS 3.0 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
10. YIELD (gpm): N/A METHOD OF TEST
11. WATER ZONES (depth):
12. CHLORINATION: Type N/A Amount N/A

| DEPTH From | DEPTH To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 4 AR | Red-Br Clayey Silt |
| 4 | 26 | Bl-Gr Argillite |

If additional space is needed use back of form

13. CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| | +3.0 | 15.0 | 2" | SCH 40 | PVC |
| | | | | | |
| | | | | | |

14. GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | 0 | 12.5 | cement | gravity |
| | 12.5 | 14.0 | bentonite | gravity |

15. SCREEN:

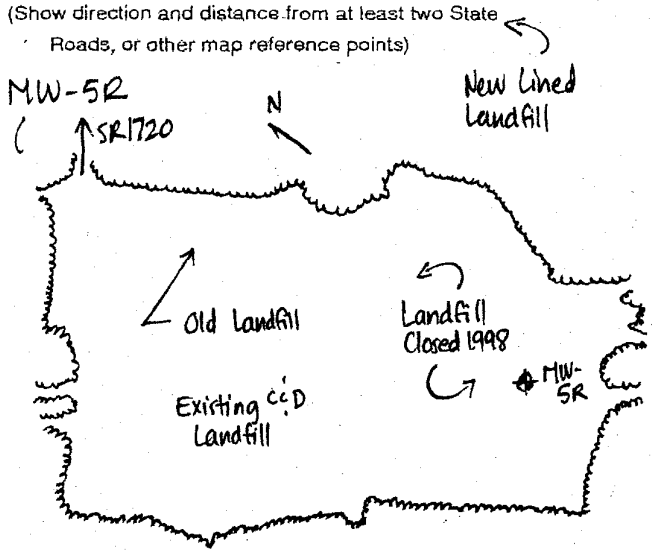
| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | 15.0 | 25.0 | 2" | 0.010" | PVC |
| | | | | | |
| | | | | | |

16. SAND/GRAVEL PACK:

| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | 14.0 | 26.0 | #2 | filter sand |
| | | | | |

17. REMARKS: MW-5R

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

James A. Skumer Jr 3/2/99
SIGNATURE OF CONTRACTOR OR AGENT DATE

FOR OFFICE USE ONLY

Submit original to Division of Water Quality and copy to well owner.

GW-1 REV. 1/98

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. SERIAL NO.
Lat. Long. RO
Minor Basin
Basin Code
Header Ent. GW-1 Ent.

## WELL CONSTRUCTION RECORD

ILLING CONTRACTOR: GAI Consultants

ILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
SR 1720
(Road, Community, or Subdivision and Lot No.)

OWNER City of Albemarle
ADDRESS Attn: James Coble PO Box 190
(Street or Route No.)
Albemarle NC 28001
City or Town State Zip Code

DATE DRILLED 9-8-94 USE OF WELL Monitoring
TOTAL DEPTH 37.0
CUTTINGS COLLECTED YES [ ] NO [x]
DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
STATIC WATER LEVEL Below Top of Casing: 20.00 FT.
(Use "+" if Above Top of Casing)
TOP OF CASING IS 1.95 FT. Above Land Surface*
sing Terminated at/or below land surface is illegal unless a variance is issued accordance with 15A NCAC 2C .0118
YIELD (gpm): N/A METHOD OF TEST
WATER ZONES (depth): 25.5 - 37.0

CHLORINATION: Type N/A Amount

| DEPTH From To | DRILLING LOG Formation Description |
|---|---|
| 0 - 7 | Red and tan sandy silt |
| 7 - 24 | Tan mudstone, thin bedded, weathered, fractured |
| 24 - 37 | Gray mudstone, slightly weathered, fractured |

If additional space is needed use back of form

CASING:

| | Depth From | To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|---|
| | + 1.95 | 20.5 | | 2" | Sch 40 | PVC |
| | | | | | | |
| | | | | | | |

GROUT:

| | Depth From | To | Ft. | Material | Method |
|---|---|---|---|---|---|
| | 0 | 15.0 | | cement | tremie |
| | 15.0 | 17.5 | | bentonite | pellets |

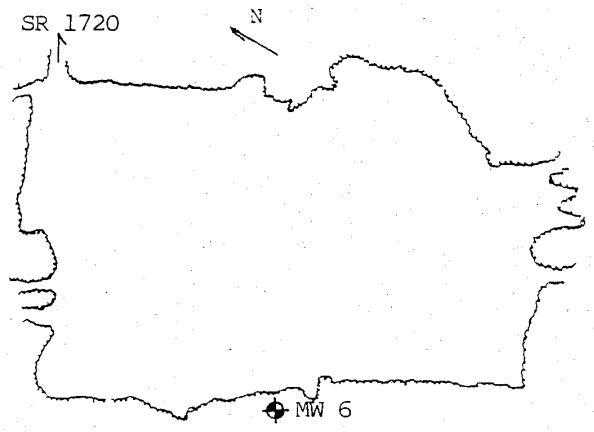
SCREEN:

| | Depth From | To | Ft | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|---|
| | 20.5 | 35.5 | | 2 | | .010 | | PVC |
| | | | | | | | | |
| | | | | | | | | |

SAND/GRAVEL PACK:

| | Depth From | To | Ft. | Size | Material |
|---|---|---|---|---|---|
| | 17.5 | 37.0 | | filter | sand |
| | | | | | |

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




MARKS: Monitoring Well 6

EREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL RUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward L Cerstin Jr 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Environmental Management and copy to well owner.

REV. 9/91

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Albemarle County: Stanly
   SR 1720
   (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
   ADDRESS Attn: James Coble PO Box 190
   (Street or Route No.)
   Albemarle NC 28001
   City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 28.5
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 10.89 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.08 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 13 - 28.5
11. CHLORINATION: Type N/A Amount ____
12. CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| | +2.08 | 12.92 | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

13. GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | 0 | 9.0 | cement | tremie |
| | 9.0 | 11.0 | bentonite | pellets |

14. SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | 12.92 | 27.92 | 2 in. | .010 in. | PVC |
| | | | in. | in. | |
| | | | in. | in. | |

15. SAND/GRAVEL PACK:

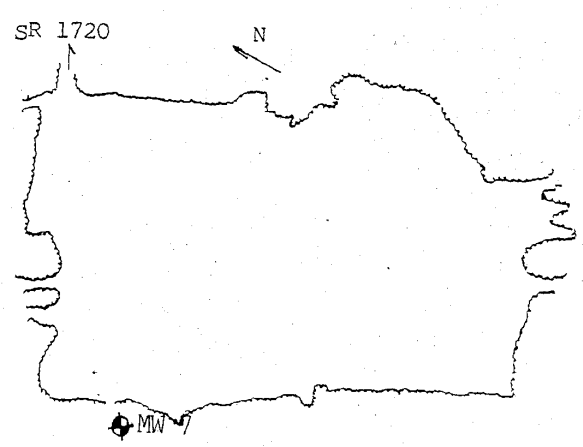
| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | 11.0 | 28.5 | filter | sand |
| | | | | |

16. REMARKS: Monitoring Well 7

| DEPTH From - To | DRILLING LOG Formation Description |
|---|---|
| 0 - 0.5 | Topsoil (removed) |
| 0.5 - 3.5 | Brown sandy clay |
| 3.5 - 18.0 | Yellow gray silty clay, weathered mudstone fragments |
| 18.0 - 22.0 | Tan and gray mudstone, weathered |
| 22.0 - 28.5 | Gray mudstone, slightly weathered, fractured |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward A Teuton Jr 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REV. 9/91
Submit original to Division of Environmental Management and copy to well owner

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Albemarle County: Stanly
   SR 1720
   (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
   ADDRESS Attn: James Coble PO Box 190
   (Street or Route No.)
   Albemarle NC 28001
   City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 37.5
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 29.64 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.00 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 23 - 37.5
11. CHLORINATION: Type N/A Amount ____
12. CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| | +2.00 | 20.5 | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

13. GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | 0 | 17.0 | cement | tremie |
| | 17.0 | 19.0 | bentonite | pellets |

14. SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | 20.5 | 35.5 | 2 in. | .010 in. | PVC |
| | | | in. | in. | |
| | | | in. | in. | |

15. SAND/GRAVEL PACK:

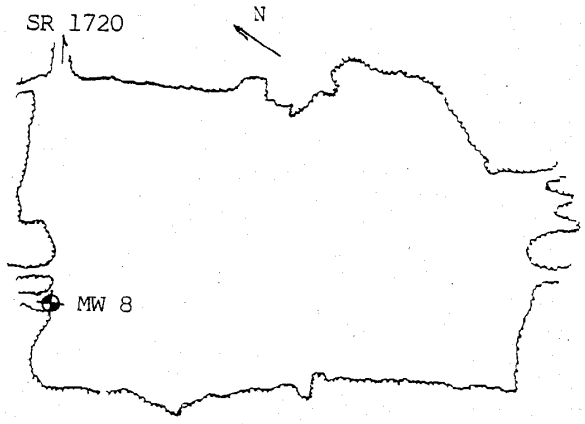
| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | 19.0 | 37.5 | filter | sand |
| | | | | |

16. REMARKS: Monitoring Well 8

| DEPTH From | DEPTH To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 22.5 | Yellow brown mudstone, thin bedded, fractured slightly weathered |
| 22.5 | 37.5 | Light gray mudstone, thin bedded, fractured slightly weathered |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward A Austin Jr 10/5/94

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

GW-1 REV. 9/91

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Albemarle County: Stanly
   SR 1720
   (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
   ADDRESS Attn: James Coble PO Box 190
   (Street or Route No.)
   Albemarle NC 28001
   City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 17.8
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 6.52 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.90 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 3 - 17.8
11. CHLORINATION: Type N/A Amount ____
12. CASING:

| Depth From | To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| +3.90 | 1.10 | | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

13. GROUT:

| Depth From | To | Ft. | Material | Method |
|---|---|---|---|---|
| 0 | 0.5 | | cement | pour |
| 0.5 | 1.0 | | bentonite | pellets |

14. SCREEN:

| Depth From | To | Ft | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|
| 1.1 | 16.1 | | 2 | | .010 | | PVC |
| | | | | | | | |
| | | | | | | | |

15. SAND/GRAVEL PACK:

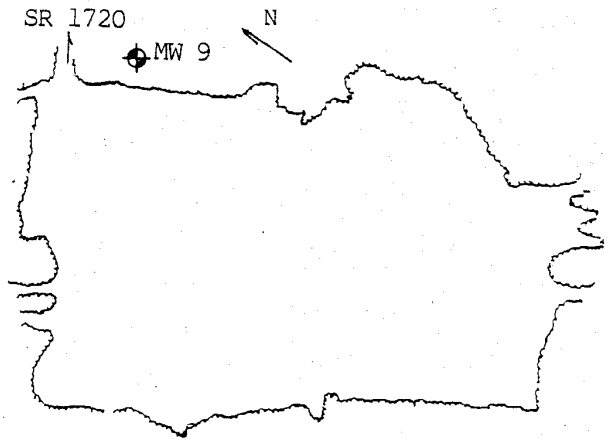
| Depth From | To | Ft. | Size | Material |
|---|---|---|---|---|
| 1.0 | 17.8 | | filter | sand |
| | | | | |

16. REMARKS: Monitoring Well 9

| DEPTH From | To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 3.0 | Brown sandy clay, trace mudstone fragments |
| 3.0 | 17.8 | Gray and tan mudstone weathered, fractured |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward A Crestin Jr 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

GW-1 REV. 9/91

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Albemarle County: Stanly
   SR 1720
   (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
   ADDRESS Attn: James Coble PO Box 190
   (Street or Route No.)
   Albemarle NC 28001
   City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 18.0
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 4.81 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.90 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 5.0 - 18.0
11. CHLORINATION: Type N/A Amount ____
12. CASING:

| Depth From | To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| +2.90 | 2.1 | | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

13. GROUT:

| Depth From | To | Ft. | Material | Method |
|---|---|---|---|---|
| 0 | 0.5 | | cement | pour |
| 0.5 | 1.5 | | bentonite | pellets |

14. SCREEN:

| Depth From | To | Ft. | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|
| 2.1 | 17.7 | | 2 | | .010 | | PVC |
| | | | | | | | |
| | | | | | | | |

15. SAND/GRAVEL PACK:

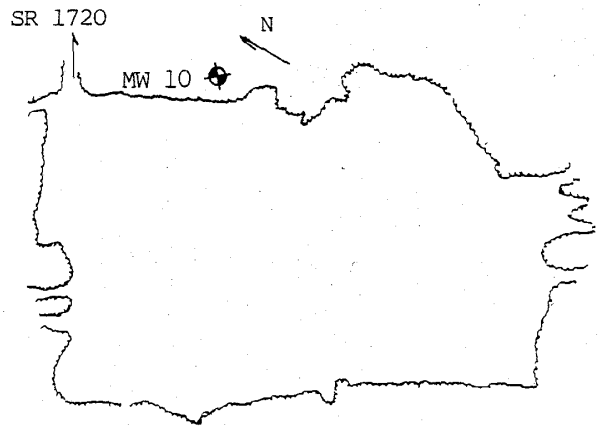
| Depth From | To | Ft. | Size | Material |
|---|---|---|---|---|
| 1.5 | 18.0 | | filter | sand |
| | | | | |

16. REMARKS: Monitoring Well 10

| DEPTH From | To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 3 | Brown clay with mud-stone fragments |
| 3 | 18 | Gray mudstone, slightly weathered fractured, clay seams |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

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Edward A. Coates Jr. 10/5/94

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

SW1 REV. 9/91

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. ____ SERIAL NO. ____
Lat. ____ Long. ____ RO ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
SR 1720
(Road, Community, or Subdivision and Lot No.)
2. OWNER City of Albemarle
ADDRESS Attn: James Coble PO Box 190
(Street or Route No.)
Albemarle NC 28001
City or Town State Zip Code
3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 17.6
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 7.28 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.71 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST ____
10. WATER ZONES (depth): 4.5 - 17.6
11. CHLORINATION: Type N/A Amount ____

| DEPTH From | To | DRILLING LOG Formation Description |
|---|---|---|
| 0 | 9.5 | Brown clay with gray sand size mudstone fragments |
| 9.5 | 17.6 | Gray mudstone, weathered, fractured, clay seams |

If additional space is needed use back of form

12. CASING:

| Depth From | To | Ft. | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| +2.71 | 2.24 | | 2" | Sch 40 | PVC |
| | | | | | |
| | | | | | |

13. GROUT:

| Depth From | To | Ft. | Material | Method |
|---|---|---|---|---|
| 0 | 0.75 | | cement | pour |
| 0.75 | 1.80 | | bentonite | pellets |

14. SCREEN:

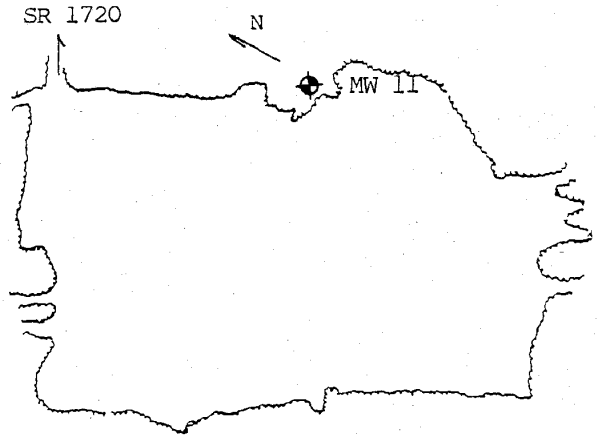
| Depth From | To | Ft | Diameter | in. | Slot Size | in. | Material |
|---|---|---|---|---|---|---|---|
| 2.24 | 17.24 | | 2 | | .010 | | PVC |
| | | | | | | | |
| | | | | | | | |

15. SAND/GRAVEL PACK:

| Depth From | To | Ft. | Size | Material |
|---|---|---|---|---|
| 1.80 | 17.6 | | filter | sand |
| | | | | |

16. REMARKS: Monitoring Well 11

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward L Custon Jr 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE

REV. 9/91

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Division of Environmental Management - Groundwater Section
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Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants

DRILLER REGISTRATION NUMBER: 446

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle County: Stanly
SR 1720
(Road, Community, or Subdivision and Lot No.)

2. OWNER City of Albemarle
ADDRESS Attn: James Coble PO Box 190
(Street or Route No.)
Albemarle NC 28001
City or Town State Zip Code

3. DATE DRILLED 9-8-94 USE OF WELL Monitoring
4. TOTAL DEPTH 22.40
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 14.31 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.04 FT. Above Land Surface*
Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST _____
10. WATER ZONES (depth): 9 - 22.40
11. CHLORINATION: Type N/A Amount _____
12. CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|---|
| | +3.04 | 6.96 Ft. | 2" | Sch 40 | PVC |
| | | Ft. | | | |
| | | Ft. | | | |

13. GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | 0 | 2.5 Ft. | cement | pour |
| | 2.5 | 4.5 Ft. | bentonite | pellets |

14. SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | 6.96 | 21.96 Ft | 2 in. | .010 in. | PVC |
| | | Ft. | in. | in. | |
| | | Ft. | in. | in. | |

15. SAND/GRAVEL PACK:

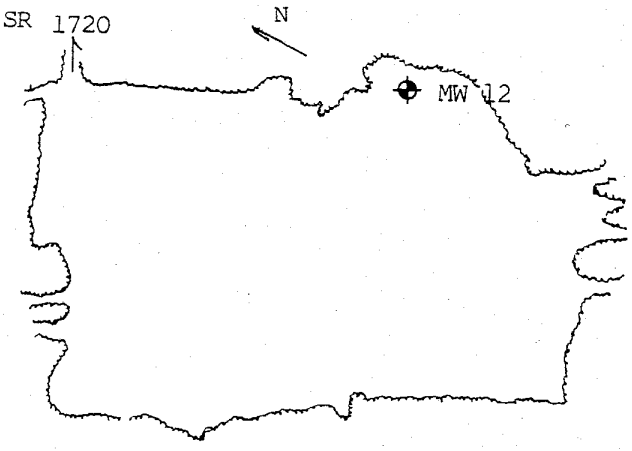
| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | 4.5 | 22.4 Ft. | filter | sand |
| | | Ft. | | |

16. REMARKS: Monitoring Well 12

| DEPTH From To | DRILLING LOG Formation Description |
|---|---|
| 0 - 8 | Red, orange, brown sandy clay |
| 8 - 22.4 | Yellow gray fine sandy silt |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)




I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Edward A Austin Jr. 10/5/94
SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

GW-1 REV. 9/91

## MONITORING WELL 4R

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Mudstone saprolite |
| | | | Mudstone, weathered, fractured |
| 5 | | | |
| | | | Yellow brown silty clay with mudstone layers |
| 10 | | | |
| 15 | | | |
| 20 | | | |
| 25 | | | Mudstone, weathered, fractured |
| 30 | | | |
| 35 | | | End of Boring |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 35.7 ft DATE: 9-8-94
DEPTH TO WATER: 18 ft after drilling

## MONITORING WELL 5

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Topsoil, 6 in. |
| | | | Red brown silty clay, trace weathered mudstone |
| 5 | | | Green gray mudstone, slightly weathered, fractured |
| 10 | | | |
| 15 | | | |
| 20 | | | End of Boring |
| 25 | | | |
| 30 | | | |
| 35 | | | |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 20.5 ft DATE: 9-8-94
DEPTH TO WATER: 12.5 ft after drilling, 3.4 ft after 24 hrs

GAI CONSULTANTS

## MONITORING WELL 6

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION | SPT VALUE |
|---|---|---|---|---|
| | | | Red and tan sandy silt | 31 |
| 5 | | | | 40 |
| | | | Tan mudstone, thin bedded, weathered, fractured | |
| 10 | | | | |
| 15 | | | | |
| 20 | | | | |
| | | | Gray mudstone, slightly weathered, fractured | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| | | | End of Boring | |
| 40 | | | | |
| 45 | | | | |

COMPLETION DEPTH: 37.0 ft DATE: 9-8-94
DEPTH TO WATER: 25.5 ft after drilling, 18 ft after 24 hrs

## MONITORING WELL 7

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Topsoil (removed) |
| | | | Brown sandy clay |
| 5 | | | Yellow gray silty clay, weathered mudstone fragments |
| 10 | | | |
| 15 | | | |
| | | | Tan and gray mudstone, weathered |
| 20 | | | |
| | | | Gray mudstone, slightly weathered, fractured |
| 25 | | | |
| 30 | | | End of Boring |
| 35 | | | |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 28.5 ft DATE: 9-8-94
DEPTH TO WATER: 12.9 ft after drilling, 8.8 ft after 12 hrs

GAI CONSULTANTS

## MONITORING WELL 8

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Yellow brown mudstone, thin bedded, fractured, slightly weathered |
| 5 | | | |
| 10 | | | |
| 15 | | | |
| 20 | | | |
| | | | Light gray mudstone, thin bedded, fractured, slightly weathered |
| 25 | | | |
| 30 | | | |
| 35 | | | |
| | | | End of Boring |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 37.5 ft DATE: 9-8-94
DEPTH TO WATER: 33.5 ft after drilling, 27.6 ft after 24 hrs

## MONITORING WELL 9

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Brown sandy clay, trace mudstone fragments |
| | | | Gray and tan mudstone, weathered, fractured |
| 5 | | | |
| 10 | | | |
| 15 | | | |
| | | | End of Boring |
| 20 | | | |
| 25 | | | |
| 30 | | | |
| 35 | | | |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 17.8 ft DATE: 9-8-94
DEPTH TO WATER: 1.6 ft after drilling, 2.6 ft after 24 hrs

**GAI CONSULTANTS**

## MONITORING WELL 10

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION | SPT VALUE |
|---|---|---|---|---|
| | | | Brown clay with mudstone fragments | 7 |
| | | | Gray mudstone, slightly weathered, fractured, clay seams | |
| 5 | | | | |
| 10 | | | | |
| 15 | | | | |
| | | | End of Boring | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |

COMPLETION DEPTH: 18.0 ft DATE: 9-8-94
DEPTH TO WATER: 5 ft after drilling, 1.9 ft after 24 hrs

## MONITORING WELL 11

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans

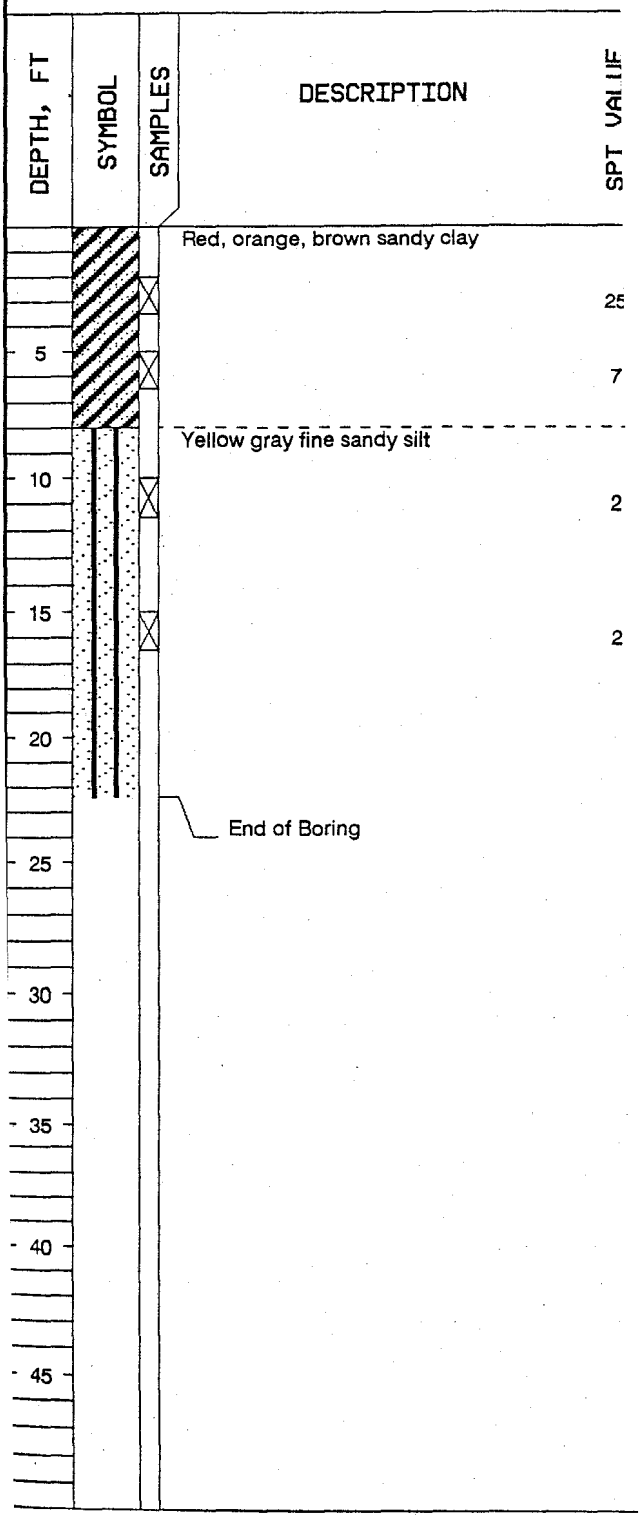
| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION |
|---|---|---|---|
| | | | Brown clay with gray sand size mudstone fragments |
| 5 | | | |
| 10 | | | Gray mudstone, weathered, fractures, clay seams |
| 15 | | | |
| | | | End of Boring |
| 20 | | | |
| 25 | | | |
| 30 | | | |
| 35 | | | |
| 40 | | | |
| 45 | | | |

COMPLETION DEPTH: 17.6 ft DATE: 9-8-94
DEPTH TO WATER: 4.6 ft after drilling, 4.6 ft after 24 hrs

**GAI CONSULTANTS**

# MONITORING WELL 12

PROJECT: Albemarle Landfill
Albemarle, North Carolina
LOCATION: see Landfill Plans




COMPLETION DEPTH: 22.4 ft DATE: 9-8-94
DEPTH TO WATER: 12 ft after drilling, 11.3 ft after 24 hrs

**GAI CONSULTANTS**

MW-8D

# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2663

**1. WELL CONTRACTOR:**

Derry Huneycutt
Well Contractor (Individual) Name

Derry's Well Drilling
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

Albemarle | NC | 28002
City or Town | State | Zip Code

(704) 982-9070
Area code- Phone number

**2. WELL INFORMATION:**

SITE WELL ID #(if applicable) MW-8D

WELL CONSTRUCTION PERMIT#(if applicable)

OTHER ASSOCIATED PERMIT #(if applicable)

**3. WELL USE** (Check Applicable Box) Monitoring ■ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 6/25/07

TIME COMPLETED 3:30 AM ☐ PM ☑

**4. WELL LOCATION:**

CITY: Albemarle COUNTY Stanley

40592-B Stoney Gap Rd. 28002
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ■ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 35.307433

LONGITUDE 80.1547725

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ■ GPS ☐ Topographic map
*(location of well must be shown on a USGS topo map and attached to this form if not using GPS)*

**5. FACILITY**- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY City of Albemarle Closed MWSLF

STREET ADDRESS 40592-B Stoney Gap Rd.

Albemarle | NC | 28002
City or Town | State | Zip Code

CONTACT PERSON Mr. Mike Lambert

MAILING ADDRESS PO Box 190

Albemarle | NC | 28002
City or Town | State | Zip Code

(704) 984-9667
Area code - Phone number

**6. WELL DETAILS:**

a. TOTAL DEPTH: 75.90

b. DOES WELL REPLACE EXISTING WELL? YES ■ NO ☐

c. WATER LEVEL Below Top of Casing: 51.70 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.00 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): na METHOD OF TEST na

f. DISINFECTION: Type na Amount na

g. WATER ZONES (depth):
From 62.00 To 62.50 From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

**7. CASING:**

| From | To | Diameter | Thickness/ Weight | Material |
|---|---|---|---|---|
| 0 | 60.90 | 2 | SCH40 | PVC |
| | | | | |
| | | | | |

**8. GROUT:**

| From | To | Material | Method |
|---|---|---|---|
| 0 | 3 | Neat Cement | Pour |
| 3 | 55.10 | Bentonite Grout | Tremie |
| | | | |

**9. SCREEN:**

| From | To | Diameter | Slot Size | Material |
|---|---|---|---|---|
| 60.90 | 75.90 | 2 in. | 0.01 in. | PVC |
| | | in. | in. | |
| | | in. | in. | |

**10. SAND/GRAVEL PACK:**

| From | To | Size | Material |
|---|---|---|---|
| 58.25 | 75.90 | #2 | Filter Sand |
| | | | |
| | | | |

**11. DRILLING LOG**

| From | To | Formation Description |
|---|---|---|
| 0 | 23 | Rock, Argillite, Y.Br. |
| 23 | 33 | Rock, Argillite, Lt. Gray |
| 33 | 36 | Saprolite, Dark Brown |
| 36 | 75.90 | Rock, Slate, Very competent |

**12. REMARKS:**

MW-8D Installed as type II MW for monitoring across/upgradient of closed MSWLF

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 8-28-07

Derry C. Huneycutt
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 3/07

MW-24

# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2663

**1. WELL CONTRACTOR:**

Derry Huneycutt
Well Contractor (Individual) Name

Derry's Well Drilling
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

Albemarle | NC | 28002
City or Town | State | Zip Code

(704) 982-9070
Area code- Phone number

**2. WELL INFORMATION:**

SITE WELL ID #(if applicable) MW-24

WELL CONSTRUCTION PERMIT#(if applicable)

OTHER ASSOCIATED PERMIT #(if applicable)

**3. WELL USE** (Check Applicable Box) Monitoring ■ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 7/4/07

TIME COMPLETED 10:30 AM ☑ PM ☐

**4. WELL LOCATION:**

CITY: Albemarle COUNTY Stanley

40592-B Stoney Gap Rd. 28002
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ■ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 35.304957
LONGITUDE 80.1556268

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ■ GPS ☐ Topographic map
*(location of well must be shown on a USGS topo map and attached to this form if not using GPS)*

**5. FACILITY**- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY City of Albemarle Closed MWSLF

STREET ADDRESS 40592-B Stoney Gap Rd.

Albemarle | NC | 28002
City or Town | State | Zip Code

CONTACT PERSON Mr. Mike Lambert

MAILING ADDRESS PO Box 190

Albemarle | NC | 28002
City or Town | State | Zip Code

(704) 984-9667
Area code - Phone number

**6. WELL DETAILS:**

a. TOTAL DEPTH: 21.25

b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ■

c. WATER LEVEL Below Top of Casing: 12.98 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.00 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): na METHOD OF TEST na

f. DISINFECTION: Type na Amount na

g. WATER ZONES (depth):

| | | | |
|---|---|---|---|
| From 17 | To 17.5 | From | To |
| From | To | From | To |
| From | To | From | To |

**7. CASING:**

| Depth From | To | Ft. | Diameter | Thickness/ Weight | Material |
|---|---|---|---|---|---|
| 0 | 6.25 | | 2 | SCH40 | PVC |
| | | | | | |
| | | | | | |

**8. GROUT:**

| Depth From | To | Ft. | Material | Method |
|---|---|---|---|---|
| 0 | 4 | | Neat Cement | Pour |
| 4 | 6 | | 3/8" Bent. Chips | Pour |
| | | | | |

**9. SCREEN:**

| Depth From | To | Ft. | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| 6.25 | 21.25 | | 2 in. | 0.01 in. | PVC |
| | | | in. | in. | |
| | | | in. | in. | |

**10. SAND/GRAVEL PACK:**

| Depth From | To | Ft. | Size | Material |
|---|---|---|---|---|
| 6 | 21.25 | | #2 | ~~Filter Sand~~ |
| | | | | |
| | | | | |

**11. DRILLING LOG**

| From | To | Formation Description |
|---|---|---|
| ~~0~~ | ~~3~~ | ~~Silt, Lt. Brown~~ |
| ~~3~~ | ~~5.75~~ | ~~PWR, Brown~~ |
| ~~5.75~~ | ~~21.25~~ | ~~Rock, Argillite, Brown to Gray~~ |

**12. REMARKS:**

~~MW-24 Installed as type II MW for monitoring downgradient of closed MSWLF~~

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 8-28-07

Derry L. Huneycutt
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 3/07

MW-25

# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2663

**1. WELL CONTRACTOR:**

Derry Huneycutt
Well Contractor (Individual) Name

Derry's Well Drilling
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

Albemarle NC 28002
City or Town State Zip Code

(704)-982-9070
Area code- Phone number

**2. WELL INFORMATION:**

SITE WELL ID #(if applicable) MW-25

WELL CONSTRUCTION PERMIT#(if applicable)

OTHER ASSOCIATED PERMIT #(if applicable)

**3. WELL USE** (Check Applicable Box) Monitoring ■ Municipal/Public☐ Industrial/Commercial☐ Agricultural☐ Recovery☐ Injection☐ Irrigation☐ Other☐ (list use)

DATE DRILLED 7/4/07

TIME COMPLETED 2:30 AM☐ PM■

**4. WELL LOCATION:**

CITY: Albemarle COUNTY Stanley

40592-B Stoney Gap Rd. 28002
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ■ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 35.303816
LONGITUDE 80.1547026

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ■ GPS ☐ Topographic map
*(location of well must be shown on a USGS topo map and attached to this form if not using GPS)*

**5. FACILITY**- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY City of Albemarle Closed MWSLF

STREET ADDRESS 40592-B Stoney Gap Rd.

Albemarle NC 28002
City or Town State Zip Code

CONTACT PERSON Mr. Mike Lambert

MAILING ADDRESS PO Box 190

Albemarle NC 28002
City or Town State Zip Code

(704)-984-9667
Area code - Phone number

**6. WELL DETAILS:**

a. TOTAL DEPTH: 18.20

b. DOES WELL REPLACE EXISTING WELL? YES☐ NO■

c. WATER LEVEL Below Top of Casing: 11.05 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.00 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): na METHOD OF TEST na

f. DISINFECTION: Type na Amount na

g. WATER ZONES (depth):

| From | To | From | To |
|---|---|---|---|
| 16 | 16.25 | | |
| | | | |
| | | | |

**7. CASING:**

| From | To | Ft. | Diameter | Thickness/ Weight | Material |
|---|---|---|---|---|---|
| 0 | 6.20 | | 2 | Sch40 | PVC |
| | | | | | |
| | | | | | |

**8. GROUT:**

| From | To | Ft. | Material | Method |
|---|---|---|---|---|
| 0 | 3 | | Neat Cement | Pour |
| 3 | 5 | | 3/8" Bent. Chips | Pour |
| | | | | |

**9. SCREEN:**

| From | To | Ft. | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| 6.20 | 18.20 | | 2 in. | 0.01 in. | PVC |
| | | | in. | in. | |
| | | | in. | in. | |

**10. SAND/GRAVEL PACK:**

| From | To | Ft. | Size | Material |
|---|---|---|---|---|
| 5 | 18.20 | | #2 | ~~Filter Sand~~ |
| | | | | |
| | | | | |

**11. DRILLING LOG**

| From | To | Formation Description |
|---|---|---|
| ~~0~~ | ~~4~~ | ~~Silt, Lt. Brown~~ |
| ~~4~~ | ~~5~~ | ~~PWR, Brown~~ |
| ~~5~~ | ~~18.20~~ | ~~Rock, Argillite, Brown to Gray~~ |

**12. REMARKS:**

~~MW-25 Installed as type II MW for monitoring downgradient of closed MSWLF~~

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 8-28-07

Derry L. Huneycutt
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 3/07

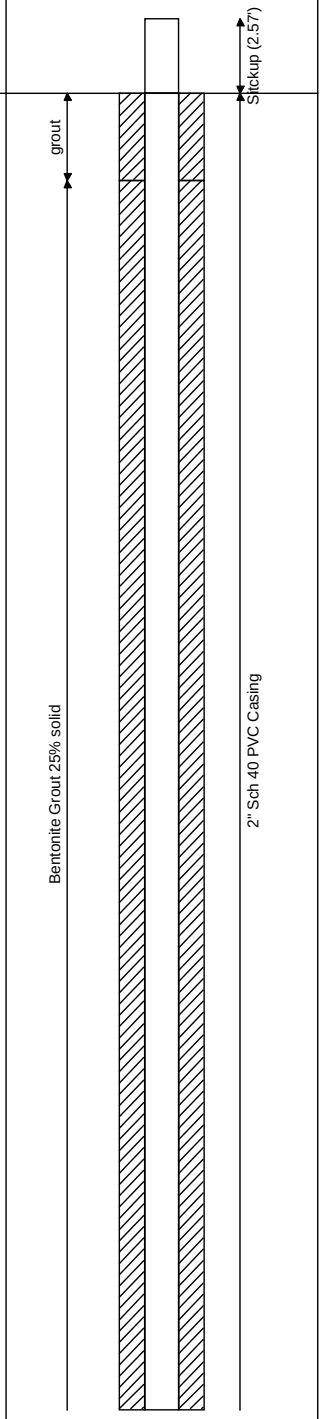
# LOG OF BORING: MW-8D

**Albemarle Closed Landfill** **Project No. G07059.0**

| | | | | | |
|---|---|---|---|---|---|
| Drilling contractor: | Derry's Well Drilling | Date started: | 6/25/2007 | Surface elevation: | 488.81 ft (MSL) |
| Drill rig & method: | 6" OD DTH no SPT | Date ended: | 6/25/2007 | Top of pipe elevation: | 491.38 ft (MSL) |
| Logged by: | J. Pfohl | Completion depth: | 75.90 ft | Depth to water (TOB): | 65.30 ft |
| | | Stickup height: | 2.57 ft | Depth to water (24hrs): | N/A |

| Depth (ft) | SPT (bpf) | Soil Type Symbol | Sample | Description of Material & Remarks |
|---|---|---|---|---|
| | | | | Argillite; yellow-brown, thin beds, few fractures with depth |
| 5 | | | | |
| 10 | | | | |
| 15 | | | | |
| 20 | | | | |
| 25 | | | | Weathered Siltstone |
| | | | | Siltstone; light grey, competent |
| 30 | | | | |
| | | | | Weathered Argillite; dark brown |
| 35 | | | | |
| | | | | Argillite; light grey, competent |
| 40 | | | | |
| 45 | | | | |

Well Diagram




**Municipal Engineering Services Company, P.A.**
Operation/Construction Managers Civil/Sanitary EngineersEnvironmental Studies
*PO Box 97, Garner, North Carolina 27529 (919) 772-5393PO Box 349, Boone, North Carolina 28607 (828) 262-1767*

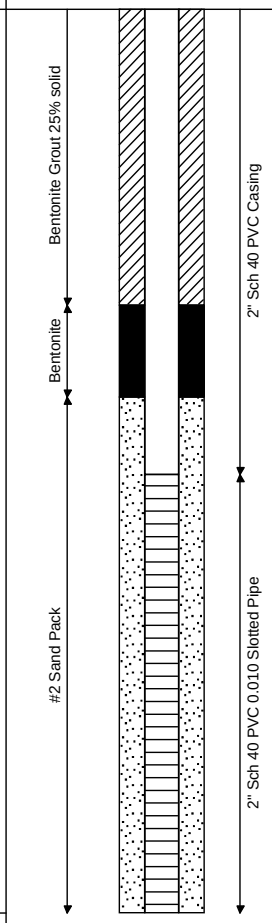
# LOG OF BORING: MW-8D

**Albemarle Closed Landfill** **Project No. G07059.0**

| | | | | | |
|---|---|---|---|---|---|
| Drilling contractor: | Derry's Well Drilling | Date started: | 6/25/2007 | Surface elevation: | 488.81 ft (MSL) |
| Drill rig & method: | 6" OD DTH no SPT | Date ended: | 6/25/2007 | Top of pipe elevation: | 491.38 ft (MSL) |
| Logged by: | J. Pfohl | Completion depth: | 75.90 ft | Depth to water (TOB): | 65.30 ft |
| | | Stickup height: | 2.57 ft | Depth to water (24hrs): | N/A |

| Depth (ft) | SPT (bpf) | Soil Type Symbol | Sample | Description of Material & Remarks |
|---|---|---|---|---|
| | | | | Argillite; light gray, competent |
| 50 | | | | |
| 55 | | | | |
| 60 | | | | |
| | | | | small fractures, water observed |
| 65 | | | | small fractures |
| 70 | | | | |
| 75 | | | | |
| | | | | Boring terminated at 75.9 feet |
| 80 | | | | |
| 85 | | | | |
| 90 | | | | |

Well Diagram

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Operation/Construction Managers Civil/Sanitary EngineersEnvironmental Studies
*PO Box 97, Garner, North Carolina 27529 (919) 772-5393PO Box 349, Boone, North Carolina 28607 (828) 262-1767*

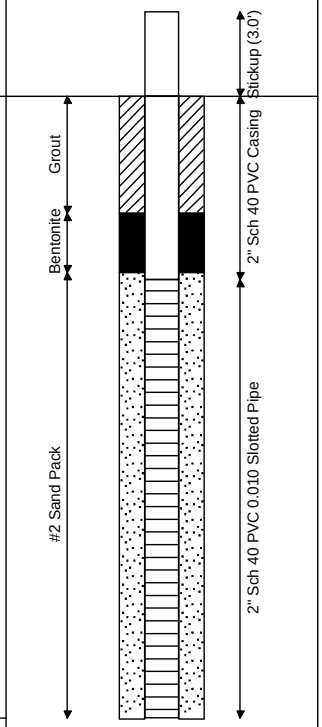
# LOG OF BORING: MW-24

**Albemarle Closed Landfill** **Project No. G07059.0**

| | | | | | |
|---|---|---|---|---|---|
| Drilling contractor: | Derry's Well Drilling | Date started: | 7/4/2007 | Surface elevation: | 429.19 ft (MSL) |
| Drill rig & method: | 6" OD DTH no SPT | Date ended: | 7/4/2007 | Top of pipe elevation: | 432.19 ft (MSL) |
| Logged by: | J. Pfohl | Completion depth: | 21.25 ft | Depth to water (TOB): | 10.17 ft |
| | | Stickup height: | 3.00 ft | Depth to water (24hrs): | N/A |

| Depth (ft) | SPT (bpf) | Soil Type Symbol | Sample | Description of Material & Remarks |
|---|---|---|---|---|
| | | | | Silt; light brown, few PWR fragments, dry |
| | | | | PWR-Argillite; brown slightly weathered, dry |
| 5 | | | | Argillite; Top of Rock = 423.44 ft amsl - brown, weatherd, dry |
| 10 | | | | Argillite; grey, hard, fine grained |
| 15 | | | | water observed |
| 20 | | | | Boring terminated at 21.3 feet |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |

Well Diagram




**Municipal Engineering Services Company, P.A.**
Operation/Construction Managers Civil/Sanitary EngineersEnvironmental Studies
*PO Box 97, Garner, North Carolina 27529 (919) 772-5393PO Box 349, Boone, North Carolina 28607 (828) 262-1767*

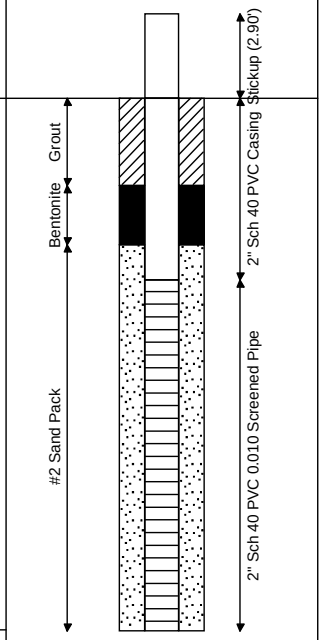
# LOG OF BORING: MW-25

**Albemarle Closed Landfill** **Project No. G07059.0**

| | | | | | |
|---|---|---|---|---|---|
| Drilling contractor: | Derry's Well Drilling | Date started: | 7/4/2007 | Surface elevation: | 422.32 ft (MSL) |
| Drill rig & method: | 6" OD DTH no SPT | Date ended: | 7/4/2007 | Top of pipe elevation: | 425.22 ft (MSL) |
| Logged by: | J. Pfohl | Completion depth: | 18.20 ft | Depth to water (TOB): | 9.01 ft |
| | | Stickup height: | 2.90 ft | Depth to water (24hrs): | N/A |

| Depth (ft) | SPT (bpf) | Soil Type Symbol | Sample | Description of Material & Remarks |
|---|---|---|---|---|
| | | | | Silt with fine grained sand, light brown, dry |
| 5 | | | | PWR; brown |
| | | | | Argillite; Top of Rock = 417.32 ft amsl - brown, dry |
| | | | | Argillite; grey, competent, fine grained |
| 10 | | | | |
| 15 | | | | water observed |
| | | | | Boring terminated at 18.2 feet |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |

Well Diagram

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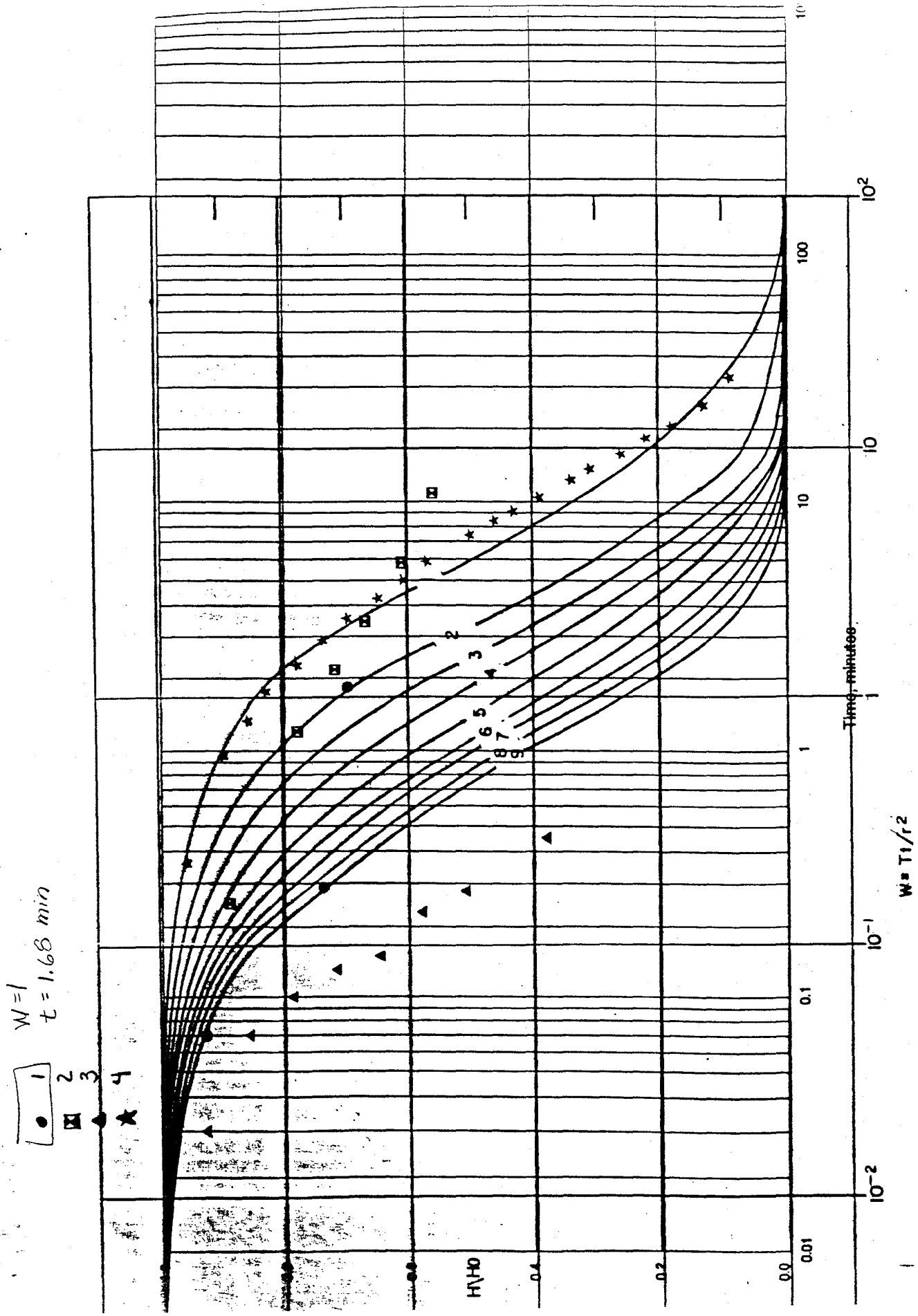
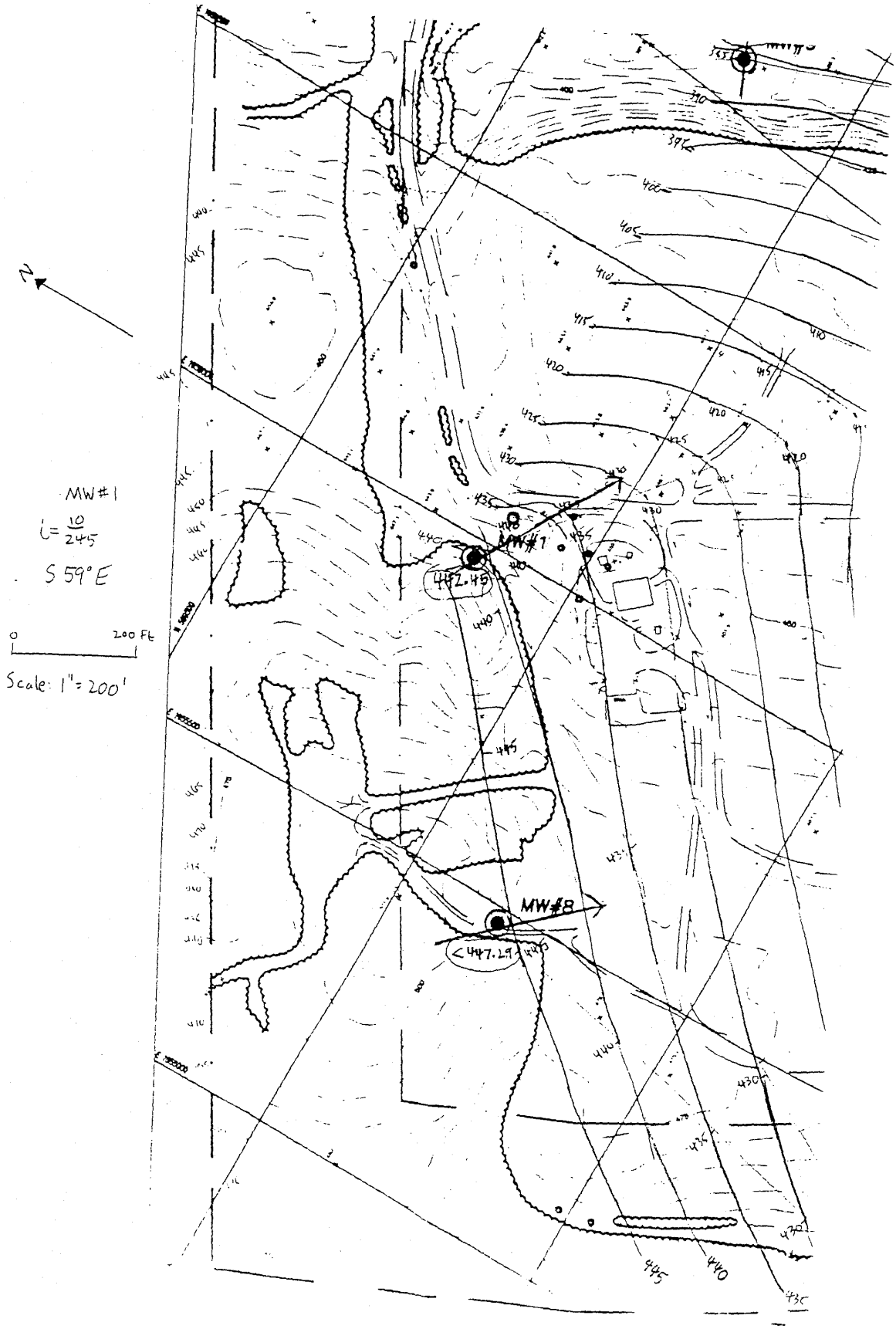
SLUG TEST MW1 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 13.5 | RADIUS, in. | 1 |
| HT OF STICKUP | 1.6 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 1.68 |
| INITIAL TIME | 59.83 | k, cm/sec | 1.4E-04 |
| INITIAL GW BELOW TOC | 15.1 | | |
| HO | 15.1 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 14.1 | 0.93 | 0 | 59 | 54 | 0.07 |
| 4 | 4 | 11.1 | 0.74 | 1 | 0 | 7 | 0.29 |
| 4.5 | 4.5 | 10.6 | 0.70 | 1 | 1 | 40 | 1.84 |

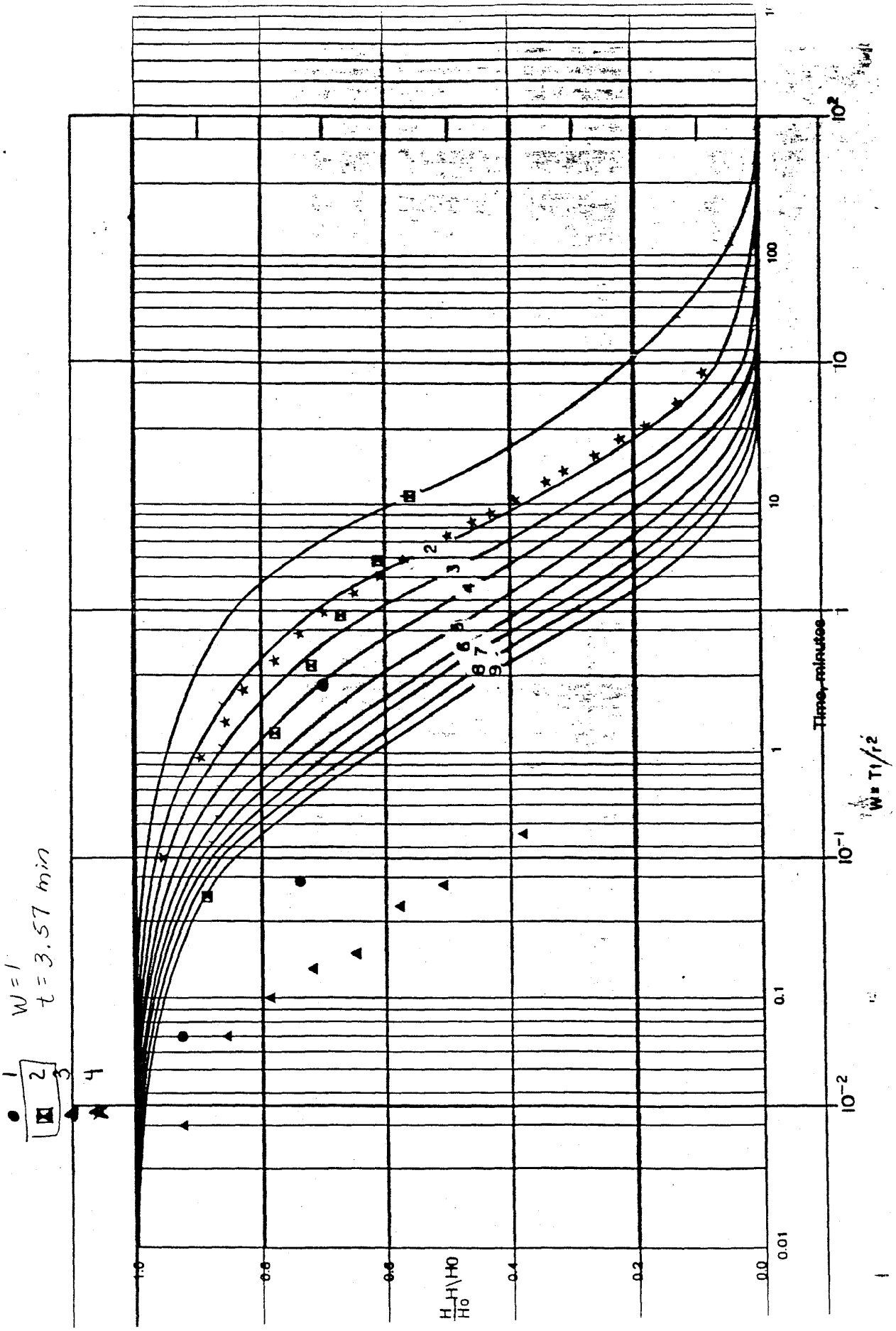

W=1
t = 1.68 min
1
2
3
4
H/H0
0.0
0.2
0.4
0.01
0.1
1
10
100
$10^{-2}$
$10^{-1}$
1
10
$10^2$
Time, minutes
W = Tt/r²
2
3
4
5
6
7
8
9

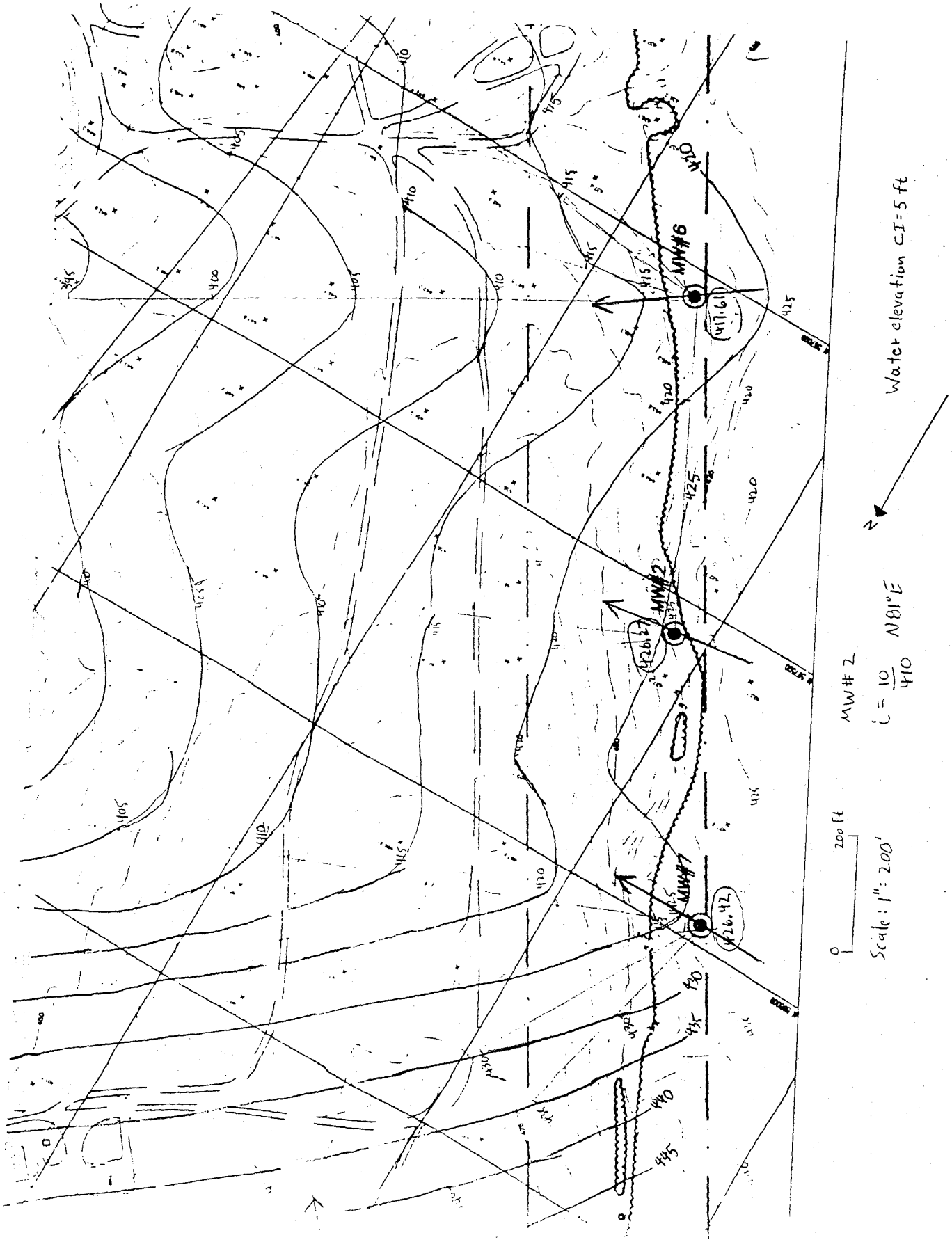

N
MW#1
i = 10/245
S 59° E
0
200 Ft
Scale: 1" = 200'
MW#7
442.45
MW#8
447.29

SLUG TEST MW2 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 7.1 | RADIUS, in. | 1 |
| HT OF STICKUP | 1.9 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 3.57 |
| INITIAL TIME | 57.67 | k, cm/sec | 6.6E-05 |
| INITIAL GW BELOW TOC | 9 | | |
| H0 | 9 | | |

| GW READING | DH | H | H/H0 | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 8 | 0.89 | 0 | 57 | 55 | 0.25 |
| 2 | 2 | 7 | 0.78 | 0 | 58 | 53 | 1.21 |
| 2.5 | 2.5 | 6.5 | 0.72 | 0 | 59 | 51 | 2.18 |
| 3 | 3 | 6 | 0.67 | 1 | 1 | 8 | 3.46 |
| 3.5 | 3.5 | 5.5 | 0.61 | 1 | 3 | 30 | 5.83 |
| 4 | 4 | 5 | 0.56 | 1 | 8 | 27 | 10.78 |

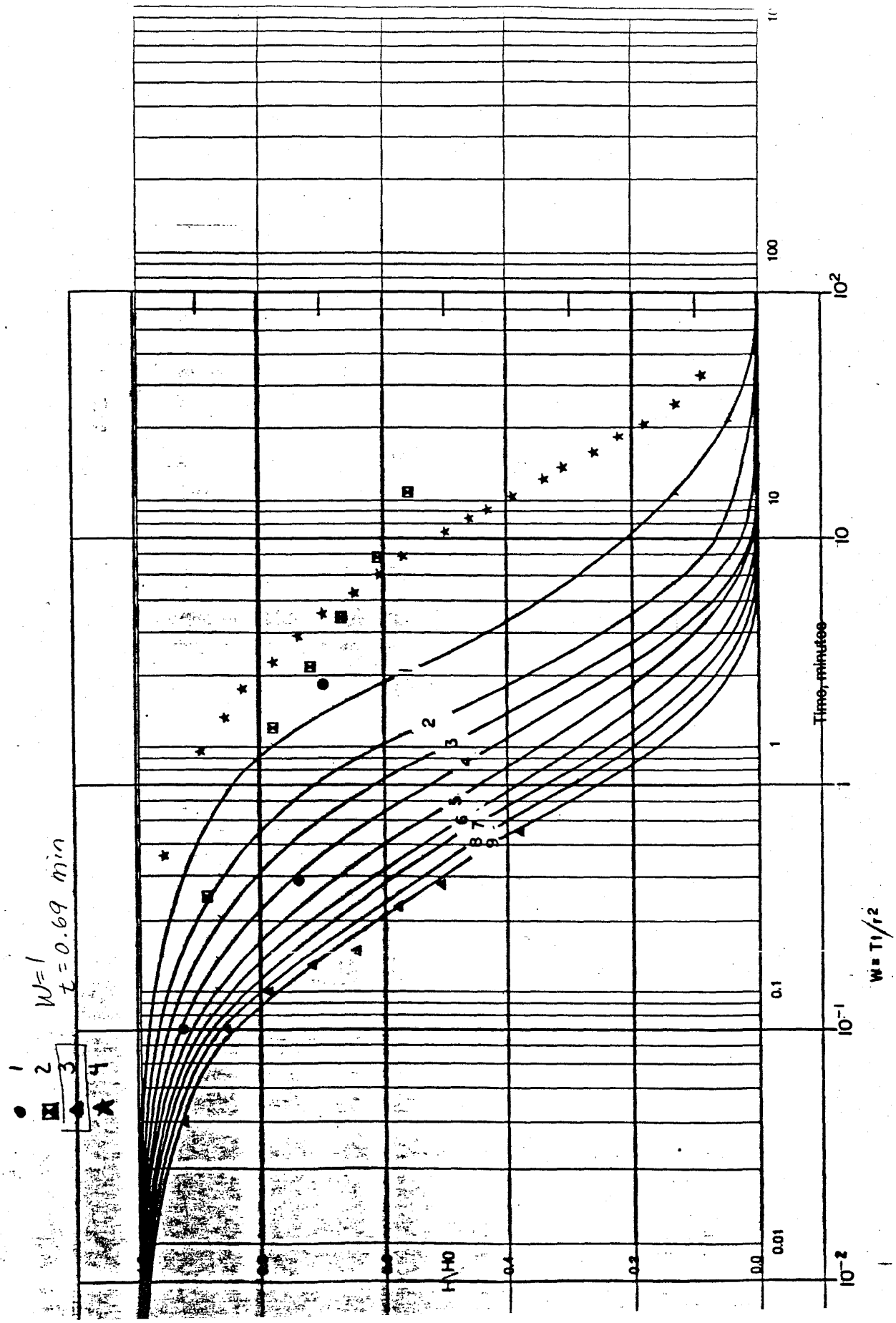

W = 1
t = 3.57 min
1
2
3
4
5
6
7
8
9
1.0
0.8
0.6
0.4
0.2
0.0
H/Ho
0.01
0.1
1
10
100
10²
10⁻²
10⁻¹
1
10
Time, minutes
W = Tt/r²


MW#6
(417.61)
MW#2
(426.27)
MW#1
(426.42)
Water elevation CI=5 ft
N
MW#2
i = 10/410 N81°E
0
200 ft
Scale: 1" = 200'

SLUG TEST MW3 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 12.3 | RADIUS, in. | 1 |
| HT OF STICKUP | 2.1 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 0.69 |
| INITIAL TIME | 0 | k, cm/sec | 3.4E-04 |
| INITIAL GW BELOW TOC | 14.4 | | |
| HO | 14.4 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 13.4 | 0.93 | 0 | 0 | 2 | 0.03 |
| 2 | 2 | 12.4 | 0.86 | 0 | 0 | 4 | 0.07 |
| 3 | 3 | 11.4 | 0.79 | 0 | 0 | 6 | 0.10 |
| 4 | 4 | 10.4 | 0.72 | 0 | 0 | 8 | 0.13 |
| 5 | 5 | 9.4 | 0.65 | 0 | 0 | 9 | 0.15 |
| 6 | 6 | 8.4 | 0.58 | 0 | 0 | 14 | 0.23 |
| 7 | 7 | 7.4 | 0.51 | 0 | 0 | 17 | 0.28 |
| 9 | 9 | 5.4 | 0.38 | 0 | 0 | 27 | 0.45 |


W=1
t=0.69 min
1
2
3
4
h/H0
0.0
0.1
0.2
0.4
0.01
0.1
1
10
100
10^-2
10^-1
1
10
10^2
Time, minutes
W = T1/r^2

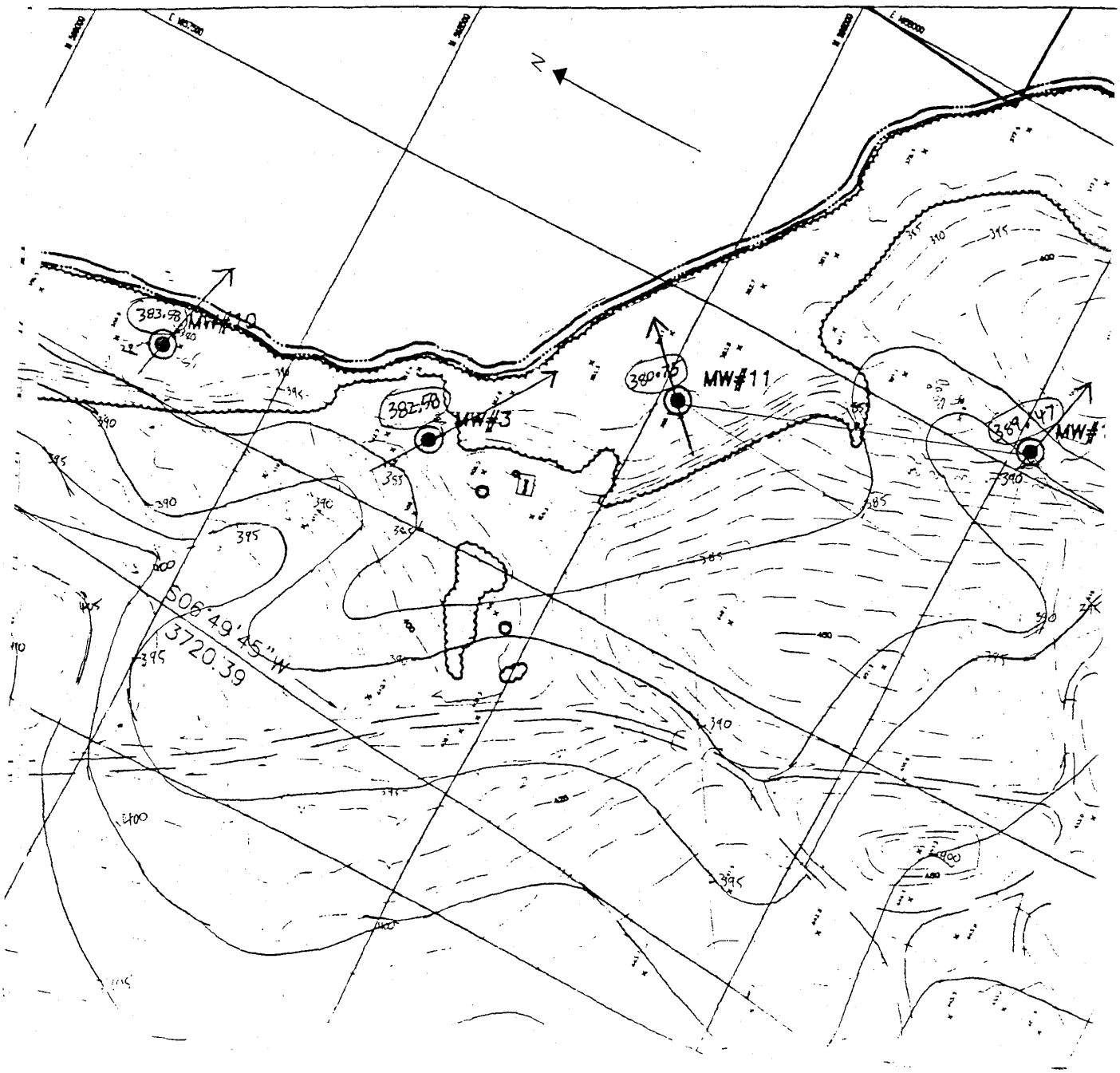
| | | |
|---|---|---|
| MW#8 | 1655475.76 | 568 |
| MW#9 | 1656883.02 | 569 |
| MW#10 | 1657073.47 | 568 |
| MW#11 | 1657356.36 | 567 |
| MW#12 | 1657534.73 | 567 |

0 200 ft

Scale: 1" = 200'

MW#3

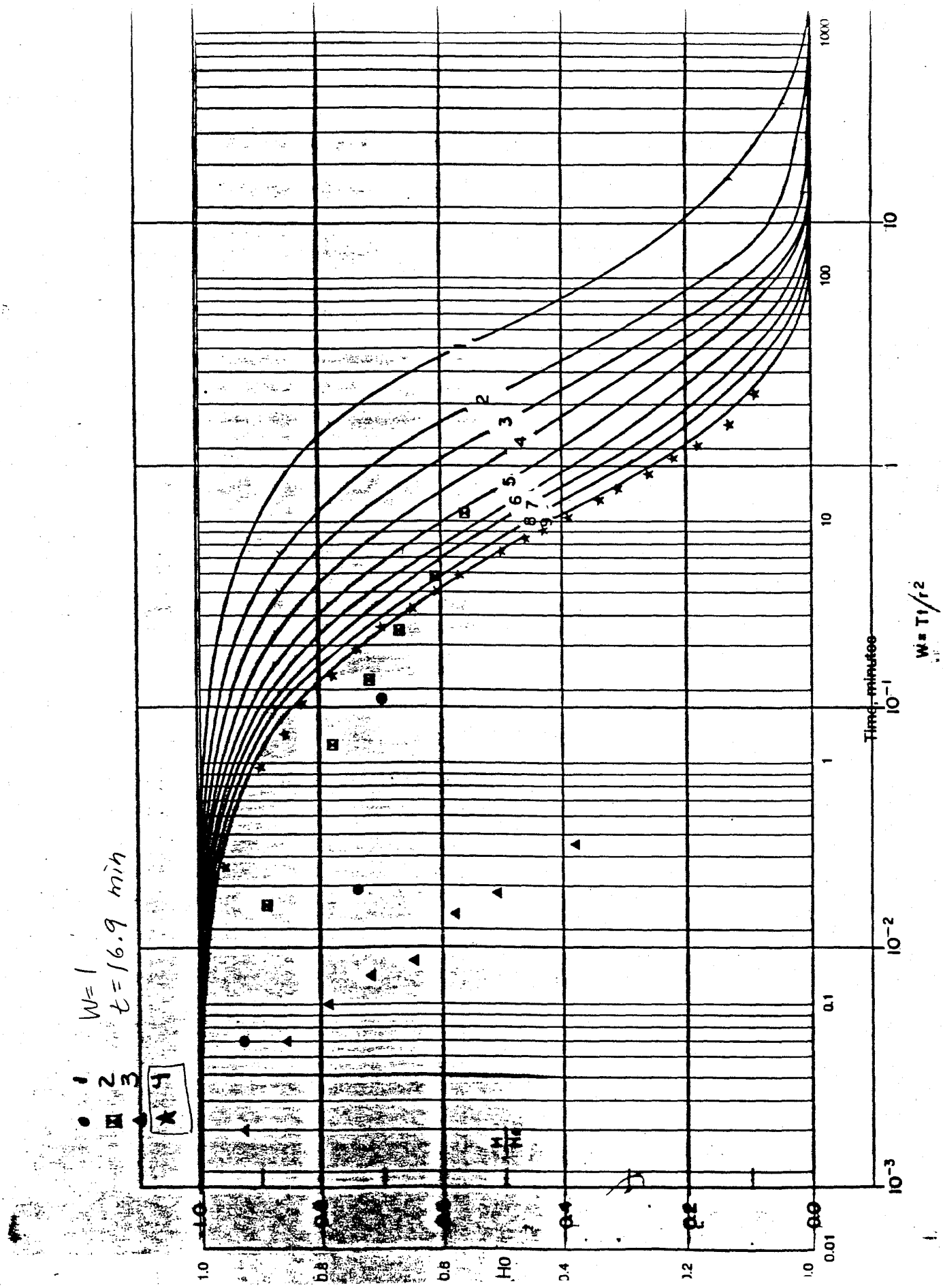
$i = \frac{10}{200}$ S54°E

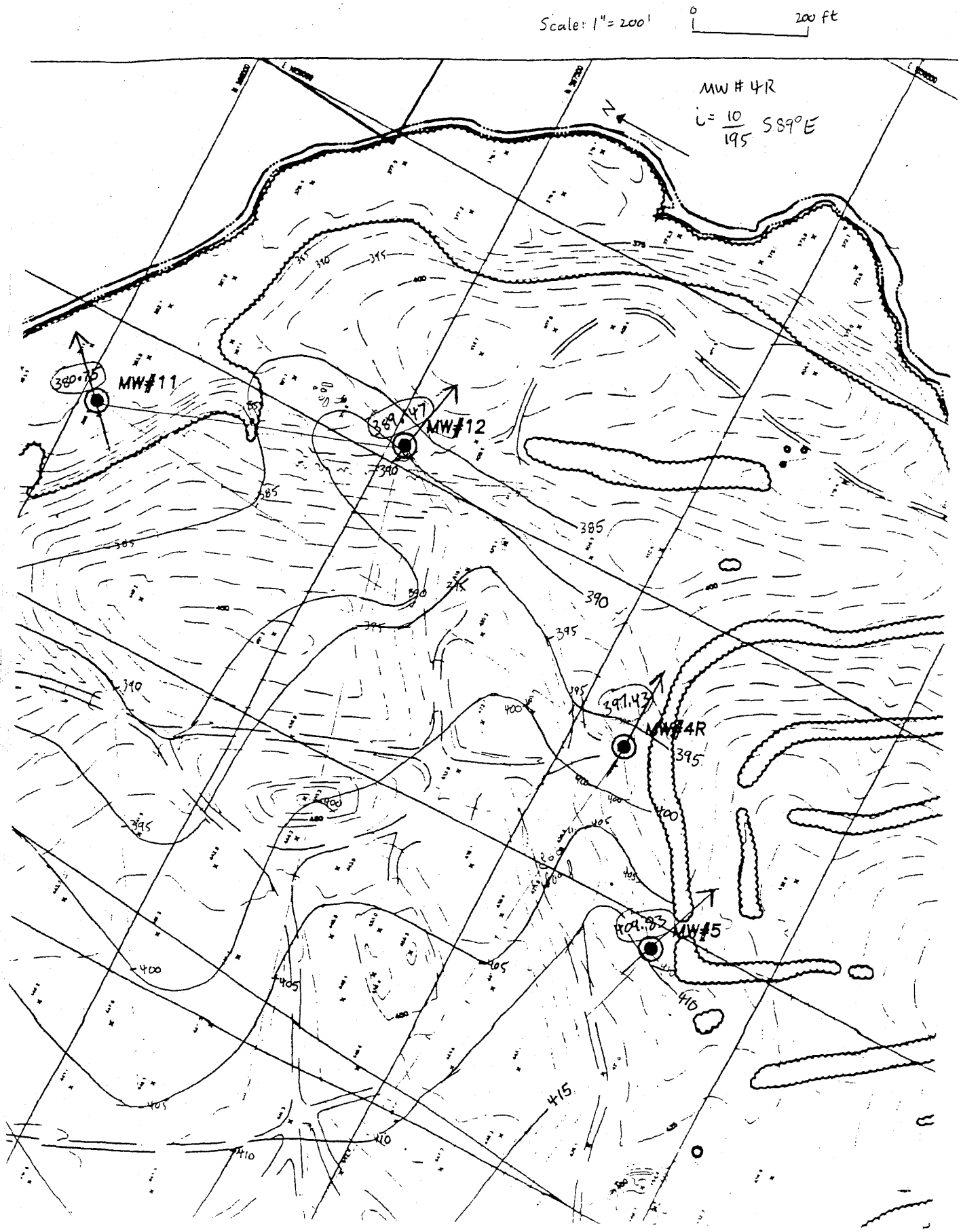


SLUG TEST MW4R ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 20.2 | RADIUS, in. | 1 |
| HT OF STICKUP | 2.85 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 16.9 |
| INITIAL TIME | 24.62 | k, cm/sec | 1.4E-05 |
| INITIAL GW BELOW TOC | 23.05 | | |
| H0 | 23.05 | | |

| GW READING | DH | H | H/H0 | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 22.05 | 0.96 | 0 | 24 | 59 | 0.36 |
| 2.4 | 2.4 | 20.65 | 0.90 | 0 | 25 | 35 | 0.96 |
| 3.3 | 3.3 | 19.75 | 0.86 | 0 | 25 | 57 | 1.33 |
| 4 | 4 | 19.05 | 0.83 | 0 | 26 | 23 | 1.76 |
| 5 | 5 | 18.05 | 0.78 | 0 | 26 | 54 | 2.28 |
| 6 | 6 | 17.05 | 0.74 | 0 | 27 | 32 | 2.91 |
| 7 | 7 | 16.05 | 0.70 | 0 | 28 | 11 | 3.56 |
| 8 | 8 | 15.05 | 0.65 | 0 | 28 | 53 | 4.26 |
| 9 | 9 | 14.05 | 0.61 | 0 | 29 | 38 | 5.01 |
| 10 | 10 | 13.05 | 0.57 | 0 | 30 | 30 | 5.88 |
| 11.6 | 11.6 | 11.45 | 0.50 | 0 | 32 | 2 | 7.41 |
| 12.5 | 12.5 | 10.55 | 0.46 | 0 | 33 | 2 | 8.41 |
| 13.1 | 13.1 | 9.95 | 0.43 | 0 | 33 | 46 | 9.15 |
| 14 | 14 | 9.05 | 0.39 | 0 | 34 | 59 | 10.36 |
| 15.2 | 15.2 | 7.85 | 0.34 | 0 | 36 | 52 | 12.25 |
| 16 | 16 | 7.05 | 0.31 | 0 | 38 | 16 | 13.65 |
| 17 | 17 | 6.05 | 0.26 | 0 | 40 | 23 | 15.76 |
| 18 | 18 | 5.05 | 0.22 | 0 | 42 | 56 | 18.31 |
| 19 | 19 | 4.05 | 0.18 | 0 | 45 | 12 | 20.58 |
| 20 | 20 | 3.05 | 0.13 | 0 | 49 | 41 | 25.06 |
| 21 | 21 | 2.05 | 0.09 | 0 | 57 | 24 | 32.78 |

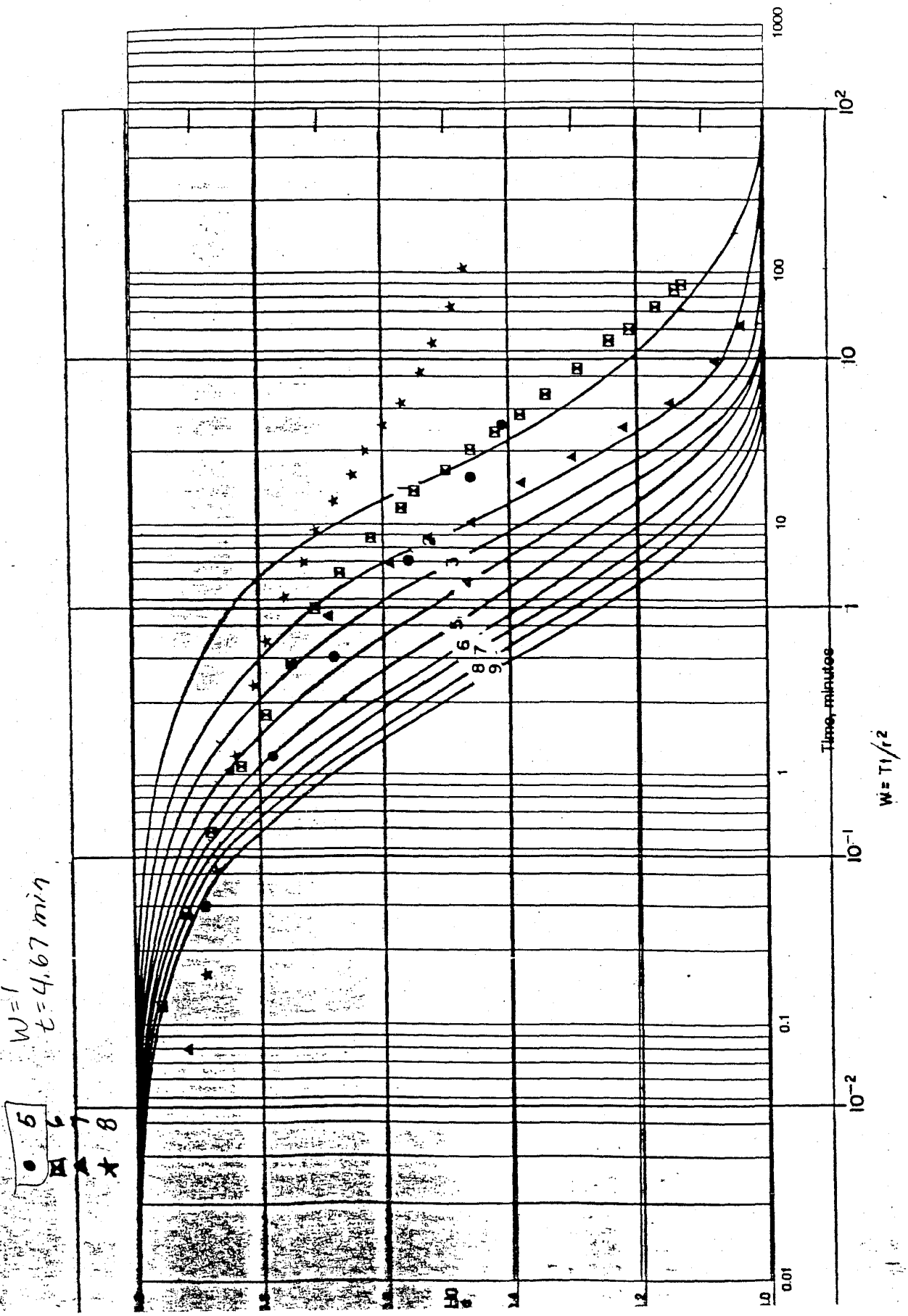

1
2
3
4
W = 1
t = 16.9 min
1.0
0.8
0.6
0.4
0.2
0.0
Ho
H/Ho
0.01
0.1
1
10
100
1000
$10^{-3}$
$10^{-2}$
$10^{-1}$
Time, minutes
W = Tt/r²

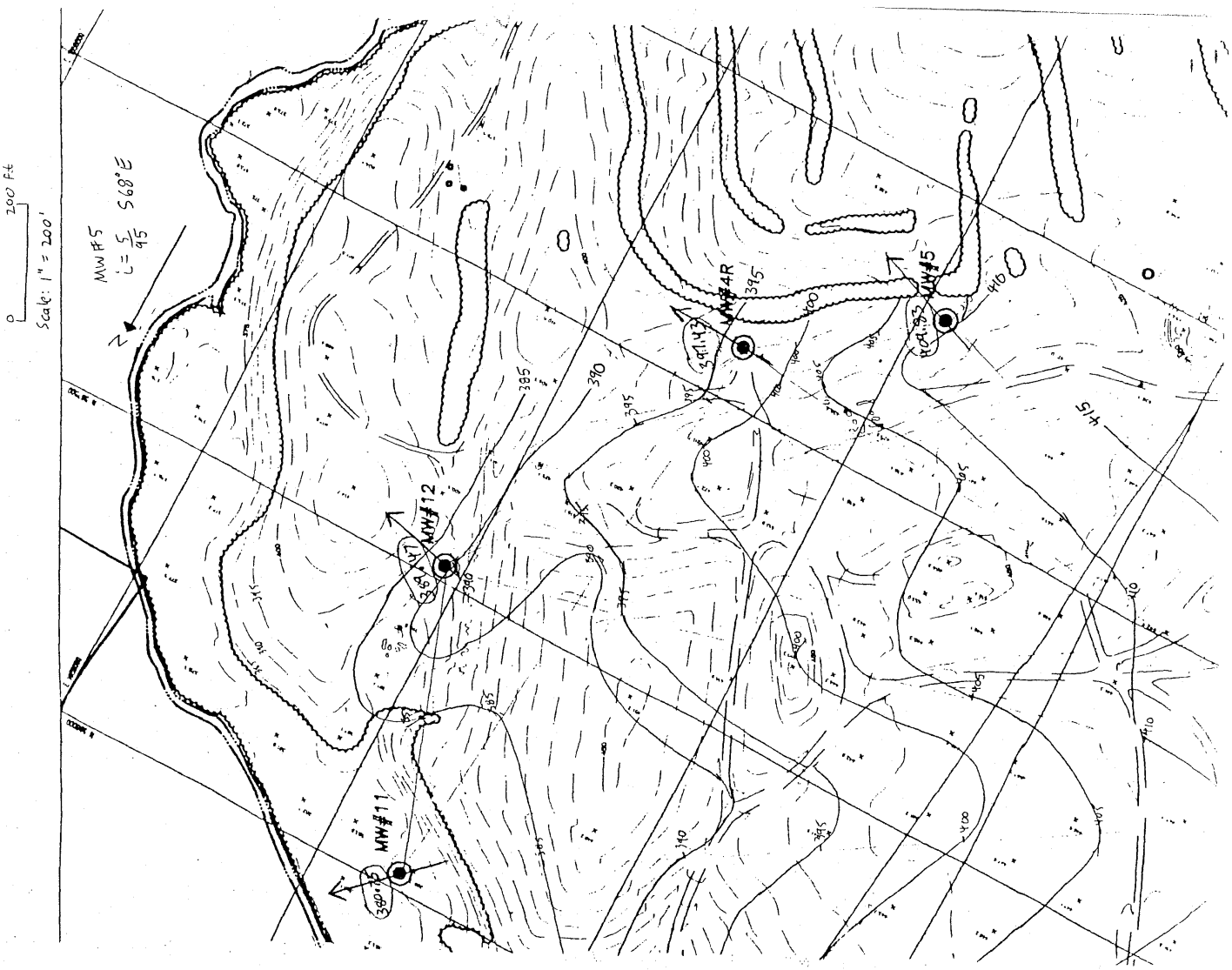

Scale: 1" = 200'
0
200 ft
MW # 4R
i = 10/195 S89°E
N
380.75
MW#11
389.47
MW#12
397.43
MW#4R
404.93
MW#5
385
390
395
400
405
410
415

SLUG TEST MW5 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 6.8 | RADIUS, in. | 1 |
| HT OF STICKUP | 2.5 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 4.67 |
| INITIAL TIME | 47.7 | k, cm/sec | 5.0E-05 |
| INITIAL GW BELOW TOC | 9.3 | | |
| HO | 9.3 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 8.3 | 0.89 | 0 | 48 | 0 | 0.30 |
| 2 | 2 | 7.3 | 0.78 | 0 | 48 | 54 | 1.20 |
| 3 | 3 | 6.3 | 0.68 | 0 | 50 | 43 | 3.02 |
| 4.1 | 4.1 | 5.2 | 0.56 | 0 | 54 | 46 | 7.07 |
| 5 | 5 | 4.3 | 0.46 | 1 | 3 | 16 | 15.57 |
| 5.5 | 5.5 | 3.8 | 0.41 | 1 | 13 | 30 | 25.80 |

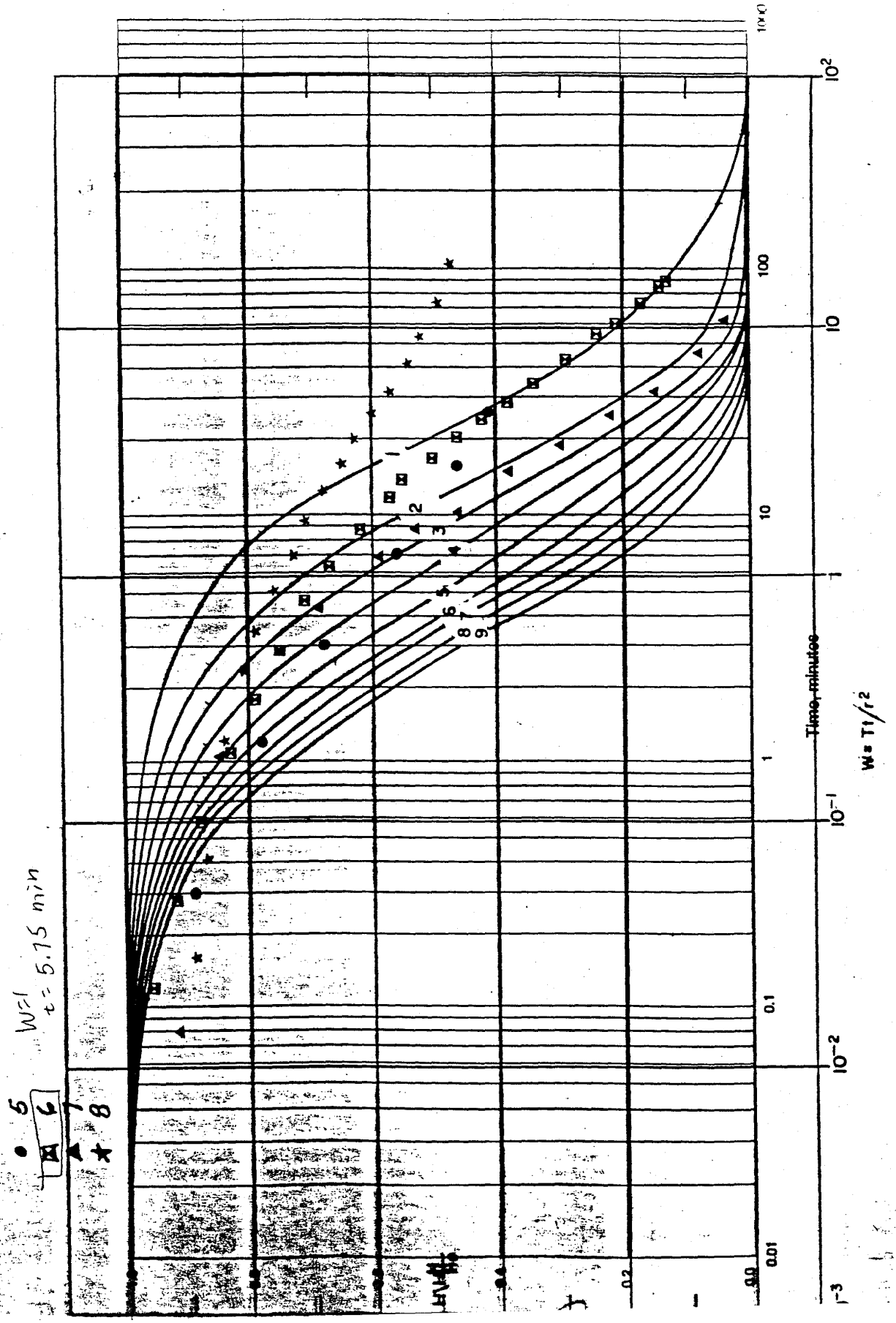

1000
100
10
1
0.1
0.01
$10^2$
10
1
$10^{-1}$
$10^{-2}$
Time, minutes
$W = Tt/r^2$
1
2
3
4
5
6
7
8
9
W=1
t=4.67 min

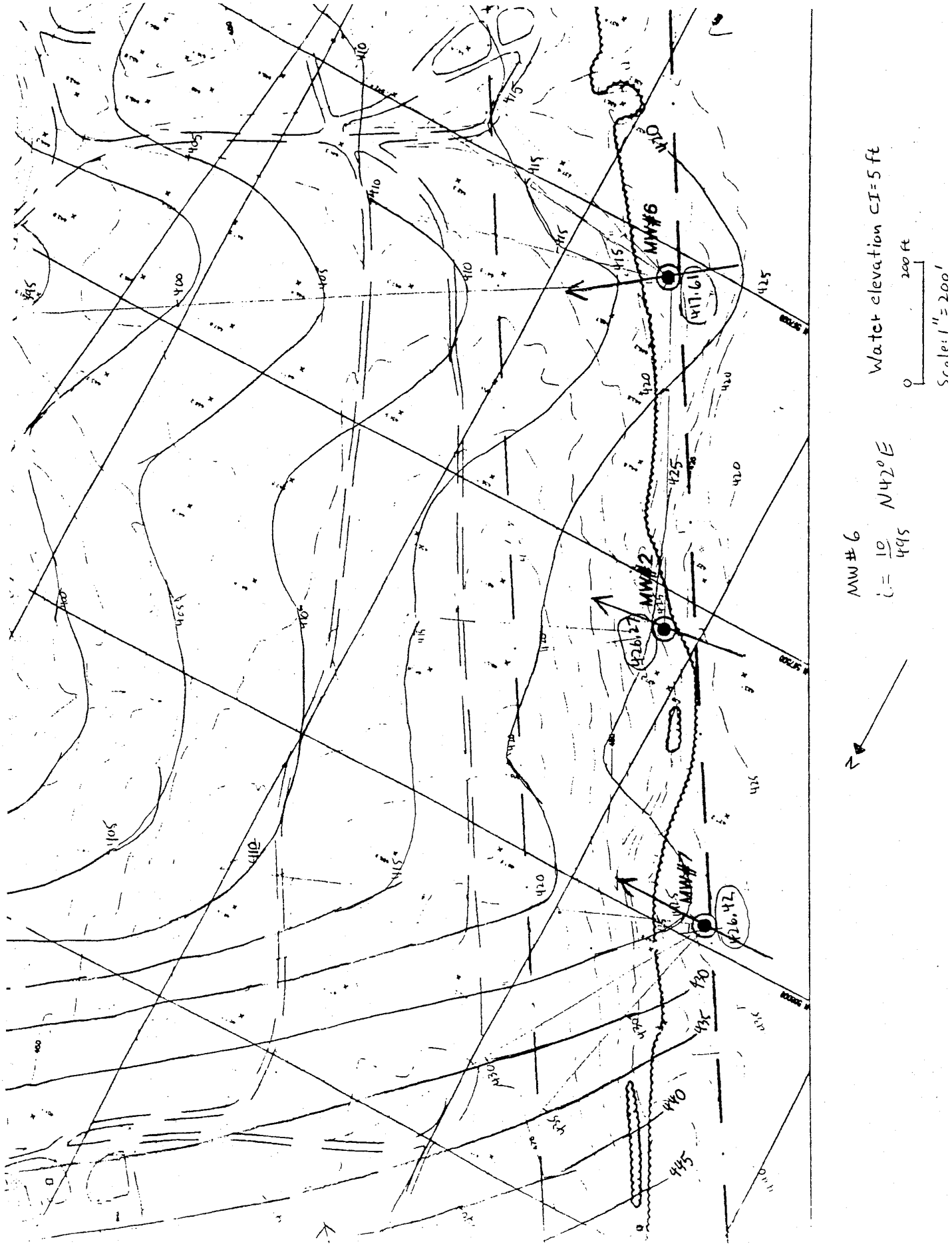

0
200 Ft
Scale: 1" = 200'
MW#5
i = 5/45 S68°E
N
MW#11
380.15
MW#12
384.14
390
395
MW#4R
391.43
400
MW#15
409.93
410
415

SLUG TEST MW6 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 22.2 | RADIUS, in. | 1 |
| HT OF STICKUP | 2 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 5.75 |
| INITIAL TIME | 51.5 | k, cm/sec | 4.1E-05 |
| INITIAL GW BELOW TOC | 24.2 | | |
| H0 | 24.2 | | |

| GW READING | DH | H | H/H0 | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 23.2 | 0.96 | 0 | 51 | 37 | 0.12 |
| 2 | 2 | 22.2 | 0.92 | 0 | 51 | 47 | 0.28 |
| 3 | 3 | 21.2 | 0.88 | 0 | 52 | 5 | 0.58 |
| 4 | 4 | 20.2 | 0.83 | 0 | 52 | 35 | 1.08 |
| 5 | 5 | 19.2 | 0.79 | 0 | 53 | 17 | 1.78 |
| 6 | 6 | 18.2 | 0.75 | 0 | 54 | 22 | 2.87 |
| 7.1 | 7.1 | 17.1 | 0.71 | 0 | 56 | 8 | 4.63 |
| 8 | 8 | 16.2 | 0.67 | 0 | 57 | 47 | 6.28 |
| 9.2 | 9.2 | 15 | 0.62 | 1 | 0 | 16 | 8.77 |
| 10.3 | 10.3 | 13.9 | 0.57 | 1 | 3 | 5 | 11.58 |
| 11 | 11 | 13.2 | 0.55 | 1 | 5 | 6 | 13.60 |
| 12 | 12 | 12.2 | 0.50 | 1 | 8 | 12 | 16.70 |
| 13.1 | 13.1 | 11.1 | 0.46 | 1 | 11 | 50 | 20.33 |
| 14.1 | 14.1 | 10.1 | 0.42 | 1 | 15 | 37 | 24.12 |
| 15 | 15 | 9.2 | 0.38 | 1 | 19 | 49 | 28.32 |
| 16 | 16 | 8.2 | 0.34 | 1 | 25 | 27 | 33.95 |
| 17.3 | 17.3 | 6.9 | 0.29 | 1 | 34 | 26 | 42.93 |
| 18.5 | 18.5 | 5.7 | 0.24 | 1 | 46 | 0 | 54.50 |
| 19 | 19 | 5.2 | 0.21 | 1 | 51 | 33 | 60.05 |
| 20 | 20 | 4.2 | 0.17 | 2 | 4 | 4 | 72.57 |
| 20.8 | 20.8 | 3.4 | 0.14 | 2 | 16 | 30 | 85.00 |
| 21 | 21 | 3.2 | 0.13 | 2 | 20 | 0 | 88.50 |

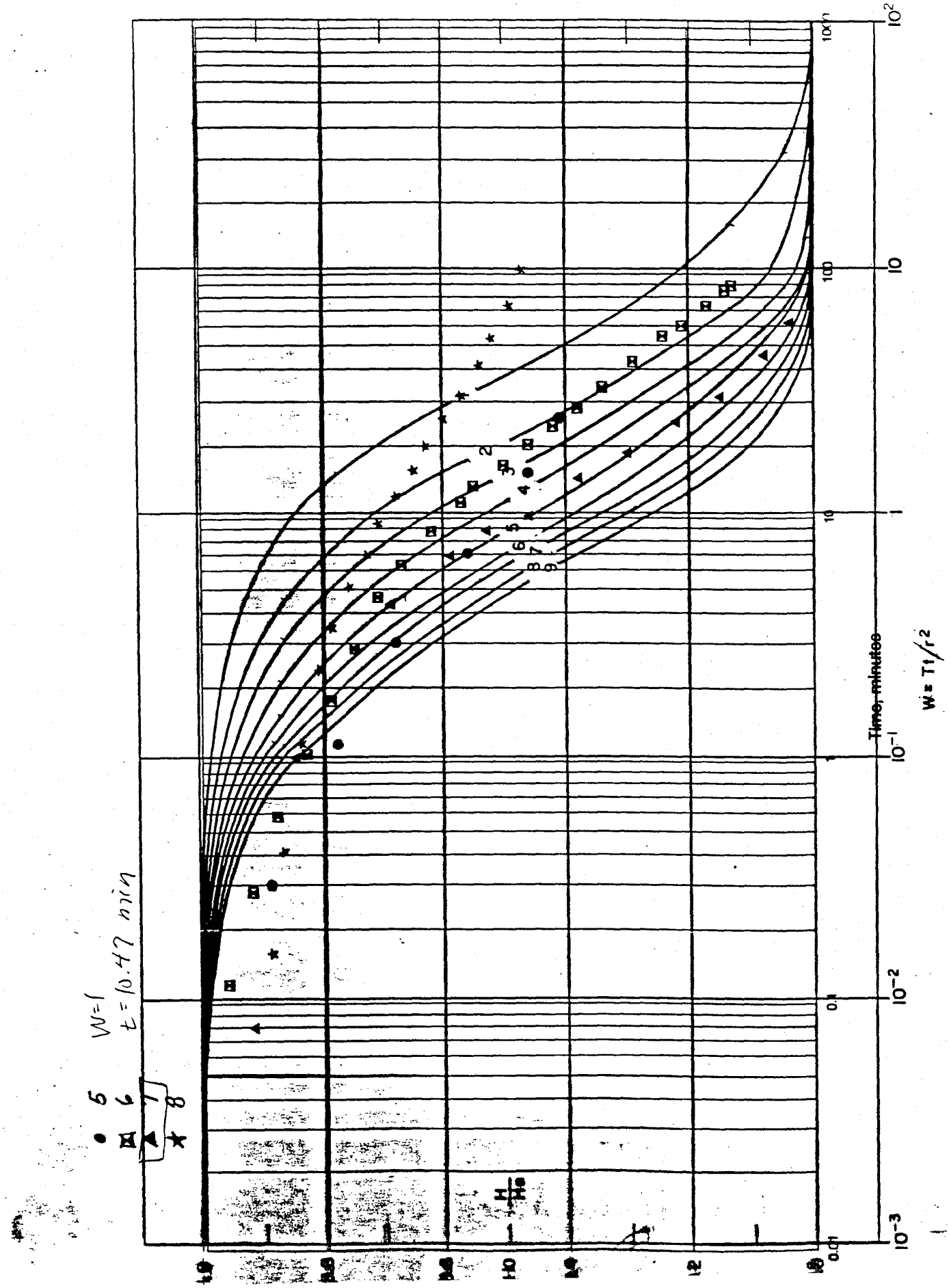

Time, minutes
W = Tt/r²
Well
t = 5.75 min
1
2
3
4
5
6
7
8
9

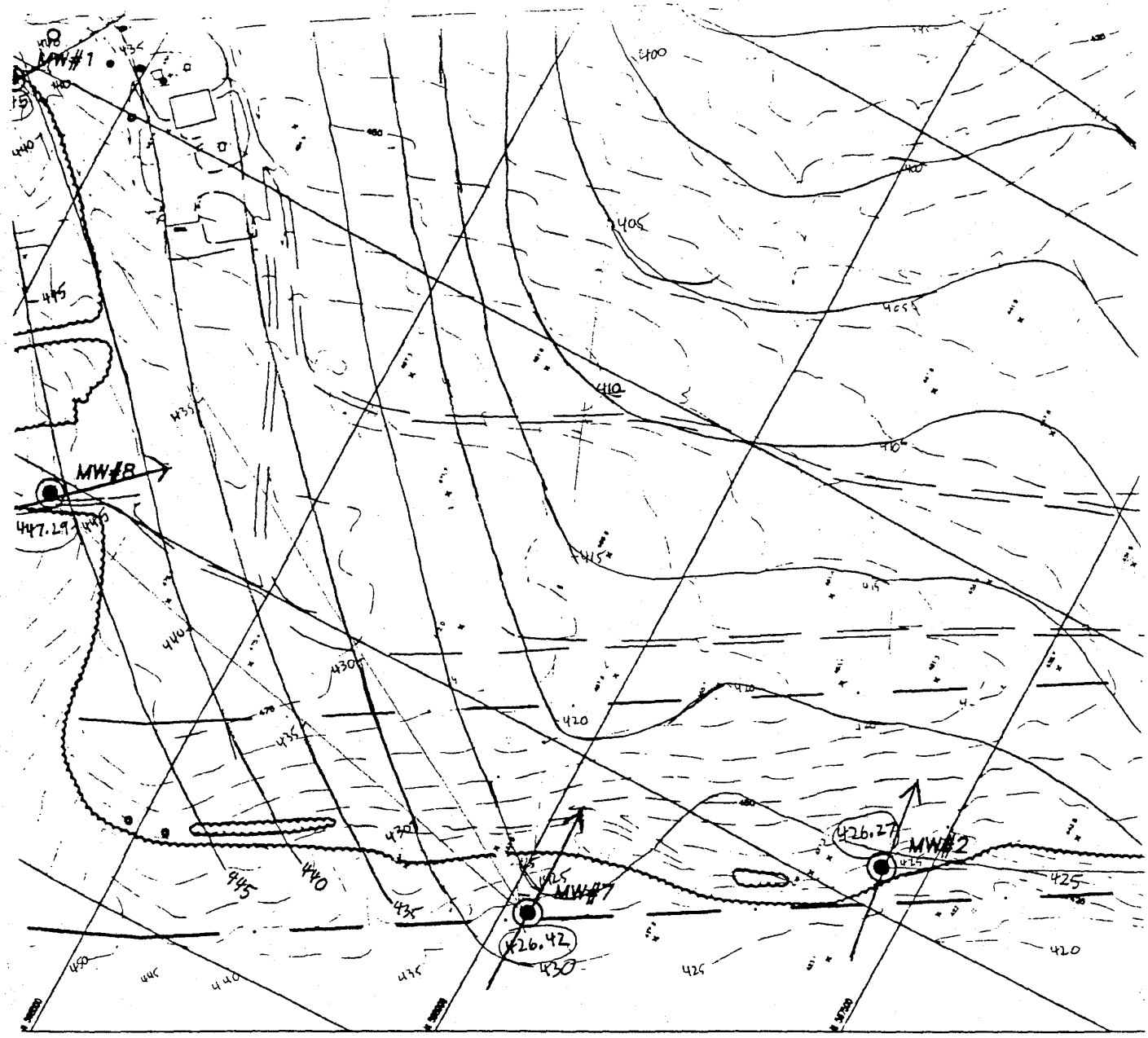

Water elevation CI=5 ft
Scale: 1" = 200'
0
200 ft
MW#6
MW#2
MW#7
N
N42°E

SLUG TEST MW7 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 11 | RADIUS, in. | 1 |
| HT OF STICKUP | 2 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 10.47 |
| INITIAL TIME | 31.17 | k, cm/sec | 2.2E-05 |
| INITIAL GW BELOW TOC | 13 | | |
| HO | 13 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 12 | 0.92 | 0 | 31 | 15 | 0.08 |
| 2 | 2 | 11 | 0.85 | 0 | 32 | 13 | 1.05 |
| 3.2 | 3.2 | 9.8 | 0.75 | 0 | 34 | 3 | 2.88 |
| 4 | 4 | 9 | 0.69 | 0 | 35 | 29 | 4.31 |
| 5.3 | 5.3 | 7.7 | 0.59 | 0 | 38 | 5 | 6.91 |
| 6.1 | 6.1 | 6.9 | 0.53 | 0 | 39 | 59 | 8.81 |
| 7 | 7 | 6 | 0.46 | 0 | 41 | 23 | 10.21 |
| 8.1 | 8.1 | 4.9 | 0.38 | 0 | 45 | 56 | 14.76 |
| 9.1 | 9.1 | 3.9 | 0.30 | 0 | 50 | 1 | 18.85 |
| 10.2 | 10.2 | 2.8 | 0.22 | 0 | 56 | 6 | 24.93 |
| 11 | 11 | 2 | 0.15 | 1 | 2 | 22 | 31.20 |
| 12 | 12 | 1 | 0.08 | 1 | 16 | 35 | 45.41 |
| 12.5 | 12.5 | 0.5 | 0.04 | 1 | 32 | 51 | 61.68 |


W=1
t=10.47 min
Time, minutes
W = Tt/r²
H/Ho




MW # 7

$i = \frac{10}{350}$

N 90° E

N

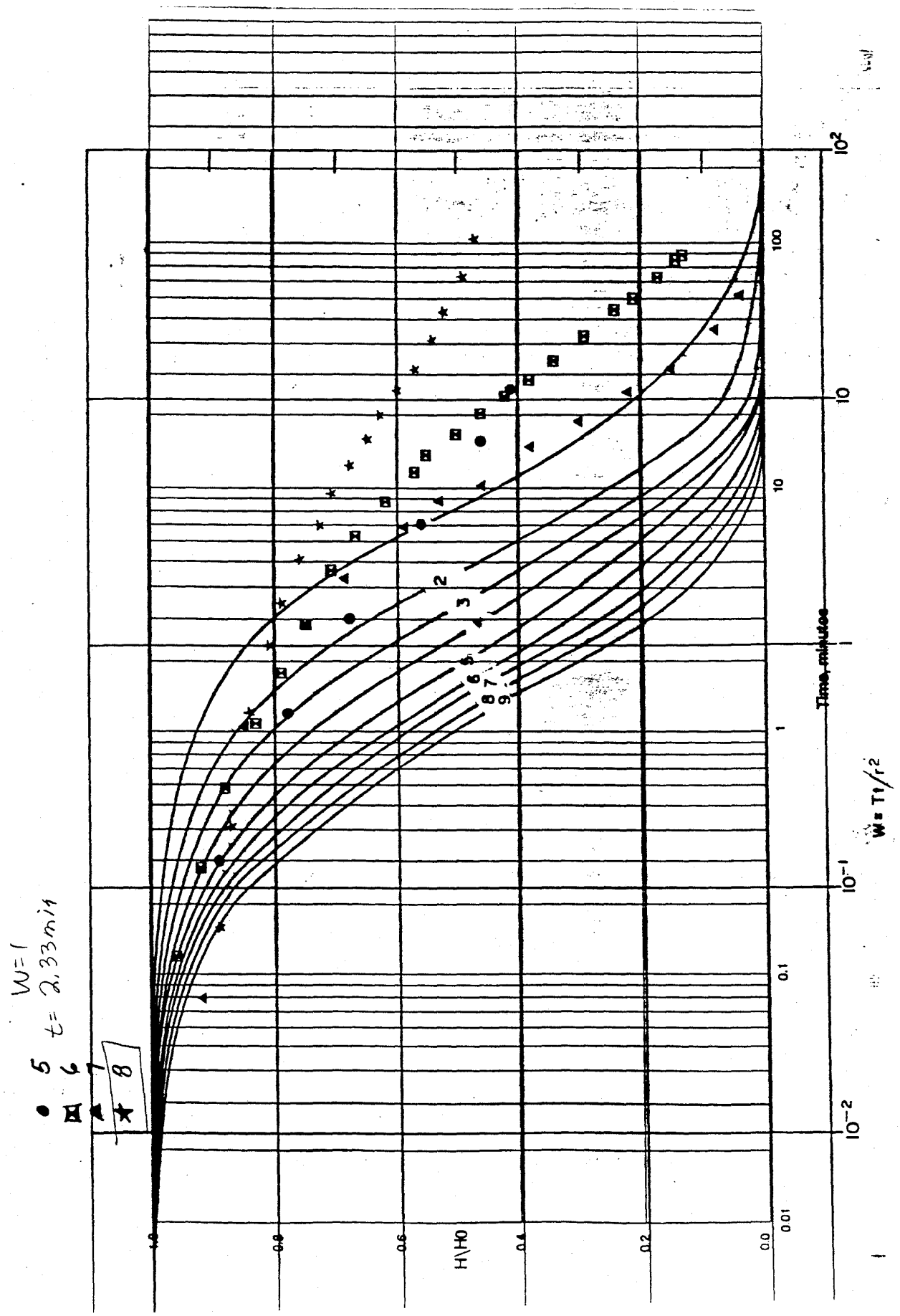
200 feet

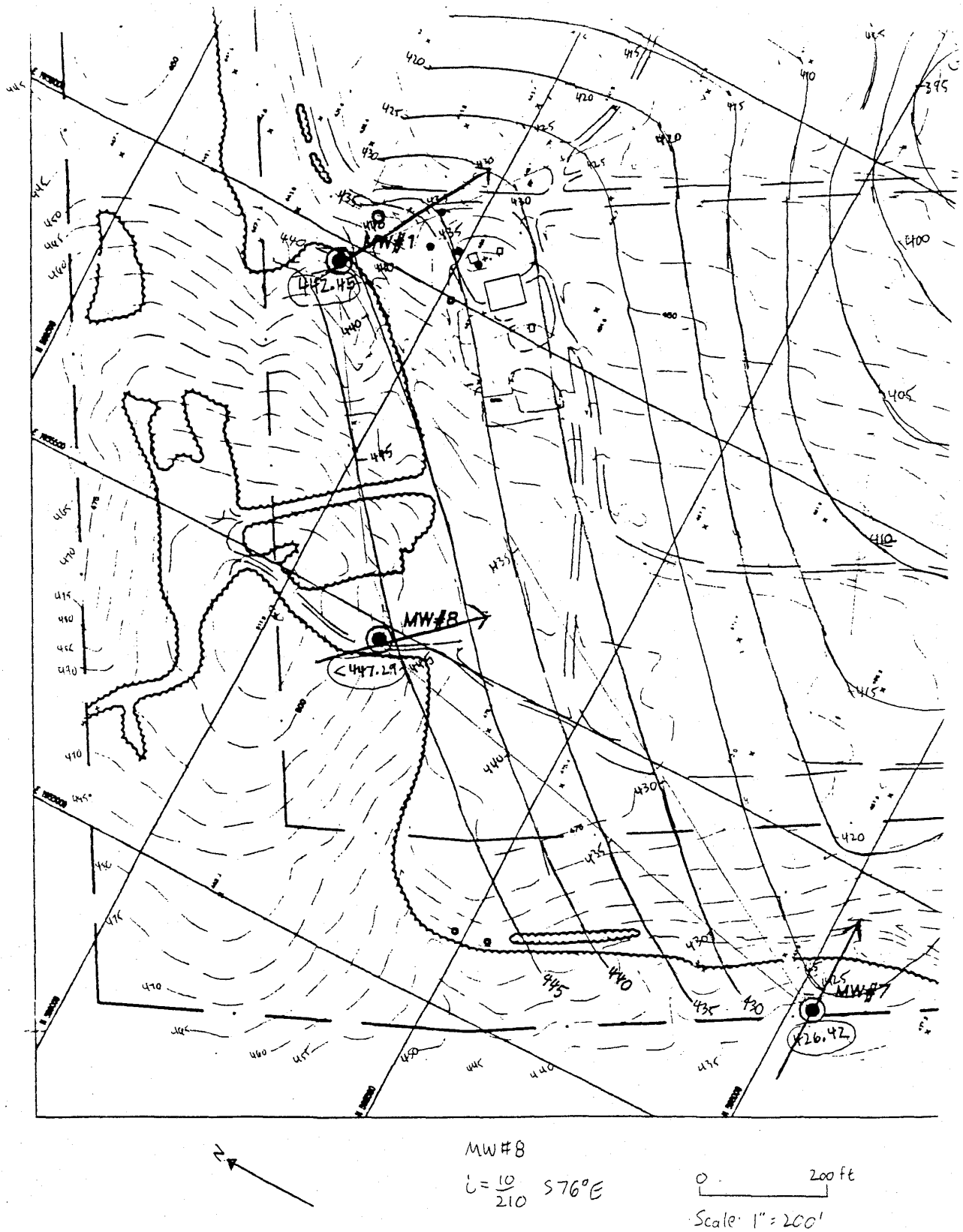
Scale 1" = 200'

SLUG TEST MW8 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 35.6 | RADIUS, in. | 1 |
| HT OF STICKUP | 2 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 2.33 |
| INITIAL TIME | 27.42 | k, cm/sec | 1.0E-04 |
| INITIAL GW BELOW TOC | 37.6 | | |
| HO | 37.6 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 4 | 4 | 33.6 | 0.89 | 0 | 27 | 35 | 0.16 |
| 5 | 5 | 32.6 | 0.87 | 0 | 27 | 50 | 0.41 |
| 6 | 6 | 31.6 | 0.84 | 0 | 28 | 38 | 1.21 |
| 7.1 | 7.1 | 30.5 | 0.81 | 0 | 29 | 46 | 2.35 |
| 8 | 8 | 29.6 | 0.79 | 0 | 30 | 54 | 3.48 |
| 9 | 9 | 28.6 | 0.76 | 0 | 32 | 30 | 5.08 |
| 10 | 10 | 27.6 | 0.73 | 0 | 34 | 24 | 6.98 |
| 11 | 11 | 26.6 | 0.71 | 0 | 36 | 52 | 9.45 |
| 12 | 12 | 25.6 | 0.68 | 0 | 39 | 47 | 12.36 |
| 13 | 13 | 24.6 | 0.65 | 0 | 43 | 16 | 15.85 |
| 14 | 14 | 23.6 | 0.63 | 0 | 47 | 26 | 20.01 |
| 15 | 15 | 22.6 | 0.60 | 0 | 53 | 1 | 25.60 |
| 16 | 16 | 21.6 | 0.57 | 0 | 58 | 45 | 31.33 |
| 17.12 | 17.12 | 20.48 | 0.54 | 1 | 8 | 45 | 41.33 |
| 18 | 18 | 19.6 | 0.52 | 1 | 20 | 41 | 53.26 |
| 19 | 19 | 18.6 | 0.49 | 1 | 40 | 41 | 73.26 |
| 20 | 20 | 17.6 | 0.47 | 2 | 11 | 15 | 103.83 |

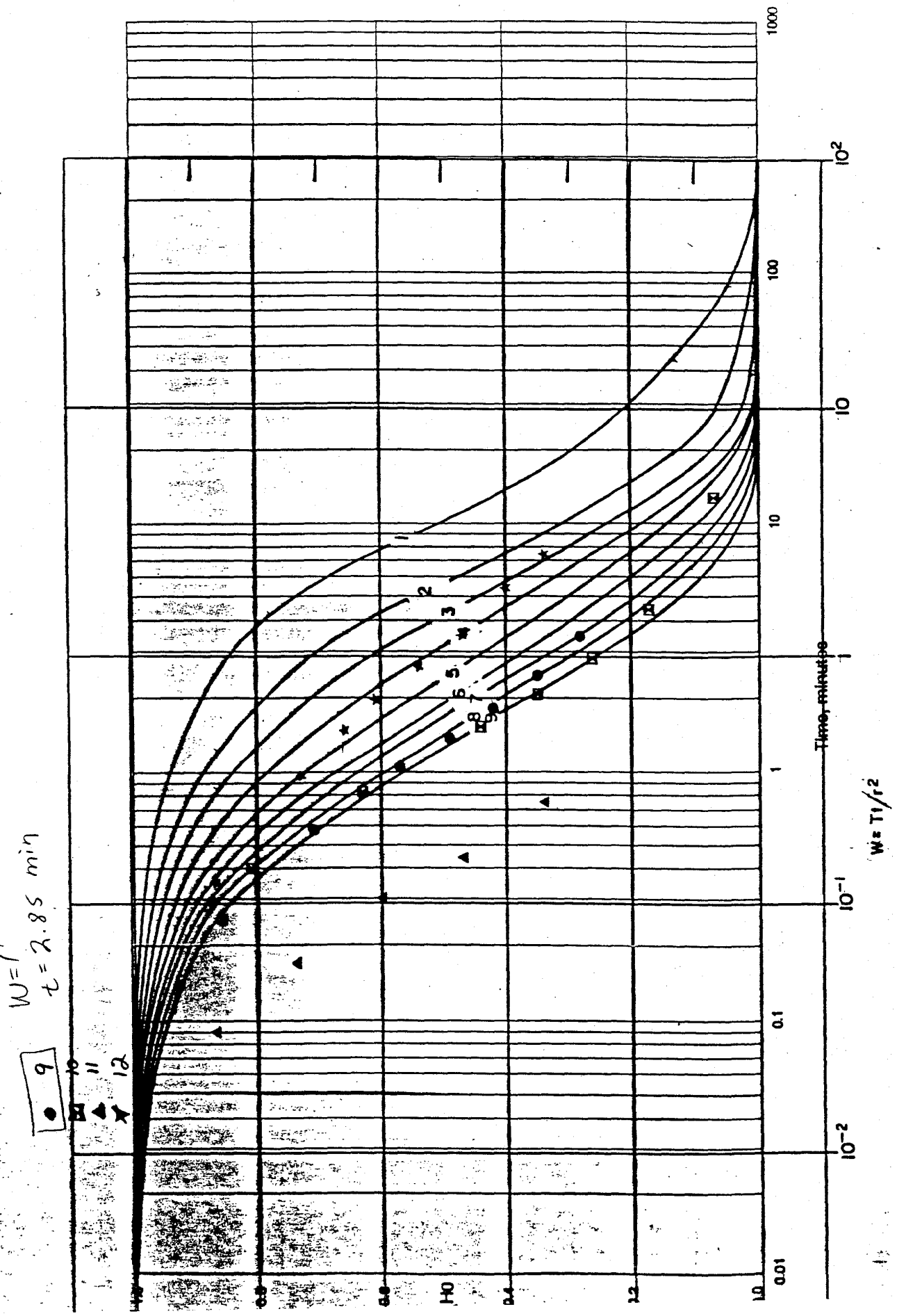

W=1
t= 2.33min
5
6
7
8
H/Ho
1.0
0.8
0.6
0.4
0.2
0.0
0.01
0.1
1
10
100
$10^{-2}$
$10^{-1}$
1
10
$10^{2}$
Time, minutes
$W = Tt/r^2$
2
3
4
5
6
7
8
9

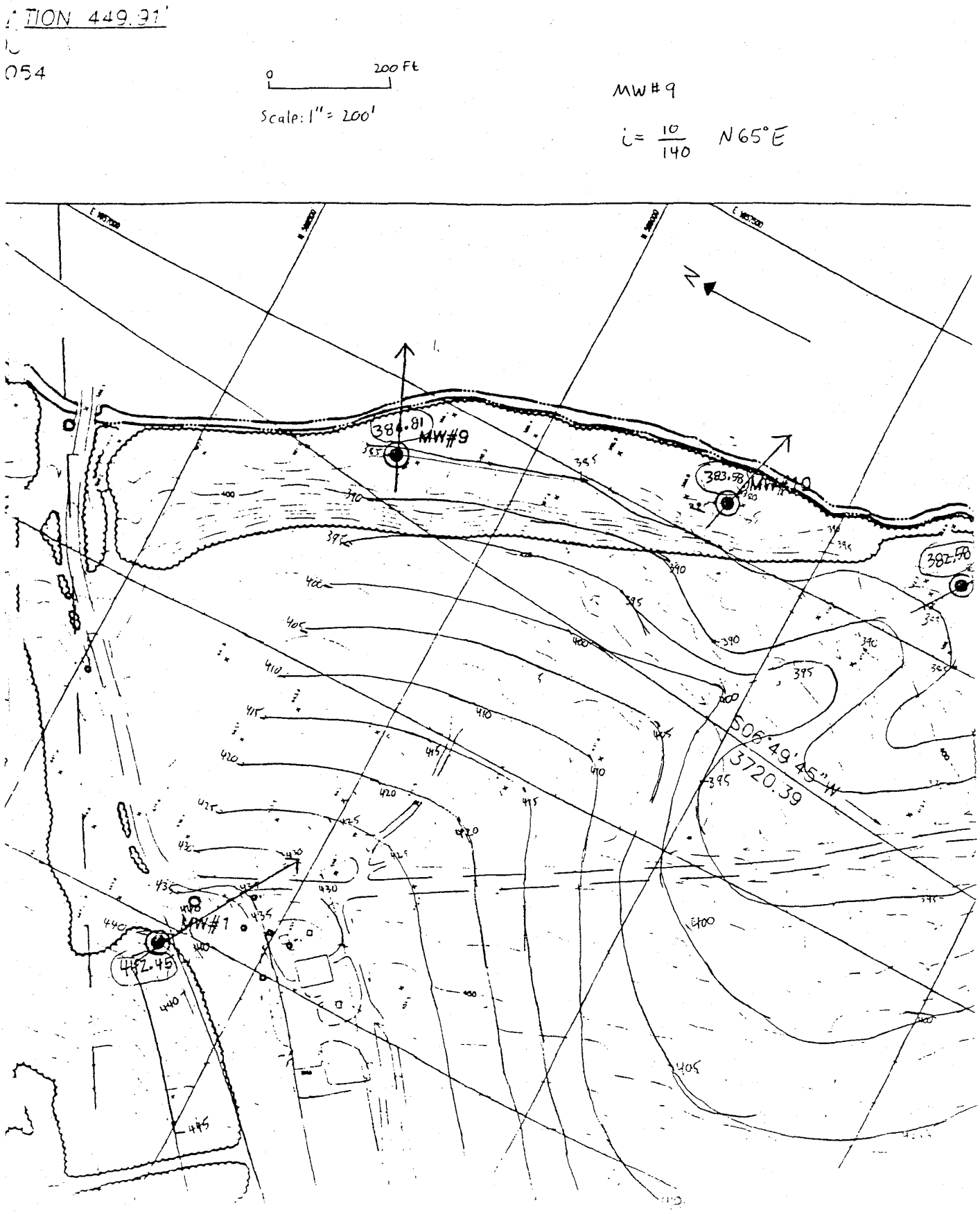

MW#1
442.45
MW#8
<447.29
MW#7
426.42
MW#8
i = 10/210 S76°E
0 200 ft
Scale: 1" = 200'

SLUG TEST MW9 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 2.9 | RADIUS, in. | 1 |
| HT OF STICKUP | 4 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 2.85 |
| INITIAL TIME | 51.92 | k, cm/sec | 8.3E-05 |
| INITIAL GW BELOW TOC | 6.9 | | |
| HO | 6.9 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 5.9 | 0.86 | 0 | 52 | 10 | 0.25 |
| 2 | 2 | 4.9 | 0.71 | 0 | 52 | 30 | 0.58 |
| 3 | 3 | 3.9 | 0.57 | 0 | 52 | 59 | 1.06 |
| 3.5 | 3.5 | 3.4 | 0.49 | 0 | 53 | 19 | 1.40 |
| 4 | 4 | 2.9 | 0.42 | 0 | 53 | 45 | 1.83 |
| 4.5 | 4.5 | 2.4 | 0.35 | 0 | 54 | 21 | 2.43 |
| 5 | 5 | 1.9 | 0.28 | 0 | 55 | 23 | 3.46 |

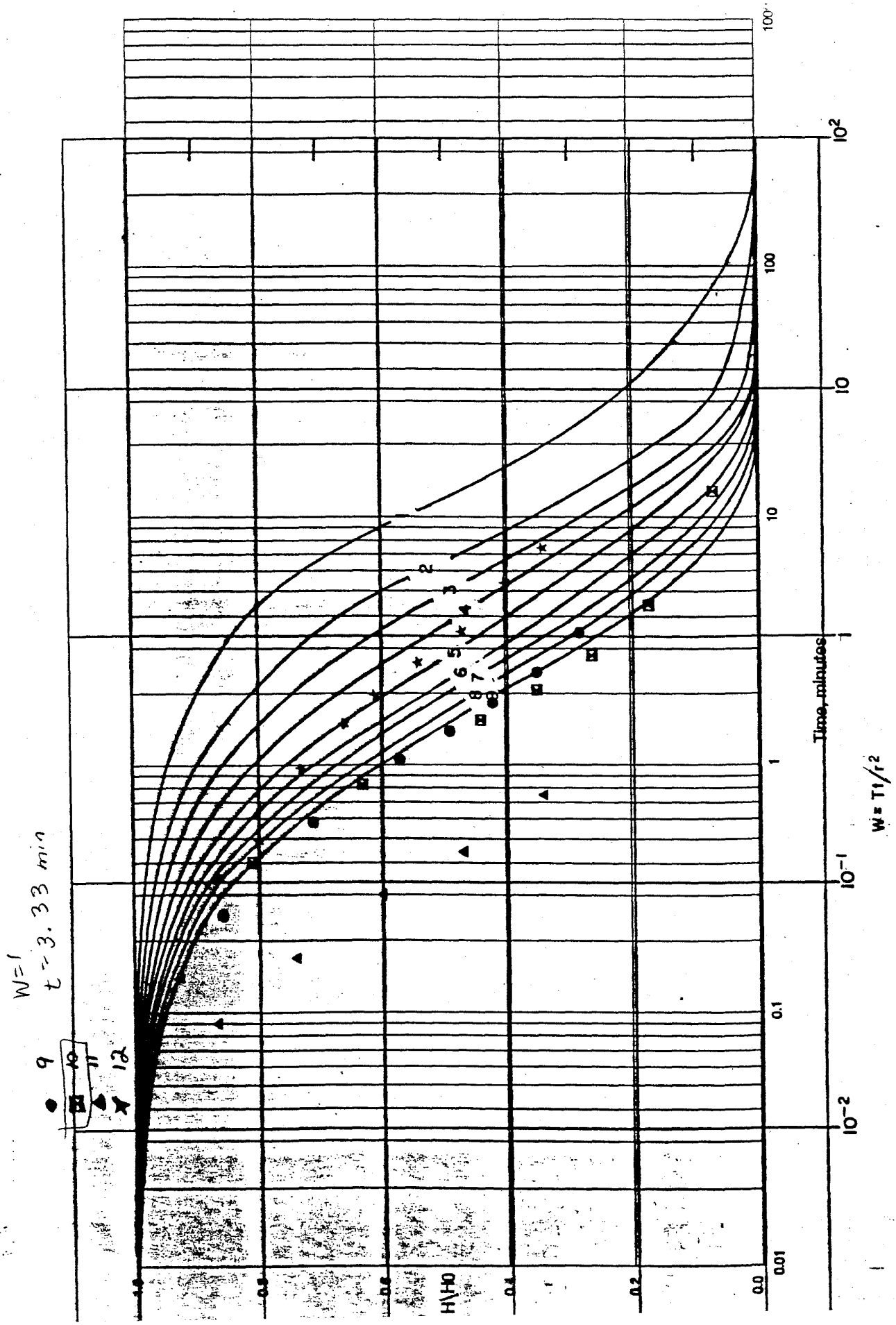

W=1
t=2.85 min
9
10
11
12
1
2
3
4
5
6
7
8
9
1000
100
10
1
0.1
0.01
$10^2$
10
1
$10^{-1}$
$10^{-2}$
Time, minutes
$W = Tt/r^2$

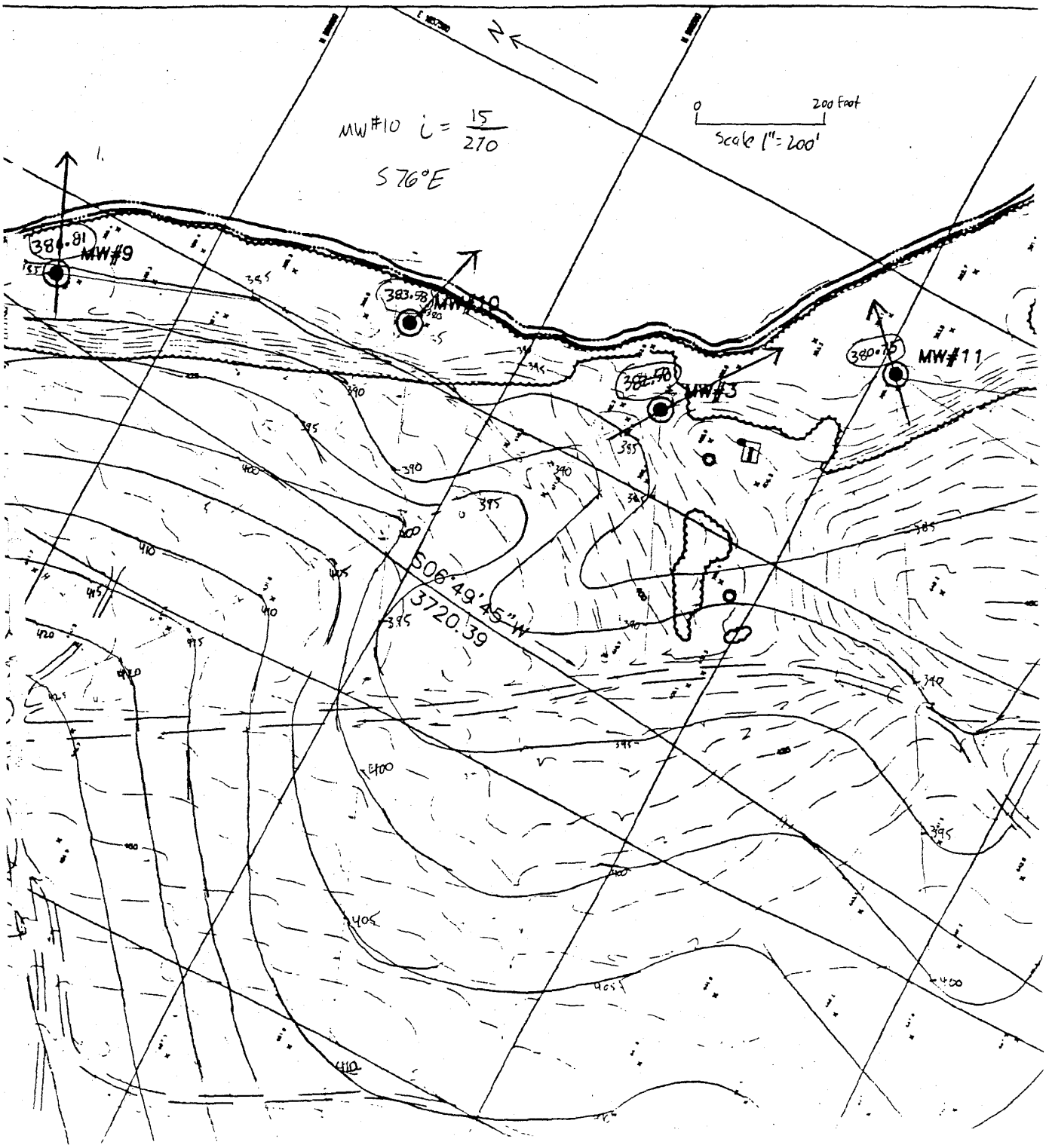

TION 449.31'
054
0
200 Ft
Scale: 1" = 200'
MW#9
i = 10/140 N65°E
N
384.81
MW#9
383.58
MW#10
382.90
S06°49'45"W
3720.39
MW#1
442.45

SLUG TEST MW10 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 2.5 | RADIUS, in. | 1 |
| HT OF STICKUP | 2.9 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 3.33 |
| INITIAL TIME | 48.5 | k, cm/sec | 7.1E-05 |
| INITIAL GW BELOW TOC | 5.4 | | |
| HO | 5.4 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 4.4 | 0.81 | 0 | 48 | 54 | 0.40 |
| 2 | 2 | 3.4 | 0.63 | 0 | 49 | 20 | 0.83 |
| 3 | 3 | 2.4 | 0.44 | 0 | 50 | 3 | 1.55 |
| 3.5 | 3.5 | 1.9 | 0.35 | 0 | 50 | 34 | 2.07 |
| 4 | 4 | 1.4 | 0.26 | 0 | 51 | 20 | 2.83 |
| 4.5 | 4.5 | 0.9 | 0.17 | 0 | 52 | 55 | 4.42 |
| 5 | 5 | 0.4 | 0.07 | 1 | 1 | 13 | 12.72 |

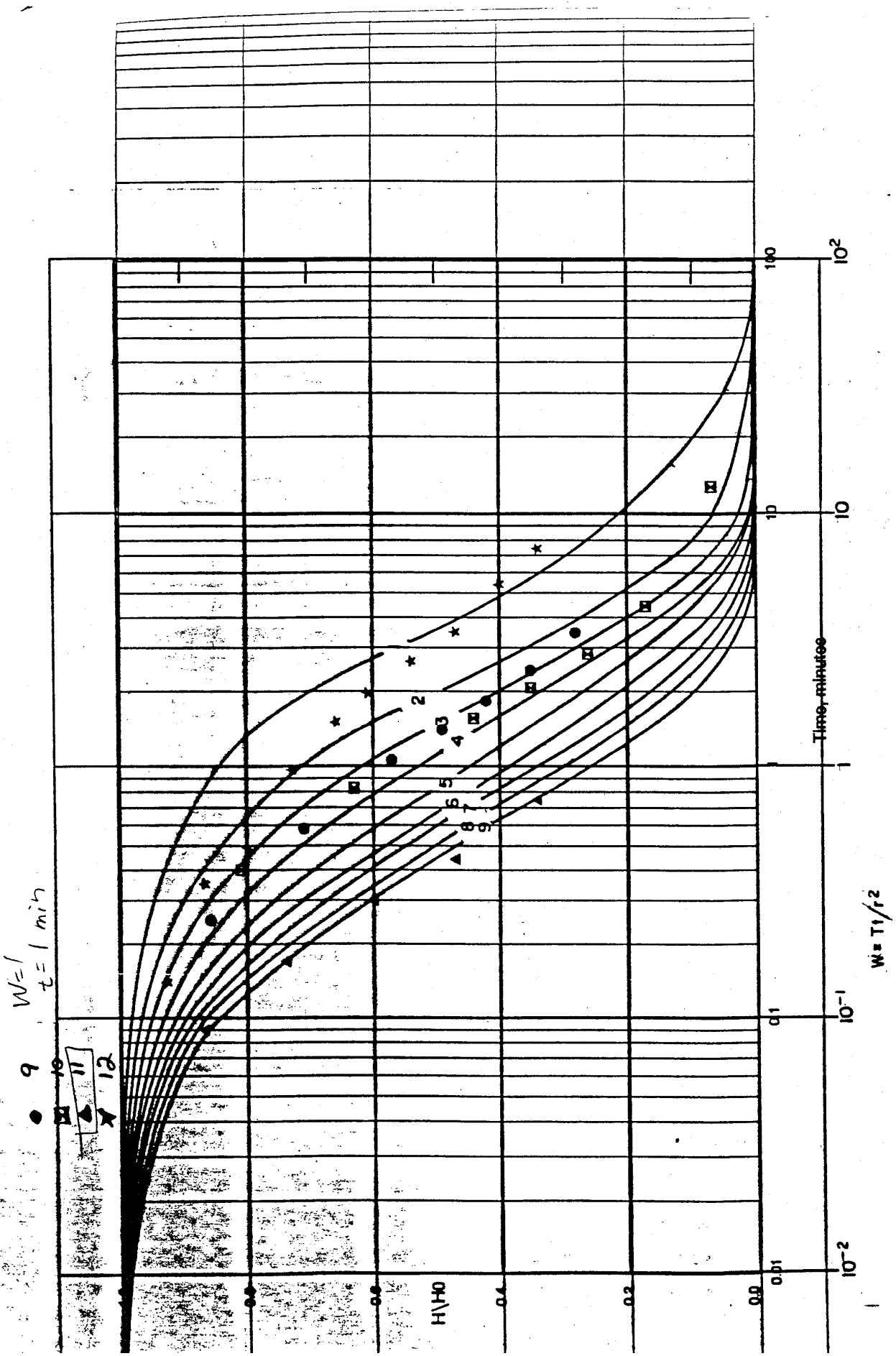

W=1
t=3.33 min
9
10
11
12
1
2
3
4
5
6
7
8
H/H0
1.0
0.8
0.6
0.4
0.2
0.0
0.01
0.1
1
10
100
$10^{-2}$
$10^{-1}$
1
10
100
$10^2$
Time, minutes
W = Tt/r²


N
0
200 Foot
Scale 1" = 200'
MW#10 i = 15/270
S 76°E
386.81
MW#9
383.58
MW#10
MW#11
MW#3
S06°49'45"W
3720.39

SLUG TEST MW11 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 5.05 | RADIUS, in. | 1 |
| HT OF STICKUP | 2.5 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 1 |
| INITIAL TIME | 15.83 | k, cm/sec | 2.4E-04 |
| INITIAL GW BELOW TOC | 7.55 | | |
| HO | 7.55 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 6.55 | 0.87 | 0 | 15 | 55 | 0.09 |
| 2 | 2 | 5.55 | 0.74 | 0 | 16 | 0 | 0.17 |
| 3 | 3 | 4.55 | 0.60 | 0 | 16 | 8 | 0.30 |
| 4 | 4 | 3.55 | 0.47 | 0 | 16 | 16 | 0.44 |
| 5 | 5 | 2.55 | 0.34 | 0 | 16 | 35 | 0.75 |


W=1
t=1 min
9
10
11
12
H/H0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
0.01
0.1
1.0
10
100
$10^{-2}$
$10^{-1}$
1
10
$10^2$
Time, minutes
W = Tt/r²
1
2
3
4
5
6
7
8
9
10

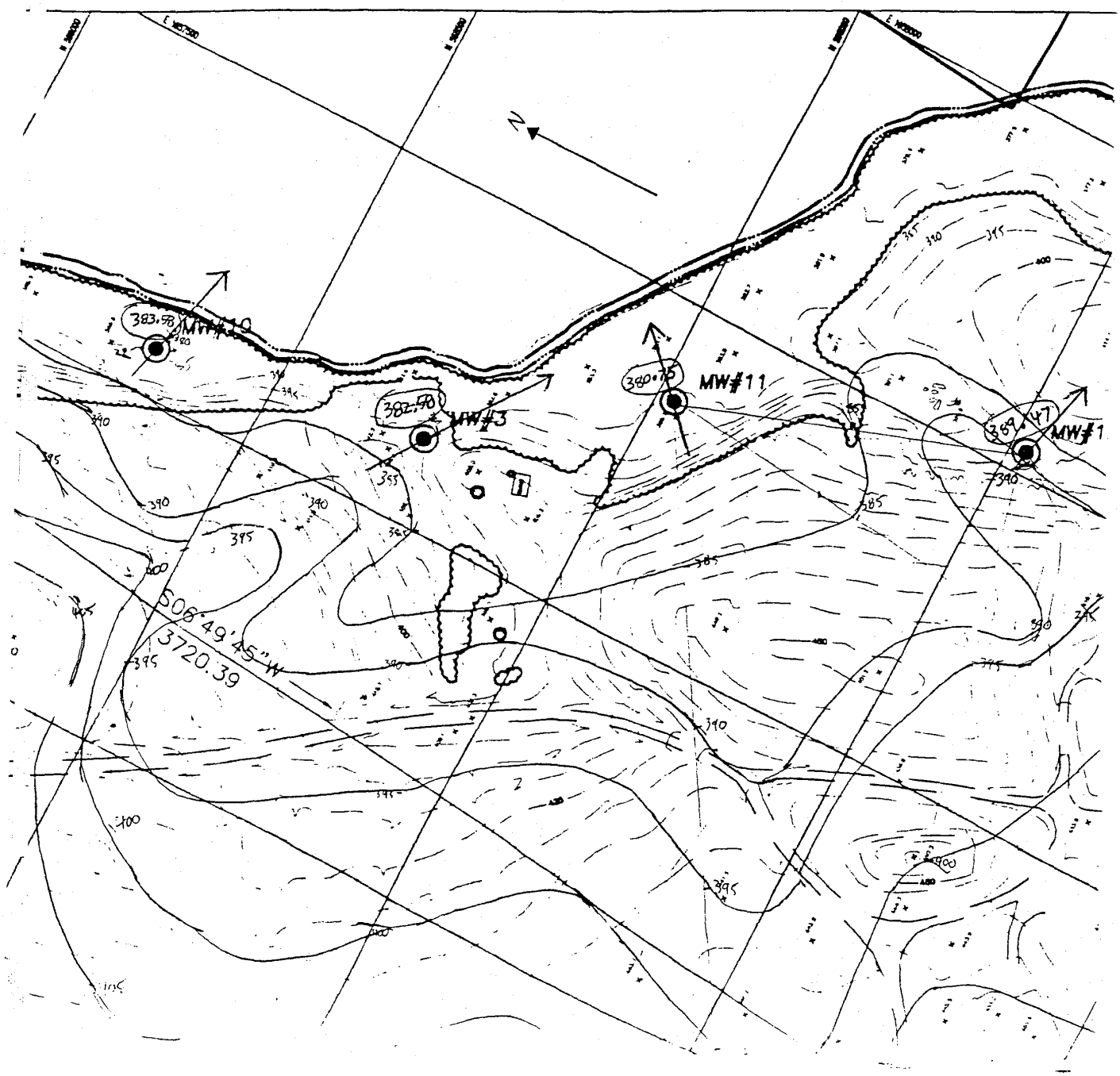
| | | |
|---|---|---|
| MW#8 | 1655475.76 | 568 |
| MW#9 | 1656883.02 | 569 |
| MW#10 | 1657073.47 | 568 |
| MW#11 | 1657356.36 | 567 |
| MW#12 | 1657534.73 | 567 |

0 200 ft

Scale 1" = 200'

MW# 11

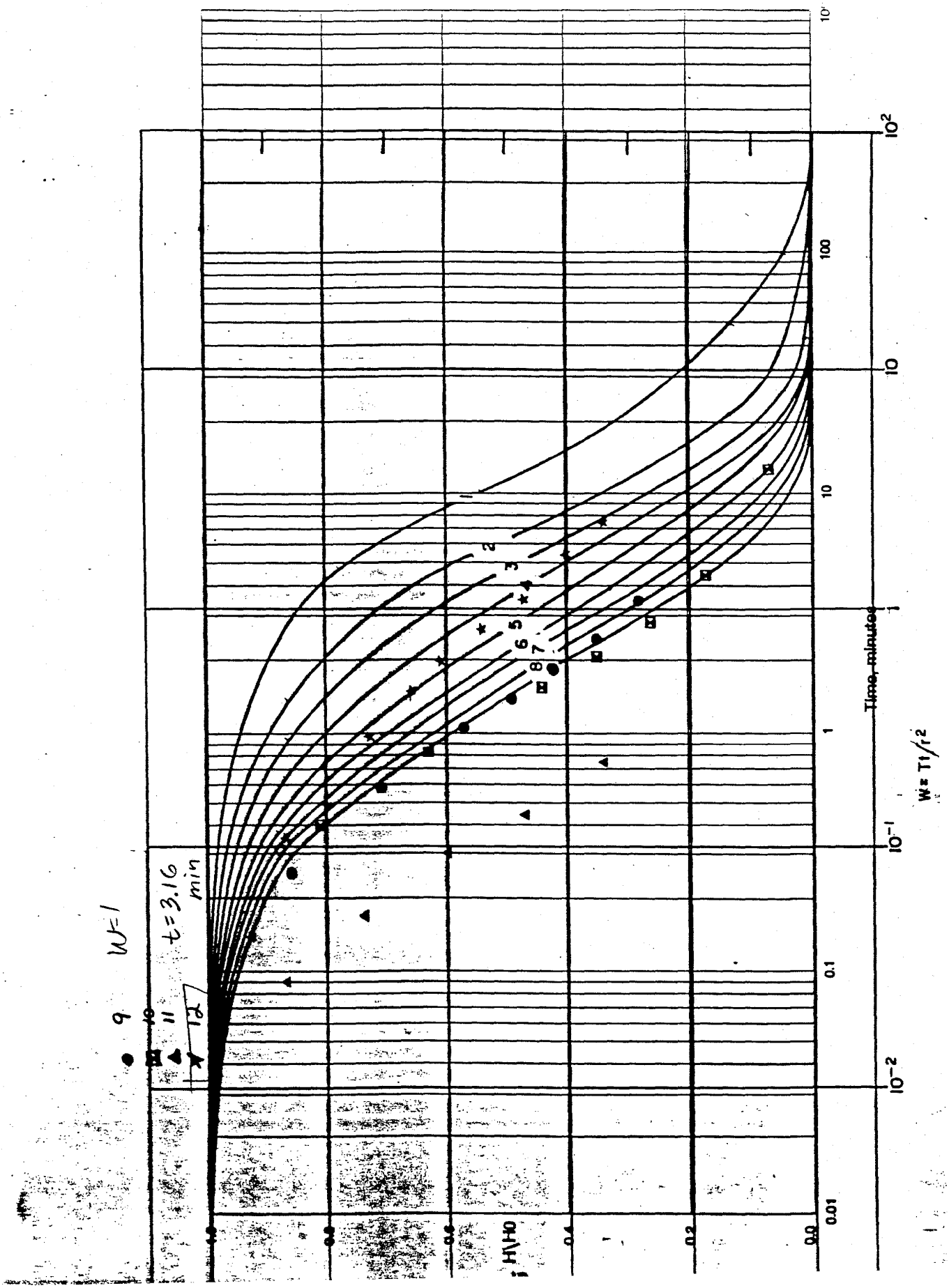
$i = \frac{15}{690}$ N47°E



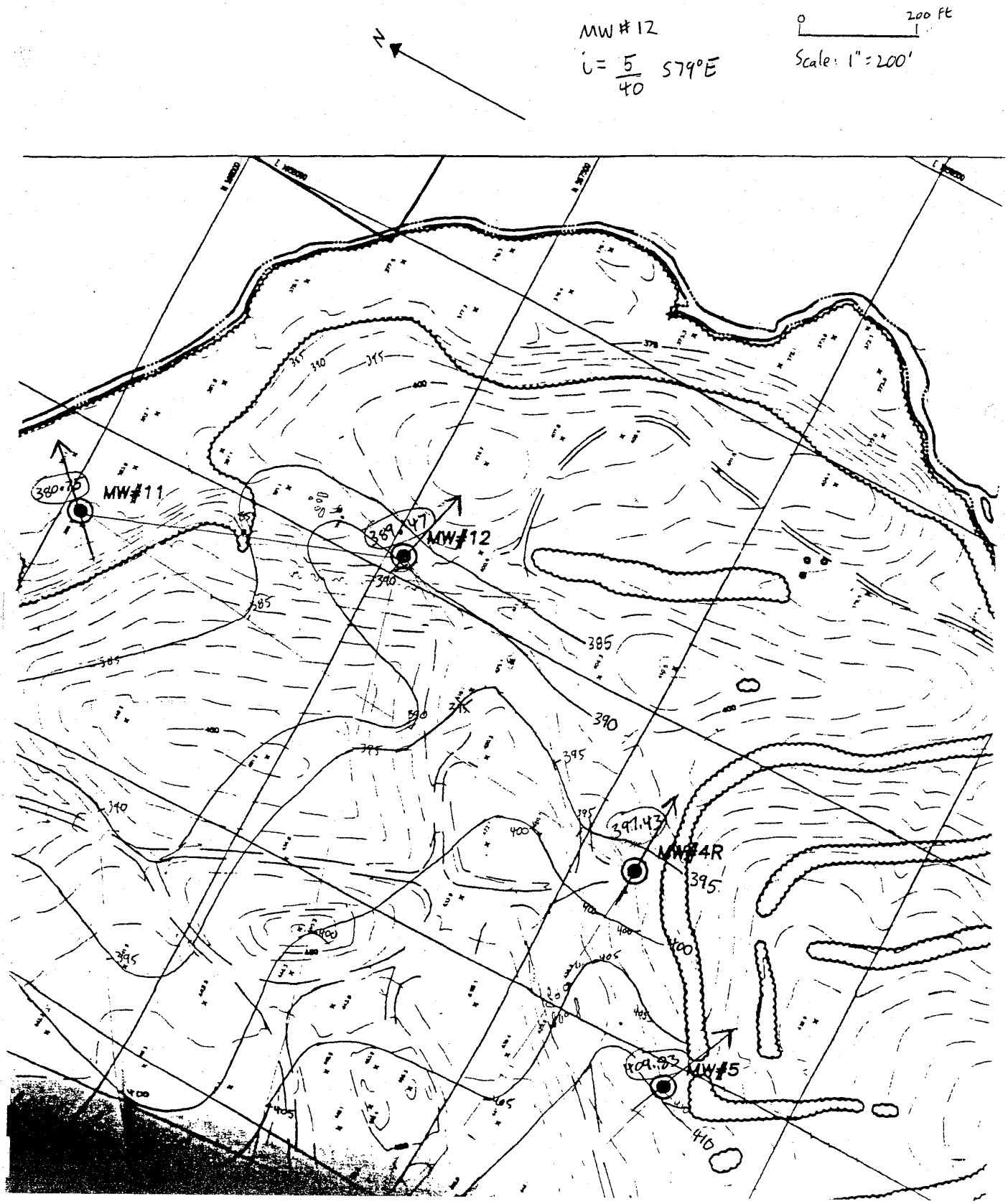
SLUG TEST MW12 ALBEMARLE

| | | | |
|---|---|---|---|
| DEPTH TO GW | 12.2 | RADIUS, in. | 1 |
| HT OF STICKUP | 3 | WET SCREEN, ft | 15 |
| INITIAL GW READING | 0 | t, min | 3.16 |
| INITIAL TIME | 24.03 | k, cm/sec | 7.4E-05 |
| INITIAL GW BELOW TOC | 15.2 | | |
| HO | 15.2 | | |

| GW READING | DH | H | H/HO | HOUR | MIN | SEC | TIME |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 14.2 | 0.93 | 0 | 24 | 10 | 0.14 |
| 2 | 2 | 13.2 | 0.87 | 0 | 24 | 23 | 0.35 |
| 3 | 3 | 12.2 | 0.80 | 0 | 24 | 31 | 0.49 |
| 4.1 | 4.1 | 11.1 | 0.73 | 0 | 25 | 0 | 0.97 |
| 5.2 | 5.2 | 10 | 0.66 | 0 | 25 | 32 | 1.50 |
| 6 | 6 | 9.2 | 0.61 | 0 | 26 | 0 | 1.97 |
| 7 | 7 | 8.2 | 0.54 | 0 | 26 | 40 | 2.64 |
| 8 | 8 | 7.2 | 0.47 | 0 | 27 | 31 | 3.49 |
| 9.1 | 9.1 | 6.1 | 0.40 | 0 | 29 | 26 | 5.40 |
| 10 | 10 | 5.2 | 0.34 | 0 | 31 | 27 | 7.42 |


Time, minutes
W = Tt/r²
H/H₀
1
2
3
4
5
6
7
8
9
10
11
12
W=1
t=3.16 min

| | | | | |
|---|---|---|---|---|
| MW#11 | 1657356.36 | 567971.52 | 386.78 | 384.40 |
| MW#12 | 1657534.73 | 567474.43 | 400.73 | 398.07 |



Slug Test MW-8D

| | | | |
|---|---|---|---|
| Initial offset in logger reading (feet): | 0.083 | Date: | 07/17/2007 |
| Offset increment in logger reading (feet/sec): | 0.000004 | | |
| Initial depth to water table (feet): | 51.9 | | |
| Depth of probe below water table (feet): | 0.000 | | |

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/17/2007 7:54:01 | 28441.5 | 0.0 | 9.99 | 9.903 | 9.9 | 0.99575 |
| 7/17/2007 7:56:01 | 28561.0 | 119.5 | 9.93 | 9.844 | 9.84 | 0.99318 |
| 7/17/2007 7:58:01 | 28681.5 | 240.0 | 9.85 | 9.768 | 9.77 | 0.98979 |
| 7/17/2007 8:00:01 | 28801.0 | 359.5 | 9.78 | 9.689 | 9.69 | 0.98629 |
| 7/17/2007 8:02:01 | 28921.5 | 480.0 | 9.7 | 9.617 | 9.62 | 0.98303 |
| 7/17/2007 8:04:01 | 29041.0 | 599.5 | 9.63 | 9.546 | 9.55 | 0.97984 |
| 7/17/2007 8:06:01 | 29161.5 | 720.0 | 9.56 | 9.477 | 9.48 | 0.97667 |
| 7/17/2007 8:08:01 | 29281.0 | 839.5 | 9.5 | 9.411 | 9.41 | 0.97366 |
| 7/17/2007 8:10:01 | 29401.5 | 960.0 | 9.44 | 9.347 | 9.35 | 0.97067 |
| 7/17/2007 8:12:01 | 29521.0 | 1079.5 | 9.37 | 9.285 | 9.28 | 0.96776 |
| 7/17/2007 8:14:01 | 29641.5 | 1200.0 | 9.31 | 9.223 | 9.22 | 0.96488 |
| 7/17/2007 8:16:01 | 29761.0 | 1319.5 | 9.25 | 9.165 | 9.16 | 0.96212 |
| 7/17/2007 8:18:01 | 29881.5 | 1440.0 | 9.2 | 9.108 | 9.11 | 0.95943 |
| 7/17/2007 8:20:01 | 30001.0 | 1559.5 | 9.14 | 9.052 | 9.05 | 0.95673 |
| 7/17/2007 8:22:01 | 30121.5 | 1680.0 | 9.09 | 8.996 | 9 | 0.95406 |
| 7/17/2007 8:24:01 | 30241.0 | 1799.5 | 9.04 | 8.944 | 8.94 | 0.95152 |
| 7/17/2007 8:26:01 | 30361.5 | 1920.0 | 8.98 | 8.891 | 8.89 | 0.94897 |
| 7/17/2007 8:28:01 | 30481.0 | 2039.5 | 8.93 | 8.839 | 8.84 | 0.94640 |
| 7/17/2007 8:30:01 | 30601.5 | 2160.0 | 8.88 | 8.789 | 8.79 | 0.94396 |
| 7/17/2007 8:32:01 | 30721.0 | 2279.5 | 8.84 | 8.743 | 8.74 | 0.94166 |
| 7/17/2007 8:34:01 | 30841.5 | 2400.0 | 8.79 | 8.697 | 8.7 | 0.93935 |
| 7/17/2007 8:36:01 | 30961.0 | 2519.5 | 8.75 | 8.652 | 8.65 | 0.93712 |
| 7/17/2007 8:38:01 | 31081.5 | 2640.0 | 8.71 | 8.612 | 8.61 | 0.93509 |
| 7/17/2007 8:40:01 | 31201.0 | 2759.5 | 8.66 | 8.568 | 8.57 | 0.93289 |
| 7/17/2007 8:42:01 | 31321.5 | 2880.0 | 8.62 | 8.526 | 8.53 | 0.93073 |
| 7/17/2007 8:44:01 | 31441.0 | 2999.5 | 8.58 | 8.483 | 8.48 | 0.92857 |
| 7/17/2007 8:46:01 | 31561.5 | 3120.0 | 8.54 | 8.442 | 8.44 | 0.92644 |
| 7/17/2007 8:48:01 | 31681.0 | 3239.5 | 8.5 | 8.403 | 8.4 | 0.92445 |
| 7/17/2007 8:50:01 | 31801.5 | 3360.0 | 8.46 | 8.361 | 8.36 | 0.92226 |
| 7/17/2007 8:52:01 | 31921.0 | 3479.5 | 8.42 | 8.324 | 8.32 | 0.92036 |
| 7/17/2007 8:54:01 | 32041.5 | 3600.0 | 8.38 | 8.286 | 8.29 | 0.91835 |
| 7/17/2007 8:56:01 | 32161.0 | 3719.5 | 8.35 | 8.249 | 8.25 | 0.91638 |
| 7/17/2007 8:58:01 | 32281.5 | 3840.0 | 8.31 | 8.211 | 8.21 | 0.91440 |
| 7/17/2007 9:00:01 | 32401.0 | 3959.5 | 8.28 | 8.176 | 8.18 | 0.91252 |
| 7/17/2007 9:02:01 | 32521.5 | 4080.0 | 8.24 | 8.140 | 8.14 | 0.91064 |
| 7/17/2007 9:04:01 | 32641.0 | 4199.5 | 8.21 | 8.107 | 8.11 | 0.90885 |
| 7/17/2007 9:06:01 | 32761.5 | 4320.0 | 8.17 | 8.070 | 8.07 | 0.90689 |
| 7/17/2007 9:08:01 | 32881.0 | 4439.5 | 8.14 | 8.034 | 8.03 | 0.90492 |
| 7/17/2007 9:10:01 | 33001.5 | 4560.0 | 8.1 | 7.998 | 8 | 0.90300 |
| 7/17/2007 9:12:01 | 33121.0 | 4679.5 | 8.06 | 7.962 | 7.96 | 0.90102 |
| 7/17/2007 9:14:01 | 33241.5 | 4800.0 | 8.03 | 7.931 | 7.93 | 0.89930 |
| 7/17/2007 9:16:01 | 33361.0 | 4919.5 | 8 | 7.895 | 7.9 | 0.89735 |
| 7/17/2007 9:18:01 | 33481.5 | 5040.0 | 7.97 | 7.867 | 7.87 | 0.89579 |
| 7/17/2007 9:20:01 | 33601.0 | 5159.5 | 7.94 | 7.833 | 7.83 | 0.89394 |

Slug Test MW-8D

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/17/2007 9:22:01 | 33721.5 | 5280.0 | 7.9 | 7.799 | 7.8 | 0.89202 |
| 7/17/2007 9:24:01 | 33841.0 | 5399.5 | 7.87 | 7.767 | 7.77 | 0.89027 |
| 7/17/2007 9:26:01 | 33961.5 | 5520.0 | 7.84 | 7.737 | 7.74 | 0.88856 |
| 7/17/2007 9:28:01 | 34081.0 | 5639.5 | 7.81 | 7.705 | 7.71 | 0.88679 |
| 7/17/2007 9:30:01 | 34201.5 | 5760.0 | 7.78 | 7.674 | 7.67 | 0.88501 |
| 7/17/2007 9:32:01 | 34321.0 | 5879.5 | 7.75 | 7.643 | 7.64 | 0.88329 |
| 7/17/2007 9:34:01 | 34441.5 | 6000.0 | 7.72 | 7.613 | 7.61 | 0.88155 |
| 7/17/2007 9:36:01 | 34561.0 | 6119.5 | 7.69 | 7.584 | 7.58 | 0.87987 |
| 7/17/2007 9:38:01 | 34681.5 | 6240.0 | 7.66 | 7.556 | 7.56 | 0.87830 |
| 7/17/2007 9:40:01 | 34801.0 | 6359.5 | 7.64 | 7.530 | 7.53 | 0.87677 |
| 7/17/2007 9:42:01 | 34921.5 | 6480.0 | 7.61 | 7.498 | 7.5 | 0.87495 |
| 7/17/2007 9:44:01 | 35041.0 | 6599.5 | 7.58 | 7.471 | 7.47 | 0.87336 |
| 7/17/2007 9:46:01 | 35161.5 | 6720.0 | 7.55 | 7.442 | 7.44 | 0.87170 |
| 7/17/2007 9:48:01 | 35281.0 | 6839.5 | 7.53 | 7.417 | 7.42 | 0.87022 |
| 7/17/2007 9:50:01 | 35401.5 | 6960.0 | 7.5 | 7.389 | 7.39 | 0.86861 |
| 7/17/2007 9:52:01 | 35521.0 | 7079.5 | 7.47 | 7.360 | 7.36 | 0.86687 |
| 7/17/2007 9:54:01 | 35641.5 | 7200.0 | 7.45 | 7.334 | 7.33 | 0.86537 |
| 7/17/2007 9:56:01 | 35761.0 | 7319.5 | 7.42 | 7.308 | 7.31 | 0.86380 |
| 7/17/2007 9:58:01 | 35881.5 | 7440.0 | 7.39 | 7.281 | 7.28 | 0.86216 |
| 7/17/2007 10:00:01 | 36001.0 | 7559.5 | 7.37 | 7.255 | 7.26 | 0.86064 |
| 7/17/2007 10:02:01 | 36121.5 | 7680.0 | 7.34 | 7.227 | 7.23 | 0.85894 |
| 7/17/2007 10:04:01 | 36241.0 | 7799.5 | 7.32 | 7.203 | 7.2 | 0.85752 |
| 7/17/2007 10:06:01 | 36361.5 | 7920.0 | 7.29 | 7.176 | 7.18 | 0.85587 |
| 7/17/2007 10:08:01 | 36481.0 | 8039.5 | 7.27 | 7.151 | 7.15 | 0.85438 |
| 7/17/2007 10:10:01 | 36601.5 | 8160.0 | 7.24 | 7.122 | 7.12 | 0.85259 |
| 7/17/2007 10:12:01 | 36721.0 | 8279.5 | 7.21 | 7.098 | 7.1 | 0.85116 |
| 7/17/2007 10:14:01 | 36841.5 | 8400.0 | 7.19 | 7.074 | 7.07 | 0.84966 |
| 7/17/2007 10:16:01 | 36961.0 | 8519.5 | 7.17 | 7.048 | 7.05 | 0.84809 |
| 7/17/2007 10:18:01 | 37081.5 | 8640.0 | 7.15 | 7.028 | 7.03 | 0.84683 |
| 7/17/2007 10:20:01 | 37201.0 | 8759.5 | 7.12 | 6.999 | 7 | 0.84501 |
| 7/17/2007 10:22:01 | 37321.5 | 8880.0 | 7.09 | 6.975 | 6.98 | 0.84355 |
| 7/17/2007 10:24:01 | 37441.0 | 8999.5 | 7.07 | 6.953 | 6.95 | 0.84215 |
| 7/17/2007 10:26:01 | 37561.5 | 9120.0 | 7.05 | 6.928 | 6.93 | 0.84062 |
| 7/17/2007 10:28:01 | 37681.0 | 9239.5 | 7.02 | 6.903 | 6.9 | 0.83902 |
| 7/17/2007 10:30:01 | 37801.5 | 9360.0 | 7 | 6.883 | 6.88 | 0.83779 |
| 7/17/2007 10:32:01 | 37921.0 | 9479.5 | 6.97 | 6.854 | 6.85 | 0.83593 |
| 7/17/2007 10:34:01 | 38041.5 | 9600.0 | 6.95 | 6.829 | 6.83 | 0.83438 |
| 7/17/2007 10:36:01 | 38161.0 | 9719.5 | 6.93 | 6.806 | 6.81 | 0.83289 |
| 7/17/2007 10:38:01 | 38281.5 | 9840.0 | 6.91 | 6.788 | 6.79 | 0.83177 |
| 7/17/2007 10:40:01 | 38401.0 | 9959.5 | 6.88 | 6.761 | 6.76 | 0.83001 |
| 7/17/2007 10:42:01 | 38521.5 | 10080.0 | 6.86 | 6.737 | 6.74 | 0.82844 |
| 7/17/2007 10:44:01 | 38641.0 | 10199.5 | 6.84 | 6.715 | 6.72 | 0.82705 |
| 7/17/2007 10:46:01 | 38761.5 | 10320.0 | 6.82 | 6.695 | 6.69 | 0.82573 |
| 7/17/2007 10:48:01 | 38881.0 | 10439.5 | 6.8 | 6.671 | 6.67 | 0.82420 |
| 7/17/2007 10:50:01 | 39001.5 | 10560.0 | 6.78 | 6.653 | 6.65 | 0.82300 |
| 7/17/2007 10:52:01 | 39121.0 | 10679.5 | 6.75 | 6.623 | 6.62 | 0.82107 |
| 7/17/2007 10:54:01 | 39241.5 | 10800.0 | 6.73 | 6.602 | 6.6 | 0.81966 |
| 7/17/2007 10:56:01 | 39361.0 | 10919.5 | 6.71 | 6.580 | 6.58 | 0.81825 |
| 7/17/2007 10:58:01 | 39481.5 | 11040.0 | 6.68 | 6.558 | 6.56 | 0.81677 |

Slug Test MW-8D

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/17/2007 11:00:01 | 39601.0 | 11159.5 | 6.66 | 6.537 | 6.54 | 0.81541 |
| 7/17/2007 11:02:01 | 39721.5 | 11280.0 | 6.64 | 6.516 | 6.52 | 0.81398 |
| 7/17/2007 11:04:01 | 39841.0 | 11399.5 | 6.62 | 6.491 | 6.49 | 0.81228 |
| 7/17/2007 11:06:01 | 39961.5 | 11520.0 | 6.6 | 6.471 | 6.47 | 0.81098 |
| 7/17/2007 11:08:01 | 40081.0 | 11639.5 | 6.58 | 6.453 | 6.45 | 0.80974 |
| 7/17/2007 11:10:01 | 40201.5 | 11760.0 | 6.56 | 6.429 | 6.43 | 0.80816 |
| 7/17/2007 11:12:01 | 40321.0 | 11879.5 | 6.54 | 6.411 | 6.41 | 0.80691 |
| 7/17/2007 11:14:01 | 40441.5 | 12000.0 | 6.52 | 6.389 | 6.39 | 0.80545 |
| 7/17/2007 11:16:01 | 40561.0 | 12119.5 | 6.5 | 6.374 | 6.37 | 0.80440 |
| 7/17/2007 11:18:01 | 40681.5 | 12240.0 | 6.48 | 6.351 | 6.35 | 0.80287 |
| 7/17/2007 11:20:01 | 40801.0 | 12359.5 | 6.46 | 6.324 | 6.32 | 0.80099 |
| 7/17/2007 11:22:01 | 40921.5 | 12480.0 | 6.44 | 6.305 | 6.31 | 0.79972 |
| 7/17/2007 11:24:01 | 41041.0 | 12599.5 | 6.42 | 6.286 | 6.29 | 0.79838 |
| 7/17/2007 11:26:01 | 41161.5 | 12720.0 | 6.4 | 6.265 | 6.26 | 0.79689 |
| 7/17/2007 11:30:01 | 41401.5 | 12960.0 | 6.36 | 6.226 | 6.23 | 0.79419 |
| 7/17/2007 11:32:01 | 41521.0 | 13079.5 | 6.34 | 6.204 | 6.2 | 0.79269 |
| 7/17/2007 11:34:01 | 41641.5 | 13200.0 | 6.32 | 6.187 | 6.19 | 0.79146 |
| 7/17/2007 11:36:01 | 41761.0 | 13319.5 | 6.3 | 6.165 | 6.17 | 0.78996 |
| 7/17/2007 11:38:01 | 41881.5 | 13440.0 | 6.29 | 6.151 | 6.15 | 0.78894 |
| 7/17/2007 11:40:01 | 42001.0 | 13559.5 | 6.27 | 6.132 | 6.13 | 0.78763 |
| 7/17/2007 11:42:01 | 42121.5 | 13680.0 | 6.24 | 6.107 | 6.11 | 0.78582 |
| 7/17/2007 11:44:01 | 42241.0 | 13799.5 | 6.22 | 6.087 | 6.09 | 0.78444 |
| 7/17/2007 11:46:01 | 42361.5 | 13920.0 | 6.21 | 6.073 | 6.07 | 0.78341 |
| 7/17/2007 11:48:01 | 42481.0 | 14039.5 | 6.2 | 6.058 | 6.06 | 0.78230 |
| 7/17/2007 11:50:01 | 42601.5 | 14160.0 | 6.17 | 6.034 | 6.03 | 0.78062 |
| 7/17/2007 11:52:01 | 42721.0 | 14279.5 | 6.16 | 6.020 | 6.02 | 0.77957 |
| 7/17/2007 11:54:01 | 42841.5 | 14400.0 | 6.13 | 5.995 | 6 | 0.77781 |
| 7/17/2007 11:58:01 | 43081.5 | 14640.0 | 6.1 | 5.961 | 5.96 | 0.77534 |
| 7/17/2007 12:00:01 | 43201.0 | 14759.5 | 6.08 | 5.942 | 5.94 | 0.77392 |
| 7/17/2007 12:02:01 | 43321.5 | 14880.0 | 6.07 | 5.924 | 5.92 | 0.77265 |
| 7/17/2007 12:04:01 | 43441.0 | 14999.5 | 6.05 | 5.908 | 5.91 | 0.77144 |
| 7/17/2007 12:06:01 | 43561.5 | 15120.0 | 6.03 | 5.893 | 5.89 | 0.77030 |
| 7/17/2007 12:08:01 | 43681.0 | 15239.5 | 6.02 | 5.875 | 5.88 | 0.76901 |
| 7/17/2007 12:10:01 | 43801.5 | 15360.0 | 6 | 5.856 | 5.86 | 0.76757 |
| 7/17/2007 12:12:01 | 43921.0 | 15479.5 | 5.98 | 5.838 | 5.84 | 0.76628 |
| 7/17/2007 12:14:01 | 44041.5 | 15600.0 | 5.97 | 5.823 | 5.82 | 0.76512 |
| 7/17/2007 12:16:01 | 44161.0 | 15719.5 | 5.95 | 5.802 | 5.8 | 0.76360 |
| 7/17/2007 12:18:01 | 44281.5 | 15840.0 | 5.93 | 5.787 | 5.79 | 0.76244 |
| 7/17/2007 12:22:01 | 44521.5 | 16080.0 | 5.9 | 5.757 | 5.76 | 0.76019 |
| 7/17/2007 12:24:01 | 44641.0 | 16199.5 | 5.88 | 5.738 | 5.74 | 0.75879 |
| 7/17/2007 12:26:01 | 44761.5 | 16320.0 | 5.87 | 5.724 | 5.72 | 0.75770 |
| 7/17/2007 12:28:01 | 44881.0 | 16439.5 | 5.84 | 5.697 | 5.7 | 0.75561 |
| 7/17/2007 12:32:01 | 45121.0 | 16679.5 | 5.82 | 5.671 | 5.67 | 0.75363 |
| 7/17/2007 12:34:01 | 45241.5 | 16800.0 | 5.79 | 5.645 | 5.65 | 0.75168 |
| 7/17/2007 12:36:01 | 45361.0 | 16919.5 | 5.78 | 5.632 | 5.63 | 0.75064 |
| 7/17/2007 12:38:01 | 45481.5 | 17040.0 | 5.77 | 5.617 | 5.62 | 0.74952 |
| 7/17/2007 12:40:01 | 45601.0 | 17159.5 | 5.75 | 5.603 | 5.6 | 0.74841 |
| 7/17/2007 12:42:01 | 45721.5 | 17280.0 | 5.73 | 5.583 | 5.58 | 0.74689 |
| 7/17/2007 12:46:01 | 45961.5 | 17520.0 | 5.71 | 5.557 | 5.56 | 0.74487 |

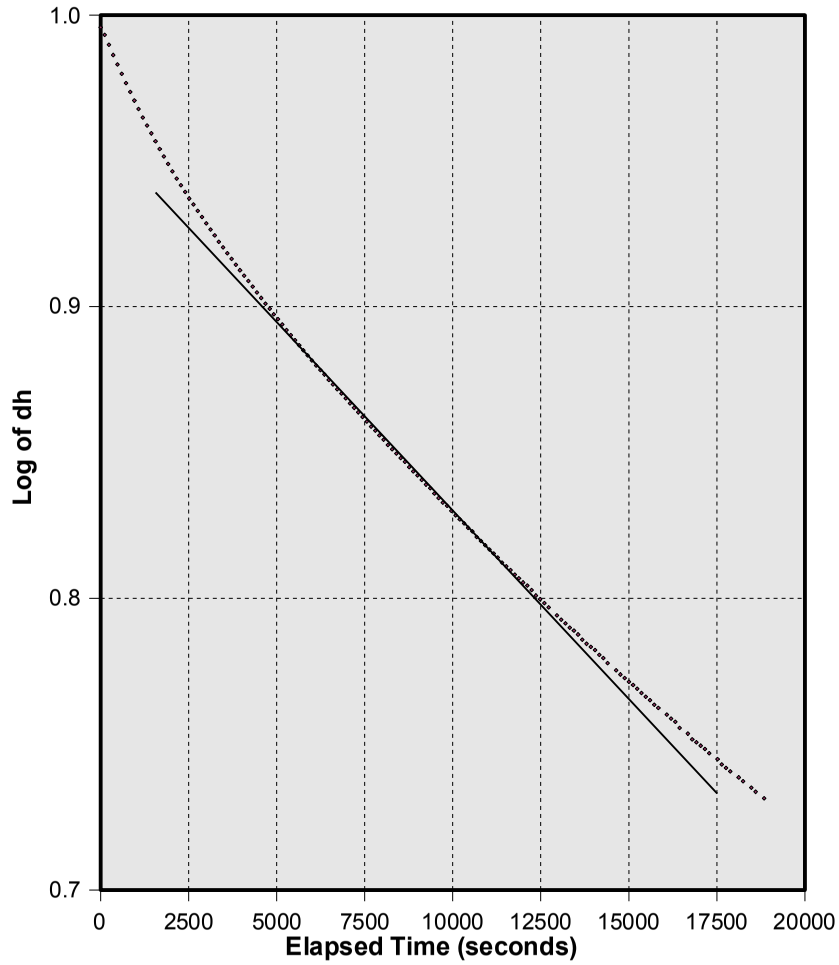
Slug Test MW-8D

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/17/2007 12:48:01 | 46081.0 | 17639.5 | 5.69 | 5.534 | 5.53 | 0.74304 |
| 7/17/2007 12:50:01 | 46201.5 | 17760.0 | 5.67 | 5.520 | 5.52 | 0.74190 |
| 7/17/2007 12:52:01 | 46321.0 | 17879.5 | 5.66 | 5.504 | 5.5 | 0.74068 |
| 7/17/2007 12:56:01 | 46561.0 | 18119.5 | 5.63 | 5.478 | 5.48 | 0.73864 |
| 7/17/2007 12:58:01 | 46681.5 | 18240.0 | 5.62 | 5.462 | 5.46 | 0.73733 |
| 7/17/2007 13:02:01 | 46921.5 | 18480.0 | 5.59 | 5.434 | 5.43 | 0.73510 |
| 7/17/2007 13:04:01 | 47041.0 | 18599.5 | 5.57 | 5.416 | 5.42 | 0.73371 |
| 7/17/2007 13:08:01 | 47281.0 | 18839.5 | 5.54 | 5.388 | 5.39 | 0.73146 |
| 7/17/2007 13:10:01 | 47401.5 | 18960.0 | 0.16 | 0.000 | | |

Slug Test MW-8D

**Slug Test by Bouwer and Rice**

| | | |
|---|---|---|
| **Displacement Method:** | Injection | |
| **Well depth:** | 75.90 | ft |
| **Stick up height:** | 2.57 | ft |
| **Depth to sand pack (BGS):** | 58.25 | ft |
| **Depth to screened interval (BGS):** | 60.90 | ft |
| **Well diameter:** | 2.00 | in |
| **Diameter of annular space:** | 6.00 | in |
| Initial depth to water table from top of pipe: | 51.90 | ft |
| **Initial Head Change:** | 9.90 | ft |
| Total well length: | 78.47 | ft |
| Radius of well casing: | 0.0833 | ft |
| Assumed porosity of sand/gravel pack: | 30% | |
| Adjusted radius of well casing: | 0.1537 | ft |
| $r_c$: | 0.0833 | ft |
| Radius of gravel pack ($r_w$): | 0.2500 | ft |
| Screened interval: | 15.00 | ft |
| Length of open section ($L_e$): | 15.00 | ft |
| $L_e$ / $r_w$: | 60.0000 | |
| **A (dimensionless):** | 3.472 | |
| **B (dimensionless):** | 0.581 | |
| **Drawdown at time = 0 ($y_0$):** | 7.96 | ft |
| **Drawdown at time = t ($y_t$):** | 6.32 | ft |
| **Elapsed Time between $y_0$ and $y_t$ (t):** | 7680 | sec |
| Initial water column in well ($L_w$): | 26.57 | ft |
| $\ln(R_e/r_w)$ = | 2.84 | |
| K = | 1.97E-08 | ft/sec |
| | **6.02E-07** | **cm/sec** |
| | 0.62 | ft/yr |




| | |
|---|---|
| Water above sand pack: | Yes |
| %Duration below sand pack: | 0.00% |
| Water above screen: | Yes |
| %Duration below screen: | 0.00% |

Slug Test MW-24

| | | | |
|---|---|---|---|
| Initial offset in logger reading (feet): | -0.020 | Date: | 07/16/2007 |
| Offset increment in logger reading (feet/sec): | 0.000007 | | |
| Initial depth to water table (feet): | 12.98 | | |
| Depth of probe below water table (feet): | 9.898 | | |

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 15:50:18 | 57018.5 | 0.0 | 4.37 | 4.386 | 5.511 | 0.74127 |
| 7/16/2007 15:50:19 | 57019.0 | 0.5 | 4.49 | 4.508 | 5.389 | 0.73155 |
| 7/16/2007 15:50:19 | 57019.5 | 1.0 | 4.43 | 4.443 | 5.455 | 0.73676 |
| 7/16/2007 15:50:20 | 57020.0 | 1.5 | 4.54 | 4.561 | 5.337 | 0.72726 |
| 7/16/2007 15:50:21 | 57021.0 | 2.5 | 4.62 | 4.638 | 5.260 | 0.72095 |
| 7/16/2007 15:50:23 | 57023.0 | 4.5 | 4.69 | 4.705 | 5.193 | 0.71538 |
| 7/16/2007 15:50:26 | 57026.0 | 7.5 | 4.76 | 4.776 | 5.122 | 0.70940 |
| 7/16/2007 15:50:29 | 57029.5 | 11.0 | 4.82 | 4.840 | 5.058 | 0.70394 |
| 7/16/2007 15:50:33 | 57033.5 | 15.0 | 4.88 | 4.902 | 4.996 | 0.69859 |
| 7/16/2007 15:50:38 | 57038.5 | 20.0 | 4.95 | 4.963 | 4.935 | 0.69325 |
| 7/16/2007 15:50:44 | 57044.0 | 25.5 | 5.02 | 5.039 | 4.859 | 0.68652 |
| 7/16/2007 15:50:50 | 57050.5 | 32.0 | 5.08 | 5.099 | 4.799 | 0.68112 |
| 7/16/2007 15:50:55 | 57055.5 | 37.0 | 5.14 | 5.156 | 4.742 | 0.67594 |
| 7/16/2007 15:51:01 | 57061.0 | 42.5 | 5.2 | 5.215 | 4.683 | 0.67050 |
| 7/16/2007 15:51:06 | 57066.0 | 47.5 | 5.25 | 5.270 | 4.628 | 0.66538 |
| 7/16/2007 15:51:11 | 57071.0 | 52.5 | 5.31 | 5.324 | 4.574 | 0.66028 |
| 7/16/2007 15:51:17 | 57077.0 | 58.5 | 5.37 | 5.383 | 4.515 | 0.65465 |
| 7/16/2007 15:51:23 | 57083.0 | 64.5 | 5.42 | 5.436 | 4.462 | 0.64952 |
| 7/16/2007 15:51:29 | 57089.5 | 71.0 | 5.47 | 5.490 | 4.408 | 0.64424 |
| 7/16/2007 15:51:36 | 57096.5 | 78.0 | 5.52 | 5.542 | 4.356 | 0.63909 |
| 7/16/2007 15:51:43 | 57103.5 | 85.0 | 5.57 | 5.592 | 4.306 | 0.63408 |
| 7/16/2007 15:51:51 | 57111.5 | 93.0 | 5.63 | 5.644 | 4.254 | 0.62881 |
| 7/16/2007 15:51:59 | 57119.5 | 101.0 | 5.68 | 5.694 | 4.204 | 0.62368 |
| 7/16/2007 15:52:08 | 57128.0 | 109.5 | 5.73 | 5.742 | 4.155 | 0.61860 |
| 7/16/2007 15:52:15 | 57135.5 | 117.0 | 5.77 | 5.790 | 4.107 | 0.61356 |
| 7/16/2007 15:52:24 | 57144.0 | 125.5 | 5.83 | 5.842 | 4.055 | 0.60803 |
| 7/16/2007 15:52:31 | 57151.5 | 133.0 | 5.87 | 5.889 | 4.008 | 0.60297 |
| 7/16/2007 15:52:40 | 57160.5 | 142.0 | 5.92 | 5.936 | 3.961 | 0.59786 |
| 7/16/2007 15:52:49 | 57169.5 | 151.0 | 5.97 | 5.983 | 3.915 | 0.59268 |
| 7/16/2007 15:52:58 | 57178.5 | 160.0 | 6.01 | 6.028 | 3.870 | 0.58766 |
| 7/16/2007 15:53:08 | 57188.0 | 169.5 | 6.06 | 6.075 | 3.823 | 0.58236 |
| 7/16/2007 15:53:18 | 57198.0 | 179.5 | 6.1 | 6.120 | 3.778 | 0.57723 |
| 7/16/2007 15:53:27 | 57207.0 | 188.5 | 6.15 | 6.165 | 3.733 | 0.57203 |
| 7/16/2007 15:53:37 | 57217.0 | 198.5 | 6.19 | 6.210 | 3.688 | 0.56677 |
| 7/16/2007 15:53:46 | 57226.5 | 208.0 | 6.24 | 6.254 | 3.644 | 0.56157 |
| 7/16/2007 15:53:55 | 57235.5 | 217.0 | 6.28 | 6.297 | 3.601 | 0.55642 |
| 7/16/2007 15:54:05 | 57245.0 | 226.5 | 6.32 | 6.339 | 3.559 | 0.55133 |
| 7/16/2007 15:54:14 | 57254.5 | 236.0 | 6.37 | 6.382 | 3.516 | 0.54606 |
| 7/16/2007 15:54:25 | 57265.5 | 247.0 | 6.41 | 6.424 | 3.474 | 0.54085 |
| 7/16/2007 15:54:36 | 57276.0 | 257.5 | 6.45 | 6.465 | 3.432 | 0.53558 |
| 7/16/2007 15:54:47 | 57287.5 | 269.0 | 6.49 | 6.507 | 3.390 | 0.53024 |
| 7/16/2007 15:54:58 | 57298.0 | 279.5 | 6.53 | 6.547 | 3.350 | 0.52510 |
| 7/16/2007 15:55:10 | 57310.0 | 291.5 | 6.57 | 6.587 | 3.310 | 0.51989 |
| 7/16/2007 15:55:17 | 57317.0 | 298.5 | 6.61 | 6.627 | 3.271 | 0.51462 |

Slug Test MW-24

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 15:55:38 | 57338.0 | 319.5 | 6.65 | 6.666 | 3.232 | 0.50943 |
| 7/16/2007 15:55:55 | 57355.5 | 337.0 | 6.69 | 6.706 | 3.192 | 0.50403 |
| 7/16/2007 15:56:11 | 57371.5 | 353.0 | 6.73 | 6.743 | 3.155 | 0.49899 |
| 7/16/2007 15:56:29 | 57389.0 | 370.5 | 6.76 | 6.780 | 3.118 | 0.49388 |
| 7/16/2007 15:56:47 | 57407.5 | 389.0 | 6.8 | 6.818 | 3.080 | 0.48857 |
| 7/16/2007 15:57:06 | 57426.5 | 408.0 | 6.84 | 6.854 | 3.043 | 0.48334 |
| 7/16/2007 15:57:24 | 57444.5 | 426.0 | 6.87 | 6.889 | 3.008 | 0.47834 |
| 7/16/2007 15:57:43 | 57463.5 | 445.0 | 6.91 | 6.924 | 2.974 | 0.47327 |
| 7/16/2007 15:58:02 | 57482.5 | 464.0 | 6.95 | 6.960 | 2.938 | 0.46800 |
| 7/16/2007 15:58:22 | 57502.5 | 484.0 | 6.98 | 6.995 | 2.903 | 0.46282 |
| 7/16/2007 15:58:42 | 57522.0 | 503.5 | 7.02 | 7.030 | 2.868 | 0.45757 |
| 7/16/2007 15:59:01 | 57541.0 | 522.5 | 7.05 | 7.063 | 2.835 | 0.45256 |
| 7/16/2007 15:59:22 | 57562.5 | 544.0 | 7.08 | 7.097 | 2.800 | 0.44719 |
| 7/16/2007 15:59:42 | 57582.5 | 564.0 | 7.12 | 7.130 | 2.767 | 0.44206 |
| 7/16/2007 16:00:04 | 57604.5 | 586.0 | 7.15 | 7.162 | 2.735 | 0.43704 |
| 7/16/2007 16:00:27 | 57627.5 | 609.0 | 7.18 | 7.195 | 2.703 | 0.43179 |
| 7/16/2007 16:00:51 | 57651.0 | 632.5 | 7.21 | 7.228 | 2.670 | 0.42648 |
| 7/16/2007 16:01:13 | 57673.0 | 654.5 | 7.25 | 7.259 | 2.639 | 0.42143 |
| 7/16/2007 16:01:36 | 57696.5 | 678.0 | 7.28 | 7.292 | 2.606 | 0.41599 |
| 7/16/2007 16:01:58 | 57718.0 | 699.5 | 7.31 | 7.321 | 2.576 | 0.41099 |
| 7/16/2007 16:02:22 | 57742.5 | 724.0 | 7.34 | 7.352 | 2.545 | 0.40576 |
| 7/16/2007 16:02:49 | 57769.0 | 750.5 | 7.37 | 7.383 | 2.515 | 0.40047 |
| 7/16/2007 16:03:13 | 57793.0 | 774.5 | 7.4 | 7.413 | 2.485 | 0.39529 |
| 7/16/2007 16:03:40 | 57820.5 | 802.0 | 7.43 | 7.444 | 2.454 | 0.38987 |
| 7/16/2007 16:04:04 | 57844.5 | 826.0 | 7.46 | 7.474 | 2.424 | 0.38456 |
| 7/16/2007 16:04:31 | 57871.0 | 852.5 | 7.49 | 7.502 | 2.395 | 0.37936 |
| 7/16/2007 16:04:59 | 57899.5 | 881.0 | 7.52 | 7.530 | 2.368 | 0.37429 |
| 7/16/2007 16:05:28 | 57928.0 | 909.5 | 7.55 | 7.558 | 2.340 | 0.36916 |
| 7/16/2007 16:05:53 | 57953.0 | 934.5 | 7.58 | 7.587 | 2.311 | 0.36377 |
| 7/16/2007 16:06:20 | 57980.0 | 961.5 | 7.6 | 7.615 | 2.283 | 0.35852 |
| 7/16/2007 16:06:50 | 58010.5 | 992.0 | 7.63 | 7.642 | 2.255 | 0.35320 |
| 7/16/2007 16:07:23 | 58043.0 | 1024.5 | 7.66 | 7.671 | 2.226 | 0.34762 |
| 7/16/2007 16:07:53 | 58073.5 | 1055.0 | 7.69 | 7.697 | 2.201 | 0.34256 |
| 7/16/2007 16:08:25 | 58105.0 | 1086.5 | 7.71 | 7.723 | 2.175 | 0.33744 |
| 7/16/2007 16:08:59 | 58139.0 | 1120.5 | 7.74 | 7.749 | 2.149 | 0.33226 |
| 7/16/2007 16:09:29 | 58169.5 | 1151.0 | 7.76 | 7.774 | 2.123 | 0.32702 |
| 7/16/2007 16:09:59 | 58199.5 | 1181.0 | 7.79 | 7.799 | 2.099 | 0.32192 |
| 7/16/2007 16:10:33 | 58233.5 | 1215.0 | 7.82 | 7.826 | 2.072 | 0.31634 |
| 7/16/2007 16:11:12 | 58272.0 | 1253.5 | 7.84 | 7.851 | 2.047 | 0.31113 |
| 7/16/2007 16:11:44 | 58304.0 | 1285.5 | 7.87 | 7.874 | 2.023 | 0.30605 |
| 7/16/2007 16:12:18 | 58338.0 | 1319.5 | 7.89 | 7.898 | 1.999 | 0.30092 |
| 7/16/2007 16:12:51 | 58371.0 | 1352.5 | 7.91 | 7.922 | 1.976 | 0.29572 |
| 7/16/2007 16:13:28 | 58408.0 | 1389.5 | 7.94 | 7.945 | 1.953 | 0.29069 |
| 7/16/2007 16:14:07 | 58447.0 | 1428.5 | 7.96 | 7.968 | 1.929 | 0.28538 |
| 7/16/2007 16:14:44 | 58484.0 | 1465.5 | 7.98 | 7.992 | 1.905 | 0.28001 |
| 7/16/2007 16:15:25 | 58525.5 | 1507.0 | 8.01 | 8.015 | 1.883 | 0.27480 |
| 7/16/2007 16:15:59 | 58559.0 | 1540.5 | 8.03 | 8.037 | 1.861 | 0.26975 |
| 7/16/2007 16:16:41 | 58601.0 | 1582.5 | 8.05 | 8.059 | 1.838 | 0.26441 |
| 7/16/2007 16:17:22 | 58642.0 | 1623.5 | 8.07 | 8.081 | 1.817 | 0.25925 |

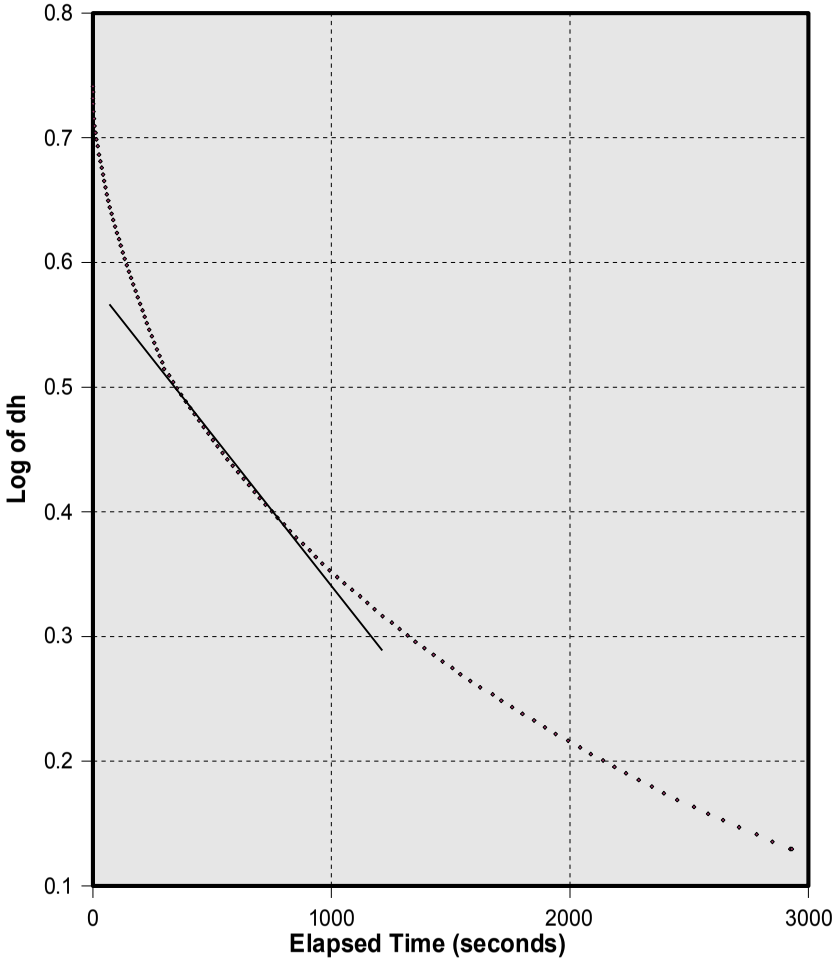
Slug Test MW-24

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 16:18:14 | 58694.5 | 1676.0 | 8.1 | 8.105 | 1.793 | 0.25356 |
| 7/16/2007 16:18:51 | 58731.0 | 1712.5 | 8.12 | 8.126 | 1.772 | 0.24850 |
| 7/16/2007 16:19:36 | 58776.0 | 1757.5 | 8.14 | 8.146 | 1.751 | 0.24340 |
| 7/16/2007 16:20:19 | 58819.5 | 1801.0 | 8.16 | 8.168 | 1.730 | 0.23799 |
| 7/16/2007 16:21:08 | 58868.5 | 1850.0 | 8.18 | 8.189 | 1.709 | 0.23277 |
| 7/16/2007 16:21:54 | 58914.0 | 1895.5 | 8.21 | 8.210 | 1.687 | 0.22722 |
| 7/16/2007 16:22:38 | 58958.5 | 1940.0 | 8.23 | 8.231 | 1.667 | 0.22186 |
| 7/16/2007 16:23:31 | 59011.5 | 1993.0 | 8.25 | 8.252 | 1.646 | 0.21645 |
| 7/16/2007 16:24:21 | 59061.5 | 2043.0 | 8.27 | 8.272 | 1.625 | 0.21097 |
| 7/16/2007 16:25:06 | 59106.0 | 2087.5 | 8.29 | 8.292 | 1.606 | 0.20567 |
| 7/16/2007 16:25:57 | 59157.5 | 2139.0 | 8.31 | 8.311 | 1.587 | 0.20060 |
| 7/16/2007 16:26:45 | 59205.0 | 2186.5 | 8.33 | 8.329 | 1.568 | 0.19546 |
| 7/16/2007 16:27:34 | 59254.0 | 2235.5 | 8.35 | 8.348 | 1.550 | 0.19026 |
| 7/16/2007 16:28:27 | 59307.0 | 2288.5 | 8.36 | 8.367 | 1.531 | 0.18500 |
| 7/16/2007 16:29:22 | 59362.0 | 2343.5 | 8.38 | 8.385 | 1.512 | 0.17969 |
| 7/16/2007 16:30:12 | 59412.5 | 2394.0 | 8.4 | 8.404 | 1.494 | 0.17430 |
| 7/16/2007 16:31:08 | 59468.5 | 2450.0 | 8.42 | 8.422 | 1.475 | 0.16885 |
| 7/16/2007 16:32:19 | 59539.0 | 2520.5 | 8.44 | 8.441 | 1.457 | 0.16336 |
| 7/16/2007 16:33:18 | 59598.5 | 2580.0 | 8.46 | 8.460 | 1.438 | 0.15778 |
| 7/16/2007 16:34:21 | 59661.0 | 2642.5 | 8.48 | 8.476 | 1.422 | 0.15275 |
| 7/16/2007 16:35:28 | 59728.0 | 2709.5 | 8.5 | 8.495 | 1.403 | 0.14705 |
| 7/16/2007 16:36:41 | 59801.5 | 2783.0 | 8.51 | 8.513 | 1.384 | 0.14128 |
| 7/16/2007 16:37:47 | 59867.5 | 2849.0 | 8.53 | 8.532 | 1.366 | 0.13542 |
| 7/16/2007 16:39:03 | 59943.0 | 2924.5 | 8.55 | 8.550 | 1.347 | 0.12951 |
| 7/16/2007 16:39:08 | 59948.5 | 2930.0 | 8.55 | 8.550 | 1.347 | 0.12952 |

Slug Test MW-24

**Slug Test by Bouwer and Rice**

| | | |
|---|---|---|
| **Displacement Method:** | Injection | |
| **Well depth:** | 21.25 | ft |
| **Stick up height:** | 3.00 | ft |
| **Depth to sand pack (BGS):** | 6.00 | ft |
| **Depth to screened interval (BGS):** | 6.25 | ft |
| **Well diameter:** | 2.00 | in |
| **Diameter of annular space:** | 6.00 | in |
| Initial depth to water table from top of pipe: | 12.98 | ft |
| **Initial Head Change:** | 5.51 | ft |
| Total well length: | 24.25 | ft |
| Radius of well casing: | 0.0833 | ft |
| Assumed porosity of sand/gravel pack: | 30% | |
| Adjusted radius of well casing: | 0.1537 | ft |
| $r_c$: | 0.0833 | ft |
| Radius of gravel pack ($r_w$): | 0.2500 | ft |
| Screened interval: | 15.00 | ft |
| Length of open section ($L_e$): | 11.27 | ft |
| $L_e$ / $r_w$: | 45.0800 | |
| **A (dimensionless):** | 3.034 | |
| **B (dimensionless):** | 0.507 | |
| **Drawdown at time = 0 ($y_0$):** | 3.32 | ft |
| **Drawdown at time = t ($y_t$):** | 2.48 | ft |
| **Elapsed Time between $y_0$ and $y_t$ (t):** | 487.5 | sec |
| Initial water column in well ($L_w$): | 11.27 | ft |
| $\ln(R_e/r_w)$ = | 2.36 | |
| K = | 4.31E-07 | ft/sec |
| | **1.32E-05** | **cm/sec** |
| | 13.61 | ft/yr |




| | |
|---|---|
| Water above sand pack: | No |
| %Duration below sand pack: | 27.79% |
| Water above screen: | No |
| %Duration below screen: | 32.32% |

Slug Test MW-25

| | | | |
|---|---|---|---|
| Initial offset in logger reading (feet): | -0.012 | Date: | 07/16/2007 |
| Offset increment in logger reading (feet/sec): | 0.000001 | | |
| Initial depth to water table (feet): | 10.92 | | |
| Depth of probe below water table (feet): | 8.202 | | |

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 12:36:10 | 45370.5 | 0.0 | 2.34 | 2.351 | 5.852 | 0.76728 |
| 7/16/2007 12:36:11 | 45371.0 | 0.5 | 2.42 | 2.428 | 5.775 | 0.76153 |
| 7/16/2007 12:36:12 | 45372.0 | 1.5 | 2.49 | 2.504 | 5.699 | 0.75577 |
| 7/16/2007 12:36:13 | 45373.0 | 2.5 | 2.59 | 2.598 | 5.605 | 0.74855 |
| 7/16/2007 12:36:14 | 45374.5 | 4.0 | 2.67 | 2.681 | 5.522 | 0.74207 |
| 7/16/2007 12:36:16 | 45376.0 | 5.5 | 2.74 | 2.749 | 5.454 | 0.73669 |
| 7/16/2007 12:36:17 | 45377.5 | 7.0 | 2.8 | 2.815 | 5.388 | 0.73140 |
| 7/16/2007 12:36:19 | 45379.5 | 9.0 | 2.88 | 2.888 | 5.315 | 0.72547 |
| 7/16/2007 12:36:23 | 45383.5 | 13.0 | 2.94 | 2.954 | 5.249 | 0.72005 |
| 7/16/2007 12:36:31 | 45391.5 | 21.0 | 3.01 | 3.018 | 5.185 | 0.71472 |
| 7/16/2007 12:36:38 | 45398.5 | 28.0 | 3.07 | 3.082 | 5.121 | 0.70933 |
| 7/16/2007 12:36:45 | 45405.5 | 35.0 | 3.13 | 3.143 | 5.060 | 0.70412 |
| 7/16/2007 12:36:53 | 45413.0 | 42.5 | 3.19 | 3.205 | 4.998 | 0.69877 |
| 7/16/2007 12:37:00 | 45420.0 | 49.5 | 3.25 | 3.264 | 4.939 | 0.69361 |
| 7/16/2007 12:37:08 | 45428.0 | 57.5 | 3.31 | 3.323 | 4.880 | 0.68839 |
| 7/16/2007 12:37:15 | 45435.5 | 65.0 | 3.37 | 3.379 | 4.824 | 0.68338 |
| 7/16/2007 12:37:23 | 45443.5 | 73.0 | 3.42 | 3.436 | 4.767 | 0.67822 |
| 7/16/2007 12:37:31 | 45451.0 | 80.5 | 3.48 | 3.492 | 4.711 | 0.67309 |
| 7/16/2007 12:37:39 | 45459.0 | 88.5 | 3.54 | 3.547 | 4.656 | 0.66799 |
| 7/16/2007 12:37:48 | 45468.0 | 97.5 | 3.59 | 3.603 | 4.600 | 0.66273 |
| 7/16/2007 12:37:57 | 45477.5 | 107.0 | 3.65 | 3.660 | 4.543 | 0.65732 |
| 7/16/2007 12:38:06 | 45486.0 | 115.5 | 3.7 | 3.714 | 4.489 | 0.65212 |
| 7/16/2007 12:38:16 | 45496.0 | 125.5 | 3.76 | 3.768 | 4.435 | 0.64687 |
| 7/16/2007 12:38:26 | 45506.5 | 136.0 | 3.81 | 3.820 | 4.383 | 0.64175 |
| 7/16/2007 12:38:36 | 45516.5 | 146.0 | 3.86 | 3.872 | 4.331 | 0.63656 |
| 7/16/2007 12:38:48 | 45528.0 | 157.5 | 3.91 | 3.924 | 4.279 | 0.63132 |
| 7/16/2007 12:39:00 | 45540.0 | 169.5 | 3.96 | 3.972 | 4.230 | 0.62632 |
| 7/16/2007 12:39:12 | 45552.5 | 182.0 | 4.01 | 4.022 | 4.180 | 0.62115 |
| 7/16/2007 12:39:25 | 45565.0 | 194.5 | 4.06 | 4.071 | 4.131 | 0.61603 |
| 7/16/2007 12:39:39 | 45579.0 | 208.5 | 4.11 | 4.121 | 4.081 | 0.61074 |
| 7/16/2007 12:39:55 | 45595.5 | 225.0 | 4.16 | 4.168 | 4.034 | 0.60571 |
| 7/16/2007 12:40:10 | 45610.5 | 240.0 | 4.2 | 4.215 | 3.987 | 0.60062 |
| 7/16/2007 12:40:27 | 45627.5 | 257.0 | 4.25 | 4.262 | 3.940 | 0.59548 |
| 7/16/2007 12:40:44 | 45644.5 | 274.0 | 4.3 | 4.309 | 3.893 | 0.59026 |
| 7/16/2007 12:41:02 | 45662.0 | 291.5 | 4.34 | 4.354 | 3.848 | 0.58522 |
| 7/16/2007 12:41:19 | 45679.5 | 309.0 | 4.39 | 4.401 | 3.801 | 0.57988 |
| 7/16/2007 12:41:37 | 45697.5 | 327.0 | 4.44 | 4.446 | 3.756 | 0.57471 |
| 7/16/2007 12:41:56 | 45716.0 | 345.5 | 4.48 | 4.490 | 3.712 | 0.56959 |
| 7/16/2007 12:42:13 | 45733.5 | 363.0 | 4.52 | 4.533 | 3.669 | 0.56453 |
| 7/16/2007 12:42:33 | 45753.5 | 383.0 | 4.57 | 4.577 | 3.625 | 0.55930 |
| 7/16/2007 12:42:52 | 45772.5 | 402.0 | 4.61 | 4.620 | 3.582 | 0.55411 |
| 7/16/2007 12:43:11 | 45791.5 | 421.0 | 4.65 | 4.662 | 3.540 | 0.54899 |
| 7/16/2007 12:43:32 | 45812.0 | 441.5 | 4.69 | 4.705 | 3.497 | 0.54369 |
| 7/16/2007 12:43:54 | 45834.5 | 464.0 | 4.74 | 4.747 | 3.455 | 0.53844 |

Slug Test MW-25

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 12:44:16 | 45856.0 | 485.5 | 4.78 | 4.787 | 3.415 | 0.53339 |
| 7/16/2007 12:44:37 | 45877.0 | 506.5 | 4.82 | 4.827 | 3.375 | 0.52827 |
| 7/16/2007 12:45:02 | 45902.0 | 531.5 | 4.86 | 4.870 | 3.332 | 0.52270 |
| 7/16/2007 12:45:27 | 45927.5 | 557.0 | 4.9 | 4.910 | 3.292 | 0.51746 |
| 7/16/2007 12:45:51 | 45951.5 | 581.0 | 4.94 | 4.948 | 3.254 | 0.51242 |
| 7/16/2007 12:46:17 | 45977.5 | 607.0 | 4.98 | 4.988 | 3.214 | 0.50705 |
| 7/16/2007 12:46:43 | 46003.0 | 632.5 | 5.01 | 5.025 | 3.177 | 0.50203 |
| 7/16/2007 12:47:09 | 46029.5 | 659.0 | 5.05 | 5.063 | 3.139 | 0.49680 |
| 7/16/2007 12:47:36 | 46056.5 | 686.0 | 5.09 | 5.101 | 3.101 | 0.49152 |
| 7/16/2007 12:48:06 | 46086.0 | 715.5 | 5.13 | 5.138 | 3.064 | 0.48631 |
| 7/16/2007 12:48:32 | 46112.5 | 742.0 | 5.16 | 5.174 | 3.028 | 0.48118 |
| 7/16/2007 12:49:00 | 46140.0 | 769.5 | 5.2 | 5.209 | 2.993 | 0.47613 |
| 7/16/2007 12:49:30 | 46170.0 | 799.5 | 5.23 | 5.245 | 2.957 | 0.47088 |
| 7/16/2007 12:49:59 | 46199.0 | 828.5 | 5.27 | 5.280 | 2.922 | 0.46571 |
| 7/16/2007 12:50:22 | 46222.0 | 851.5 | 5.3 | 5.315 | 2.887 | 0.46048 |
| 7/16/2007 12:50:54 | 46254.5 | 884.0 | 5.34 | 5.351 | 2.851 | 0.45503 |
| 7/16/2007 12:51:23 | 46283.5 | 913.0 | 5.37 | 5.384 | 2.818 | 0.44998 |
| 7/16/2007 12:51:56 | 46316.5 | 946.0 | 5.41 | 5.417 | 2.785 | 0.44487 |
| 7/16/2007 12:52:31 | 46351.0 | 980.5 | 5.44 | 5.450 | 2.752 | 0.43970 |
| 7/16/2007 12:53:05 | 46385.0 | 1014.5 | 5.47 | 5.483 | 2.719 | 0.43446 |
| 7/16/2007 12:53:42 | 46422.0 | 1051.5 | 5.51 | 5.516 | 2.686 | 0.42916 |
| 7/16/2007 12:54:22 | 46462.0 | 1091.5 | 5.54 | 5.549 | 2.653 | 0.42380 |
| 7/16/2007 12:54:58 | 46498.0 | 1127.5 | 5.57 | 5.582 | 2.620 | 0.41837 |
| 7/16/2007 12:55:37 | 46537.5 | 1167.0 | 5.6 | 5.615 | 2.587 | 0.41287 |
| 7/16/2007 12:56:17 | 46577.0 | 1206.5 | 5.63 | 5.645 | 2.557 | 0.40781 |
| 7/16/2007 12:56:56 | 46616.5 | 1246.0 | 5.67 | 5.676 | 2.526 | 0.40252 |
| 7/16/2007 12:57:41 | 46661.5 | 1291.0 | 5.7 | 5.707 | 2.496 | 0.39716 |
| 7/16/2007 12:58:20 | 46700.0 | 1329.5 | 5.73 | 5.737 | 2.466 | 0.39191 |
| 7/16/2007 12:59:02 | 46742.5 | 1372.0 | 5.76 | 5.766 | 2.437 | 0.38678 |
| 7/16/2007 12:59:45 | 46785.0 | 1414.5 | 5.78 | 5.794 | 2.409 | 0.38176 |
| 7/16/2007 13:00:23 | 46823.5 | 1453.0 | 5.81 | 5.822 | 2.381 | 0.37669 |
| 7/16/2007 13:01:07 | 46867.5 | 1497.0 | 5.84 | 5.851 | 2.352 | 0.37137 |
| 7/16/2007 13:01:52 | 46912.5 | 1542.0 | 5.87 | 5.879 | 2.324 | 0.36618 |
| 7/16/2007 13:02:38 | 46958.0 | 1587.5 | 5.9 | 5.907 | 2.296 | 0.36092 |
| 7/16/2007 13:03:25 | 47005.5 | 1635.0 | 5.93 | 5.936 | 2.267 | 0.35540 |
| 7/16/2007 13:04:22 | 47062.5 | 1692.0 | 5.95 | 5.963 | 2.239 | 0.35001 |
| 7/16/2007 13:05:09 | 47109.5 | 1739.0 | 5.98 | 5.989 | 2.213 | 0.34494 |
| 7/16/2007 13:06:03 | 47163.0 | 1792.5 | 6.01 | 6.015 | 2.187 | 0.33982 |
| 7/16/2007 13:06:57 | 47217.5 | 1847.0 | 6.03 | 6.041 | 2.161 | 0.33463 |
| 7/16/2007 13:07:51 | 47271.5 | 1901.0 | 6.06 | 6.067 | 2.135 | 0.32938 |
| 7/16/2007 13:08:52 | 47332.0 | 1961.5 | 6.08 | 6.093 | 2.109 | 0.32407 |
| 7/16/2007 13:09:42 | 47382.0 | 2011.5 | 6.11 | 6.119 | 2.083 | 0.31869 |
| 7/16/2007 13:10:35 | 47435.0 | 2064.5 | 6.14 | 6.145 | 2.057 | 0.31324 |
| 7/16/2007 13:11:37 | 47497.0 | 2126.5 | 6.16 | 6.171 | 2.031 | 0.30772 |
| 7/16/2007 13:12:36 | 47556.5 | 2186.0 | 6.19 | 6.197 | 2.005 | 0.30214 |
| 7/16/2007 13:13:39 | 47619.0 | 2248.5 | 6.21 | 6.220 | 1.982 | 0.29714 |
| 7/16/2007 13:14:35 | 47675.0 | 2304.5 | 6.23 | 6.244 | 1.958 | 0.29185 |
| 7/16/2007 13:15:40 | 47740.5 | 2370.0 | 6.26 | 6.268 | 1.934 | 0.28651 |
| 7/16/2007 13:16:43 | 47803.5 | 2433.0 | 6.28 | 6.291 | 1.911 | 0.28132 |

Slug Test MW-25

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 13:17:47 | 47867.5 | 2497.0 | 6.3 | 6.313 | 1.889 | 0.27630 |
| 7/16/2007 13:18:45 | 47925.0 | 2554.5 | 6.33 | 6.336 | 1.866 | 0.27099 |
| 7/16/2007 13:19:45 | 47985.5 | 2615.0 | 6.35 | 6.360 | 1.842 | 0.26538 |
| 7/16/2007 13:20:50 | 48050.5 | 2680.0 | 6.37 | 6.383 | 1.819 | 0.25994 |
| 7/16/2007 13:21:55 | 48115.0 | 2744.5 | 6.39 | 6.404 | 1.798 | 0.25491 |
| 7/16/2007 13:23:01 | 48181.5 | 2811.0 | 6.42 | 6.425 | 1.778 | 0.24982 |
| 7/16/2007 13:24:05 | 48245.0 | 2874.5 | 6.44 | 6.447 | 1.756 | 0.24442 |
| 7/16/2007 13:25:17 | 48317.0 | 2946.5 | 6.46 | 6.468 | 1.735 | 0.23920 |
| 7/16/2007 13:26:24 | 48384.0 | 3013.5 | 6.48 | 6.489 | 1.714 | 0.23392 |
| 7/16/2007 13:27:46 | 48466.0 | 3095.5 | 6.5 | 6.510 | 1.693 | 0.22858 |
| 7/16/2007 13:29:01 | 48541.5 | 3171.0 | 6.52 | 6.531 | 1.671 | 0.22292 |
| 7/16/2007 13:30:20 | 48620.5 | 3250.0 | 6.54 | 6.552 | 1.650 | 0.21744 |
| 7/16/2007 13:31:36 | 48696.5 | 3326.0 | 6.56 | 6.571 | 1.631 | 0.21242 |
| 7/16/2007 13:32:38 | 48758.0 | 3387.5 | 6.58 | 6.590 | 1.612 | 0.20734 |
| 7/16/2007 13:33:36 | 48816.5 | 3446.0 | 6.6 | 6.609 | 1.593 | 0.20220 |
| 7/16/2007 13:35:02 | 48902.0 | 3531.5 | 6.62 | 6.628 | 1.574 | 0.19701 |
| 7/16/2007 13:36:10 | 48970.5 | 3600.0 | 6.64 | 6.649 | 1.553 | 0.19119 |
| 7/16/2007 13:37:20 | 49040.0 | 3669.5 | 6.66 | 6.668 | 1.534 | 0.18585 |
| 7/16/2007 13:38:25 | 49105.5 | 3735.0 | 6.68 | 6.686 | 1.516 | 0.18074 |
| 7/16/2007 13:39:36 | 49176.0 | 3805.5 | 6.7 | 6.705 | 1.497 | 0.17528 |
| 7/16/2007 13:40:34 | 49234.0 | 3863.5 | 6.72 | 6.724 | 1.478 | 0.16974 |
| 7/16/2007 13:41:28 | 49288.5 | 3918.0 | 6.73 | 6.741 | 1.461 | 0.16473 |
| 7/16/2007 13:42:29 | 49349.0 | 3978.5 | 6.75 | 6.759 | 1.443 | 0.15936 |
| 7/16/2007 13:43:17 | 49397.0 | 4026.5 | 6.77 | 6.776 | 1.426 | 0.15422 |
| 7/16/2007 13:44:26 | 49466.5 | 4096.0 | 6.78 | 6.793 | 1.409 | 0.14903 |
| 7/16/2007 13:45:32 | 49532.0 | 4161.5 | 6.8 | 6.811 | 1.391 | 0.14346 |
| 7/16/2007 13:46:37 | 49597.0 | 4226.5 | 6.82 | 6.828 | 1.374 | 0.13814 |
| 7/16/2007 13:47:53 | 49673.0 | 4302.5 | 6.84 | 6.845 | 1.358 | 0.13275 |
| 7/16/2007 13:49:33 | 49773.0 | 4402.5 | 6.85 | 6.861 | 1.342 | 0.12762 |
| 7/16/2007 13:51:12 | 49872.5 | 4502.0 | 6.87 | 6.878 | 1.325 | 0.12210 |
| 7/16/2007 13:53:04 | 49984.0 | 4613.5 | 6.89 | 6.894 | 1.309 | 0.11685 |
| 7/16/2007 13:54:58 | 50098.5 | 4728.0 | 6.9 | 6.910 | 1.292 | 0.11120 |
| 7/16/2007 13:57:17 | 50237.5 | 4867.0 | 6.92 | 6.926 | 1.276 | 0.10582 |
| 7/16/2007 13:59:48 | 50388.0 | 5017.5 | 6.94 | 6.943 | 1.259 | 0.10003 |
| 7/16/2007 14:01:57 | 50517.0 | 5146.5 | 6.95 | 6.959 | 1.243 | 0.09450 |
| 7/16/2007 14:04:12 | 50652.5 | 5282.0 | 6.97 | 6.976 | 1.226 | 0.08855 |
| 7/16/2007 14:06:37 | 50797.0 | 5426.5 | 6.98 | 6.992 | 1.210 | 0.08288 |
| 7/16/2007 14:08:34 | 50914.0 | 5543.5 | 7 | 7.006 | 1.196 | 0.07786 |
| 7/16/2007 14:10:27 | 51027.5 | 5657.0 | 7.01 | 7.020 | 1.182 | 0.07278 |
| 7/16/2007 14:12:31 | 51151.0 | 5780.5 | 7.03 | 7.034 | 1.169 | 0.06763 |
| 7/16/2007 14:16:37 | 51397.5 | 6027.0 | 7.05 | 7.055 | 1.148 | 0.05982 |
| 7/16/2007 14:20:37 | 51637.5 | 6267.0 | 7.07 | 7.075 | 1.127 | 0.05186 |
| 7/16/2007 14:24:37 | 51877.5 | 6507.0 | 7.09 | 7.097 | 1.105 | 0.04336 |
| 7/16/2007 14:26:37 | 51997.0 | 6626.5 | 7.1 | 7.111 | 1.091 | 0.03786 |
| 7/16/2007 14:30:37 | 52237.0 | 6866.5 | 7.12 | 7.130 | 1.072 | 0.03029 |
| 7/16/2007 14:34:37 | 52477.0 | 7106.5 | 7.14 | 7.149 | 1.053 | 0.02259 |
| 7/16/2007 14:38:37 | 52717.0 | 7346.5 | 7.16 | 7.170 | 1.033 | 0.01392 |
| 7/16/2007 14:42:37 | 52957.0 | 7586.5 | 7.18 | 7.186 | 1.017 | 0.00720 |
| 7/16/2007 14:46:37 | 53197.0 | 7826.5 | 7.2 | 7.202 | 1.000 | -0.00005 |

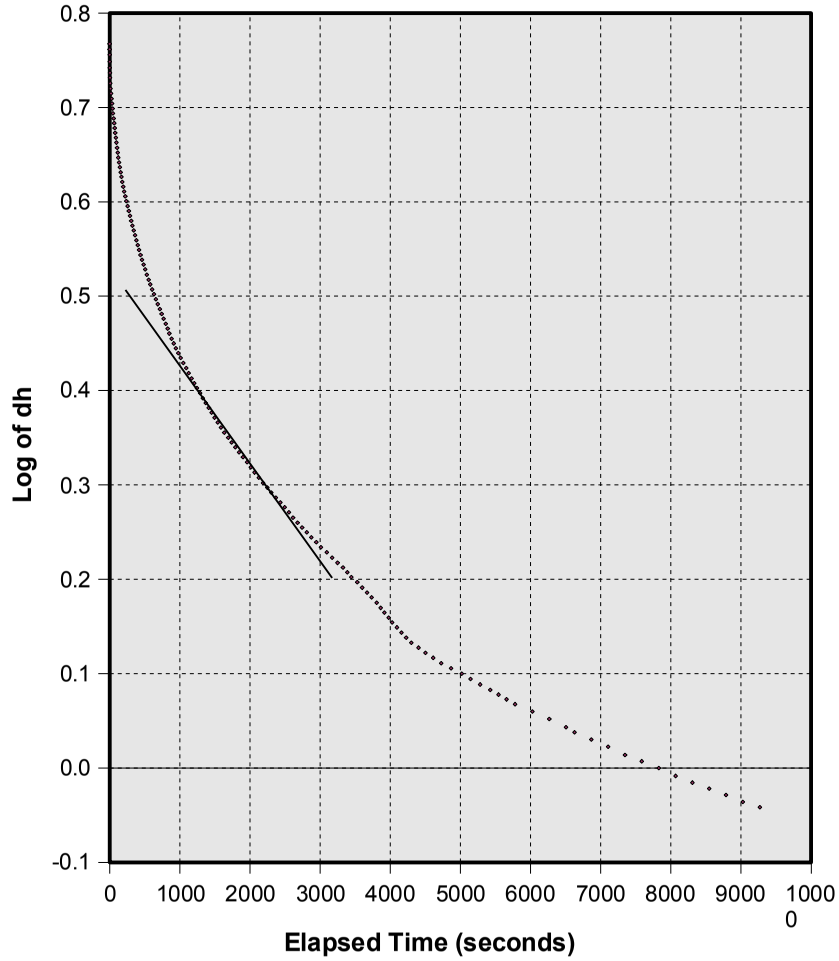
Slug Test MW-25

| Time | Time (sec) | Elapsed Time (sec) | Logger Reading (ft) | Adjusted Reading (ft) | dh (ft) | Log of dh |
|---|---|---|---|---|---|---|
| 7/16/2007 14:50:37 | 53437.0 | 8066.5 | 7.22 | 7.221 | 0.981 | -0.00831 |
| 7/16/2007 14:54:37 | 53677.0 | 8306.5 | 7.23 | 7.237 | 0.965 | -0.01538 |
| 7/16/2007 14:58:37 | 53917.0 | 8546.5 | 7.25 | 7.251 | 0.951 | -0.02165 |
| 7/16/2007 15:02:37 | 54157.0 | 8786.5 | 7.26 | 7.266 | 0.937 | -0.02848 |
| 7/16/2007 15:06:37 | 54397.0 | 9026.5 | 7.28 | 7.282 | 0.921 | -0.03589 |
| 7/16/2007 15:10:37 | 54637.0 | 9266.5 | 7.29 | 7.293 | 0.909 | -0.04151 |
| 7/16/2007 15:14:37 | 54877.0 | 9506.5 | 7.3 | 7.307 | 0.895 | -0.04817 |
| 7/16/2007 15:16:37 | 54997.5 | 9627.0 | 7.31 | 7.316 | 0.886 | -0.05252 |

Slug Test MW-25

**Slug Test by Bouwer and Rice**

| | | |
|---|---|---|
| **Displacement Method:** | Injection | |
| **Well depth:** | 18.20 | ft |
| **Stick up height:** | 2.90 | ft |
| **Depth to sand pack (BGS):** | 5.00 | ft |
| **Depth to screened interval (BGS):** | 6.20 | ft |
| **Well diameter:** | 2.00 | in |
| **Diameter of annular space:** | 6.00 | in |
| Initial depth to water table from top of pipe: | 10.92 | ft |
| **Initial Head Change:** | 5.85 | ft |
| Total well length: | 21.10 | ft |
| Radius of well casing: | 0.0833 | ft |
| Assumed porosity of sand/gravel pack: | 30% | |
| Adjusted radius of well casing: | 0.1537 | ft |
| $r_c$: | 0.0833 | ft |
| Radius of gravel pack ($r_w$): | 0.2500 | ft |
| Screened interval: | 12.00 | ft |
| Length of open section ($L_e$): | 10.18 | ft |
| $L_e$ / $r_w$: | 40.7200 | |
| **A (dimensionless):** | 2.900 | |
| **B (dimensionless):** | 0.484 | |
| **Drawdown at time = 0 ($y_0$):** | 2.68 | ft |
| **Drawdown at time = t ($y_t$):** | 1.89 | ft |
| **Elapsed Time between $y_0$ and $y_t$ (t):** | 2930.5 | sec |
| Initial water column in well ($L_w$): | 10.18 | ft |
| $\ln(R_e/r_w)$ = | 2.28 | |
| K = | 9.24E-08 | ft/sec |
| | **2.82E-06** | **cm/sec** |
| | 2.91 | ft/yr |




| | |
|---|---|
| Water above sand pack: | No |
| %Duration below sand pack: | 48.39% |
| Water above screen: | No |
| %Duration below screen: | 68.90% |

**Table 4:** Hydrogeologic Summary Table - From Albemarle Design Phase 2

| Lithology | K (cm/sec) | Total Porosity (n) | Effective Porosity Range ($n_e$) | Effective Porosity ($n_e$) |
|---|---|---|---|---|
| Silty Clay/Clayey Silt | 5.30E-05 | 49% | 6% | 6% |
| Silty Sand/Sandy Silt | 6.40E-06 | 52% | 11% | 11% |
| Silty Gravel | 1.75E-04 | 48% | 28% | 28% |
| PWR | 8.41E-04 | 20-40% | 20% | 20% |
| Argillite | 3.65E-04 | 21-41% | 0.9 - 32.7% | 12% |
| Metatuff | 1.30E-03 | 7.2 - 54.7% | 2.0 - 47.0% | 21% |
| Gabbro | 2.96E-06 | 41.7 - 45.0% | 2 - 5% | 5% |

NOTES:

1. Hydraulic Conductivity (K) values represented in this table are based on average observed values calculated for this Design Study.

2. n and $n_e$ were calculated based on the average derived from Table C-1 and C-2. n and ne for PWR, Argillite, Metatuff, and Gabbro are based of published porosity ranges (see Section 4.3.2).

# APPENDIX B

Sampling History

| Date | Action |
|---|---|
| March 20, 1991 | MW-1, MW-3 installed |
| March 21, 1991 | MW-2 installed |
| March 25, 1991 | MW-4 installed |
| April 1994 | Completed Ground and Surface Water Monitoring System |
| September 8, 1994 | MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12 installed |
| September 15, 1994 | Background Sampling – Appendix I |
| November 29, 1994 | Background Sampling – Appendix I |
| February 6, 1995 | Background Sampling – Appendix I |
| February 27, 1995 | Background Sampling – Appendix I |
| October 30, 1995 | Sampling – Appendix I |
| April 29, 1996 | Sampling – Appendix I |
| October 24, 1996 | Sampling – Appendix I |
| May 28, 1997 | Sampling – Appendix I |
| October 1, 1997 | Sampling – Appendix I |
| October 23, 1997 | Sampling – Appendix I |
| April 22, 1998 | Sampling – Appendix I |
| October 27, 1998 | Sampling – Appendix I |
| February 24, 1999 | MW-5R installed |
| February 25, 1999 | MW-5 abandoned |
| April 14, 1999 | Sampling – Appendix I |
| February 7, 2000 | Sampling – Appendix I |
| June 2, 2000 | Sampling – Appendix I |
| December 5, 2000 | Sampling – Appendix I |
| July 11, 2001 | Sampling – Appendix I |
| January 9, 2002 | Sampling – Appendix I |
| June 25, 2002 | Sampling – Appendix I |
| December 16, 2002 | Sampling – Appendix I |
| June 18, 2003 | Sampling – Appendix I |
| January 6, 2004 | Sampling – Appendix I |
| June 23, 2004 | Sampling – Appendix I |
| January 6, 2005 | Sampling – Appendix I |
| June 16, 2005 | Sampling – Appendix I |
| January 26, 2006 | Sampling – Appendix I |
| July 13, 2006 | Sampling – Appendix I |
| January 25, 2007 | Sampling – Appendix I |
| June 25, 2007 | Installed MW-8D adjacent to MW-8 |
| July 3, 2007 | Sampling – Appendix I |
| July 4, 2007 | Installed MW-24 and MW-25 |
| July 13, 2007 | Sampled MW-24 and MW-25 |
| August 2007 | Sampling - Appendix II: MW-1, MW-2, MW-3, MW-6, MW-7, MW-9 |

Summary of Background Sampling

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | NCGW2L [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-1 | Arsenic | 09/16/1994 | 0.065 | mg/l | 0.05 | 1.05 | |
| MW-10 | Arsenic | 09/16/1994 | **0.06** | **mg/l** | **0.005** | **0.05** | **0.01** |
| MW-10 | Arsenic | 11/29/1994 | 0.2 | mg/l | 0.01 | 1 | |
| MW-10 | Arsenic | 02/07/1995 | 0.001 | mg/l | 0.001 | 0.0018 | |
| MW-2 | Arsenic | 09/16/1994 | 0.25 | mg/l | 0.1 | 2 | |
| MW-3 | Arsenic | 09/16/1994 | 0.36 | mg/l | 0.05 | 1.05 | |
| MW-5 | Arsenic | 02/07/1995 | 0.07 | mg/l | 0.05 | | |
| MW-7 | Arsenic | 09/15/1994 | **0.14** | **mg/l** | **0.1** | **0.1** | **0.04** |
| MW-7 | Arsenic | 11/29/1994 | **0.093** | **mg/l** | **0.01** | **0.015** | **0.078** |
| MW-7 | Arsenic | 02/07/1995 | 0.025 | mg/l | 0.01 | 0.05 | |
| MW-7 | Arsenic | 02/27/1995 | 0.057 | mg/l | 0.05 | 0.1 | |
| **MW-9** | **Arsenic** | **09/16/1994** | 0.076 | mg/l | 0.05 | 1.05 | |
| **MW-9** | **Arsenic** | **11/29/1994** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| MW-9 | Arsenic | 02/07/1995 | 0.018 | mg/l | 0.01 | | |
| MW-1 | Barium, total | 09/16/1994 | 0.018 | mg/l | 0.01 | | |
| MW-10 | Barium, total | 09/16/1994 | 0.089 | mg/l | 0.05 | 1.05 | |
| MW-11 | Barium, total | 09/15/1994 | 0.19 | mg/l | 0.1 | 2 | |
| MW-12 | Barium, total | 09/15/1994 | 0.07 | mg/l | 0.05 | | |
| **MW-2** | **Barium, total** | **09/16/1994** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| MW-9 | Barium, total | 09/16/1994 | 0.09 | mg/l | 0.05 | 1.05 | |
| MW-2 | Beryllium, total | 09/16/1994 | **0.062** | **mg/l** | **0.005** | **0.05** | **0.012** |
| MW-2 | Beryllium, total | 02/07/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-9 | Beryllium, total | 11/29/1994 | 0.015 | mg/l | 0.01 | | |
| MW-1 | Cadmium, total | 09/16/1994 | **0.054** | **mg/l** | **0.01** | **0.05** | **0.004** |
| **MW-2** | **Cadmium, total** | **09/16/1994** | 0.065 | mg/l | 0.05 | 0.1 | |
| MW-9 | Cadmium, total | 09/16/1994 | 0.111 | mg/l | 0.05 | 1.05 | |
| **MW-1** | **Chromium, total** | **09/16/1994** | 0.081 | mg/l | 0.04 | | |
| **MW-10** | **Chromium, total** | **09/16/1994** | 0.01 | mg/l | 0.01 | 0.015 | |
| **MW-10** | **Chromium, total** | **11/29/1994** | 0.016 | mg/l | 0.01 | 0.05 | |
| MW-10 | Chromium, total | 02/07/1995 | 0.018 | mg/l | 0.01 | | |
| MW-10 | Chromium, total | 02/28/1995 | 0.011 | mg/l | 0.01 | 0.015 | |
| **MW-11** | **Chromium, total** | **09/15/1994** | 0.012 | mg/l | 0.01 | 0.05 | |
| **MW-11** | **Chromium, total** | **11/29/1994** | 0.027 | mg/l | 0.01 | 0.05 | |
| **MW-11** | **Chromium, total** | **02/07/1995** | 0.018 | mg/l | 0.01 | | |
| **MW-11** | **Chromium, total** | **02/28/1995** | 0.022 | mg/l | 0.01 | 0.05 | |
| **MW-12** | **Chromium, total** | **09/15/1994** | 0.12 | mg/l | 0.05 | 1.05 | |
| MW-12 | Chromium, total | 11/30/1994 | 0.012 | mg/l | 0.01 | 0.015 | |
| **MW-12** | **Chromium, total** | **02/07/1995** | **0.28** | **mg/l** | **0.1** | **0.1** | **0.18** |
| MW-12 | Chromium, total | 02/28/1995 | 0.22 | mg/l | 0.1 | 2 | |
| **MW-2** | **Chromium, total** | **09/16/1994** | 0.16 | mg/l | 0.05 | | |
| MW-2 | Chromium, total | 11/30/1994 | **0.249** | **mg/l** | **0.005** | **0.05** | **0.199** |
| **MW-2** | **Chromium, total** | **02/07/1995** | 0.18 | mg/l | 0.1 | 1 | |
| MW-2 | Chromium, total | 02/27/1995 | 0.083 | mg/l | 0.05 | 1.05 | |
| MW-3 | Chromium, total | 09/16/1994 | 0.093 | mg/l | 0.04 | | |
| MW-3 | Chromium, total | 11/29/1994 | **0.131** | **mg/l** | **0.05** | **0.1** | **0.031** |
| MW-4R | Chromium, total | 09/15/1994 | 0.022 | mg/l | 0.01 | | |
| MW-5 | Chromium, total | 09/15/1994 | **0.177** | **mg/l** | **0.01** | **0.05** | **0.127** |
| MW-5 | Chromium, total | 11/29/1994 | **0.021** | **mg/l** | **0.01** | **0.015** | **0.006** |
| MW-5 | Chromium, total | 02/07/1995 | 0.141 | mg/l | 0.05 | 1.05 | |
| MW-5 | Chromium, total | 02/27/1995 | 0.045 | mg/l | 0.01 | | |
| MW-6 | Chromium, total | 09/15/1994 | 0.203 | mg/l | 0.2 | 1 | |
| MW-6 | Chromium, total | 11/29/1994 | **0.173** | **mg/l** | **0.01** | **0.05** | **0.123** |

Summary of Background Sampling

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | NCGW2L [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-6 | Chromium, total | 02/07/1995 | 0.099 | mg/l | 0.04 | | |
| MW-7 | Chromium, total | 09/15/1994 | **0.347** | **mg/l** | **0.05** | **0.1** | **0.247** |
| MW-7 | Chromium, total | 11/29/1994 | 0.041 | mg/l | 0.01 | | |
| MW-7 | Chromium, total | 02/27/1995 | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| **MW-9** | **Chromium, total** | **09/16/1994** | 0.128 | mg/l | 0.04 | | |
| **MW-9** | **Chromium, total** | **11/29/1994** | **0.262** | **mg/l** | **0.05** | **0.1** | **0.162** |
| MW-9 | Chromium, total | 02/07/1995 | 0.145 | mg/l | 0.05 | 1.05 | |
| MW-9 | Chromium, total | 02/27/1995 | **0.15** | **mg/l** | **0.01** | **0.05** | **0.1** |
| MW-1 | Cobalt, total | 02/07/1995 | **0.054** | **mg/l** | **0.005** | **0.05** | **0.004** |
| MW-1 | Cobalt, total | 02/27/1995 | **0.022** | **mg/l** | **0.01** | **0.015** | **0.007** |
| MW-10 | Cobalt, total | 11/29/1994 | 0.1 | mg/l | 0.1 | 2 | |
| MW-10 | Cobalt, total | 02/07/1995 | 0.059 | mg/l | 0.05 | 1.05 | |
| MW-10 | Cobalt, total | 02/28/1995 | 0.039 | mg/l | 0.01 | 0.05 | |
| MW-11 | Cobalt, total | 11/29/1994 | 0.06 | mg/l | 0.05 | 0.1 | |
| MW-11 | Cobalt, total | 02/07/1995 | 0.107 | mg/l | 0.05 | 1.05 | |
| MW-11 | Cobalt, total | 02/28/1995 | **0.117** | **mg/l** | **0.05** | **0.1** | **0.017** |
| MW-12 | Cobalt, total | 02/07/1995 | 0.015 | mg/l | 0.01 | | |
| MW-12 | Cobalt, total | 02/28/1995 | **0.051** | **mg/l** | **0.01** | **0.05** | **0.001** |
| MW-2 | Cobalt, total | 09/16/1994 | **0.02** | **mg/l** | **0.01** | **0.015** | **0.005** |
| MW-2 | Cobalt, total | 11/30/1994 | 0.013 | mg/l | 0.01 | | |
| MW-2 | Cobalt, total | 02/07/1995 | 0.026 | mg/l | 0.01 | 0.05 | |
| MW-2 | Cobalt, total | 02/27/1995 | 1.51 | mg/l | 0.05 | | |
| MW-5 | Cobalt, total | 02/07/1995 | **0.008** | **mg/l** | **0.001** | **0.0018** | **0.0063** |
| MW-5 | Cobalt, total | 02/27/1995 | **0.63** | **mg/l** | **0.01** | **0.015** | **0.615** |
| MW-9 | Cobalt, total | 11/29/1994 | 0.034 | mg/l | 0.025 | | |
| MW-9 | Cobalt, total | 02/07/1995 | **1.4** | **mg/l** | **0.1** | **1** | **0.4** |
| MW-9 | Cobalt, total | 02/27/1995 | **2.32** | **mg/l** | **0.1** | **2** | **0.32** |
| MW-1 | Copper | 09/16/1994 | 0.02 | mg/l | 0.01 | 0.05 | |
| MW-11 | Copper | 09/15/1994 | **4** | **mg/l** | **0.05** | **1.05** | **2.95** |
| MW-11 | Copper | 02/07/1995 | **0.46** | **mg/l** | **0.005** | **0.05** | **0.41** |
| **MW-2** | **Copper** | **09/16/1994** | 0.97 | mg/l | 0.1 | | |
| MW-9 | Copper | 09/16/1994 | **1.69** | **mg/l** | **0.1** | **0.1** | **1.59** |
| **MW-1** | **Lead, total** | **09/16/1994** | 0.012 | mg/l | 0.01 | 0.05 | |
| **MW-1** | **Lead, total** | **02/07/1995** | 0.017 | mg/l | 0.01 | | |
| **MW-10** | **Lead, total** | **09/16/1994** | 0.193 | mg/l | 0.05 | 1.05 | |
| MW-10 | Lead, total | 11/29/1994 | **0.047** | **mg/l** | **0.01** | **0.015** | **0.032** |
| MW-10 | Lead, total | 02/07/1995 | 0.083 | mg/l | 0.04 | | |
| MW-11 | Lead, total | 09/15/1994 | 0.002 | mg/l | 0.002 | | |
| **MW-11** | **Lead, total** | **02/07/1995** | **0.108** | **mg/l** | **0.05** | **0.1** | **0.008** |
| **MW-11** | **Lead, total** | **02/28/1995** | 0.062 | mg/l | 0.01 | | |
| **MW-12** | **Lead, total** | **09/15/1994** | **0.054** | **mg/l** | **0.01** | **0.05** | **0.004** |
| **MW-12** | **Lead, total** | **02/07/1995** | 0.096 | mg/l | 0.05 | 1.05 | |
| **MW-2** | **Lead, total** | **09/16/1994** | 0.064 | mg/l | 0.04 | | |
| **MW-2** | **Lead, total** | **02/07/1995** | 0.055 | mg/l | 0.01 | | |
| MW-2 | Lead, total | 02/27/1995 | 0.07 | mg/l | 0.05 | 0.1 | |
| **MW-3** | **Lead, total** | **09/16/1994** | 0.015 | mg/l | 0.01 | 0.015 | |
| MW-4R | Lead, total | 02/07/1995 | 0.019 | mg/l | 0.01 | 0.05 | |
| **MW-5** | **Lead, total** | **09/15/1994** | 0.037 | mg/l | 0.005 | 0.05 | |
| MW-5 | Lead, total | 11/29/1994 | **0.02** | **mg/l** | **0.01** | **0.015** | **0.005** |
| **MW-5** | **Lead, total** | **02/07/1995** | 0.07 | mg/l | 0.05 | | |
| **MW-5** | **Lead, total** | **02/27/1995** | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-6 | Lead, total | 02/07/1995 | 0.011 | mg/l | 0.01 | 0.05 | |

Summary of Background Sampling

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | NCGW2L [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-7 | Lead, total | 09/15/1994 | 0.062 | mg/l | 0.05 | 1.05 | |
| MW-7 | Lead, total | 02/07/1995 | 0.01 | mg/l | 0.005 | 0.05 | |
| **MW-9** | **Lead, total** | **09/16/1994** | 0.082 | mg/l | 0.05 | 1.05 | |
| **MW-9** | **Lead, total** | **02/07/1995** | 0.11 | mg/l | 0.05 | 1.05 | |
| **MW-9** | **Lead, total** | **02/27/1995** | 0.015 | mg/l | 0.01 | 0.015 | |
| **MW-1** | **Nickel, total** | **09/16/1994** | 0.158 | mg/l | 0.05 | 1.05 | |
| MW-1 | Nickel, total | 11/30/1994 | 0.008 | mg/l | 0.05 | 1.05 | |
| MW-10 | Nickel, total | 11/29/1994 | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| **MW-11** | **Nickel, total** | **09/15/1994** | 0.032 | mg/l | 0.005 | 0.05 | |
| **MW-11** | **Nickel, total** | **11/29/1994** | 0.073 | mg/l | 0.05 | 1.05 | |
| **MW-11** | **Nickel, total** | **02/07/1995** | 0.019 | mg/l | 0.01 | 0.05 | |
| **MW-11** | **Nickel, total** | **02/28/1995** | 0.011 | mg/l | 0.01 | 0.015 | |
| MW-12 | Nickel, total | 11/30/1994 | **0.04** | **mg/l** | **0.01** | **0.015** | **0.025** |
| **MW-12** | **Nickel, total** | **02/07/1995** | 0.022 | mg/l | 0.01 | 0.05 | |
| **MW-2** | **Nickel, total** | **09/16/1994** | 0.01 | mg/l | 0.01 | 0.05 | |
| **MW-2** | **Nickel, total** | **02/07/1995** | 0.026 | mg/l | 0.01 | | |
| MW-2 | Nickel, total | 02/27/1995 | 0.183 | mg/l | 0.05 | 1.05 | |
| MW-9 | Nickel, total | 11/29/1994 | 0.104 | mg/l | 0.05 | 1.05 | |
| MW-1 | Vanadium | 09/16/1994 | **0.028** | **mg/l** | **0.01** | **0.015** | **0.013** |
| MW-10 | Vanadium | 09/16/1994 | 0.032 | mg/l | 0.01 | | |
| MW-10 | Vanadium | 11/29/1994 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-11 | Vanadium | 09/15/1994 | 0.016 | mg/l | 0.005 | 0.05 | |
| MW-11 | Vanadium | 11/29/1994 | 0.076 | mg/l | 0.05 | 1.05 | |
| MW-11 | Vanadium | 02/07/1995 | 0.015 | mg/l | 0.01 | 0.05 | |
| MW-11 | Vanadium | 02/28/1995 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-2 | Vanadium | 09/16/1994 | 0.012 | mg/l | 0.01 | 0.015 | |
| MW-2 | Vanadium | 02/07/1995 | 0.01 | mg/l | 0.01 | 0.015 | |
| MW-2 | Vanadium | 02/27/1995 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-3 | Vanadium | 09/16/1994 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-9 | Vanadium | 09/16/1994 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-9 | Vanadium | 11/29/1994 | 0.017 | mg/l | 0.01 | 0.05 | |
| MW-9 | Vanadium | 02/07/1995 | 0.014 | mg/l | 0.01 | 0.015 | |
| MW-9 | Vanadium | 02/27/1995 | 0.018 | mg/l | 0.01 | 0.05 | |
| EB | Zinc | 11/29/1994 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-1 | Zinc | 09/16/1994 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-1 | Zinc | 11/30/1994 | 0.07 | mg/l | 0.05 | 1.05 | |
| MW-1 | Zinc | 02/27/1995 | 0.2 | mg/l | 0.05 | 1.05 | |
| MW-10 | Zinc | 09/16/1994 | 0.001 | mg/l | 0.001 | 0.0018 | |
| MW-10 | Zinc | 11/29/1994 | **0.124** | **mg/l** | **0.005** | **0.05** | **0.074** |
| MW-11 | Zinc | 09/15/1994 | 0.11 | mg/l | 0.1 | 1 | |
| MW-11 | Zinc | 11/29/1994 | **0.051** | **mg/l** | **0.01** | **0.05** | **0.001** |
| MW-11 | Zinc | 02/07/1995 | 0.26 | mg/l | 0.05 | | |
| MW-11 | Zinc | 02/28/1995 | 0.28 | mg/l | 0.1 | 2 | |
| MW-12 | Zinc | 11/30/1994 | **0.064** | **mg/l** | **0.01** | **0.015** | **0.049** |
| MW-12 | Zinc | 02/07/1995 | 0.136 | mg/l | 0.05 | 1.05 | |
| **MW-2** | **Zinc** | **09/16/1994** | **0.071** | **mg/l** | **0.01** | **0.05** | **0.021** |
| MW-2 | Zinc | 02/07/1995 | 0.004 | mg/l | 0.002 | | |
| MW-2 | Zinc | 02/27/1995 | 0.027 | mg/l | 0.01 | | |
| MW-3 | Zinc | 02/27/1995 | 0.155 | mg/l | 0.04 | | |
| MW-4R | Zinc | 11/29/1994 | 0.05 | mg/l | 0.05 | 0.1 | |
| MW-4R | Zinc | 02/07/1995 | **0.142** | **mg/l** | **0.01** | **0.05** | **0.092** |
| MW-4R | Zinc | 02/27/1995 | 0.033 | mg/l | 0.01 | 0.05 | |

Summary of Background Sampling

| Well ID | Parameter Name [1] | Sample Date | Result | Unit | PQL [2] | NCGW2L [3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-5 | Zinc | 09/15/1994 | 0.043 | mg/l | 0.04 | | |
| MW-5 | Zinc | 11/29/1994 | **0.025** | **mg/l** | **0.01** | **0.015** | **0.01** |
| MW-5 | Zinc | 02/07/1995 | 0.058 | mg/l | 0.05 | 1.05 | |
| MW-5 | Zinc | 02/27/1995 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-6 | Zinc | 11/29/1994 | 0.011 | mg/l | 0.01 | | |
| MW-7 | Zinc | 02/27/1995 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-9 | Zinc | 09/16/1994 | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| MW-9 | Zinc | 11/29/1994 | 0.046 | mg/l | 0.04 | | |
| MW-9 | Zinc | 02/07/1995 | 0.012 | mg/l | 0.01 | | |
| SW-3 | Zinc | 02/06/1995 | 0.063 | mg/l | 0.05 | 1.05 | |
| SW-3 | Zinc | 02/27/1995 | 0.09 | mg/l | 0.05 | 1.05 | |

[1] Table only contains detected constituents.

[2] PQL = Practical Quantitation Limit

[3] NCGW2L = North Carolina Ground Water 2L Standard

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16S | Antimony | 01/26/2007 | 0.72 | ug/l | 6 | | |
| MW-18 | Antimony | 12/06/2000 | 0.0051 | mg/l | 0.005 | | |
| MW-19 | Antimony | 12/06/2000 | 0.23 | mg/l | 0.005 | | |
| **MW-13** | **Arsenic** | **05/12/1999** | **0.054** | **mg/l** | **0.005** | **0.05** | **0.004** |
| **MW-13** | **Arsenic** | **06/28/1999** | **0.17** | **mg/l** | **0.005** | **0.05** | **0.12** |
| MW-13 | Arsenic | 10/04/1999 | 0.025 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 06/06/2000 | 0.018 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 12/06/2000 | 0.024 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 07/16/2001 | 0.022 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 01/10/2002 | 0.028 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 06/25/2002 | 0.02 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 12/17/2002 | 0.025 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 06/19/2003 | 0.032 | mg/l | 0.005 | 0.05 | |
| MW-13 | Arsenic | 01/07/2004 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 06/24/2004 | 0.02 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 01/07/2005 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 06/17/2005 | 0.046 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 01/25/2006 | 0.0186 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 07/14/2006 | 0.0144 | mg/l | 0.01 | 0.05 | |
| MW-13 | Arsenic | 01/26/2007 | 7.1 | ug/l | 10 | 50 | |
| MW-14 | Arsenic | 03/16/1999 | 0.0078 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 05/12/1999 | 0.028 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 06/28/1999 | 0.042 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 10/05/1999 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 06/06/2000 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 07/16/2001 | 0.02 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 01/10/2002 | 0.0075 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 06/26/2002 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 12/17/2002 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 06/19/2003 | 0.038 | mg/l | 0.005 | 0.05 | |
| MW-14 | Arsenic | 06/24/2004 | 0.029 | mg/l | 0.01 | 0.05 | |
| MW-14 | Arsenic | 01/07/2005 | 0.014 | mg/l | 0.01 | 0.05 | |
| MW-14 | Arsenic | 06/17/2005 | 0.015 | mg/l | 0.01 | 0.05 | |
| MW-14 | Arsenic | 01/26/2006 | 0.0216 | mg/l | 0.01 | 0.05 | |
| MW-14 | Arsenic | 01/26/2007 | 12.1 | ug/l | 10 | 50 | |
| **MW-15** | **Arsenic** | **03/16/1999** | **0.061** | **mg/l** | **0.01** | **0.05** | **0.011** |
| **MW-15** | **Arsenic** | **05/12/1999** | **0.19** | **mg/l** | **0.005** | **0.05** | **0.14** |
| **MW-15** | **Arsenic** | **06/28/1999** | **0.27** | **mg/l** | **0.005** | **0.05** | **0.22** |
| MW-15 | Arsenic | 10/05/1999 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-15 | Arsenic | 06/07/2000 | 0.011 | mg/l | 0.005 | 0.05 | |
| **MW-15** | **Arsenic** | **12/06/2000** | **0.089** | **mg/l** | **0.005** | **0.05** | **0.039** |
| **MW-15** | **Arsenic** | **07/16/2001** | **0.066** | **mg/l** | **0.005** | **0.05** | **0.016** |
| MW-15 | Arsenic | 01/10/2002 | 0.013 | mg/l | 0.005 | 0.05 | |
| **MW-15** | **Arsenic** | **06/26/2002** | **0.081** | **mg/l** | **0.005** | **0.05** | **0.031** |
| **MW-15** | **Arsenic** | **12/17/2002** | **0.056** | **mg/l** | **0.005** | **0.05** | **0.006** |
| MW-15 | Arsenic | 06/19/2003 | 0.013 | mg/l | 0.005 | 0.05 | |
| MW-15 | Arsenic | 06/24/2004 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-15 | Arsenic | 06/17/2005 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-15 | Arsenic | 01/26/2007 | 11.5 | ug/l | 10 | 50 | |
| **MW-16D** | **Arsenic** | **03/16/1999** | **0.12** | **mg/l** | **0.02** | **0.05** | **0.07** |
| **MW-16D** | **Arsenic** | **05/12/1999** | **0.092** | **mg/l** | **0.005** | **0.05** | **0.042** |
| **MW-16D** | **Arsenic** | **06/28/1999** | **0.085** | **mg/l** | **0.005** | **0.05** | **0.035** |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16D | Arsenic | 10/05/1999 | 0.028 | mg/l | 0.005 | 0.05 | |
| MW-16D | Arsenic | 06/06/2000 | 0.014 | mg/l | 0.005 | 0.05 | |
| MW-16D | Arsenic | 12/06/2000 | 0.041 | mg/l | 0.005 | 0.05 | |
| **MW-16D** | **Arsenic** | **07/16/2001** | **0.052** | **mg/l** | **0.005** | **0.05** | **0.002** |
| MW-16D | Arsenic | 01/10/2002 | 0.012 | mg/l | 0.005 | 0.05 | |
| **MW-16D** | **Arsenic** | **06/26/2002** | **0.055** | **mg/l** | **0.005** | **0.05** | **0.005** |
| MW-16D | Arsenic | 12/17/2002 | 0.037 | mg/l | 0.005 | 0.05 | |
| MW-16D | Arsenic | 06/19/2003 | 0.026 | mg/l | 0.005 | 0.05 | |
| MW-16D | Arsenic | 06/24/2004 | 0.016 | mg/l | 0.01 | 0.05 | |
| MW-16D | Arsenic | 01/07/2005 | 0.03 | mg/l | 0.01 | 0.05 | |
| MW-16D | Arsenic | 01/26/2006 | 0.0113 | mg/l | 0.01 | 0.05 | |
| **MW-16D** | **Arsenic** | **07/14/2006** | **0.101** | **mg/l** | **0.01** | **0.05** | **0.051** |
| MW-16D | Arsenic | 01/26/2007 | 13.3 | ug/l | 10 | 50 | |
| MW-16S | Arsenic | 05/12/1999 | 0.027 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 06/28/1999 | 0.027 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 10/05/1999 | 0.0052 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 06/06/2000 | 0.0084 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 12/06/2000 | 0.018 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 07/16/2001 | 0.0092 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 01/10/2002 | 0.0064 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 06/26/2002 | 0.024 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 12/17/2002 | 0.007 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 06/19/2003 | 0.024 | mg/l | 0.005 | 0.05 | |
| MW-16S | Arsenic | 06/24/2004 | 0.016 | mg/l | 0.01 | 0.05 | |
| MW-16S | Arsenic | 01/07/2005 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-16S | Arsenic | 06/17/2005 | 0.014 | mg/l | 0.01 | 0.05 | |
| MW-16S | Arsenic | 01/26/2007 | 3 | ug/l | 10 | 50 | |
| **MW-17** | **Arsenic** | **03/16/1999** | **0.069** | **mg/l** | **0.01** | **0.05** | **0.019** |
| **MW-17** | **Arsenic** | **05/12/1999** | **0.22** | **mg/l** | **0.005** | **0.05** | **0.17** |
| **MW-17** | **Arsenic** | **06/28/1999** | **0.33** | **mg/l** | **0.005** | **0.05** | **0.28** |
| **MW-17** | **Arsenic** | **10/06/1999** | **0.11** | **mg/l** | **0.005** | **0.05** | **0.06** |
| MW-17 | Arsenic | 06/06/2000 | 0.03 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 12/06/2000 | 0.038 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 07/16/2001 | 0.022 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 01/10/2002 | 0.023 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 06/26/2002 | 0.048 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 12/16/2002 | 0.0084 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 06/19/2003 | 0.031 | mg/l | 0.005 | 0.05 | |
| MW-17 | Arsenic | 06/17/2005 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-17 | Arsenic | 07/14/2006 | 0.0144 | mg/l | 0.01 | 0.05 | |
| MW-17 | Arsenic | 01/26/2007 | 6.9 | ug/l | 10 | 50 | |
| **MW-18** | **Arsenic** | **03/16/1999** | **0.062** | **mg/l** | **0.02** | **0.05** | **0.012** |
| **MW-18** | **Arsenic** | **05/12/1999** | **0.097** | **mg/l** | **0.005** | **0.05** | **0.047** |
| MW-18 | Arsenic | 06/28/1999 | 0.045 | mg/l | 0.005 | 0.05 | |
| MW-18 | Arsenic | 10/06/1999 | 0.023 | mg/l | 0.005 | 0.05 | |
| MW-18 | Arsenic | 12/06/2000 | 0.0097 | mg/l | 0.005 | 0.05 | |
| MW-18 | Arsenic | 01/26/2007 | 4.3 | ug/l | 10 | 50 | |
| MW-19 | Arsenic | 03/16/1999 | 0.0059 | mg/l | 0.005 | 0.05 | |
| MW-19 | Arsenic | 05/12/1999 | 0.025 | mg/l | 0.005 | 0.05 | |
| MW-19 | Arsenic | 06/28/1999 | 0.035 | mg/l | 0.005 | 0.05 | |
| **MW-19** | **Arsenic** | **12/06/2000** | **0.26** | **mg/l** | **0.005** | **0.05** | **0.21** |
| MW-19 | Arsenic | 01/10/2002 | 0.0072 | mg/l | 0.005 | 0.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-19 | Arsenic | 12/16/2002 | 0.0064 | mg/l | 0.005 | 0.05 | |
| MW-19 | Arsenic | 01/26/2007 | 3.9 | ug/l | 10 | 50 | |
| **MW-20** | **Arsenic** | **03/16/1999** | **0.5** | **mg/l** | **0.06** | **0.05** | **0.45** |
| **MW-20** | **Arsenic** | **05/12/1999** | **0.3** | **mg/l** | **0.005** | **0.05** | **0.25** |
| **MW-20** | **Arsenic** | **06/28/1999** | **0.28** | **mg/l** | **0.005** | **0.05** | **0.23** |
| **MW-20** | **Arsenic** | **10/06/1999** | **0.43** | **mg/l** | **0.005** | **0.05** | **0.38** |
| MW-20 | Arsenic | 06/07/2000 | 0.027 | mg/l | 0.005 | 0.05 | |
| **MW-20** | **Arsenic** | **12/06/2000** | **0.2** | **mg/l** | **0.005** | **0.05** | **0.15** |
| **MW-20** | **Arsenic** | **07/16/2001** | **0.071** | **mg/l** | **0.005** | **0.05** | **0.021** |
| **MW-20** | **Arsenic** | **01/09/2002** | **0.089** | **mg/l** | **0.005** | **0.05** | **0.039** |
| **MW-20** | **Arsenic** | **06/25/2002** | **0.22** | **mg/l** | **0.005** | **0.05** | **0.17** |
| **MW-20** | **Arsenic** | **12/17/2002** | **0.1** | **mg/l** | **0.005** | **0.05** | **0.05** |
| MW-20 | Arsenic | 06/19/2003 | 0.017 | mg/l | 0.005 | 0.05 | |
| MW-20 | Arsenic | 01/07/2004 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 06/24/2004 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 01/07/2005 | 0.011 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 06/16/2005 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 01/25/2006 | 0.0124 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 07/13/2006 | 0.0124 | mg/l | 0.01 | 0.05 | |
| MW-20 | Arsenic | 01/26/2007 | 13.5 | ug/l | 10 | 50 | |
| MW-21R | Arsenic | 03/16/1999 | 0.042 | mg/l | 0.005 | 0.05 | |
| **MW-21R** | **Arsenic** | **05/12/1999** | **0.22** | **mg/l** | **0.005** | **0.05** | **0.17** |
| **MW-21R** | **Arsenic** | **06/28/1999** | **0.3** | **mg/l** | **0.005** | **0.05** | **0.25** |
| **MW-21R** | **Arsenic** | **10/06/1999** | **0.16** | **mg/l** | **0.005** | **0.05** | **0.11** |
| MW-21R | Arsenic | 06/07/2000 | 0.04 | mg/l | 0.005 | 0.05 | |
| **MW-21R** | **Arsenic** | **12/06/2000** | **0.15** | **mg/l** | **0.005** | **0.05** | **0.1** |
| MW-21R | Arsenic | 07/16/2001 | 0.039 | mg/l | 0.005 | 0.05 | |
| MW-21R | Arsenic | 01/09/2002 | 0.043 | mg/l | 0.005 | 0.05 | |
| **MW-21R** | **Arsenic** | **06/25/2002** | **0.058** | **mg/l** | **0.005** | **0.05** | **0.008** |
| **MW-21R** | **Arsenic** | **12/17/2002** | **0.053** | **mg/l** | **0.005** | **0.05** | **0.003** |
| MW-21R | Arsenic | 06/19/2003 | 0.0093 | mg/l | 0.005 | 0.05 | |
| MW-21R | Arsenic | 01/07/2004 | 0.024 | mg/l | 0.01 | 0.05 | |
| MW-21R | Arsenic | 01/07/2005 | 0.018 | mg/l | 0.01 | 0.05 | |
| MW-21R | Arsenic | 06/17/2005 | 0.021 | mg/l | 0.01 | 0.05 | |
| MW-21R | Arsenic | 07/13/2006 | 0.0145 | mg/l | 0.01 | 0.05 | |
| MW-21R | Arsenic | 01/26/2007 | 11.4 | ug/l | 10 | 50 | |
| MW-22 | Arsenic | 03/16/1999 | 0.02 | mg/l | 0.005 | 0.05 | |
| **MW-22** | **Arsenic** | **05/12/1999** | **0.16** | **mg/l** | **0.005** | **0.05** | **0.11** |
| **MW-22** | **Arsenic** | **06/30/1999** | **0.13** | **mg/l** | **0.005** | **0.05** | **0.08** |
| MW-22 | Arsenic | 10/04/1999 | 0.026 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 07/16/2001 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 01/09/2002 | 0.0072 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 06/26/2002 | 0.0054 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 12/16/2002 | 0.018 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 06/19/2003 | 0.011 | mg/l | 0.005 | 0.05 | |
| MW-22 | Arsenic | 01/26/2007 | 3.9 | ug/l | 10 | 50 | |
| MW-23 | Arsenic | 03/16/1999 | 0.042 | mg/l | 0.02 | 0.05 | |
| MW-23 | Arsenic | 05/12/1999 | 0.025 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 06/28/1999 | 0.025 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 10/04/1999 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 06/06/2000 | 0.0061 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 12/06/2000 | 0.0078 | mg/l | 0.005 | 0.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-23 | Arsenic | 07/16/2001 | 0.0076 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 01/10/2002 | 0.015 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 06/25/2002 | 0.0084 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 06/19/2003 | 0.0062 | mg/l | 0.005 | 0.05 | |
| MW-23 | Arsenic | 06/24/2004 | 0.01 | mg/l | 0.01 | 0.05 | |
| MW-23 | Arsenic | 06/17/2005 | 0.012 | mg/l | 0.01 | 0.05 | |
| MW-23 | Arsenic | 01/26/2007 | 3 | ug/l | 10 | 50 | |
| SW-2 | Arsenic | 01/26/2007 | 2.4 | ug/l | 10 | 50 | |
| SW-6 | Arsenic | 01/26/2007 | 2.8 | ug/l | 10 | 50 | |
| MW-13 | Barium, total | 03/16/1999 | 0.74 | mg/l | 0.05 | 2 | |
| MW-13 | Barium, total | 05/12/1999 | 0.16 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 06/28/1999 | 0.62 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 10/04/1999 | 0.083 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 06/06/2000 | 0.056 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 12/06/2000 | 0.042 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 07/16/2001 | 0.038 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 01/10/2002 | 0.039 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 06/25/2002 | 0.036 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 12/17/2002 | 0.07 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 06/19/2003 | 0.057 | mg/l | 0.005 | 2 | |
| MW-13 | Barium, total | 01/26/2007 | 102 | ug/l | 100 | 2000 | |
| MW-14 | Barium, total | 03/16/1999 | 0.031 | mg/l | 0.01 | 2 | |
| MW-14 | Barium, total | 05/12/1999 | 0.038 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 06/28/1999 | 0.048 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 10/05/1999 | 0.01 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 06/06/2000 | 0.0083 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 07/16/2001 | 0.048 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 01/10/2002 | 0.0076 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 06/26/2002 | 0.024 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 12/17/2002 | 0.014 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 06/19/2003 | 0.0079 | mg/l | 0.005 | 2 | |
| MW-14 | Barium, total | 01/26/2007 | 35.1 | ug/l | 100 | 2000 | |
| **MW-15** | **Barium, total** | **03/16/1999** | **3.6** | **mg/l** | **0.2** | **2** | **1.6** |
| MW-15 | Barium, total | 05/12/1999 | 0.51 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 06/28/1999 | 0.53 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 10/05/1999 | 0.21 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 06/07/2000 | 0.12 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 12/06/2000 | 0.22 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 07/16/2001 | 0.11 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 01/10/2002 | 0.03 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 06/26/2002 | 0.13 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 12/17/2002 | 0.04 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 06/19/2003 | 0.023 | mg/l | 0.005 | 2 | |
| MW-15 | Barium, total | 01/26/2007 | 15.1 | ug/l | 100 | 2000 | |
| **MW-16D** | **Barium, total** | **03/16/1999** | **2.1** | **mg/l** | **0.2** | **2** | **0.1** |
| MW-16D | Barium, total | 05/12/1999 | 0.44 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 06/28/1999 | 0.35 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 10/05/1999 | 0.065 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 06/06/2000 | 0.3 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 12/06/2000 | 0.19 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 07/16/2001 | 0.54 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 01/10/2002 | 0.094 | mg/l | 0.005 | 2 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16D | Barium, total | 06/26/2002 | 0.16 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 12/17/2002 | 0.12 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 06/19/2003 | 0.085 | mg/l | 0.005 | 2 | |
| MW-16D | Barium, total | 07/14/2006 | 0.653 | mg/l | 0.5 | 2 | |
| MW-16D | Barium, total | 01/26/2007 | 62.4 | ug/l | 100 | 2000 | |
| MW-16S | Barium, total | 03/16/1999 | 0.078 | mg/l | 0.01 | 2 | |
| MW-16S | Barium, total | 05/12/1999 | 0.082 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 06/28/1999 | 0.078 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 10/05/1999 | 0.22 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 06/06/2000 | 0.031 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 12/06/2000 | 0.059 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 07/16/2001 | 0.045 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 01/10/2002 | 0.031 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 06/26/2002 | 0.056 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 12/17/2002 | 0.031 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 06/19/2003 | 0.11 | mg/l | 0.005 | 2 | |
| MW-16S | Barium, total | 01/26/2007 | 28.6 | ug/l | 100 | 2000 | |
| MW-17 | Barium, total | 03/16/1999 | 0.25 | mg/l | 0.02 | 2 | |
| MW-17 | Barium, total | 05/12/1999 | 0.1 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 06/28/1999 | 0.077 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 10/06/1999 | 0.067 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 06/06/2000 | 0.018 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 12/06/2000 | 0.033 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 07/16/2001 | 0.048 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 01/10/2002 | 0.047 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 06/26/2002 | 0.035 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 12/16/2002 | 0.041 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 06/19/2003 | 0.032 | mg/l | 0.005 | 2 | |
| MW-17 | Barium, total | 01/26/2007 | 7.7 | ug/l | 100 | 2000 | |
| **MW-18** | **Barium, total** | **03/16/1999** | **5.8** | **mg/l** | **0.2** | **2** | **3.8** |
| MW-18 | Barium, total | 05/12/1999 | 0.83 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 06/28/1999 | 0.3 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 10/06/1999 | 0.2 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 06/06/2000 | 0.035 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 12/06/2000 | 0.073 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 07/16/2001 | 0.02 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 01/10/2002 | 0.0095 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 12/16/2002 | 0.013 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 06/19/2003 | 0.019 | mg/l | 0.005 | 2 | |
| MW-18 | Barium, total | 01/26/2007 | 9.6 | ug/l | 100 | 2000 | |
| MW-19 | Barium, total | 03/16/1999 | 0.23 | mg/l | 0.01 | 2 | |
| MW-19 | Barium, total | 05/12/1999 | 0.085 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 06/28/1999 | 0.12 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 10/06/1999 | 0.019 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 06/06/2000 | 0.011 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 12/06/2000 | 0.21 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 07/16/2001 | 0.0083 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 01/10/2002 | 0.019 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 06/26/2002 | 0.0068 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 12/16/2002 | 0.0055 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 06/19/2003 | 0.0063 | mg/l | 0.005 | 2 | |
| MW-19 | Barium, total | 01/26/2007 | 11.6 | ug/l | 100 | 2000 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-20** | **Barium, total** | **03/16/1999** | **4.2** | **mg/l** | **0.1** | **2** | **2.2** |
| MW-20 | Barium, total | 05/12/1999 | 0.47 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 06/28/1999 | 0.29 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 10/06/1999 | 0.64 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 06/07/2000 | 0.26 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 12/06/2000 | 0.35 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 07/16/2001 | 0.084 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 01/09/2002 | 0.18 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 06/25/2002 | 0.38 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 12/17/2002 | 0.15 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 06/19/2003 | 0.016 | mg/l | 0.005 | 2 | |
| MW-20 | Barium, total | 01/26/2007 | 6.7 | ug/l | 100 | 2000 | |
| MW-21R | Barium, total | 03/16/1999 | 0.92 | mg/l | 0.1 | 2 | |
| MW-21R | Barium, total | 05/12/1999 | 0.37 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 06/28/1999 | 0.3 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 10/06/1999 | 0.14 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 06/07/2000 | 0.0084 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 12/06/2000 | 0.022 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 07/16/2001 | 0.0078 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 01/09/2002 | 0.009 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 06/25/2002 | 0.018 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 12/17/2002 | 0.0072 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 06/19/2003 | 0.0056 | mg/l | 0.005 | 2 | |
| MW-21R | Barium, total | 01/26/2007 | 17.3 | ug/l | 100 | 2000 | |
| MW-22 | Barium, total | 03/16/1999 | 0.47 | mg/l | 0.1 | 2 | |
| MW-22 | Barium, total | 05/12/1999 | 0.15 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 06/30/1999 | 0.16 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 10/04/1999 | 0.059 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 06/06/2000 | 0.038 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 12/06/2000 | 0.02 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 07/16/2001 | 0.022 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 01/09/2002 | 0.031 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 06/26/2002 | 0.027 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 12/16/2002 | 0.044 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 06/19/2003 | 0.032 | mg/l | 0.005 | 2 | |
| MW-22 | Barium, total | 01/26/2007 | 21.6 | ug/l | 100 | 2000 | |
| MW-23 | Barium, total | 03/16/1999 | 0.71 | mg/l | 0.1 | 2 | |
| MW-23 | Barium, total | 05/12/1999 | 0.17 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 06/28/1999 | 0.12 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 10/04/1999 | 0.071 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 06/06/2000 | 0.045 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 12/06/2000 | 0.04 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 07/16/2001 | 0.041 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 01/10/2002 | 0.044 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 06/25/2002 | 0.044 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 12/17/2002 | 0.024 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 06/19/2003 | 0.032 | mg/l | 0.005 | 2 | |
| MW-23 | Barium, total | 01/26/2007 | 47.8 | ug/l | 100 | 2000 | |
| SW-1 | Barium, total | 10/24/1996 | 0.016 | mg/l | 0.01 | 2 | |
| SW-1 | Barium, total | 05/28/1997 | 0.013 | mg/l | 0.01 | 2 | |
| SW-1 | Barium, total | 10/23/1997 | 0.013 | mg/l | 0.01 | 2 | |
| SW-1 | Barium, total | 04/22/1998 | 0.011 | mg/l | 0.01 | 2 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| SW-1 | Barium, total | 10/28/1998 | 0.018 | mg/l | 0.01 | 2 | |
| SW-1 | Barium, total | 04/15/1999 | 0.012 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 05/12/1999 | 0.015 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 06/30/1999 | 0.02 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 10/06/1999 | 0.016 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 02/09/2000 | 0.0097 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 06/07/2000 | 0.025 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 12/05/2000 | 0.016 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 07/16/2001 | 0.017 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 01/10/2002 | 0.014 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 12/16/2002 | 0.013 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 06/19/2003 | 0.014 | mg/l | 0.005 | 2 | |
| SW-1 | Barium, total | 01/26/2007 | 11.1 | ug/l | 100 | 2000 | |
| SW-2 | Barium, total | 10/24/1996 | 0.015 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 05/28/1997 | 0.011 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 10/23/1997 | 0.013 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 04/22/1998 | 0.012 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 10/28/1998 | 0.012 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 03/16/1999 | 0.017 | mg/l | 0.01 | 2 | |
| SW-2 | Barium, total | 04/15/1999 | 0.012 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 05/12/1999 | 0.015 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 06/30/1999 | 0.009 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 10/06/1999 | 0.014 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 02/09/2000 | 0.0095 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 06/07/2000 | 0.019 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 12/06/2000 | 0.058 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 07/16/2001 | 0.014 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 01/09/2002 | 0.012 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 12/17/2002 | 0.0096 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 06/19/2003 | 0.013 | mg/l | 0.005 | 2 | |
| SW-2 | Barium, total | 01/26/2007 | 9.6 | ug/l | 100 | 2000 | |
| SW-6 | Barium, total | 03/16/1999 | 0.01 | mg/l | 0.01 | 2 | |
| SW-6 | Barium, total | 05/12/1999 | 0.011 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 06/30/1999 | 0.016 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 10/04/1999 | 0.016 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 06/06/2000 | 0.018 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 12/06/2000 | 0.016 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 07/16/2001 | 0.023 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 01/09/2002 | 0.016 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 12/17/2002 | 0.013 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 06/19/2003 | 0.014 | mg/l | 0.005 | 2 | |
| SW-6 | Barium, total | 01/26/2007 | 12.8 | ug/l | 100 | 2000 | |
| MW-13 | Beryllium, total | 03/16/1999 | 0.008 | mg/l | 0.003 | | |
| MW-13 | Beryllium, total | 05/12/1999 | 0.0012 | mg/l | 0.001 | | |
| MW-13 | Beryllium, total | 06/28/1999 | 0.0042 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 03/16/1999 | 0.12 | mg/l | 0.025 | | |
| MW-15 | Beryllium, total | 05/12/1999 | 0.0076 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 06/28/1999 | 0.008 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 10/05/1999 | 0.0031 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 06/07/2000 | 0.0018 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 12/06/2000 | 0.0028 | mg/l | 0.001 | | |
| MW-15 | Beryllium, total | 07/16/2001 | 0.0015 | mg/l | 0.001 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-15 | Beryllium, total | 06/26/2002 | 0.0017 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 03/16/1999 | 0.031 | mg/l | 0.006 | | |
| MW-16D | Beryllium, total | 05/12/1999 | 0.0055 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 06/28/1999 | 0.0046 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 06/06/2000 | 0.0025 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 12/06/2000 | 0.0019 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 07/16/2001 | 0.0023 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 06/26/2002 | 0.0013 | mg/l | 0.001 | | |
| MW-16D | Beryllium, total | 07/14/2006 | 0.0021 | mg/l | 0.002 | | |
| MW-16S | Beryllium, total | 03/16/1999 | 0.0015 | mg/l | 0.001 | | |
| MW-16S | Beryllium, total | 10/05/1999 | 0.003 | mg/l | 0.001 | | |
| MW-16S | Beryllium, total | 06/19/2003 | 0.001 | mg/l | 0.001 | | |
| MW-17 | Beryllium, total | 03/16/1999 | 0.0058 | mg/l | 0.002 | | |
| MW-17 | Beryllium, total | 05/12/1999 | 0.0017 | mg/l | 0.001 | | |
| MW-17 | Beryllium, total | 06/28/1999 | 0.0014 | mg/l | 0.001 | | |
| MW-17 | Beryllium, total | 10/06/1999 | 0.0012 | mg/l | 0.001 | | |
| MW-17 | Beryllium, total | 01/26/2007 | 0.8 | ug/l | 1 | | |
| MW-18 | Beryllium, total | 03/16/1999 | 0.11 | mg/l | 0.025 | | |
| MW-18 | Beryllium, total | 05/12/1999 | 0.0075 | mg/l | 0.001 | | |
| MW-18 | Beryllium, total | 06/28/1999 | 0.003 | mg/l | 0.001 | | |
| MW-18 | Beryllium, total | 10/06/1999 | 0.0023 | mg/l | 0.001 | | |
| MW-19 | Beryllium, total | 03/16/1999 | 0.0037 | mg/l | 0.001 | | |
| MW-19 | Beryllium, total | 05/12/1999 | 0.0013 | mg/l | 0.001 | | |
| MW-19 | Beryllium, total | 06/28/1999 | 0.0016 | mg/l | 0.001 | | |
| MW-19 | Beryllium, total | 12/06/2000 | 0.26 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 03/16/1999 | 0.08 | mg/l | 0.05 | | |
| MW-20 | Beryllium, total | 05/12/1999 | 0.0065 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 06/28/1999 | 0.0053 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 10/06/1999 | 0.011 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 06/07/2000 | 0.0025 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 12/06/2000 | 0.0052 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 07/16/2001 | 0.0017 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 01/09/2002 | 0.0034 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 06/25/2002 | 0.0067 | mg/l | 0.001 | | |
| MW-20 | Beryllium, total | 12/17/2002 | 0.0025 | mg/l | 0.001 | | |
| MW-21R | Beryllium, total | 03/16/1999 | 0.0074 | mg/l | 0.002 | | |
| MW-21R | Beryllium, total | 05/12/1999 | 0.0021 | mg/l | 0.001 | | |
| MW-21R | Beryllium, total | 06/28/1999 | 0.0029 | mg/l | 0.001 | | |
| MW-21R | Beryllium, total | 10/06/1999 | 0.0027 | mg/l | 0.001 | | |
| MW-22 | Beryllium, total | 03/16/1999 | 0.011 | mg/l | 0.003 | | |
| MW-22 | Beryllium, total | 05/12/1999 | 0.0027 | mg/l | 0.001 | | |
| MW-22 | Beryllium, total | 06/30/1999 | 0.0028 | mg/l | 0.001 | | |
| MW-22 | Beryllium, total | 10/04/1999 | 0.001 | mg/l | 0.001 | | |
| MW-23 | Beryllium, total | 03/16/1999 | 0.0095 | mg/l | 0.002 | | |
| MW-23 | Beryllium, total | 05/12/1999 | 0.0018 | mg/l | 0.001 | | |
| MW-23 | Beryllium, total | 06/28/1999 | 0.0018 | mg/l | 0.001 | | |
| MW-13 | Cadmium, total | 12/17/2002 | 0.0014 | mg/l | 0.001 | 0.0018 | |
| MW-13 | Cadmium, total | 06/19/2003 | 0.0012 | mg/l | 0.001 | 0.0018 | |
| **MW-13** | **Cadmium, total** | **01/07/2004** | **0.0019** | **mg/l** | **0.001** | **0.0018** | **0.0002** |
| MW-13 | Cadmium, total | 06/24/2004 | 0.0012 | mg/l | 0.001 | 0.0018 | |
| **MW-14** | **Cadmium, total** | **03/16/1999** | **0.0041** | **mg/l** | **0.001** | **0.0018** | **0.0024** |
| **MW-16D** | **Cadmium, total** | **03/16/1999** | **0.004** | **mg/l** | **0.001** | **0.0018** | **0.0023** |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16D | Cadmium, total | 06/24/2004 | 0.0016 | mg/l | 0.001 | 0.0018 | |
| **MW-16S** | **Cadmium, total** | **03/16/1999** | **0.0018** | **mg/l** | **0.001** | **0.0018** | **0** |
| MW-16S | Cadmium, total | 06/24/2004 | 0.001 | mg/l | 0.001 | 0.0018 | |
| **MW-17** | **Cadmium, total** | **03/16/1999** | **0.0018** | **mg/l** | **0.001** | **0.0018** | **0** |
| MW-18 | Cadmium, total | 03/16/1999 | 0.0017 | mg/l | 0.001 | 0.0018 | |
| **MW-18** | **Cadmium, total** | **01/25/2006** | **0.0031** | **mg/l** | **0.001** | **0.0018** | **0.0014** |
| MW-18 | Cadmium, total | 01/26/2007 | 0.9 | ug/l | 1 | 1.75 | |
| **MW-19** | **Cadmium, total** | **12/06/2000** | **0.24** | **mg/l** | **0.001** | **0.0018** | **0.2383** |
| **MW-19** | **Cadmium, total** | **06/17/2005** | **0.002** | **mg/l** | **0.001** | **0.0018** | **0.0003** |
| **MW-20** | **Cadmium, total** | **03/16/1999** | **0.0028** | **mg/l** | **0.001** | **0.0018** | **0.0011** |
| **MW-21R** | **Cadmium, total** | **03/16/1999** | **0.0022** | **mg/l** | **0.001** | **0.0018** | **0.0005** |
| MW-21R | Cadmium, total | 01/26/2007 | 0.6 | ug/l | 1 | 1.75 | |
| MW-22 | Cadmium, total | 03/16/1999 | 0.0016 | mg/l | 0.001 | 0.0018 | |
| **MW-23** | **Cadmium, total** | **03/16/1999** | **0.0035** | **mg/l** | **0.001** | **0.0018** | **0.0018** |
| MW-23 | Cadmium, total | 06/19/2003 | 0.001 | mg/l | 0.001 | 0.0018 | |
| SW-1 | Cadmium, total | 06/24/2004 | 0.0011 | mg/l | 0.001 | 0.0018 | |
| **MW-13** | **Chromium, total** | **03/16/1999** | **1.7** | **mg/l** | **0.1** | **0.05** | **1.65** |
| **MW-13** | **Chromium, total** | **05/12/1999** | **0.34** | **mg/l** | **0.002** | **0.05** | **0.29** |
| **MW-13** | **Chromium, total** | **06/28/1999** | **1.3** | **mg/l** | **0.002** | **0.05** | **1.25** |
| **MW-13** | **Chromium, total** | **10/04/1999** | **0.092** | **mg/l** | **0.002** | **0.05** | **0.042** |
| MW-13 | Chromium, total | 12/06/2000 | 0.014 | mg/l | 0.002 | 0.05 | |
| MW-13 | Chromium, total | 07/16/2001 | 0.0052 | mg/l | 0.002 | 0.05 | |
| MW-13 | Chromium, total | 01/10/2002 | 0.0094 | mg/l | 0.002 | 0.05 | |
| MW-13 | Chromium, total | 12/17/2002 | 0.0044 | mg/l | 0.002 | 0.05 | |
| **MW-14** | **Chromium, total** | **03/16/1999** | **0.089** | **mg/l** | **0.01** | **0.05** | **0.039** |
| **MW-14** | **Chromium, total** | **05/12/1999** | **0.062** | **mg/l** | **0.002** | **0.05** | **0.012** |
| **MW-14** | **Chromium, total** | **06/28/1999** | **0.082** | **mg/l** | **0.002** | **0.05** | **0.032** |
| MW-14 | Chromium, total | 10/05/1999 | 0.016 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 06/06/2000 | 0.0076 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 07/16/2001 | 0.02 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 01/10/2002 | 0.0052 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 06/26/2002 | 0.0096 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 12/17/2002 | 0.016 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 06/19/2003 | 0.032 | mg/l | 0.002 | 0.05 | |
| MW-14 | Chromium, total | 01/07/2004 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-14 | Chromium, total | 06/24/2004 | 0.024 | mg/l | 0.01 | 0.05 | |
| MW-14 | Chromium, total | 01/07/2005 | 0.022 | mg/l | 0.01 | 0.05 | |
| MW-14 | Chromium, total | 06/17/2005 | 0.025 | mg/l | 0.01 | 0.05 | |
| MW-14 | Chromium, total | 01/26/2007 | 13.1 | ug/l | 10 | 50 | |
| **MW-15** | **Chromium, total** | **03/16/1999** | **1.4** | **mg/l** | **0.08** | **0.05** | **1.35** |
| **MW-15** | **Chromium, total** | **05/12/1999** | **0.3** | **mg/l** | **0.002** | **0.05** | **0.25** |
| **MW-15** | **Chromium, total** | **06/28/1999** | **0.3** | **mg/l** | **0.002** | **0.05** | **0.25** |
| MW-15 | Chromium, total | 10/05/1999 | 0.034 | mg/l | 0.002 | 0.05 | |
| **MW-15** | **Chromium, total** | **12/06/2000** | **0.098** | **mg/l** | **0.002** | **0.05** | **0.048** |
| MW-15 | Chromium, total | 07/16/2001 | 0.032 | mg/l | 0.002 | 0.05 | |
| MW-15 | Chromium, total | 01/10/2002 | 0.007 | mg/l | 0.002 | 0.05 | |
| MW-15 | Chromium, total | 06/26/2002 | 0.047 | mg/l | 0.002 | 0.05 | |
| MW-15 | Chromium, total | 12/17/2002 | 0.011 | mg/l | 0.002 | 0.05 | |
| MW-15 | Chromium, total | 06/19/2003 | 0.0064 | mg/l | 0.002 | 0.05 | |
| **MW-16D** | **Chromium, total** | **03/16/1999** | **2.2** | **mg/l** | **0.08** | **0.05** | **2.15** |
| **MW-16D** | **Chromium, total** | **05/12/1999** | **0.55** | **mg/l** | **0.002** | **0.05** | **0.5** |
| **MW-16D** | **Chromium, total** | **06/28/1999** | **0.43** | **mg/l** | **0.002** | **0.05** | **0.38** |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16D | Chromium, total | 10/05/1999 | 0.023 | mg/l | 0.002 | 0.05 | |
| MW-16D | Chromium, total | 06/06/2000 | 0.014 | mg/l | 0.002 | 0.05 | |
| **MW-16D** | **Chromium, total** | **12/06/2000** | **0.13** | **mg/l** | **0.002** | **0.05** | **0.08** |
| **MW-16D** | **Chromium, total** | **07/16/2001** | **0.11** | **mg/l** | **0.002** | **0.05** | **0.06** |
| MW-16D | Chromium, total | 01/10/2002 | 0.049 | mg/l | 0.002 | 0.05 | |
| **MW-16D** | **Chromium, total** | **06/26/2002** | **0.081** | **mg/l** | **0.002** | **0.05** | **0.031** |
| MW-16D | Chromium, total | 12/17/2002 | 0.049 | mg/l | 0.002 | 0.05 | |
| MW-16D | Chromium, total | 06/19/2003 | 0.029 | mg/l | 0.002 | 0.05 | |
| MW-16D | Chromium, total | 01/07/2004 | 0.01 | mg/l | 0.01 | 0.05 | |
| **MW-16D** | **Chromium, total** | **07/14/2006** | **0.143** | **mg/l** | **0.01** | **0.05** | **0.093** |
| MW-16S | Chromium, total | 03/16/1999 | 0.024 | mg/l | 0.008 | 0.05 | |
| MW-16S | Chromium, total | 05/12/1999 | 0.03 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 06/28/1999 | 0.026 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 10/05/1999 | 0.031 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 12/06/2000 | 0.0086 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 07/16/2001 | 0.0067 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 01/10/2002 | 0.0072 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 06/26/2002 | 0.012 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 12/17/2002 | 0.0092 | mg/l | 0.002 | 0.05 | |
| MW-16S | Chromium, total | 06/19/2003 | 0.05 | mg/l | 0.002 | 0.05 | |
| **MW-17** | **Chromium, total** | **03/16/1999** | **0.12** | **mg/l** | **0.008** | **0.05** | **0.07** |
| **MW-17** | **Chromium, total** | **05/12/1999** | **0.064** | **mg/l** | **0.002** | **0.05** | **0.014** |
| MW-17 | Chromium, total | 06/28/1999 | 0.045 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 10/06/1999 | 0.03 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 12/06/2000 | 0.0078 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 07/16/2001 | 0.009 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 01/10/2002 | 0.011 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 12/16/2002 | 0.0077 | mg/l | 0.002 | 0.05 | |
| MW-17 | Chromium, total | 06/19/2003 | 0.0066 | mg/l | 0.002 | 0.05 | |
| **MW-18** | **Chromium, total** | **03/16/1999** | **4.6** | **mg/l** | **0.2** | **0.05** | **4.55** |
| **MW-18** | **Chromium, total** | **05/12/1999** | **0.69** | **mg/l** | **0.002** | **0.05** | **0.64** |
| **MW-18** | **Chromium, total** | **06/28/1999** | **0.25** | **mg/l** | **0.002** | **0.05** | **0.2** |
| **MW-18** | **Chromium, total** | **10/06/1999** | **0.16** | **mg/l** | **0.002** | **0.05** | **0.11** |
| **MW-18** | **Chromium, total** | **12/06/2000** | **0.059** | **mg/l** | **0.002** | **0.05** | **0.009** |
| MW-18 | Chromium, total | 07/16/2001 | 0.012 | mg/l | 0.002 | 0.05 | |
| MW-18 | Chromium, total | 01/10/2002 | 0.0069 | mg/l | 0.002 | 0.05 | |
| MW-18 | Chromium, total | 12/16/2002 | 0.011 | mg/l | 0.002 | 0.05 | |
| MW-18 | Chromium, total | 06/19/2003 | 0.015 | mg/l | 0.002 | 0.05 | |
| MW-18 | Chromium, total | 01/26/2007 | 3.5 | ug/l | 10 | 50 | |
| **MW-19** | **Chromium, total** | **03/16/1999** | **0.19** | **mg/l** | **0.008** | **0.05** | **0.14** |
| **MW-19** | **Chromium, total** | **05/12/1999** | **0.062** | **mg/l** | **0.002** | **0.05** | **0.012** |
| **MW-19** | **Chromium, total** | **06/28/1999** | **0.09** | **mg/l** | **0.002** | **0.05** | **0.04** |
| MW-19 | Chromium, total | 10/06/1999 | 0.012 | mg/l | 0.002 | 0.05 | |
| **MW-19** | **Chromium, total** | **12/06/2000** | **0.25** | **mg/l** | **0.002** | **0.05** | **0.2** |
| MW-19 | Chromium, total | 07/16/2001 | 0.0028 | mg/l | 0.002 | 0.05 | |
| MW-19 | Chromium, total | 01/10/2002 | 0.013 | mg/l | 0.002 | 0.05 | |
| MW-19 | Chromium, total | 06/19/2003 | 0.0026 | mg/l | 0.002 | 0.05 | |
| **MW-20** | **Chromium, total** | **03/16/1999** | **2.5** | **mg/l** | **0.2** | **0.05** | **2.45** |
| **MW-20** | **Chromium, total** | **05/12/1999** | **0.49** | **mg/l** | **0.002** | **0.05** | **0.44** |
| **MW-20** | **Chromium, total** | **06/28/1999** | **0.37** | **mg/l** | **0.002** | **0.05** | **0.32** |
| **MW-20** | **Chromium, total** | **10/06/1999** | **0.63** | **mg/l** | **0.002** | **0.05** | **0.58** |
| MW-20 | Chromium, total | 06/07/2000 | 0.005 | mg/l | 0.002 | 0.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-20** | **Chromium, total** | **12/06/2000** | **0.32** | **mg/l** | **0.002** | **0.05** | **0.27** |
| **MW-20** | **Chromium, total** | **07/16/2001** | **0.063** | **mg/l** | **0.002** | **0.05** | **0.013** |
| **MW-20** | **Chromium, total** | **01/09/2002** | **0.17** | **mg/l** | **0.002** | **0.05** | **0.12** |
| **MW-20** | **Chromium, total** | **06/25/2002** | **0.4** | **mg/l** | **0.002** | **0.05** | **0.35** |
| **MW-20** | **Chromium, total** | **12/17/2002** | **0.16** | **mg/l** | **0.002** | **0.05** | **0.11** |
| MW-20 | Chromium, total | 06/19/2003 | 0.015 | mg/l | 0.002 | 0.05 | |
| **MW-21R** | **Chromium, total** | **03/16/1999** | **0.32** | **mg/l** | **0.02** | **0.05** | **0.27** |
| **MW-21R** | **Chromium, total** | **05/12/1999** | **0.14** | **mg/l** | **0.002** | **0.05** | **0.09** |
| **MW-21R** | **Chromium, total** | **06/28/1999** | **0.17** | **mg/l** | **0.002** | **0.05** | **0.12** |
| **MW-21R** | **Chromium, total** | **10/06/1999** | **0.12** | **mg/l** | **0.002** | **0.05** | **0.07** |
| MW-21R | Chromium, total | 12/06/2000 | 0.034 | mg/l | 0.002 | 0.05 | |
| MW-21R | Chromium, total | 07/16/2001 | 0.0083 | mg/l | 0.002 | 0.05 | |
| MW-21R | Chromium, total | 01/09/2002 | 0.0089 | mg/l | 0.002 | 0.05 | |
| MW-21R | Chromium, total | 06/25/2002 | 0.015 | mg/l | 0.002 | 0.05 | |
| MW-21R | Chromium, total | 12/17/2002 | 0.014 | mg/l | 0.002 | 0.05 | |
| MW-21R | Chromium, total | 06/19/2003 | 0.0067 | mg/l | 0.002 | 0.05 | |
| **MW-22** | **Chromium, total** | **03/16/1999** | **1** | **mg/l** | **0.04** | **0.05** | **0.95** |
| **MW-22** | **Chromium, total** | **05/12/1999** | **0.42** | **mg/l** | **0.002** | **0.05** | **0.37** |
| **MW-22** | **Chromium, total** | **06/30/1999** | **0.44** | **mg/l** | **0.002** | **0.05** | **0.39** |
| **MW-22** | **Chromium, total** | **10/04/1999** | **0.11** | **mg/l** | **0.002** | **0.05** | **0.06** |
| MW-22 | Chromium, total | 06/06/2000 | 0.0022 | mg/l | 0.002 | 0.05 | |
| MW-22 | Chromium, total | 12/06/2000 | 0.011 | mg/l | 0.002 | 0.05 | |
| MW-22 | Chromium, total | 07/16/2001 | 0.015 | mg/l | 0.002 | 0.05 | |
| MW-22 | Chromium, total | 01/09/2002 | 0.034 | mg/l | 0.002 | 0.05 | |
| MW-22 | Chromium, total | 06/26/2002 | 0.0032 | mg/l | 0.002 | 0.05 | |
| **MW-22** | **Chromium, total** | **12/16/2002** | **0.063** | **mg/l** | **0.002** | **0.05** | **0.013** |
| MW-22 | Chromium, total | 06/19/2003 | 0.044 | mg/l | 0.002 | 0.05 | |
| **MW-23** | **Chromium, total** | **03/16/1999** | **0.3** | **mg/l** | **0.02** | **0.05** | **0.25** |
| **MW-23** | **Chromium, total** | **05/12/1999** | **0.12** | **mg/l** | **0.002** | **0.05** | **0.07** |
| **MW-23** | **Chromium, total** | **06/28/1999** | **0.1** | **mg/l** | **0.002** | **0.05** | **0.05** |
| MW-23 | Chromium, total | 10/04/1999 | 0.028 | mg/l | 0.002 | 0.05 | |
| MW-23 | Chromium, total | 12/06/2000 | 0.017 | mg/l | 0.002 | 0.05 | |
| MW-23 | Chromium, total | 07/16/2001 | 0.0071 | mg/l | 0.002 | 0.05 | |
| MW-23 | Chromium, total | 01/10/2002 | 0.023 | mg/l | 0.002 | 0.05 | |
| MW-23 | Chromium, total | 06/25/2002 | 0.0021 | mg/l | 0.002 | 0.05 | |
| MW-23 | Chromium, total | 12/17/2002 | 0.0037 | mg/l | 0.002 | 0.05 | |
| SW-1 | Chromium, total | 04/22/1998 | 0.002 | mg/l | 0.002 | 0.05 | |
| SW-2 | Chromium, total | 03/16/1999 | 0.0033 | mg/l | 0.002 | 0.05 | |
| SW-2 | Chromium, total | 12/06/2000 | 0.0094 | mg/l | 0.002 | 0.05 | |
| SW-6 | Chromium, total | 06/30/1999 | 0.0045 | mg/l | 0.002 | 0.05 | |
| SW-6 | Chromium, total | 10/04/1999 | 0.002 | mg/l | 0.002 | 0.05 | |
| MW-13 | Cobalt, total | 03/16/1999 | 0.9 | mg/l | 0.04 | | |
| MW-13 | Cobalt, total | 05/12/1999 | 0.11 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 06/28/1999 | 0.41 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 10/04/1999 | 0.041 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 06/06/2000 | 0.13 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 12/06/2000 | 0.096 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 07/16/2001 | 0.093 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 01/10/2002 | 0.11 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 06/25/2002 | 0.11 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 12/17/2002 | 0.14 | mg/l | 0.005 | | |
| MW-13 | Cobalt, total | 06/19/2003 | 0.23 | mg/l | 0.005 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-13 | Cobalt, total | 01/07/2004 | 0.2 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 06/24/2004 | 0.22 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 01/07/2005 | 0.22 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 06/17/2005 | 0.22 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 01/25/2006 | 0.224 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 07/14/2006 | 0.171 | mg/l | 0.01 | | |
| MW-13 | Cobalt, total | 01/26/2007 | 235 | ug/l | 10 | | |
| MW-14 | Cobalt, total | 03/16/1999 | 0.032 | mg/l | 0.002 | | |
| MW-14 | Cobalt, total | 05/12/1999 | 0.024 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 06/28/1999 | 0.033 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 10/05/1999 | 0.018 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 06/06/2000 | 0.01 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 07/16/2001 | 0.018 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 06/26/2002 | 0.011 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 12/17/2002 | 0.011 | mg/l | 0.005 | | |
| MW-14 | Cobalt, total | 01/07/2004 | 0.015 | mg/l | 0.01 | | |
| MW-14 | Cobalt, total | 01/07/2005 | 0.011 | mg/l | 0.01 | | |
| MW-14 | Cobalt, total | 06/17/2005 | 0.022 | mg/l | 0.01 | | |
| MW-14 | Cobalt, total | 01/26/2007 | 22.9 | ug/l | 10 | | |
| MW-15 | Cobalt, total | 03/16/1999 | 0.92 | mg/l | 0.04 | | |
| MW-15 | Cobalt, total | 05/12/1999 | 0.093 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 06/28/1999 | 0.094 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 10/05/1999 | 0.029 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 06/07/2000 | 0.0055 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 12/06/2000 | 0.028 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 07/16/2001 | 0.011 | mg/l | 0.005 | | |
| MW-15 | Cobalt, total | 06/26/2002 | 0.017 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 03/16/1999 | 2.1 | mg/l | 0.1 | | |
| MW-16D | Cobalt, total | 05/12/1999 | 0.32 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 06/28/1999 | 0.26 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 10/05/1999 | 0.022 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 06/06/2000 | 0.18 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 12/06/2000 | 0.16 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 07/16/2001 | 0.28 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 01/10/2002 | 0.085 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 06/26/2002 | 0.16 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 12/17/2002 | 0.13 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 06/19/2003 | 0.096 | mg/l | 0.005 | | |
| MW-16D | Cobalt, total | 01/07/2004 | 0.069 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 06/24/2004 | 0.1 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 01/07/2005 | 0.075 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 06/17/2005 | 0.077 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 01/26/2006 | 0.0938 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 07/14/2006 | 0.652 | mg/l | 0.01 | | |
| MW-16D | Cobalt, total | 01/26/2007 | 128 | ug/l | 10 | | |
| MW-16S | Cobalt, total | 03/16/1999 | 0.041 | mg/l | 0.002 | | |
| MW-16S | Cobalt, total | 05/12/1999 | 0.032 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 06/28/1999 | 0.026 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 10/05/1999 | 0.14 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 12/06/2000 | 0.0062 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 07/16/2001 | 0.0096 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 01/10/2002 | 0.01 | mg/l | 0.005 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16S | Cobalt, total | 06/26/2002 | 0.025 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 12/17/2002 | 0.011 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 06/19/2003 | 0.099 | mg/l | 0.005 | | |
| MW-16S | Cobalt, total | 01/07/2004 | 0.012 | mg/l | 0.01 | | |
| MW-16S | Cobalt, total | 06/24/2004 | 0.042 | mg/l | 0.01 | | |
| MW-16S | Cobalt, total | 01/07/2005 | 0.024 | mg/l | 0.01 | | |
| MW-16S | Cobalt, total | 06/17/2005 | 0.019 | mg/l | 0.01 | | |
| MW-16S | Cobalt, total | 07/14/2006 | 0.023 | mg/l | 0.01 | | |
| MW-16S | Cobalt, total | 01/26/2007 | 11 | ug/l | 10 | | |
| MW-17 | Cobalt, total | 03/16/1999 | 0.62 | mg/l | 0.04 | | |
| MW-17 | Cobalt, total | 05/12/1999 | 0.26 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 06/28/1999 | 0.21 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 10/06/1999 | 0.16 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 06/06/2000 | 0.028 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 12/06/2000 | 0.032 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 07/16/2001 | 0.033 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 01/10/2002 | 0.043 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 06/26/2002 | 0.056 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 12/16/2002 | 0.046 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 06/19/2003 | 0.082 | mg/l | 0.005 | | |
| MW-17 | Cobalt, total | 06/24/2004 | 0.017 | mg/l | 0.01 | | |
| MW-17 | Cobalt, total | 06/17/2005 | 0.013 | mg/l | 0.01 | | |
| MW-17 | Cobalt, total | 07/14/2006 | 0.0136 | mg/l | 0.01 | | |
| MW-17 | Cobalt, total | 01/26/2007 | 3 | ug/l | 10 | | |
| MW-18 | Cobalt, total | 03/16/1999 | 1.6 | mg/l | 0.1 | | |
| MW-18 | Cobalt, total | 05/12/1999 | 0.18 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 06/28/1999 | 0.065 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 10/06/1999 | 0.048 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 06/06/2000 | 0.023 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 12/06/2000 | 0.013 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 07/16/2001 | 0.015 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 01/10/2002 | 0.007 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 12/16/2002 | 0.0062 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 06/19/2003 | 0.0077 | mg/l | 0.005 | | |
| MW-18 | Cobalt, total | 01/26/2007 | 6.2 | ug/l | 10 | | |
| MW-19 | Cobalt, total | 03/16/1999 | 0.094 | mg/l | 0.004 | | |
| MW-19 | Cobalt, total | 05/12/1999 | 0.075 | mg/l | 0.005 | | |
| MW-19 | Cobalt, total | 06/28/1999 | 0.077 | mg/l | 0.005 | | |
| MW-19 | Cobalt, total | 06/06/2000 | 0.0068 | mg/l | 0.005 | | |
| MW-19 | Cobalt, total | 12/06/2000 | 0.23 | mg/l | 0.005 | | |
| MW-19 | Cobalt, total | 01/10/2002 | 0.0076 | mg/l | 0.005 | | |
| MW-19 | Cobalt, total | 06/24/2004 | 0.01 | mg/l | 0.01 | | |
| MW-19 | Cobalt, total | 07/13/2006 | 0.0191 | mg/l | 0.01 | | |
| MW-19 | Cobalt, total | 01/26/2007 | 6.2 | ug/l | 10 | | |
| MW-20 | Cobalt, total | 03/16/1999 | 0.86 | mg/l | 0.04 | | |
| MW-20 | Cobalt, total | 05/12/1999 | 0.098 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 06/28/1999 | 0.066 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 10/06/1999 | 0.12 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 06/07/2000 | 0.039 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 12/06/2000 | 0.053 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 07/16/2001 | 0.015 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 01/09/2002 | 0.033 | mg/l | 0.005 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-20 | Cobalt, total | 06/25/2002 | 0.069 | mg/l | 0.005 | | |
| MW-20 | Cobalt, total | 12/17/2002 | 0.037 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 03/16/1999 | 0.34 | mg/l | 0.02 | | |
| MW-21R | Cobalt, total | 05/12/1999 | 0.13 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 06/28/1999 | 0.15 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 10/06/1999 | 0.064 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 12/06/2000 | 0.0082 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 06/25/2002 | 0.006 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 12/17/2002 | 0.005 | mg/l | 0.005 | | |
| MW-21R | Cobalt, total | 01/26/2007 | 3.1 | ug/l | 10 | | |
| MW-22 | Cobalt, total | 03/16/1999 | 0.22 | mg/l | 0.02 | | |
| MW-22 | Cobalt, total | 05/12/1999 | 0.082 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 06/30/1999 | 0.081 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 10/04/1999 | 0.02 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 06/06/2000 | 0.0093 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 12/06/2000 | 0.0079 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 07/16/2001 | 0.012 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 01/09/2002 | 0.014 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 06/26/2002 | 0.017 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 12/16/2002 | 0.015 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 06/19/2003 | 0.0059 | mg/l | 0.005 | | |
| MW-22 | Cobalt, total | 01/07/2005 | 0.01 | mg/l | 0.01 | | |
| MW-22 | Cobalt, total | 01/26/2007 | 4.6 | ug/l | 10 | | |
| MW-23 | Cobalt, total | 03/16/1999 | 0.19 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 05/12/1999 | 0.055 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 06/28/1999 | 0.042 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 10/04/1999 | 0.021 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 06/06/2000 | 0.024 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 12/06/2000 | 0.014 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 07/16/2001 | 0.025 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 01/10/2002 | 0.02 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 06/25/2002 | 0.029 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 12/17/2002 | 0.042 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 06/19/2003 | 0.032 | mg/l | 0.005 | | |
| MW-23 | Cobalt, total | 01/07/2004 | 0.026 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 06/24/2004 | 0.039 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 01/07/2005 | 0.032 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 06/17/2005 | 0.018 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 01/25/2006 | 0.0205 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 07/14/2006 | 0.0215 | mg/l | 0.01 | | |
| MW-23 | Cobalt, total | 01/26/2007 | 19.6 | ug/l | 10 | | |
| SW-2 | Cobalt, total | 12/06/2000 | 0.0056 | mg/l | 0.005 | | |
| MW-13 | Copper | 03/16/1999 | 0.81 | mg/l | 0.05 | 1 | |
| MW-13 | Copper | 05/12/1999 | 0.12 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 06/28/1999 | 0.64 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 10/04/1999 | 0.037 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 06/06/2000 | 0.0027 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 12/06/2000 | 0.0051 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 07/16/2001 | 0.0036 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 01/10/2002 | 0.0077 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 06/25/2002 | 0.0064 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 12/17/2002 | 0.0077 | mg/l | 0.002 | 1 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-13 | Copper | 06/19/2003 | 0.0039 | mg/l | 0.002 | 1 | |
| MW-13 | Copper | 01/26/2007 | 12.2 | ug/l | 10 | 1000 | |
| MW-14 | Copper | 03/16/1999 | 0.059 | mg/l | 0.01 | 1 | |
| MW-14 | Copper | 05/12/1999 | 0.054 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 06/28/1999 | 0.071 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 10/05/1999 | 0.026 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 06/06/2000 | 0.0024 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 07/16/2001 | 0.02 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 06/26/2002 | 0.011 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 12/17/2002 | 0.0078 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 06/19/2003 | 0.0026 | mg/l | 0.002 | 1 | |
| MW-14 | Copper | 01/26/2007 | 18.1 | ug/l | 10 | 1000 | |
| **MW-15** | **Copper** | **03/16/1999** | **8.2** | **mg/l** | **0.2** | **1** | **7.2** |
| **MW-15** | **Copper** | **05/12/1999** | **1.4** | **mg/l** | **0.002** | **1** | **0.4** |
| **MW-15** | **Copper** | **06/28/1999** | **1.4** | **mg/l** | **0.002** | **1** | **0.4** |
| MW-15 | Copper | 10/05/1999 | 0.43 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 12/06/2000 | 0.39 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 07/16/2001 | 0.14 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 01/10/2002 | 0.021 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 06/26/2002 | 0.22 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 12/17/2002 | 0.024 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 06/19/2003 | 0.014 | mg/l | 0.002 | 1 | |
| MW-15 | Copper | 01/26/2007 | 53.9 | ug/l | 10 | 1000 | |
| **MW-16D** | **Copper** | **03/16/1999** | **6.7** | **mg/l** | **0.2** | **1** | **5.7** |
| **MW-16D** | **Copper** | **05/12/1999** | **1.6** | **mg/l** | **0.002** | **1** | **0.6** |
| MW-16D | Copper | 06/28/1999 | 1 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 10/05/1999 | 0.061 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 06/06/2000 | 0.31 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 12/06/2000 | 0.27 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 07/16/2001 | 0.3 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 01/10/2002 | 0.093 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 06/26/2002 | 0.16 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 12/17/2002 | 0.082 | mg/l | 0.002 | 1 | |
| MW-16D | Copper | 06/19/2003 | 0.051 | mg/l | 0.002 | 1 | |
| **MW-16D** | **Copper** | **07/14/2006** | **1.68** | **mg/l** | **0.2** | **1** | **0.68** |
| MW-16D | Copper | 01/26/2007 | 41.1 | ug/l | 10 | 1000 | |
| MW-16S | Copper | 03/16/1999 | 0.091 | mg/l | 0.01 | 1 | |
| MW-16S | Copper | 05/12/1999 | 0.075 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 06/28/1999 | 0.077 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 10/05/1999 | 0.38 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 12/06/2000 | 0.0062 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 07/16/2001 | 0.019 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 01/10/2002 | 0.021 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 06/26/2002 | 0.046 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 12/17/2002 | 0.012 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 06/19/2003 | 0.11 | mg/l | 0.002 | 1 | |
| MW-16S | Copper | 01/26/2007 | 52.1 | ug/l | 10 | 1000 | |
| MW-17 | Copper | 03/16/1999 | 0.57 | mg/l | 0.02 | 1 | |
| MW-17 | Copper | 05/12/1999 | 0.37 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 06/28/1999 | 0.31 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 10/06/1999 | 0.098 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 12/06/2000 | 0.022 | mg/l | 0.002 | 1 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-17 | Copper | 07/16/2001 | 0.027 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 01/10/2002 | 0.037 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 06/26/2002 | 0.0039 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 12/16/2002 | 0.016 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 06/19/2003 | 0.012 | mg/l | 0.002 | 1 | |
| MW-17 | Copper | 01/26/2007 | 321 | ug/l | 10 | 1000 | |
| **MW-18** | **Copper** | **03/16/1999** | **2.7** | **mg/l** | **0.2** | **1** | **1.7** |
| MW-18 | Copper | 05/12/1999 | 0.44 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 06/28/1999 | 0.14 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 10/06/1999 | 0.096 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 06/06/2000 | 0.018 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 12/06/2000 | 0.043 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 07/16/2001 | 0.0075 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 01/10/2002 | 0.0034 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 12/16/2002 | 0.0082 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 06/19/2003 | 0.01 | mg/l | 0.002 | 1 | |
| MW-18 | Copper | 01/26/2007 | 29.4 | ug/l | 10 | 1000 | |
| MW-19 | Copper | 03/16/1999 | 0.2 | mg/l | 0.01 | 1 | |
| MW-19 | Copper | 05/12/1999 | 0.079 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 06/28/1999 | 0.11 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 10/06/1999 | 0.0096 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 12/06/2000 | 0.29 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 01/10/2002 | 0.012 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 06/26/2002 | 0.0032 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 12/16/2002 | 0.002 | mg/l | 0.002 | 1 | |
| MW-19 | Copper | 01/26/2007 | 9.1 | ug/l | 10 | 1000 | |
| **MW-20** | **Copper** | **03/16/1999** | **2** | **mg/l** | **0.1** | **1** | **1** |
| MW-20 | Copper | 05/12/1999 | 0.27 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 06/28/1999 | 0.19 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 10/06/1999 | 0.32 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 06/07/2000 | 0.027 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 12/06/2000 | 0.18 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 07/16/2001 | 0.038 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 01/09/2002 | 0.09 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 06/25/2002 | 0.21 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 12/17/2002 | 0.08 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 06/19/2003 | 0.0065 | mg/l | 0.002 | 1 | |
| MW-20 | Copper | 01/26/2007 | 3.6 | ug/l | 10 | 1000 | |
| **MW-21R** | **Copper** | **03/16/1999** | **3** | **mg/l** | **0.1** | **1** | **2** |
| **MW-21R** | **Copper** | **05/12/1999** | **1.1** | **mg/l** | **0.002** | **1** | **0.1** |
| **MW-21R** | **Copper** | **06/28/1999** | **1.4** | **mg/l** | **0.002** | **1** | **0.4** |
| MW-21R | Copper | 10/06/1999 | 1 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 06/07/2000 | 0.05 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 12/06/2000 | 0.3 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 07/16/2001 | 0.098 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 01/09/2002 | 0.11 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 06/25/2002 | 0.17 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 12/17/2002 | 0.12 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 06/19/2003 | 0.044 | mg/l | 0.002 | 1 | |
| MW-21R | Copper | 01/26/2007 | 218 | ug/l | 10 | 1000 | |
| MW-22 | Copper | 03/16/1999 | 0.58 | mg/l | 0.1 | 1 | |
| MW-22 | Copper | 05/12/1999 | 0.22 | mg/l | 0.002 | 1 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-22 | Copper | 06/30/1999 | 0.2 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 10/04/1999 | 0.057 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 12/06/2000 | 0.0028 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 07/16/2001 | 0.0069 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 01/09/2002 | 0.024 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 06/26/2002 | 0.0026 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 12/16/2002 | 0.034 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 06/19/2003 | 0.021 | mg/l | 0.002 | 1 | |
| MW-22 | Copper | 01/26/2007 | 4.6 | ug/l | 10 | 1000 | |
| MW-23 | Copper | 03/16/1999 | 0.99 | mg/l | 0.1 | 1 | |
| MW-23 | Copper | 05/12/1999 | 0.25 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 06/28/1999 | 0.2 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 10/04/1999 | 0.035 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 06/06/2000 | 0.0061 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 12/06/2000 | 0.036 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 07/16/2001 | 0.11 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 01/10/2002 | 0.055 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 06/25/2002 | 0.018 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 12/17/2002 | 0.0078 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 06/19/2003 | 0.0022 | mg/l | 0.002 | 1 | |
| MW-23 | Copper | 01/26/2007 | 1.9 | ug/l | 10 | 1000 | |
| SW-1 | Copper | 06/19/2003 | 0.0022 | mg/l | 0.002 | 1 | |
| SW-1 | Copper | 01/26/2007 | 0.8 | ug/l | 10 | 1000 | |
| SW-2 | Copper | 12/06/2000 | 0.0024 | mg/l | 0.002 | 1 | |
| SW-2 | Copper | 12/17/2002 | 0.0023 | mg/l | 0.002 | 1 | |
| SW-2 | Copper | 06/19/2003 | 0.0021 | mg/l | 0.002 | 1 | |
| SW-6 | Copper | 06/19/2003 | 0.0034 | mg/l | 0.002 | 1 | |
| SW-6 | Copper | 01/26/2007 | 1.2 | ug/l | 10 | 1000 | |
| **MW-13** | **Lead, total** | **03/16/1999** | **0.06** | **mg/l** | **0.005** | **0.015** | **0.045** |
| MW-13 | Lead, total | 05/12/1999 | 0.013 | mg/l | 0.005 | 0.015 | |
| **MW-13** | **Lead, total** | **06/28/1999** | **0.05** | **mg/l** | **0.005** | **0.015** | **0.035** |
| MW-13 | Lead, total | 06/19/2003 | 0.0054 | mg/l | 0.005 | 0.015 | |
| MW-14 | Lead, total | 07/16/2001 | 0.0083 | mg/l | 0.003 | 0.015 | |
| MW-14 | Lead, total | 06/26/2002 | 0.0067 | mg/l | 0.005 | 0.015 | |
| **MW-15** | **Lead, total** | **03/16/1999** | **0.15** | **mg/l** | **0.01** | **0.015** | **0.135** |
| **MW-15** | **Lead, total** | **05/12/1999** | **0.025** | **mg/l** | **0.005** | **0.015** | **0.01** |
| **MW-15** | **Lead, total** | **06/28/1999** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| MW-15 | Lead, total | 10/05/1999 | 0.0062 | mg/l | 0.005 | 0.015 | |
| MW-15 | Lead, total | 06/26/2002 | 0.0083 | mg/l | 0.005 | 0.015 | |
| **MW-16D** | **Lead, total** | **03/16/1999** | **0.59** | **mg/l** | **0.05** | **0.015** | **0.575** |
| **MW-16D** | **Lead, total** | **05/12/1999** | **0.072** | **mg/l** | **0.005** | **0.015** | **0.057** |
| **MW-16D** | **Lead, total** | **06/28/1999** | **0.054** | **mg/l** | **0.005** | **0.015** | **0.039** |
| MW-16D | Lead, total | 10/05/1999 | 0.011 | mg/l | 0.005 | 0.015 | |
| **MW-16D** | **Lead, total** | **06/06/2000** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| **MW-16D** | **Lead, total** | **12/06/2000** | **0.016** | **mg/l** | **0.005** | **0.015** | **0.001** |
| **MW-16D** | **Lead, total** | **07/16/2001** | **0.022** | **mg/l** | **0.003** | **0.015** | **0.007** |
| MW-16D | Lead, total | 01/10/2002 | 0.0078 | mg/l | 0.003 | 0.015 | |
| **MW-16D** | **Lead, total** | **06/26/2002** | **0.02** | **mg/l** | **0.005** | **0.015** | **0.005** |
| MW-16D | Lead, total | 12/17/2002 | 0.011 | mg/l | 0.005 | 0.015 | |
| MW-16D | Lead, total | 06/19/2003 | 0.0067 | mg/l | 0.005 | 0.015 | |
| **MW-16D** | **Lead, total** | **07/14/2006** | **0.0483** | **mg/l** | **0.01** | **0.015** | **0.0333** |
| **MW-16S** | **Lead, total** | **03/16/1999** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-16S** | **Lead, total** | **05/12/1999** | **0.017** | **mg/l** | **0.005** | **0.015** | **0.002** |
| **MW-16S** | **Lead, total** | **06/28/1999** | **0.019** | **mg/l** | **0.005** | **0.015** | **0.004** |
| **MW-16S** | **Lead, total** | **10/05/1999** | **0.027** | **mg/l** | **0.005** | **0.015** | **0.012** |
| MW-16S | Lead, total | 07/16/2001 | 0.0041 | mg/l | 0.003 | 0.015 | |
| MW-16S | Lead, total | 06/26/2002 | 0.012 | mg/l | 0.005 | 0.015 | |
| MW-16S | Lead, total | 12/17/2002 | 0.005 | mg/l | 0.005 | 0.015 | |
| **MW-16S** | **Lead, total** | **06/19/2003** | **0.035** | **mg/l** | **0.005** | **0.015** | **0.02** |
| **MW-16S** | **Lead, total** | **06/24/2004** | **0.016** | **mg/l** | **0.01** | **0.015** | **0.001** |
| **MW-16S** | **Lead, total** | **01/07/2005** | **0.017** | **mg/l** | **0.01** | **0.015** | **0.002** |
| **MW-17** | **Lead, total** | **03/16/1999** | **1.2** | **mg/l** | **0.1** | **0.015** | **1.185** |
| **MW-17** | **Lead, total** | **05/12/1999** | **0.36** | **mg/l** | **0.005** | **0.015** | **0.345** |
| **MW-17** | **Lead, total** | **06/28/1999** | **0.31** | **mg/l** | **0.005** | **0.015** | **0.295** |
| **MW-17** | **Lead, total** | **10/06/1999** | **0.055** | **mg/l** | **0.005** | **0.015** | **0.04** |
| MW-17 | Lead, total | 12/06/2000 | 0.013 | mg/l | 0.005 | 0.015 | |
| MW-17 | Lead, total | 07/16/2001 | 0.014 | mg/l | 0.003 | 0.015 | |
| **MW-17** | **Lead, total** | **01/10/2002** | **0.017** | **mg/l** | **0.003** | **0.015** | **0.002** |
| MW-17 | Lead, total | 12/16/2002 | 0.0095 | mg/l | 0.005 | 0.015 | |
| MW-17 | Lead, total | 06/19/2003 | 0.0098 | mg/l | 0.005 | 0.015 | |
| MW-17 | Lead, total | 01/26/2007 | 4.1 | ug/l | 10 | 15 | |
| **MW-18** | **Lead, total** | **03/16/1999** | **1.6** | **mg/l** | **0.1** | **0.015** | **1.585** |
| **MW-18** | **Lead, total** | **05/12/1999** | **0.11** | **mg/l** | **0.005** | **0.015** | **0.095** |
| **MW-18** | **Lead, total** | **06/28/1999** | **0.037** | **mg/l** | **0.005** | **0.015** | **0.022** |
| **MW-18** | **Lead, total** | **10/06/1999** | **0.024** | **mg/l** | **0.005** | **0.015** | **0.009** |
| MW-18 | Lead, total | 12/06/2000 | 0.0065 | mg/l | 0.005 | 0.015 | |
| **MW-19** | **Lead, total** | **03/16/1999** | **0.15** | **mg/l** | **0.01** | **0.015** | **0.135** |
| **MW-19** | **Lead, total** | **05/12/1999** | **0.081** | **mg/l** | **0.005** | **0.015** | **0.066** |
| **MW-19** | **Lead, total** | **06/28/1999** | **0.091** | **mg/l** | **0.005** | **0.015** | **0.076** |
| MW-19 | Lead, total | 06/06/2000 | 0.0065 | mg/l | 0.005 | 0.015 | |
| **MW-19** | **Lead, total** | **12/06/2000** | **0.24** | **mg/l** | **0.005** | **0.015** | **0.225** |
| MW-19 | Lead, total | 01/10/2002 | 0.008 | mg/l | 0.003 | 0.015 | |
| MW-19 | Lead, total | 01/07/2005 | 0.011 | mg/l | 0.01 | 0.015 | |
| MW-19 | Lead, total | 07/13/2006 | 0.014 | mg/l | 0.01 | 0.015 | |
| **MW-20** | **Lead, total** | **03/16/1999** | **1.3** | **mg/l** | **0.1** | **0.015** | **1.285** |
| **MW-20** | **Lead, total** | **05/12/1999** | **0.085** | **mg/l** | **0.005** | **0.015** | **0.07** |
| **MW-20** | **Lead, total** | **06/28/1999** | **0.058** | **mg/l** | **0.005** | **0.015** | **0.043** |
| **MW-20** | **Lead, total** | **10/06/1999** | **0.1** | **mg/l** | **0.005** | **0.015** | **0.085** |
| **MW-20** | **Lead, total** | **06/07/2000** | **0.016** | **mg/l** | **0.005** | **0.015** | **0.001** |
| **MW-20** | **Lead, total** | **12/06/2000** | **0.049** | **mg/l** | **0.005** | **0.015** | **0.034** |
| MW-20 | Lead, total | 07/16/2001 | 0.014 | mg/l | 0.003 | 0.015 | |
| **MW-20** | **Lead, total** | **01/09/2002** | **0.031** | **mg/l** | **0.003** | **0.015** | **0.016** |
| **MW-20** | **Lead, total** | **06/25/2002** | **0.078** | **mg/l** | **0.005** | **0.015** | **0.063** |
| **MW-20** | **Lead, total** | **12/17/2002** | **0.034** | **mg/l** | **0.005** | **0.015** | **0.019** |
| **MW-21R** | **Lead, total** | **03/16/1999** | **0.25** | **mg/l** | **0.02** | **0.015** | **0.235** |
| **MW-21R** | **Lead, total** | **05/12/1999** | **0.1** | **mg/l** | **0.005** | **0.015** | **0.085** |
| **MW-21R** | **Lead, total** | **06/28/1999** | **0.09** | **mg/l** | **0.005** | **0.015** | **0.075** |
| **MW-21R** | **Lead, total** | **10/06/1999** | **0.069** | **mg/l** | **0.005** | **0.015** | **0.054** |
| MW-21R | Lead, total | 12/06/2000 | 0.013 | mg/l | 0.005 | 0.015 | |
| MW-21R | Lead, total | 07/16/2001 | 0.0043 | mg/l | 0.003 | 0.015 | |
| MW-21R | Lead, total | 01/09/2002 | 0.0035 | mg/l | 0.003 | 0.015 | |
| MW-21R | Lead, total | 06/25/2002 | 0.011 | mg/l | 0.005 | 0.015 | |
| MW-21R | Lead, total | 12/17/2002 | 0.005 | mg/l | 0.005 | 0.015 | |
| MW-21R | Lead, total | 01/26/2007 | 2.9 | ug/l | 10 | 15 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-22** | **Lead, total** | **03/16/1999** | **0.077** | **mg/l** | **0.005** | **0.015** | **0.062** |
| **MW-22** | **Lead, total** | **05/12/1999** | **0.034** | **mg/l** | **0.005** | **0.015** | **0.019** |
| **MW-22** | **Lead, total** | **06/30/1999** | **0.028** | **mg/l** | **0.005** | **0.015** | **0.013** |
| MW-22 | Lead, total | 10/04/1999 | 0.01 | mg/l | 0.005 | 0.015 | |
| MW-22 | Lead, total | 12/16/2002 | 0.0083 | mg/l | 0.005 | 0.015 | |
| **MW-23** | **Lead, total** | **03/16/1999** | **0.22** | **mg/l** | **0.02** | **0.015** | **0.205** |
| **MW-23** | **Lead, total** | **05/12/1999** | **0.055** | **mg/l** | **0.005** | **0.015** | **0.04** |
| **MW-23** | **Lead, total** | **06/28/1999** | **0.045** | **mg/l** | **0.005** | **0.015** | **0.03** |
| MW-23 | Lead, total | 10/04/1999 | 0.012 | mg/l | 0.005 | 0.015 | |
| MW-23 | Lead, total | 12/06/2000 | 0.0061 | mg/l | 0.005 | 0.015 | |
| MW-23 | Lead, total | 07/16/2001 | 0.0097 | mg/l | 0.003 | 0.015 | |
| MW-23 | Lead, total | 01/10/2002 | 0.015 | mg/l | 0.003 | 0.015 | |
| MW-23 | Lead, total | 06/25/2002 | 0.0071 | mg/l | 0.005 | 0.015 | |
| SW-1 | Lead, total | 04/15/1999 | 0.0053 | mg/l | 0.005 | 0.015 | |
| SW-2 | Lead, total | 10/28/1998 | 0.0061 | mg/l | 0.005 | 0.015 | |
| SW-2 | Lead, total | 05/12/1999 | 0.005 | mg/l | 0.005 | 0.015 | |
| SW-6 | Lead, total | 06/30/1999 | 0.0052 | mg/l | 0.005 | 0.015 | |
| MW-16D | Mercury | 03/16/1999 | 0.001 | mg/l | 0.0002 | 0.0011 | |
| MW-16D | Mercury | 06/28/1999 | 0.0004 | mg/l | 0.0002 | 0.0011 | |
| MW-18 | Mercury | 03/16/1999 | 0.0009 | mg/l | 0.0002 | 0.0011 | |
| MW-20 | Mercury | 03/16/1999 | 0.001 | mg/l | 0.0002 | 0.0011 | |
| MW-21R | Mercury | 10/06/1999 | 0.0003 | mg/l | 0.0002 | 0.0011 | |
| **MW-13** | **Nickel, total** | **03/16/1999** | **1** | **mg/l** | **0.25** | **0.1** | **0.9** |
| **MW-13** | **Nickel, total** | **05/12/1999** | **0.17** | **mg/l** | **0.005** | **0.1** | **0.07** |
| **MW-13** | **Nickel, total** | **06/28/1999** | **0.78** | **mg/l** | **0.005** | **0.1** | **0.68** |
| MW-13 | Nickel, total | 10/04/1999 | 0.047 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 06/06/2000 | 0.013 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 12/06/2000 | 0.018 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 07/16/2001 | 0.01 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 01/10/2002 | 0.017 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 06/25/2002 | 0.0098 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 12/17/2002 | 0.01 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 06/19/2003 | 0.012 | mg/l | 0.005 | 0.1 | |
| MW-13 | Nickel, total | 01/26/2007 | 5.5 | ug/l | 50 | 100 | |
| **MW-14** | **Nickel, total** | **03/16/1999** | **0.14** | **mg/l** | **0.05** | **0.1** | **0.04** |
| **MW-14** | **Nickel, total** | **05/12/1999** | **0.12** | **mg/l** | **0.005** | **0.1** | **0.02** |
| **MW-14** | **Nickel, total** | **06/28/1999** | **0.16** | **mg/l** | **0.005** | **0.1** | **0.06** |
| MW-14 | Nickel, total | 10/05/1999 | 0.052 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 06/06/2000 | 0.02 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 07/16/2001 | 0.04 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 01/10/2002 | 0.0077 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 06/26/2002 | 0.023 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 12/17/2002 | 0.023 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 06/19/2003 | 0.0089 | mg/l | 0.005 | 0.1 | |
| MW-14 | Nickel, total | 01/26/2007 | 44 | ug/l | 50 | 100 | |
| **MW-15** | **Nickel, total** | **03/16/1999** | **1.5** | **mg/l** | **1** | **0.1** | **1.4** |
| **MW-15** | **Nickel, total** | **05/12/1999** | **0.21** | **mg/l** | **0.005** | **0.1** | **0.11** |
| **MW-15** | **Nickel, total** | **06/28/1999** | **0.2** | **mg/l** | **0.005** | **0.1** | **0.1** |
| MW-15 | Nickel, total | 10/05/1999 | 0.047 | mg/l | 0.005 | 0.1 | |
| MW-15 | Nickel, total | 06/07/2000 | 0.0094 | mg/l | 0.005 | 0.1 | |
| MW-15 | Nickel, total | 12/06/2000 | 0.068 | mg/l | 0.005 | 0.1 | |
| MW-15 | Nickel, total | 07/16/2001 | 0.02 | mg/l | 0.005 | 0.1 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-15 | Nickel, total | 01/10/2002 | 0.0051 | mg/l | 0.005 | 0.1 | |
| MW-15 | Nickel, total | 06/26/2002 | 0.033 | mg/l | 0.005 | 0.1 | |
| MW-15 | Nickel, total | 12/17/2002 | 0.0078 | mg/l | 0.005 | 0.1 | |
| **MW-16D** | **Nickel, total** | **03/16/1999** | **1.5** | **mg/l** | **1** | **0.1** | **1.4** |
| **MW-16D** | **Nickel, total** | **05/12/1999** | **0.34** | **mg/l** | **0.005** | **0.1** | **0.24** |
| **MW-16D** | **Nickel, total** | **06/28/1999** | **0.25** | **mg/l** | **0.005** | **0.1** | **0.15** |
| MW-16D | Nickel, total | 10/05/1999 | 0.021 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 06/06/2000 | 0.031 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 12/06/2000 | 0.092 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 07/16/2001 | 0.097 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 01/10/2002 | 0.037 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 06/26/2002 | 0.061 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 12/17/2002 | 0.04 | mg/l | 0.005 | 0.1 | |
| MW-16D | Nickel, total | 06/19/2003 | 0.024 | mg/l | 0.005 | 0.1 | |
| **MW-16D** | **Nickel, total** | **07/14/2006** | **0.122** | **mg/l** | **0.05** | **0.1** | **0.022** |
| MW-16D | Nickel, total | 01/26/2007 | 20 | ug/l | 50 | 100 | |
| MW-16S | Nickel, total | 05/12/1999 | 0.035 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 06/28/1999 | 0.025 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 10/05/1999 | 0.031 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 12/06/2000 | 0.0078 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 07/16/2001 | 0.0056 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 01/10/2002 | 0.0095 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 06/26/2002 | 0.014 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 12/17/2002 | 0.0073 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 06/19/2003 | 0.047 | mg/l | 0.005 | 0.1 | |
| MW-16S | Nickel, total | 01/26/2007 | 5.7 | ug/l | 50 | 100 | |
| **MW-17** | **Nickel, total** | **03/16/1999** | **0.18** | **mg/l** | **0.1** | **0.1** | **0.08** |
| MW-17 | Nickel, total | 05/12/1999 | 0.096 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 06/28/1999 | 0.064 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 10/06/1999 | 0.036 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 12/06/2000 | 0.0097 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 07/16/2001 | 0.0092 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 01/10/2002 | 0.014 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 12/16/2002 | 0.0098 | mg/l | 0.005 | 0.1 | |
| MW-17 | Nickel, total | 06/19/2003 | 0.0094 | mg/l | 0.005 | 0.1 | |
| **MW-18** | **Nickel, total** | **03/16/1999** | **3** | **mg/l** | **1** | **0.1** | **2.9** |
| **MW-18** | **Nickel, total** | **05/12/1999** | **0.42** | **mg/l** | **0.005** | **0.1** | **0.32** |
| **MW-18** | **Nickel, total** | **06/28/1999** | **0.15** | **mg/l** | **0.005** | **0.1** | **0.05** |
| MW-18 | Nickel, total | 10/06/1999 | 0.095 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 06/06/2000 | 0.0069 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 12/06/2000 | 0.034 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 07/16/2001 | 0.0071 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 12/16/2002 | 0.0068 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 06/19/2003 | 0.0094 | mg/l | 0.005 | 0.1 | |
| MW-18 | Nickel, total | 01/26/2007 | 3.6 | ug/l | 50 | 100 | |
| **MW-19** | **Nickel, total** | **03/16/1999** | **0.16** | **mg/l** | **0.05** | **0.1** | **0.06** |
| MW-19 | Nickel, total | 05/12/1999 | 0.054 | mg/l | 0.005 | 0.1 | |
| MW-19 | Nickel, total | 06/28/1999 | 0.081 | mg/l | 0.005 | 0.1 | |
| MW-19 | Nickel, total | 10/06/1999 | 0.0067 | mg/l | 0.005 | 0.1 | |
| **MW-19** | **Nickel, total** | **12/06/2000** | **0.24** | **mg/l** | **0.005** | **0.1** | **0.14** |
| MW-19 | Nickel, total | 01/10/2002 | 0.01 | mg/l | 0.005 | 0.1 | |
| **MW-20** | **Nickel, total** | **03/16/1999** | **2.5** | **mg/l** | **0.5** | **0.1** | **2.4** |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-20** | **Nickel, total** | **05/12/1999** | **0.3** | **mg/l** | **0.005** | **0.1** | **0.2** |
| **MW-20** | **Nickel, total** | **06/28/1999** | **0.2** | **mg/l** | **0.005** | **0.1** | **0.1** |
| **MW-20** | **Nickel, total** | **10/06/1999** | **0.37** | **mg/l** | **0.005** | **0.1** | **0.27** |
| MW-20 | Nickel, total | 06/07/2000 | 0.096 | mg/l | 0.005 | 0.1 | |
| **MW-20** | **Nickel, total** | **12/06/2000** | **0.18** | **mg/l** | **0.005** | **0.1** | **0.08** |
| MW-20 | Nickel, total | 07/16/2001 | 0.045 | mg/l | 0.005 | 0.1 | |
| MW-20 | Nickel, total | 01/09/2002 | 0.098 | mg/l | 0.005 | 0.1 | |
| **MW-20** | **Nickel, total** | **06/25/2002** | **0.22** | **mg/l** | **0.005** | **0.1** | **0.12** |
| MW-20 | Nickel, total | 12/17/2002 | 0.1 | mg/l | 0.005 | 0.1 | |
| MW-20 | Nickel, total | 06/19/2003 | 0.013 | mg/l | 0.005 | 0.1 | |
| **MW-21R** | **Nickel, total** | **03/16/1999** | **0.5** | **mg/l** | **0.5** | **0.1** | **0.4** |
| **MW-21R** | **Nickel, total** | **05/12/1999** | **0.18** | **mg/l** | **0.005** | **0.1** | **0.08** |
| **MW-21R** | **Nickel, total** | **06/28/1999** | **0.2** | **mg/l** | **0.005** | **0.1** | **0.1** |
| **MW-21R** | **Nickel, total** | **10/06/1999** | **0.13** | **mg/l** | **0.005** | **0.1** | **0.03** |
| MW-21R | Nickel, total | 12/06/2000 | 0.027 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 07/16/2001 | 0.0083 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 01/09/2002 | 0.01 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 06/25/2002 | 0.013 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 12/17/2002 | 0.012 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 06/19/2003 | 0.0069 | mg/l | 0.005 | 0.1 | |
| MW-21R | Nickel, total | 01/26/2007 | 5.6 | ug/l | 50 | 100 | |
| **MW-22** | **Nickel, total** | **03/16/1999** | **0.6** | **mg/l** | **0.5** | **0.1** | **0.5** |
| **MW-22** | **Nickel, total** | **05/12/1999** | **0.19** | **mg/l** | **0.005** | **0.1** | **0.09** |
| **MW-22** | **Nickel, total** | **06/30/1999** | **0.19** | **mg/l** | **0.005** | **0.1** | **0.09** |
| MW-22 | Nickel, total | 10/04/1999 | 0.047 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 12/06/2000 | 0.0086 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 07/16/2001 | 0.008 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 01/09/2002 | 0.016 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 12/16/2002 | 0.025 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 06/19/2003 | 0.016 | mg/l | 0.005 | 0.1 | |
| MW-22 | Nickel, total | 01/26/2007 | 3.3 | ug/l | 50 | 100 | |
| **MW-23** | **Nickel, total** | **03/16/1999** | **0.52** | **mg/l** | **0.5** | **0.1** | **0.42** |
| **MW-23** | **Nickel, total** | **05/12/1999** | **0.11** | **mg/l** | **0.005** | **0.1** | **0.01** |
| MW-23 | Nickel, total | 06/28/1999 | 0.079 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 10/04/1999 | 0.024 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 06/06/2000 | 0.016 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 12/06/2000 | 0.02 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 07/16/2001 | 0.014 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 01/10/2002 | 0.023 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 06/25/2002 | 0.019 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 12/17/2002 | 0.017 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 06/19/2003 | 0.019 | mg/l | 0.005 | 0.1 | |
| MW-23 | Nickel, total | 01/26/2007 | 14.8 | ug/l | 50 | 100 | |
| SW-2 | Nickel, total | 12/06/2000 | 0.0082 | mg/l | 0.005 | 0.1 | |
| MW-13 | Selenium, total | 06/06/2000 | 0.0065 | mg/l | 0.005 | 0.05 | |
| MW-13 | Selenium, total | 12/17/2002 | 0.016 | mg/l | 0.005 | 0.05 | |
| MW-13 | Selenium, total | 06/19/2003 | 0.012 | mg/l | 0.005 | 0.05 | |
| MW-16D | Selenium, total | 07/16/2001 | 0.02 | mg/l | 0.005 | 0.05 | |
| MW-16D | Selenium, total | 12/17/2002 | 0.0088 | mg/l | 0.005 | 0.05 | |
| MW-16S | Selenium, total | 06/06/2000 | 0.0073 | mg/l | 0.005 | 0.05 | |
| MW-17 | Selenium, total | 06/19/2003 | 0.006 | mg/l | 0.005 | 0.05 | |
| MW-18 | Selenium, total | 03/16/1999 | 0.0056 | mg/l | 0.005 | 0.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| **MW-19** | **Selenium, total** | **12/06/2000** | **0.24** | **mg/l** | **0.005** | **0.05** | **0.19** |
| MW-20 | Selenium, total | 01/26/2007 | 2 | ug/l | 10 | 50 | |
| MW-21R | Selenium, total | 12/17/2002 | 0.0051 | mg/l | 0.005 | 0.05 | |
| SW-1 | Selenium, total | 12/16/2002 | 0.005 | mg/l | 0.005 | 0.05 | |
| SW-1 | Selenium, total | 01/26/2007 | 3.3 | ug/l | 10 | 50 | |
| SW-2 | Selenium, total | 01/26/2007 | 3.2 | ug/l | 10 | 50 | |
| MW-16D | Silver, total | 07/16/2001 | 0.0026 | mg/l | 0.002 | 0.018 | |
| **MW-19** | **Silver, total** | **12/06/2000** | **0.26** | **mg/l** | **0.002** | **0.018** | **0.242** |
| MW-20 | Silver, total | 03/16/1999 | 0.0024 | mg/l | 0.002 | 0.018 | |
| MW-20 | Silver, total | 06/25/2002 | 0.0023 | mg/l | 0.002 | 0.018 | |
| MW-13 | Thallium | 07/16/2001 | 0.0026 | mg/l | 0.002 | | |
| MW-13 | Thallium | 01/07/2005 | 0.024 | mg/l | 0.01 | | |
| MW-13 | Thallium | 06/17/2005 | 0.069 | mg/l | 0.01 | | |
| MW-13 | Thallium | 01/25/2006 | 0.0729 | mg/l | 0.01 | | |
| MW-13 | Thallium | 07/14/2006 | 0.0651 | mg/l | 0.01 | | |
| MW-15 | Thallium | 03/16/1999 | 0.0041 | mg/l | 0.002 | | |
| MW-15 | Thallium | 05/12/1999 | 0.0025 | mg/l | 0.002 | | |
| MW-15 | Thallium | 06/28/1999 | 0.0036 | mg/l | 0.002 | | |
| MW-15 | Thallium | 07/16/2001 | 0.0025 | mg/l | 0.002 | | |
| MW-16D | Thallium | 06/17/2005 | 0.012 | mg/l | 0.01 | | |
| MW-16D | Thallium | 01/26/2006 | 0.0143 | mg/l | 0.01 | | |
| MW-16S | Thallium | 06/17/2005 | 0.017 | mg/l | 0.01 | | |
| MW-17 | Thallium | 06/17/2005 | 0.012 | mg/l | 0.01 | | |
| MW-20 | Thallium | 03/16/1999 | 0.0035 | mg/l | 0.002 | | |
| MW-21R | Thallium | 06/28/1999 | 0.005 | mg/l | 0.002 | | |
| MW-21R | Thallium | 01/26/2007 | 0.064 | ug/l | 5.5 | | |
| MW-23 | Thallium | 06/28/1999 | 0.0025 | mg/l | 0.002 | | |
| MW-23 | Thallium | 07/16/2001 | 0.0023 | mg/l | 0.002 | | |
| MW-23 | Thallium | 06/17/2005 | 0.01 | mg/l | 0.01 | | |
| MW-23 | Thallium | 01/26/2007 | 0.044 | ug/l | 5.5 | | |
| SW-1 | Thallium | 01/26/2007 | 0.057 | ug/l | 5.5 | | |
| MW-13 | Vanadium | 03/16/1999 | 0.035 | mg/l | 0.005 | | |
| MW-13 | Vanadium | 05/12/1999 | 0.18 | mg/l | 0.005 | | |
| MW-13 | Vanadium | 06/28/1999 | 0.81 | mg/l | 0.005 | | |
| MW-13 | Vanadium | 10/04/1999 | 0.046 | mg/l | 0.005 | | |
| MW-13 | Vanadium | 12/06/2000 | 0.0063 | mg/l | 0.005 | | |
| MW-13 | Vanadium | 01/10/2002 | 0.0063 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 03/16/1999 | 0.045 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 05/12/1999 | 0.04 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 06/28/1999 | 0.054 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 10/05/1999 | 0.014 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 06/06/2000 | 0.0052 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 07/16/2001 | 0.018 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 06/26/2002 | 0.0086 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 12/17/2002 | 0.0068 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 06/19/2003 | 0.0089 | mg/l | 0.005 | | |
| MW-14 | Vanadium | 01/26/2007 | 15.6 | ug/l | 25 | | |
| MW-15 | Vanadium | 03/16/1999 | 2.4 | mg/l | 0.25 | | |
| MW-15 | Vanadium | 05/12/1999 | 0.61 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 06/28/1999 | 0.62 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 10/05/1999 | 0.096 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 06/07/2000 | 0.02 | mg/l | 0.005 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-15 | Vanadium | 12/06/2000 | 0.21 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 07/16/2001 | 0.076 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 01/10/2002 | 0.016 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 06/26/2002 | 0.11 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 12/17/2002 | 0.012 | mg/l | 0.005 | | |
| MW-15 | Vanadium | 06/19/2003 | 0.0098 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 03/16/1999 | 2.5 | mg/l | 0.5 | | |
| MW-16D | Vanadium | 05/12/1999 | 0.73 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 06/28/1999 | 0.55 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 10/05/1999 | 0.024 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 06/06/2000 | 0.085 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 12/06/2000 | 0.18 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 07/16/2001 | 0.2 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 01/10/2002 | 0.069 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 06/26/2002 | 0.12 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 12/17/2002 | 0.059 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 06/19/2003 | 0.036 | mg/l | 0.005 | | |
| MW-16D | Vanadium | 07/14/2006 | 0.222 | mg/l | 0.04 | | |
| MW-16S | Vanadium | 03/16/1999 | 0.011 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 05/12/1999 | 0.032 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 06/28/1999 | 0.029 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 10/05/1999 | 0.052 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 12/06/2000 | 0.0056 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 07/16/2001 | 0.0085 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 01/10/2002 | 0.013 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 06/26/2002 | 0.021 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 12/17/2002 | 0.0086 | mg/l | 0.005 | | |
| MW-16S | Vanadium | 06/19/2003 | 0.057 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 03/16/1999 | 0.041 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 05/12/1999 | 0.071 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 06/28/1999 | 0.056 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 10/06/1999 | 0.034 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 12/06/2000 | 0.0089 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 07/16/2001 | 0.013 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 01/10/2002 | 0.014 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 12/16/2002 | 0.0075 | mg/l | 0.005 | | |
| MW-17 | Vanadium | 06/19/2003 | 0.0054 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 03/16/1999 | 2.5 | mg/l | 0.5 | | |
| MW-18 | Vanadium | 05/12/1999 | 0.57 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 06/28/1999 | 0.21 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 10/06/1999 | 0.13 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 12/06/2000 | 0.048 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 07/16/2001 | 0.015 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 01/10/2002 | 0.0072 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 12/16/2002 | 0.0081 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 06/19/2003 | 0.012 | mg/l | 0.005 | | |
| MW-18 | Vanadium | 01/26/2007 | 2.3 | ug/l | 25 | | |
| MW-19 | Vanadium | 03/16/1999 | 0.12 | mg/l | 0.025 | | |
| MW-19 | Vanadium | 05/12/1999 | 0.047 | mg/l | 0.005 | | |
| MW-19 | Vanadium | 06/28/1999 | 0.068 | mg/l | 0.005 | | |
| MW-19 | Vanadium | 10/06/1999 | 0.007 | mg/l | 0.005 | | |
| MW-19 | Vanadium | 12/06/2000 | 0.26 | mg/l | 0.005 | | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-19 | Vanadium | 01/10/2002 | 0.0087 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 03/16/1999 | 2.2 | mg/l | 0.5 | | |
| MW-20 | Vanadium | 05/12/1999 | 0.54 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 06/28/1999 | 0.39 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 10/06/1999 | 0.69 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 06/07/2000 | 0.06 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 12/06/2000 | 0.38 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 07/16/2001 | 0.098 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 01/09/2002 | 0.21 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 06/25/2002 | 0.46 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 12/17/2002 | 0.19 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 06/19/2003 | 0.015 | mg/l | 0.005 | | |
| MW-20 | Vanadium | 01/26/2007 | 5 | ug/l | 25 | | |
| MW-21R | Vanadium | 03/16/1999 | 0.47 | mg/l | 0.05 | | |
| MW-21R | Vanadium | 05/12/1999 | 0.2 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 06/28/1999 | 0.25 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 10/06/1999 | 0.19 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 06/07/2000 | 0.0097 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 12/06/2000 | 0.057 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 07/16/2001 | 0.016 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 01/09/2002 | 0.018 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 06/25/2002 | 0.029 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 12/17/2002 | 0.021 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 06/19/2003 | 0.0075 | mg/l | 0.005 | | |
| MW-21R | Vanadium | 01/26/2007 | 3.5 | ug/l | 25 | | |
| MW-22 | Vanadium | 03/16/1999 | 0.5 | mg/l | 0.05 | | |
| MW-22 | Vanadium | 05/12/1999 | 0.36 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 06/30/1999 | 0.37 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 10/04/1999 | 0.098 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 06/06/2000 | 0.016 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 12/06/2000 | 0.013 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 07/16/2001 | 0.025 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 01/09/2002 | 0.045 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 06/26/2002 | 0.01 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 12/16/2002 | 0.073 | mg/l | 0.005 | | |
| MW-22 | Vanadium | 06/19/2003 | 0.05 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 03/16/1999 | 0.47 | mg/l | 0.05 | | |
| MW-23 | Vanadium | 05/12/1999 | 0.082 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 06/28/1999 | 0.067 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 10/04/1999 | 0.019 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 06/06/2000 | 0.008 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 12/06/2000 | 0.013 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 07/16/2001 | 0.0067 | mg/l | 0.005 | | |
| MW-23 | Vanadium | 01/10/2002 | 0.019 | mg/l | 0.005 | | |
| SW-1 | Vanadium | 01/26/2007 | 1.3 | ug/l | 25 | | |
| SW-2 | Vanadium | 12/06/2000 | 0.012 | mg/l | 0.005 | | |
| SW-6 | Vanadium | 06/30/1999 | 0.0062 | mg/l | 0.005 | | |
| MW-13 | Zinc | 03/16/1999 | 0.84 | mg/l | 0.05 | 1.05 | |
| MW-13 | Zinc | 05/12/1999 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 06/28/1999 | 0.6 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 10/04/1999 | 0.051 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 06/06/2000 | 0.024 | mg/l | 0.01 | 1.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-13 | Zinc | 12/06/2000 | 0.031 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 07/16/2001 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 01/10/2002 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 06/25/2002 | 0.021 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 12/17/2002 | 0.021 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 06/19/2003 | 0.025 | mg/l | 0.01 | 1.05 | |
| MW-13 | Zinc | 01/26/2007 | 2.3 | ug/l | 10 | 1050 | |
| MW-14 | Zinc | 03/16/1999 | 0.045 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 05/12/1999 | 0.045 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 06/28/1999 | 0.071 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 10/05/1999 | 0.036 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 07/16/2001 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 01/10/2002 | 0.013 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 06/26/2002 | 0.025 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 12/17/2002 | 0.031 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 06/19/2003 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-14 | Zinc | 07/14/2006 | 0.104 | mg/l | 0.05 | 1.05 | |
| MW-14 | Zinc | 01/26/2007 | 27.1 | ug/l | 10 | 1050 | |
| **MW-15** | **Zinc** | **03/16/1999** | **2.9** | **mg/l** | **0.2** | **1.05** | **1.85** |
| MW-15 | Zinc | 05/12/1999 | 0.39 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 06/28/1999 | 0.39 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 10/05/1999 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 06/07/2000 | 0.029 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 12/06/2000 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 07/16/2001 | 0.058 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 01/10/2002 | 0.017 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 06/26/2002 | 0.08 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 12/17/2002 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 06/19/2003 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-15 | Zinc | 01/26/2007 | 4.3 | ug/l | 10 | 1050 | |
| **MW-16D** | **Zinc** | **03/16/1999** | **3.1** | **mg/l** | **0.2** | **1.05** | **2.05** |
| MW-16D | Zinc | 05/12/1999 | 0.52 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 06/28/1999 | 0.4 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 10/05/1999 | 0.053 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 06/06/2000 | 0.053 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 12/06/2000 | 0.2 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 07/16/2001 | 0.21 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 01/10/2002 | 0.069 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 06/26/2002 | 0.11 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 12/17/2002 | 0.089 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 06/19/2003 | 0.094 | mg/l | 0.01 | 1.05 | |
| MW-16D | Zinc | 06/24/2004 | 0.078 | mg/l | 0.05 | 1.05 | |
| MW-16D | Zinc | 01/07/2005 | 0.079 | mg/l | 0.05 | 1.05 | |
| MW-16D | Zinc | 06/17/2005 | 0.062 | mg/l | 0.05 | 1.05 | |
| MW-16D | Zinc | 07/14/2006 | 0.186 | mg/l | 0.05 | 1.05 | |
| MW-16D | Zinc | 01/26/2007 | 22.4 | ug/l | 10 | 1050 | |
| MW-16S | Zinc | 03/16/1999 | 0.062 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 05/12/1999 | 0.095 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 06/28/1999 | 0.087 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 10/05/1999 | 0.083 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 06/06/2000 | 0.012 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 12/06/2000 | 0.065 | mg/l | 0.01 | 1.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-16S | Zinc | 07/16/2001 | 0.029 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 01/10/2002 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 06/26/2002 | 0.053 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 12/17/2002 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 06/19/2003 | 0.12 | mg/l | 0.01 | 1.05 | |
| MW-16S | Zinc | 01/26/2007 | 13.5 | ug/l | 10 | 1050 | |
| MW-17 | Zinc | 03/16/1999 | 0.39 | mg/l | 0.02 | 1.05 | |
| MW-17 | Zinc | 05/12/1999 | 0.18 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 06/28/1999 | 0.14 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 10/06/1999 | 0.074 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 06/06/2000 | 0.015 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 12/06/2000 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 07/16/2001 | 0.035 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 01/10/2002 | 0.042 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 06/26/2002 | 0.012 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 12/16/2002 | 0.038 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 06/19/2003 | 0.023 | mg/l | 0.01 | 1.05 | |
| MW-17 | Zinc | 01/26/2007 | 76.4 | ug/l | 10 | 1050 | |
| **MW-18** | **Zinc** | **03/16/1999** | **4** | **mg/l** | **0.2** | **1.05** | **2.95** |
| MW-18 | Zinc | 05/12/1999 | 0.47 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 06/28/1999 | 0.2 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 10/06/1999 | 0.12 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 06/06/2000 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 12/06/2000 | 0.051 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 07/16/2001 | 0.02 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 01/10/2002 | 0.014 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 12/16/2002 | 0.03 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 06/19/2003 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-18 | Zinc | 01/26/2007 | 14.4 | ug/l | 10 | 1050 | |
| MW-19 | Zinc | 03/16/1999 | 0.33 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 05/12/1999 | 0.11 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 06/28/1999 | 0.16 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 10/06/1999 | 0.022 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 06/06/2000 | 0.03 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 12/06/2000 | 0.3 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 07/16/2001 | 0.025 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 01/10/2002 | 0.037 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 12/16/2002 | 0.015 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 06/19/2003 | 0.029 | mg/l | 0.01 | 1.05 | |
| MW-19 | Zinc | 01/26/2007 | 2.9 | ug/l | 10 | 1050 | |
| **MW-20** | **Zinc** | **03/16/1999** | **4.3** | **mg/l** | **0.1** | **1.05** | **3.25** |
| MW-20 | Zinc | 05/12/1999 | 0.48 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 06/28/1999 | 0.36 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 10/06/1999 | 0.62 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 06/07/2000 | 0.15 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 12/06/2000 | 0.37 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 07/16/2001 | 0.09 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 01/09/2002 | 0.23 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 06/25/2002 | 0.48 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 12/17/2002 | 0.22 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 06/19/2003 | 0.046 | mg/l | 0.01 | 1.05 | |
| MW-20 | Zinc | 01/26/2007 | 1.8 | ug/l | 10 | 1050 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-21R | Zinc | 03/16/1999 | 0.63 | mg/l | 0.1 | 1.05 | |
| MW-21R | Zinc | 05/12/1999 | 0.19 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 06/28/1999 | 0.22 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 10/06/1999 | 0.18 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 12/06/2000 | 0.1 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 07/16/2001 | 0.033 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 01/09/2002 | 0.048 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 06/25/2002 | 0.047 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 12/17/2002 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 06/19/2003 | 0.016 | mg/l | 0.01 | 1.05 | |
| MW-21R | Zinc | 01/26/2007 | 55 | ug/l | 10 | 1050 | |
| MW-22 | Zinc | 03/16/1999 | 0.65 | mg/l | 0.1 | 1.05 | |
| MW-22 | Zinc | 05/12/1999 | 0.25 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 06/30/1999 | 0.23 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 10/04/1999 | 0.068 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 06/06/2000 | 0.023 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 12/06/2000 | 0.032 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 07/16/2001 | 0.019 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 01/09/2002 | 0.043 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 06/26/2002 | 0.014 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 12/16/2002 | 0.042 | mg/l | 0.01 | 1.05 | |
| MW-22 | Zinc | 06/19/2003 | 0.03 | mg/l | 0.01 | 1.05 | |
| **MW-23** | **Zinc** | **03/16/1999** | **1.1** | **mg/l** | **0.1** | **1.05** | **0.05** |
| MW-23 | Zinc | 05/12/1999 | 0.23 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 06/28/1999 | 0.18 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 10/04/1999 | 0.079 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 06/06/2000 | 0.048 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 12/06/2000 | 0.067 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 07/16/2001 | 0.085 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 01/10/2002 | 0.066 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 06/25/2002 | 0.034 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 12/17/2002 | 0.019 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 06/19/2003 | 0.041 | mg/l | 0.01 | 1.05 | |
| MW-23 | Zinc | 01/26/2007 | 2.6 | ug/l | 10 | 1050 | |
| SW-1 | Zinc | 10/24/1996 | 0.021 | mg/l | 0.01 | 1.05 | |
| SW-1 | Zinc | 10/23/1997 | 0.018 | mg/l | 0.01 | 1.05 | |
| SW-1 | Zinc | 04/22/1998 | 0.011 | mg/l | 0.01 | 1.05 | |
| SW-1 | Zinc | 06/30/1999 | 0.043 | mg/l | 0.01 | 1.05 | |
| SW-1 | Zinc | 10/06/1999 | 0.0044 | mg/l | 0.01 | 1.05 | |
| SW-1 | Zinc | 12/05/2000 | 0.022 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 02/06/1995 | 0.083 | mg/l | 0.05 | 1.05 | |
| SW-2 | Zinc | 04/30/1996 | 0.054 | mg/l | 0.05 | 1.05 | |
| SW-2 | Zinc | 10/24/1996 | 0.017 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 05/28/1997 | 0.01 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 10/23/1997 | 0.01 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 04/22/1998 | 0.011 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 03/16/1999 | 0.01 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 10/06/1999 | 0.0098 | mg/l | 0.01 | 1.05 | |
| SW-2 | Zinc | 12/06/2000 | 0.016 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 03/16/1999 | 0.023 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 05/12/1999 | 0.048 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 06/30/1999 | 0.035 | mg/l | 0.01 | 1.05 | |

Subtitle D Historical Inorganics

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | PQL[2] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|
| SW-6 | Zinc | 10/04/1999 | 0.047 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 06/06/2000 | 0.023 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 12/06/2000 | 0.025 | mg/l | 0.01 | 1.05 | |
| SW-6 | Zinc | 06/19/2003 | 0.01 | mg/l | 0.01 | 1.05 | |

[1] Table only contains detected constituents.
[2] PQL = Practical Quantitation Limit
[3] NCGW2L = North Carolina Ground Water 2L Standard

Summary of NURE Sediment Database

| REC_NO | PRIME_ID | LATITUDE | LONGITUDE | SRLID | SMPMEDIA | SAMPSRC | SEDCOND | SAMPDAT | SEDTYPE | SEDCOLR | AG_PPM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5283813 | NCST010S1 | 35.3564 | -80.1328 | NCST010S1 | SEDIMENT | STREAM | WET | 10/26/1976 | PEBBLES | BROWN | 1.2 |
| 5283814 | NCST010S1 | 35.3564 | -80.1328 | NCST010S1 | SEDIMENT | STREAM | WET | 10/26/1976 | PEBBLES | BROWN | |
| 5283821 | NCST014S1 | 35.2587 | -80.1364 | NCST014S1 | SEDIMENT | STREAM | WET | 10/26/1976 | COBBLES | BROWN | -0.5 |
| 5283822 | NCST014S1 | 35.2587 | -80.1364 | NCST014S1 | SEDIMENT | STREAM | WET | 10/26/1976 | COBBLES | BROWN | |
| 5283845 | NCST026S1 | 35.2708 | -80.2090 | NCST026S1 | SEDIMENT | STREAM | WET | 10/27/1976 | PEBBLES | BROWN | -0.5 |
| 5283847 | NCST027S1 | 35.2796 | -80.2084 | NCST027S1 | SEDIMENT | STREAM | WET | 10/27/1976 | PEBBLES | BROWN | -0.5 |
| 5283848 | NCST027S1 | 35.2796 | -80.2084 | NCST027S1 | SEDIMENT | STREAM | WET | 10/27/1976 | PEBBLES | BROWN | |
| 5283849 | NCST028S1 | 35.2659 | -80.2389 | NCST028S1 | SEDIMENT | STREAM | WET | 10/27/1976 | PEBBLES | BROWN | -0.5 |
| 5283850 | NCST028S1 | 35.2659 | -80.2389 | NCST028S1 | SEDIMENT | STREAM | WET | 10/27/1976 | PEBBLES | BROWN | |

| REC_NO | AL_PCT | BA_PPM | BE_PPM | CE_PPM | CO_PPM | CR_PPM | CU_PPM | DY_PPM | HF_PPM | LI_PPM | MG_PCT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5283813 | | 5 | 2 | | 60 | -5 | 22 | | 7 | 20 | 0.480 |
| 5283814 | | | | 10 | | | | | 5 | | |
| 5283821 | | 203 | 1.5 | | 55 | 19 | 22 | | 6 | 8 | 0.245 |
| 5283822 | | | | -20 | | | | 2.1 | 5 | | |
| 5283845 | | 225 | 2 | | 12 | 9 | 24 | | 8 | 23 | 0.200 |
| 5283847 | 6.99 | 180 | 2 | 50 | 19 | 8 | 12 | 3.6 | 8 | 18 | 0.175 |
| 5283848 | 5.73 | | | 52 | | | | 3.2 | 6 | | |
| 5283849 | 7.03 | 168 | 1.5 | | 13 | 7 | 15 | | 6 | 22 | 0.095 |
| 5283850 | 5.76 | | | | | | | 1.9 | 5 | | |

| REC_NO | MN_PPM | NB_PPM | NI_PPM | P_PPM | PB_PPM | SC_PPM | SN_PPM | TI_PPM | V_PPM | ZN_PPM | Distance From Site Miles |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5283813 | | 15 | 18 | 1200 | 62 | 1.2 | -5 | | | 93 | 3.7 |
| 5283814 | | | | | | 1.2 | | | | | 3.7 |
| 5283821 | | 40 | 23 | 1000 | 25 | 21.1 | 10 | | | 36 | 3.4 |
| 5283822 | | | | | | 21.1 | | | | | 3.4 |
| 5283845 | | 30 | 13 | 900 | 22 | 20.4 | -5 | | | 44 | 4.0 |
| 5283847 | 2800 | 85 | 8 | 600 | 22 | 16.8 | 15 | 26100 | 110 | 46 | 3.6 |
| 5283848 | 2100 | | | | | 16.8 | | 19100 | 90 | | 3.6 |
| 5283849 | 1340 | 30 | 11 | 2200 | 52 | 22 | 5 | 9500 | 100 | 41 | 5.6 |
| 5283850 | 1010 | | | | | 22 | | 6900 | 80 | | 5.6 |

Appendix II Sampling

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | Qual Code | SWSL [2] | MDL[4] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|---|---|
| MW-3 | 1,1-Dichloroethane | 08/22/2007 | 2.6 | ug/l | J | 5 | 0.28 | 70 | |
| MW-6 | 1,1-Dichloroethane | 08/22/2007 | 2.5 | ug/l | J | 5 | 0.28 | 70 | |
| MW-7 | 1,1-Dichloroethane | 08/22/2007 | 2.8 | ug/l | J | 5 | 0.28 | 70 | |
| MW-9 | 1,1-Dichloroethane | 08/22/2007 | 4.4 | ug/l | J | 5 | 0.28 | 70 | |
| MW-6 | 1,1-Dichloroethene | 08/22/2007 | 1.1 | ug/l | J | 5 | 0.4 | 7 | |
| MW-2 | Arsenic | 08/22/2007 | 24.1 | ug/l | | 10 | 4 | 50 | |
| MW-3 | Arsenic | 08/22/2007 | 6.7 | ug/l | J | 10 | 4 | 50 | |
| MW-1 | Barium, total | 08/22/2007 | 158 | ug/l | | 100 | 1 | 2000 | |
| MW-2 | Barium, total | 08/22/2007 | 42 | ug/l | J | 100 | 1 | 2000 | |
| MW-3 | Barium, total | 08/22/2007 | 16 | ug/l | J | 100 | 1 | 2000 | |
| MW-6 | Barium, total | 08/22/2007 | 3 | ug/l | J | 100 | 1 | 2000 | |
| MW-7 | Barium, total | 08/22/2007 | 6 | ug/l | J | 100 | 1 | 2000 | |
| MW-9 | Barium, total | 08/22/2007 | 11 | ug/l | J | 100 | 1 | 2000 | |
| MW-6 | Benzene | 08/22/2007 | 0.54 | ug/l | J | 1 | 0.32 | 1 | |
| **MW-7** | **Benzene** | **08/22/2007** | **2.4** | **ug/l** | | 1 | **0.32** | **1** | **1.4** |
| MW-9 | Benzene | 08/22/2007 | 0.58 | ug/l | J | 1 | 0.32 | 1 | |
| MW-1 | Beryllium, total | 08/22/2007 | 0.9 | ug/l | J | 1 | 0.7 | | |
| MW-1 | Bis(2-ethylhexyl)phthalate | 08/22/2007 | 2.4 | ug/l | J | 15 | 1.9 | | |
| MW-6 | Bis(2-ethylhexyl)phthalate | 08/22/2007 | 3.2 | ug/l | J | 15 | 1.9 | | |
| MW-9 | Bis(2-ethylhexyl)phthalate | 08/22/2007 | 2.2 | ug/l | J | 15 | 1.9 | | |
| MW-1 | Cadmium, total | 08/22/2007 | 1.4 | ug/l | | 1 | 0.5 | 1.75 | |
| MW-2 | Chlorobenzene | 08/22/2007 | 1.2 | ug/l | J | 3 | 0.27 | 50 | |
| MW-3 | Chlorobenzene | 08/22/2007 | 8.2 | ug/l | | 3 | 0.27 | 50 | |
| MW-6 | Chlorobenzene | 08/22/2007 | 0.76 | ug/l | J | 3 | 0.27 | 50 | |
| MW-7 | Chlorobenzene | 08/22/2007 | 4.3 | ug/l | | 3 | 0.27 | 50 | |
| MW-9 | Chlorobenzene | 08/22/2007 | 2 | ug/l | J | 3 | 0.27 | 50 | |
| **MW-9** | **Chloroethene** | **08/22/2007** | **1.4** | **ug/l** | | 1 | **0.91** | **0.02** | **1.39** |
| MW-1 | Chromium, total | 08/22/2007 | 8.1 | ug/l | J | 10 | 3 | 50 | |
| MW-3 | cis-1,2-Dichloroethylene | 08/22/2007 | 1.1 | ug/l | J | 5 | 0.18 | 70 | |
| MW-7 | cis-1,2-Dichloroethylene | 08/22/2007 | 1.4 | ug/l | J | 5 | 0.18 | 70 | |
| MW-9 | cis-1,2-Dichloroethylene | 08/22/2007 | 5.6 | ug/l | | 5 | 0.18 | 70 | |
| MW-1 | Cobalt, total | 08/22/2007 | 23.7 | ug/l | | 10 | 2 | | |
| MW-2 | Cobalt, total | 08/22/2007 | 53.8 | ug/l | | 10 | 2 | | |
| MW-3 | Cobalt, total | 08/22/2007 | 9.6 | ug/l | J | 10 | 2 | | |
| MW-1 | Copper | 08/22/2007 | 59 | ug/l | | 10 | 3 | 1000 | |
| MW-2 | Copper | 08/22/2007 | 6 | ug/l | J | 10 | 3 | 1000 | |
| MW-3 | Dichlorodifluoromethane | 08/22/2007 | 4.2 | ug/l | J | 5 | 0.63 | 1400 | |
| MW-6 | Dichlorodifluoromethane | 08/22/2007 | 4.5 | ug/l | J | 5 | 0.63 | 1400 | |
| MW-7 | Dichlorodifluoromethane | 08/22/2007 | 3.2 | ug/l | J | 5 | 0.63 | 1400 | |
| MW-9 | Dichlorodifluoromethane | 08/22/2007 | 1.5 | ug/l | J | 5 | 0.63 | 1400 | |
| MW-9 | Ethylene dichloride | 08/22/2007 | 0.21 | ug/l | J | 1 | 0.18 | 0.38 | |
| **MW-1** | **Lead, total** | **08/22/2007** | **37** | **ug/l** | | 10 | **2** | **15** | **22** |
| MW-2 | Lead, total | 08/22/2007 | 5 | ug/l | J | 10 | 2 | 15 | |
| MW-6 | Lead, total | 08/22/2007 | 5 | ug/l | J | 10 | 2 | 15 | |

Appendix II Sampling

| Well ID | Parameter Name[1] | Sample Date | Result | Unit | Qual Code | SWSL [2] | MDL[4] | NCGW2L[3] | Exceedance |
|---|---|---|---|---|---|---|---|---|---|
| MW-3 | Methylbenzene | 08/22/2007 | 0.88 | ug/l | J | 1 | 0.35 | 1000 | |
| **MW-6** | **Methylene chloride** | **08/22/2007** | **14** | **ug/l** | | 1 | **0.19** | **4.6** | **9.4** |
| MW-1 | Nickel, total | 08/22/2007 | 25 | ug/l | J | 50 | 2 | 100 | |
| MW-2 | Nickel, total | 08/22/2007 | 47 | ug/l | J | 50 | 2 | 100 | |
| MW-2 | p-Dichlorobenzene | 08/22/2007 | 0.98 | ug/l | J | 1 | 0.33 | 1.4 | |
| **MW-3** | **p-Dichlorobenzene** | **08/22/2007** | **1.7** | **ug/l** | | 1 | **0.33** | **1.4** | **0.3** |
| MW-6 | p-Dichlorobenzene | 08/22/2007 | 0.4 | ug/l | J | 1 | 0.33 | 1.4 | |
| MW-7 | p-Dichlorobenzene | 08/22/2007 | 1.2 | ug/l | | 1 | 0.33 | 1.4 | |
| MW-9 | p-Dichlorobenzene | 08/22/2007 | 1 | ug/l | | 1 | 0.33 | 1.4 | |
| **MW-3** | **Tetrachloroethene** | **08/22/2007** | **0.87** | **ug/l** | **J** | 100 | **0.47** | **0.7** | **0.17** |
| **MW-6** | **Tetrachloroethene** | **08/22/2007** | **1.9** | **ug/l** | | 100 | **0.47** | **0.7** | **1.2** |
| **MW-7** | **Tetrachloroethene** | **08/22/2007** | **0.81** | **ug/l** | **J** | 100 | **0.47** | **0.7** | **0.11** |
| **MW-9** | **Tetrachloroethene** | **08/22/2007** | **4.4** | **ug/l** | | 100 | **0.47** | **0.7** | **3.7** |
| MW-1 | Thallium | 08/22/2007 | 0.05 | ug/l | J | 1 | 0.04 | | |
| MW-2 | Tin, total | 08/22/2007 | 7 | ug/l | J | 1 | 6 | | |
| MW-3 | Tin, total | 08/22/2007 | 11 | ug/l | J | 1 | 6 | | |
| MW-7 | Tin, total | 08/22/2007 | 12 | ug/l | J | 1 | 6 | | |
| MW-9 | Tin, total | 08/22/2007 | 9 | ug/l | J | 1 | 6 | | |
| MW-3 | Trichloroethene | 08/22/2007 | 1.1 | ug/l | | 1 | 0.26 | 2.8 | |
| MW-6 | Trichloroethene | 08/22/2007 | 0.47 | ug/l | J | 1 | 0.26 | 2.8 | |
| MW-7 | Trichloroethene | 08/22/2007 | 0.41 | ug/l | J | 1 | 0.26 | 2.8 | |
| **MW-9** | **Trichloroethene** | **08/22/2007** | **4.7** | **ug/l** | | 1 | **0.26** | **2.8** | **1.9** |
| MW-6 | Trichlorofluoromethane | 08/22/2007 | 17 | ug/l | | 1 | 0.45 | 2100 | |
| MW-7 | Trichlorofluoromethane | 08/22/2007 | 0.96 | ug/l | J | 1 | 0.45 | 2100 | |
| MW-1 | Vanadium | 08/22/2007 | 9.1 | ug/l | J | 25 | 1 | | |
| MW-2 | Vanadium | 08/22/2007 | 2.2 | ug/l | J | 25 | 1 | | |
| MW-1 | Zinc | 08/22/2007 | 123 | ug/l | | 10 | 3 | 1050 | |
| MW-2 | Zinc | 08/22/2007 | 25 | ug/l | | 10 | 3 | 1050 | |
| MW-6 | Zinc | 08/22/2007 | 8 | ug/l | J | 10 | 3 | 1050 | |
| MW-7 | Zinc | 08/22/2007 | 3 | ug/l | J | 10 | 3 | 1050 | |

[1] Table contains all constituents detected above MDL

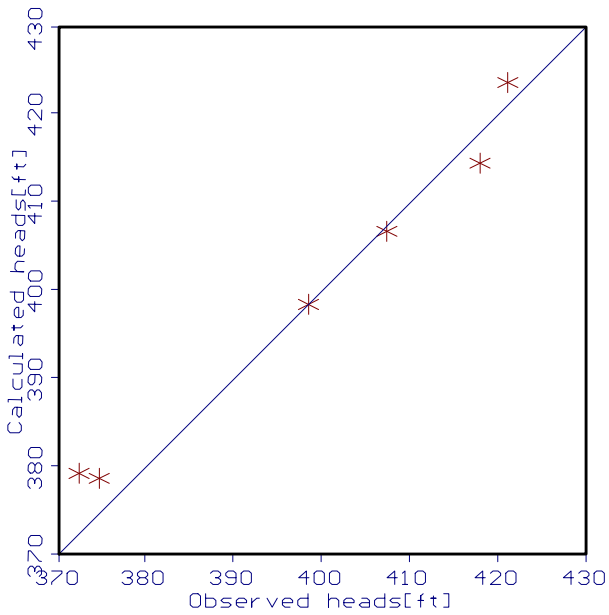
[2] SWSL = Solid Waste Section Limit (Current as of sampling date)

[3] NCGW2L = North Carolina Ground Water 2L Standard

[4] MDL = Method Detection Limit

NE=Not Established

# APPENDIX C




Period: 1

Step: 1

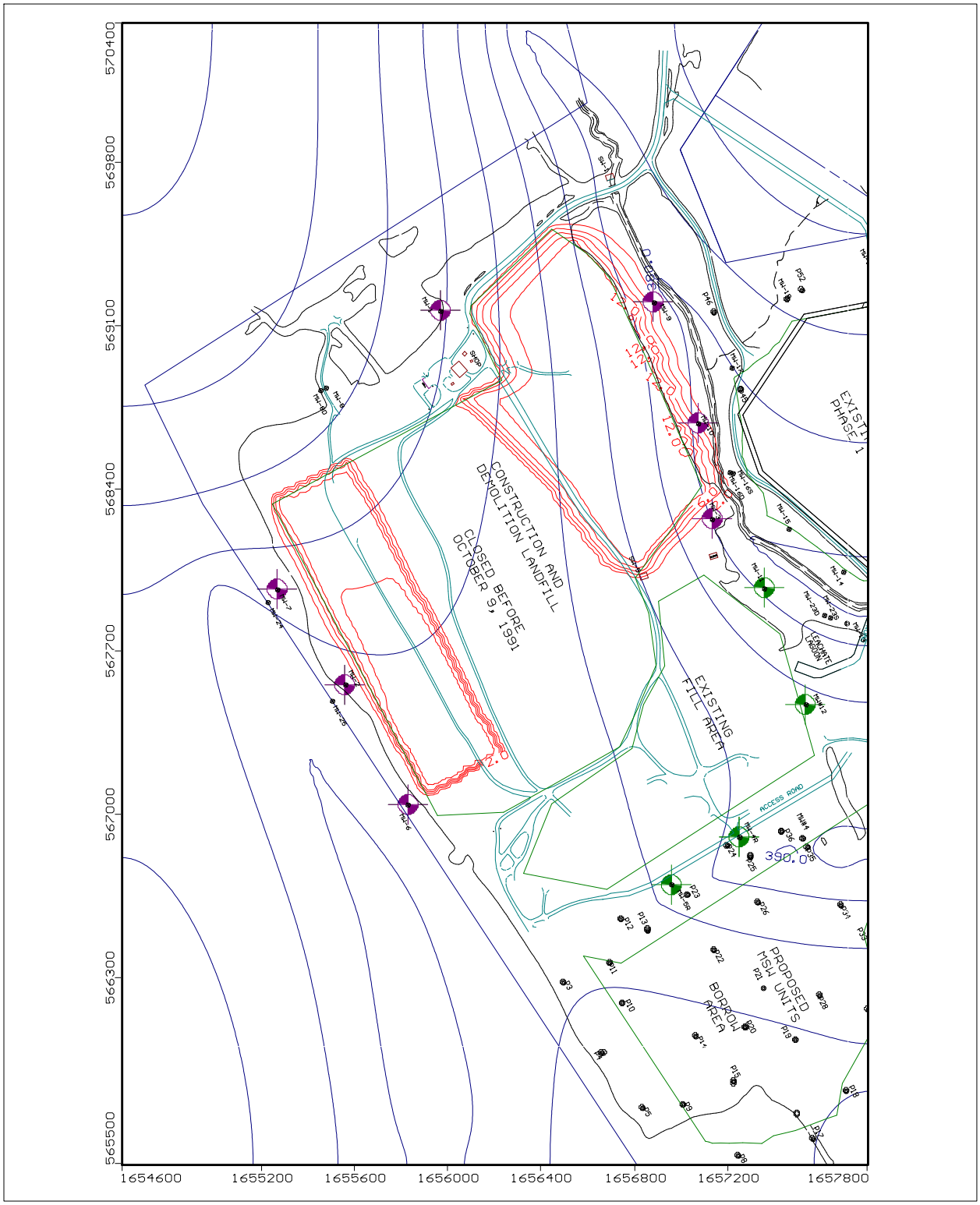
Mean error: 1.28816

Mean abs. err: 2.91047

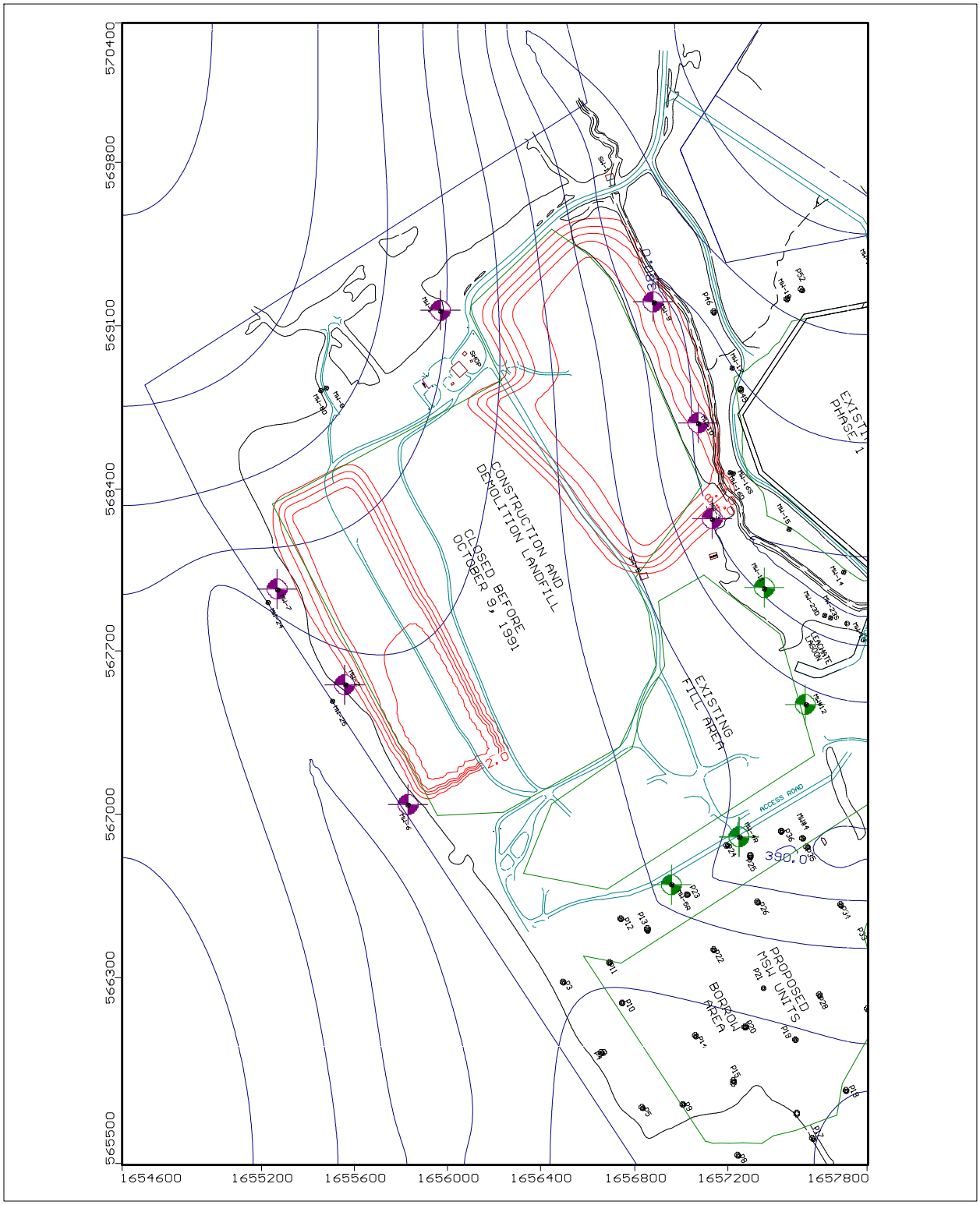
RMS error: 3.57203

Scaled RMS: 7.32875

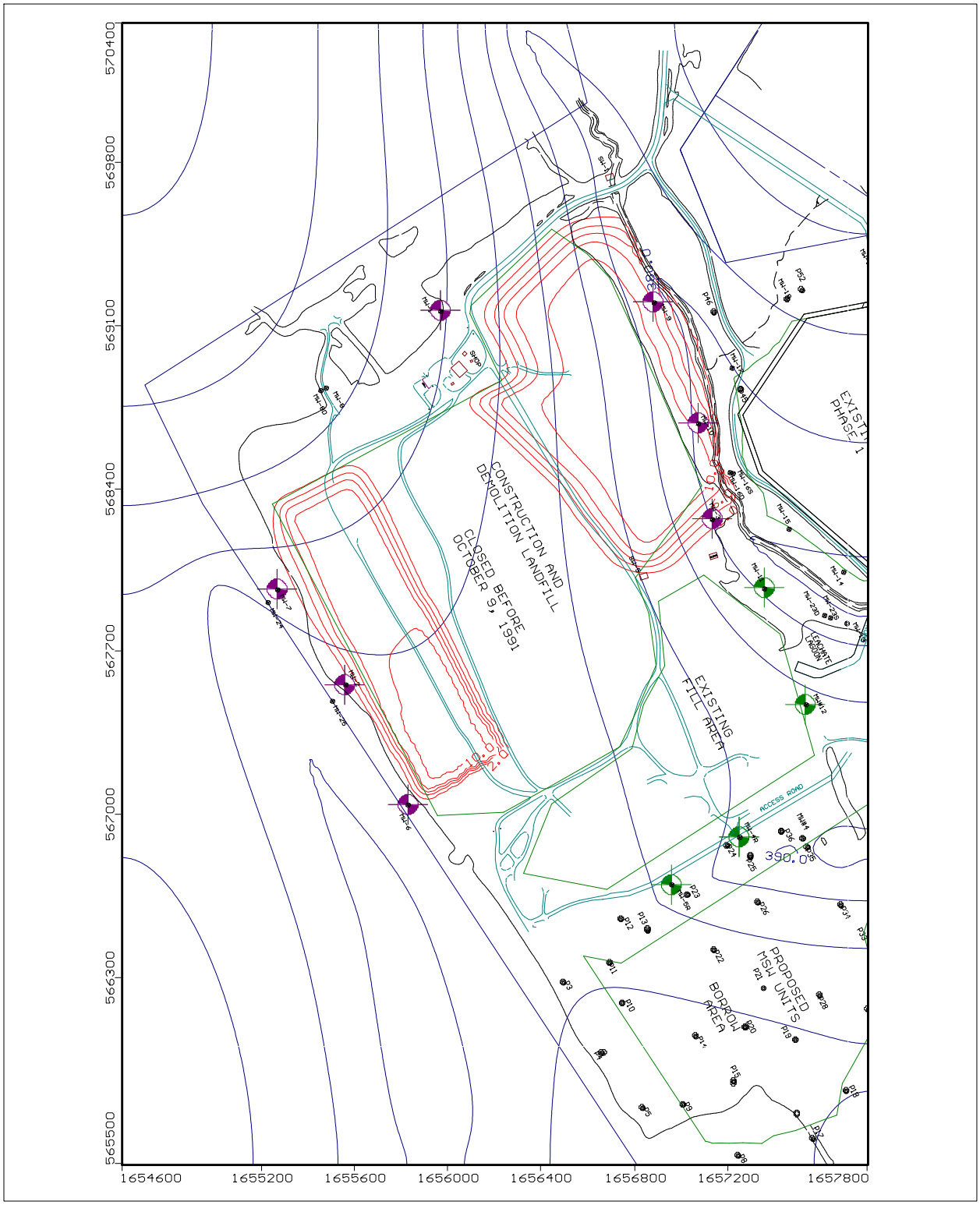
MODFLOW Water Elevation Calibration



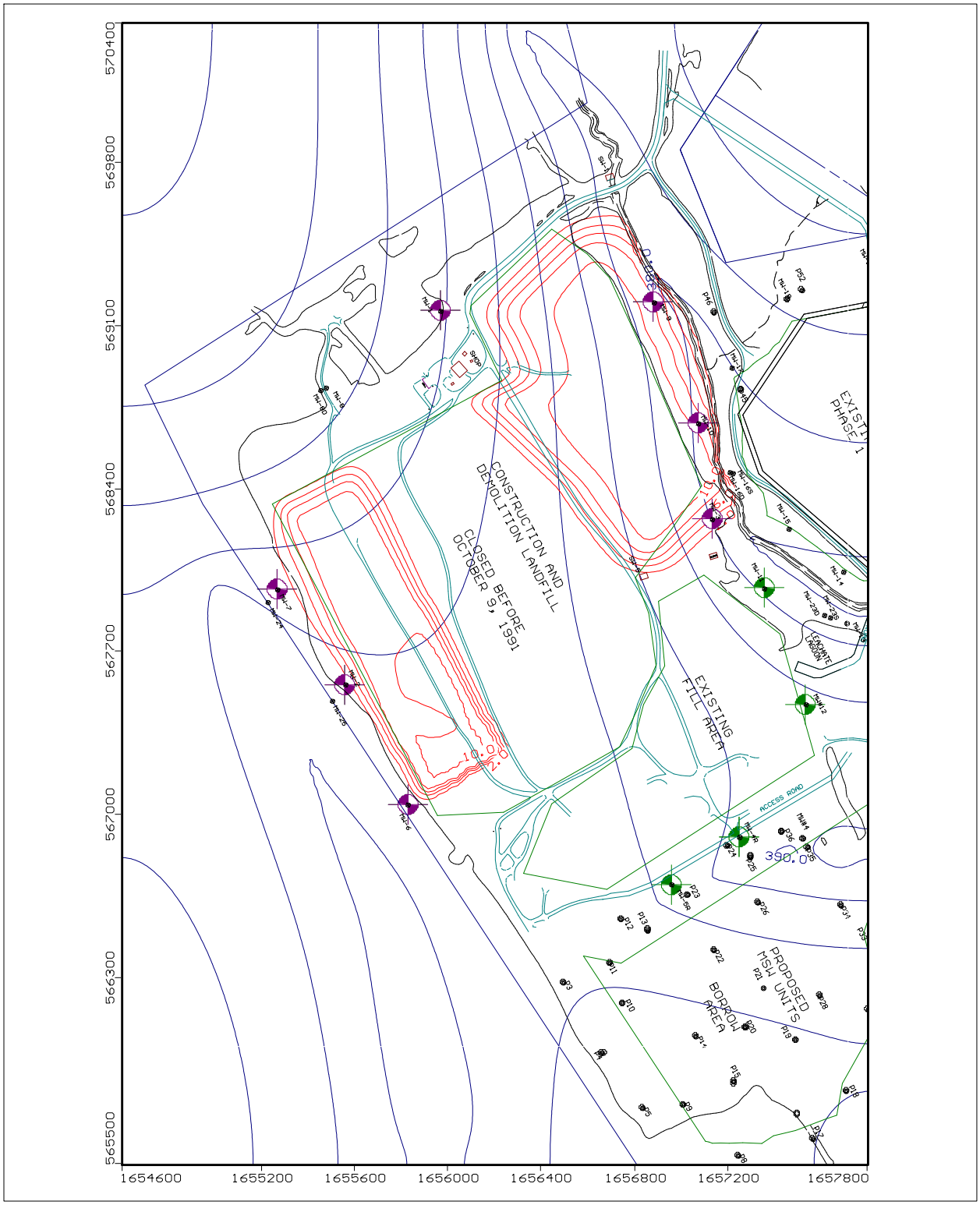

MODFLOW 8 Year Simulation
1998 VOC Contamination



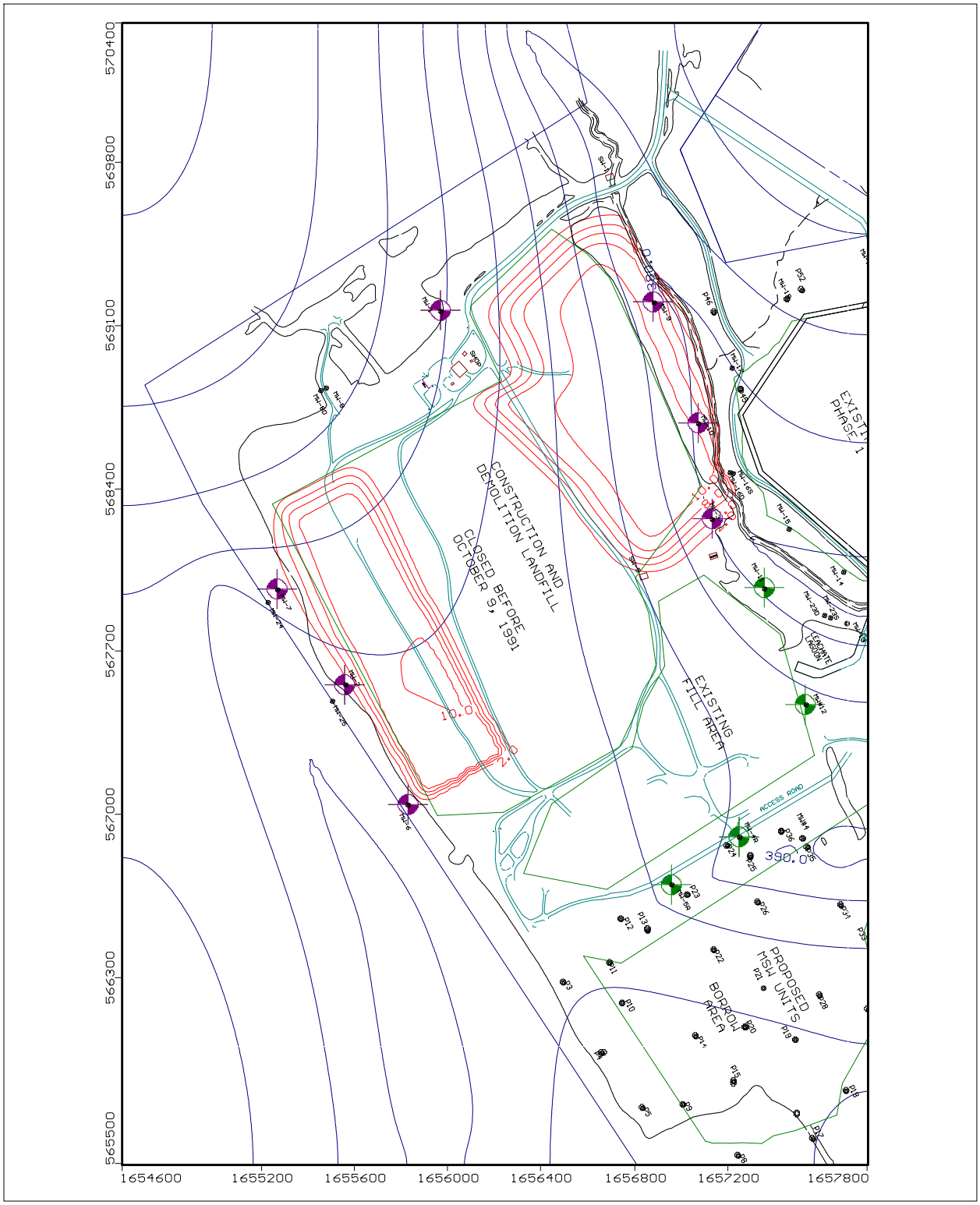

MODFLOW 14 Year Simulation
2004 VOC Contamination



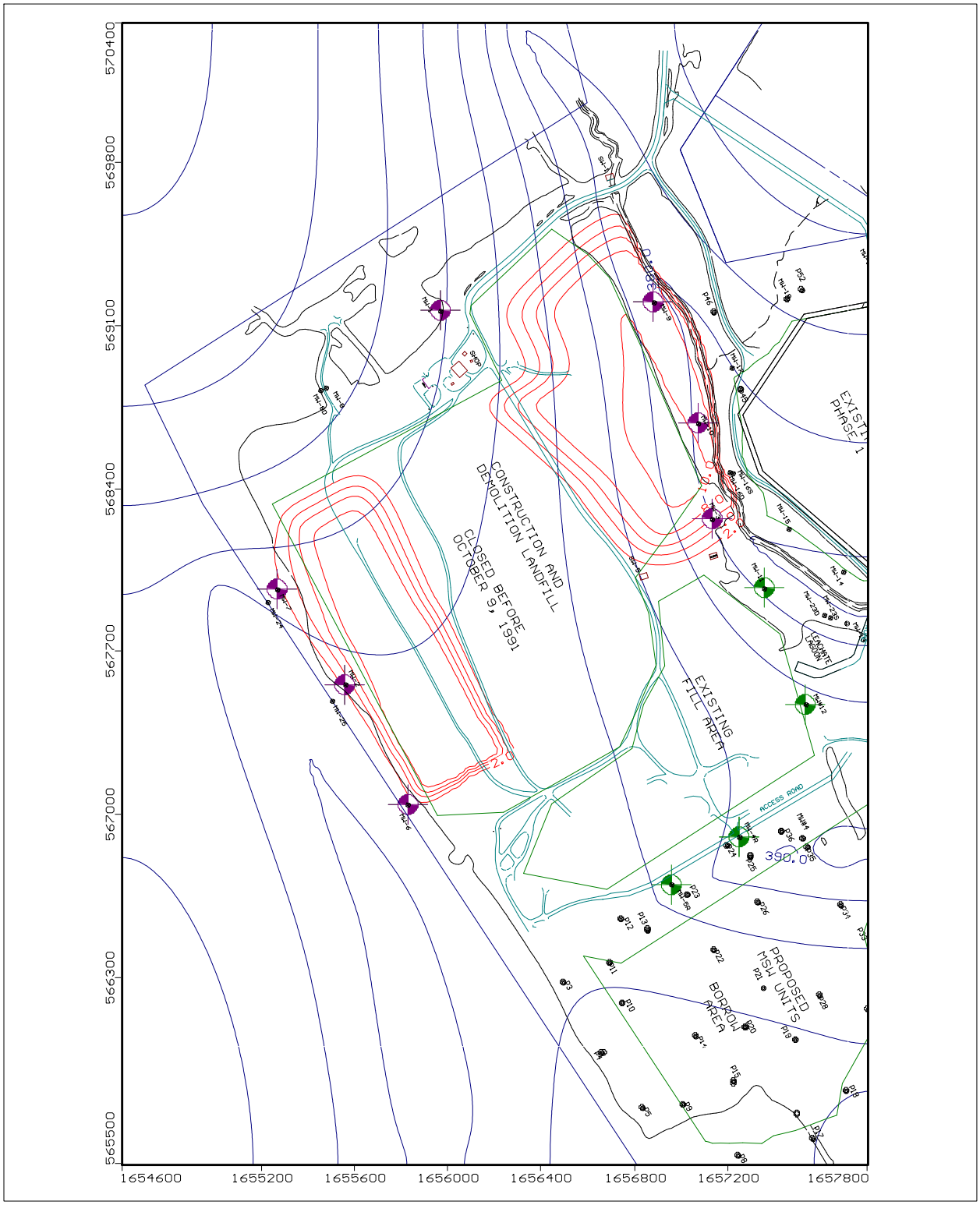

MODFLOW 15 Year Simulation
2005 VOC Contamination



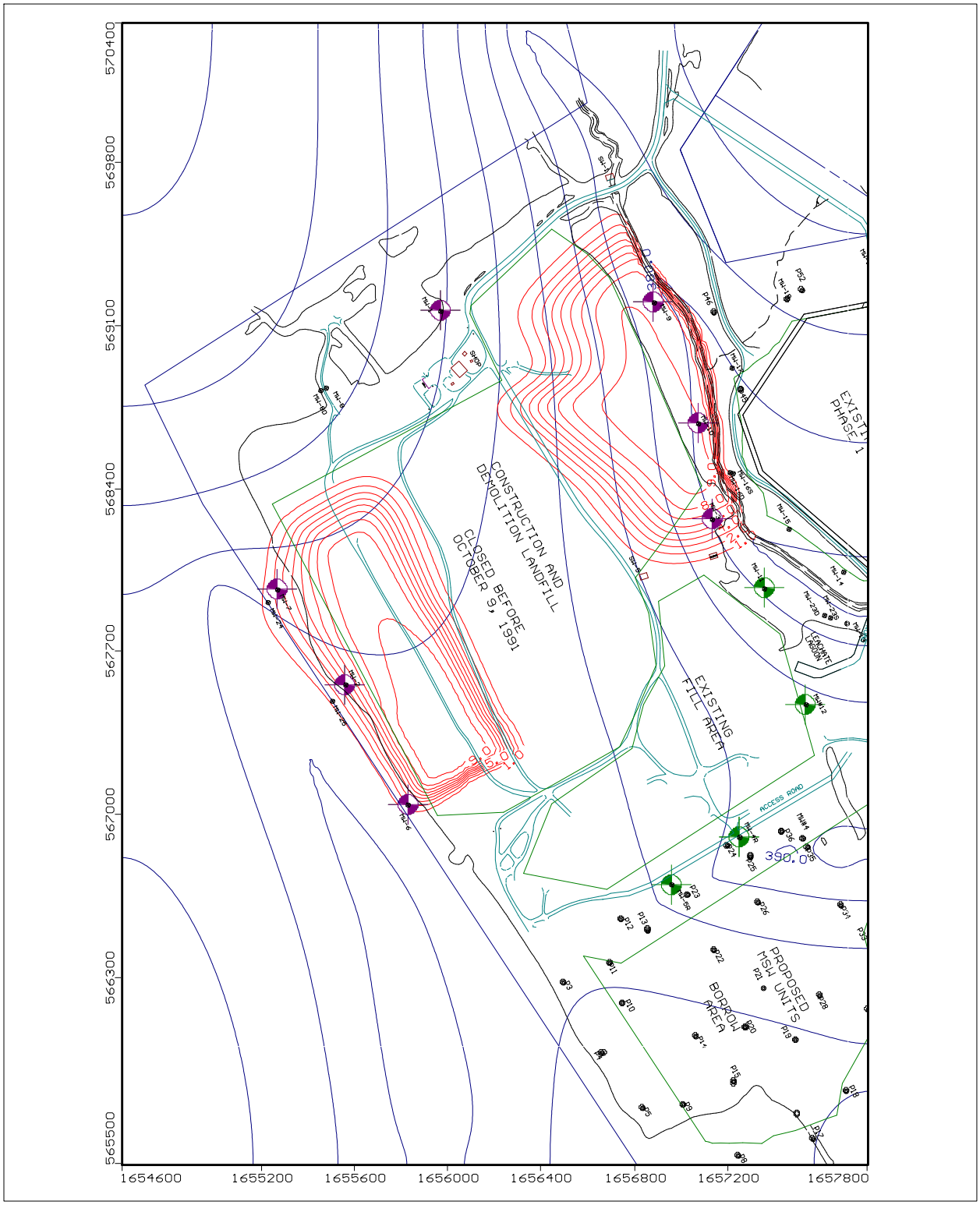

MODFLOW 16 Year Simulation
2006 VOC Contamination



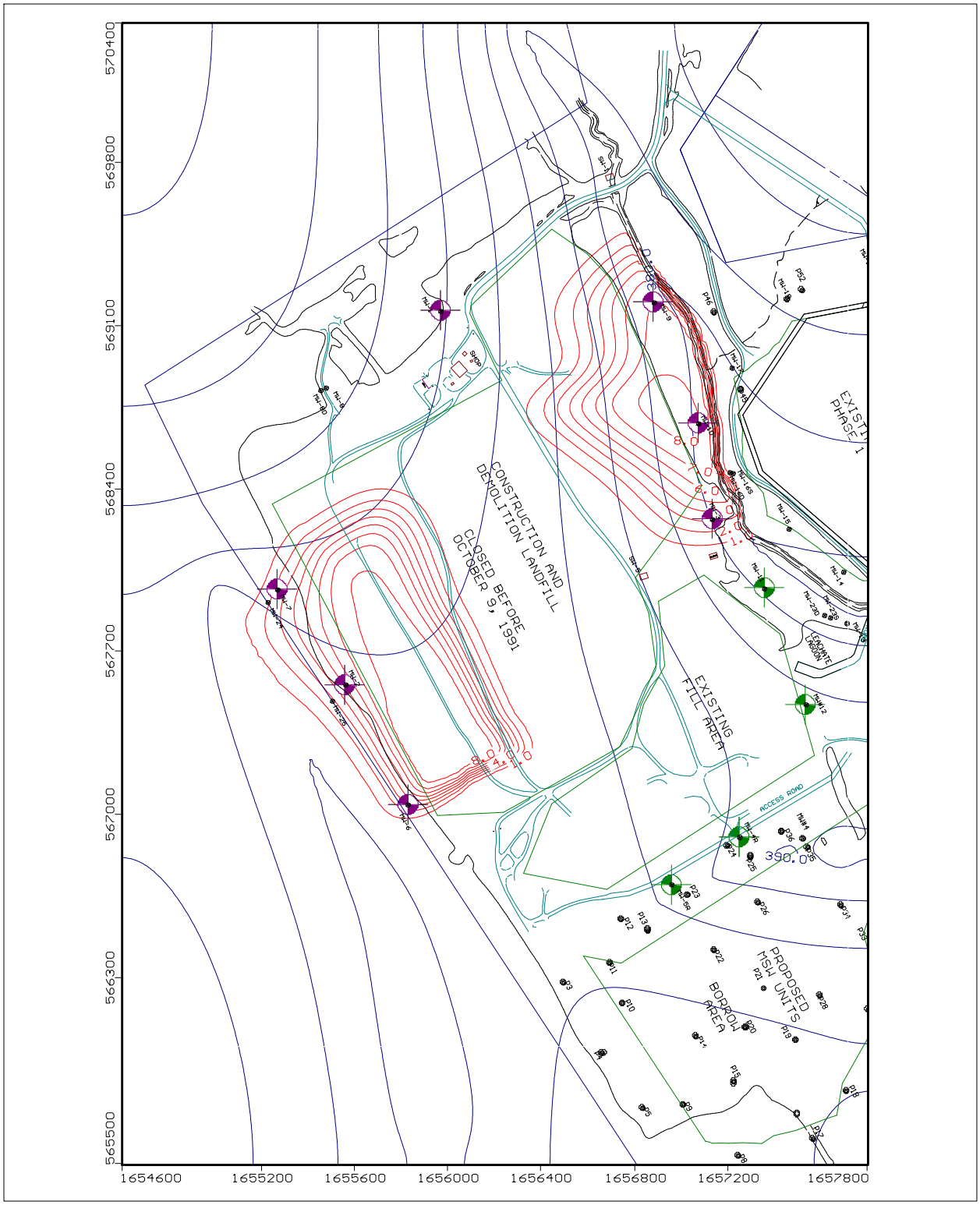

MODFLOW 17 Year Simulation
2007 VOC Contamination




MODFLOW 25 Year Simulation
2015 VOC Contamination




MODFLOW 35 Year Simulation
2025 VOC Contamination




MODFLOW 50 Year Simulation
2040 VOC Contamination

# APPENDIX D

# WATER

# QUALITY

# MONITORING

# PLAN

GAI CONSULTANTS

# GROUND AND SURFACE WATER MONITORING SYSTEM
# CITY OF ALBEMARLE LANDFILL
# ALBEMARLE, NORTH CAROLINA

FOR

MUNICIPAL ENGINEERING SERVICES COMPANY
GARNER, NORTH CAROLINA

PROJECT NO. 94123.02

APRIL 1994

GAI CONSULTANTS

GAI Consultants-NC, Inc.

4000 Blue Ridge Road
Suite 500
Raleigh, NC 27612
919/783-4783
FAX 919/783-0241

April 4, 1994

Mr. Wayne Sullivan
Municipal Engineering Services Company, P.A.
Post Office Box 97
Garner, North Carolina 27529

Re: Ground and Surface Water Monitoring System
City of Albemarle Landfill
Albemarle, North Carolina
Project No. 94123.02

Dear Mr. Sullivan:

## INTRODUCTION

The ground and surface water monitoring system for the municipal solid waste landfill of the City of Albemarle, North Carolina, is being evaluated as a part of the transition from previous North Carolina regulations to current North Carolina regulations (Subtitle D). This report presents data and information pertaining to the existing groundwater monitoring system, discusses the geology of the area, and makes recommendations for improving the ground and surface water monitoring system.

## GEOLOGY

The landfill is located in the Carolina slate belt of the Piedmont physiographic and geologic provinces. These provinces are characterized by rolling hills with generally moderately wide stream and river valleys. Surface relief at the landfill is approximately 110 feet. Drainage from the landfill is southeast to Jacobs Branch that flows southeast and east into the Pee Dee River.

The landfill lies on the southeast limb of the New London Syncline (Butler and Secor, 1991). Geology at the landfill consists of regolith and rock. The regolith consists of soil, tan to gray clayey sandy silt, and saprolite produced by in-place chemical weathering of rock. The regolith varies in thickness from 3 feet to over 15 feet based on boring logs for the groundwater monitoring wells.

Rocks below the landfill are the Mudstone Member of the Cid Formation and consist of gray to greenish gray, laminated to thinly bedded, slightly metamorphosed mudstone (Goldsmith, et al, 1988). These rocks

were deposited as wind blown volcanic ash that settled into quiet water (Conley, 1962). This formation also contains beds of crystal and vitric tuffs. Also, reportedly present on the property is a green to black hornblende gabbro sill (see Plate 1). A site visit and a review of available aerial photographs found no evidence of this sill. One Triassic diabase dike also is reportedly present. The rocks strike approximately N 45° E and dip northwest 30°. The reported regional joint systems are N 45° to 60° E, N 60° W, N 10° to 20° W, and N 30° E (Conley, 1962). The N 45° to 60° E direction probably reflects the strike of the rock. Measured joint systems at the site were N 25° to 40° W, N 60° W, N 80° to 90° E, and North.

North of the property the Flat Swamp member of the Cid Formation is present. This unit consists of gray crystal and lithic tuffs interbedded with thinly bedded mudstone.

Drainage features in the area have orientations that appear to parallel either the regional strike of the rocks or joint directions. Groundwater occurs in both the regolith and the rocks. Groundwater in the regolith generally flows either into the fractures in the rocks or is discharged into drainage features. The rock at the site generally has a low permeability, consequently, groundwater in the rock generally follows the bedding planes, joints, and/or cleavage planes present in the rock (Floyd, 1965). Groundwater supply for water wells is generally more abundant in drainage features and upland flats than on hill tops or slopes. Drainage features and upland flats reflect concentrations of fractures and/or joints which carry groundwater.

There are no reported older faults or Holocene Faults at the site (Goldsmith, et al, 1988, Howard, et al, 1978 and Conley, 1962). The landfill is not in a seismic impact zone (Algermissen, et al, 1990).

References used in the geologic study are listed in Table 1. A geologic map of the area is presented on Plate 1. These geologic and hydrogeologic information and data were used in development of preferential flow patterns and subsequent siting of groundwater monitoring wells.

**SITE REVIEW**

A geotechnical investigation was found for an adjacent property; an area remote to the landfill that reportedly will not be used for landfilling. Other data located consists of summaries of thickness of landfill cover with no groundwater data, and boring logs for the four groundwater monitoring wells. No other boring data or information was located in the Solid Waste Section, City of Albemarle, and Municipal

Engineering Services Company files even though several maps were found that showed other borings reportedly had been made. A continuing effort is being made to locate these other borings.

Four groundwater monitoring wells, at the approximate locations shown on Plate 2, were reviewed on February 7, 1994. Well construction records and boring logs for the monitoring wells are presented in Appendix A. Installation data, including depth to groundwater, are presented in Table 2. Table 3 presents information on the current condition of the four wells.

The groundwater monitoring wells have steel caps and outer casings, and appear to be grouted inside and out around a 2 inch diameter PVC standpipe well. The wells were locked; had tags with partial well installation information; had vented PVC caps; and had dedicated sampling systems. No obvious well numbers were on the lids, caps, or tags. All four existing groundwater monitoring wells appear to have been constructed in general accordance with North Carolina Regulations based on superficial appearance and the well construction records.

Reviews of the area, the U. S. G. S. topographic map, and available aerial photographs indicate there are no obvious water wells or other water intakes between the landfill and Jacobs Creek or its tributaries.

## MODIFICATIONS TO MONITORING SYSTEM

An approximate groundwater potentiometric map was constructed using groundwater depths measured on February 7, 1994 in the monitoring wells and approximate surface elevations for the wells estimated from a topographic map. The contours were constructed using the groundwater elevations with strong consideration given to existing topography and estimated depth to water relative to topography. This technique was considered warranted because of the limited amount of groundwater data available. The groundwater potentiometric map is presented on Plate 2. Groundwater levels in the wells and the potentiometric map indicate groundwater generally flows in the regolith toward the drainage features associated with Jacobs Creek. The general direction for groundwater flow is from the higher elevations downgradient toward drainage features such as streams. The flow direction in the saprolite could be influenced by remnant bedding and joints, but it will still be downgradient toward the surface drainage features.

The existing groundwater monitoring plan should be modified based on the potentiometric map, regional joint patterns, and strike of bedding. It is proposed that nine additional groundwater monitoring wells and

one replacement well be installed at the locations shown on Plate 2. Existing Groundwater Monitoring Wells 1, 2, and 3 should be maintained to monitor groundwater at the landfill. Well 4 should be abandoned. No nested wells are planned at this time, because the proposed 15 foot screen lengths should access the entire thickness of the uppermost aquifer in the regolith. There may be a need for additional wells and/or nested wells if the assumptions made in generating the groundwater potentiometric map, the groundwater flow directions, and geologic location of the uppermost aquifer are not generally confirmed by data and information from installation of these ten new groundwater monitoring wells. Table 4 presents recommended installation data and information for the proposed nine new and one replacement groundwater monitoring wells. All existing and planned wells except for Well 4 are or will be within 250 feet of the estimated landfill.

As noted in the Geology section, the streams and drainage features tend to reflect either the strike of the bedding or the joint patterns. The general purpose of all the proposed groundwater monitoring wells is to intercept the groundwater flowing in the regolith toward drainage features. The groundwater monitoring system is designed to detect any contamination before it reaches the anisotropic flow directions and narrow aquifers associated with the fractures in the rock. Fifteen foot screens are proposed for each well because the regolith is generally less than 20 feet thick and the groundwater is considered to occur in this interval. This length screen will permit monitoring of the entire water column in the regolith. There is no need at this time to locate groundwater monitoring wells to detect flow associated with the gabbro sill. This sill is located south and across a drainage feature from the current landfill.

Groundwater Monitoring Well 4 should be abandoned and replaced by Well 4R. Although Well 4 is suitably located for monitoring the groundwater, it is located approximately 340 feet away from the landfill consequently, it must be replaced in order to comply with monitoring regulations. Well 5, in conjunction with well 4R, is proposed to detect any plume of contamination flowing southeast toward the small drainage feature and stream southeast of the landfill. Proposed Wells 6 and 7 in conjunction with Well 2 should allow detection of any plume of contamination that might flow southwest from the landfill toward the unnamed tributary of Jacobs Creek. Wells 9, 10, and 11 are planned for detection of any plume of contamination flowing northeast from the closed part of the landfill toward Jacobs Creek. Wells 12 and 13 in conjunction with Well 3 are planned to detect any plume of contamination flowing northeast from the landfill toward Jacobs Creek. Well 8 is proposed as the upgradient background well for the landfill. Groundwater Monitoring Well 1 reportedly has been used as the background well, but it is not entirely

upgradient of the landfill. The manner in which the landfill has been developed precludes having individual upgradient wells for each cell or monitoring wells between the cells.

The wells should be installed according to North Carolina regulations similar to Plate 3 which shows a typical monitoring well schematic as recommended by the state of North Carolina. Groundwater monitoring wells should be constructed considering actual static groundwater levels, soil and rock types, and conditions encountered during well installation. Mounding of soil around the wells should be done if necessary to comply with the requirements concerning the sand pack, bentonite seal, and grout above the screen. All groundwater monitoring wells must be tagged, labeled, locked, have vented caps, and their location surveyed. It must be verified that the well numbers reported on the previous chemical analyses correspond to the well numbers used in the well construction records. All future sampling should report well numbers that agree with the well construction records.

Jacobs Creek and its tributaries flow by the landfill. Surface water sampling should be done upstream and downstream of the landfill in the general area of the surface water sample locations shown on Plate 4. Sampling Locations SW-1, SW-2, SW-3, and SW-4 are current sampling locations. Sampling Location SW-1 is upstream of the landfill. Sampling Location SW-2 is on a stream that feeds Jacobs Creek as it flows past the landfill. Sampling Locations SW-3 and SW-4 are downstream of the landfill on Jacobs Creek. An additional Sampling Location, numbered Sampling Location SW-5, is proposed for a tributary of Jacobs Creek that flows past the landfill on the southwest side of the landfill. Actual field locations of surface water sampling locations should be determined based on access, water availability, and their relationship to the landfill. Permanent stakes should be placed on the adjacent stream banks with the location number so that sampling can be performed at the same location every time. The actual locations of the sampling points should be surveyed and shown on the site plan for the landfill.

As used herein, the definition of certify is "to state or declare a professional opinion of conditions whose true properties cannot be known at the time certification is made, despite appropriate professional evaluation." A professional's certification of conditions in no way relieves any other party from meeting requirements imposed by contract, rules, regulations, or other means, including commonly accepted industry practices.

Bearing the above in mind and based on the following:

- well construction records,
- maps provided,
- the limited amount of groundwater data,
- the groundwater potentiometric map,
- visual field inspection of the wells and their locations,
- accuracy of well and landfill locations, and
- information provided by the operator of the landfill,

it is GAI's professional opinion that the ground and surface water monitoring plan, as described above, will be effective in early detection of any release of hazardous constituents to the uppermost aquifer, so as to be protective of public health and the environment.

Respectfully Submitted

GAI Consultants - NC, Inc.

Edward S. Custer, Jr., Ph.D., P.G.
Staff Geologist

NORTH CAROLINA LICENSED SEAL 730 GEOLOGIST EDWARD S. CUSTER, JR.

Wendell W. Parker, Ph.D., P.E.
Vice President

NORTH CAROLINA PROFESSIONAL SEAL 15945 ENGINEER WENDELL W. PARKER

ESC/esc

cc: Mr. Bobby Lutfy, Division of Solid Waste

\REPORTS\94123-02.R02

# TABLES

**TABLE 1**

**REFERENCES**

Algermissen, S. T., Perkins, D. M., Thenhaus, P. C., Hanson, S. L., and Bender, B. L., 1990, Probabilistic Earthquake Acceleration and Velocity Maps for the United States and Puerto Rico: U. S. Geological Survey Miscellaneous Field Studies Map MF-2120, scale 1:7,500,000.

Butler, J. R., and Secor, D. T. Jr., 1991, The Central Piedmont, in Horton, J. W., Jr., and Zullo, V. A., eds., The Geology of the Carolinas: The University of Tennessee Press, p. 59-78.

Conley, J. F., 1962, Geology of the Albemarle Quadrangle, North Carolina: North Carolina Department of Conservation and Development, Division of Mineral Resources, Bulletin 75, 26 p.

Floyd, E. O., 1965, Geology and Ground-Water Resources of the Monroe Area, North Carolina: North Carolina Department of Water Resources, Division of Ground Water, Ground-Water Bull. No. 5, 109 p.

Goldsmith, R., Milton, D. J., and Horton, J. W., Jr., 1988, Geologic map of the Charlotte 1° x 2° quadrangle, North Carolina and South Carolina: U. S. Geological Survey Miscellaneous Investigations Series Map MI-1251-E, scale 1:250,000.

Howard, K. A., Aaron, J. M., Brabb, E. E., Brock, M. R., Gower, H. D., Hunt, S. J., Milton, D. J., Muelhberger, W. R., Nagata, J. K., Plafker, G., Prowell, D. C., Wallace, R. E., and Witkind, I. J., 1978, Preliminary map of young faults in the United States as a guide to possible fault activity: U. S. Geological Survey Miscellaneous Field Studies Map MF-916, scale 1:5,000,000.

TABLE 2

INSTALLATION DATA FOR GROUNDWATER MONITORING WELLS

| Well Number | Depth of Water Below Ground Surface (ft) | Total Depth Below Ground Surface (ft) |
|---|---|---|
| 1 | 3.0 | 18.0 |
| 2 | 4.25 | 17.5 |
| 3 | 11.0 | 22.5 |
| 4 | 3.85 | 18.5 |

All wells were reportedly installed with 4 inch square outer steel casing, 2 inch diameter PVC standpipe, tags, PVC standpipe caps, from 0.5 to 1.0 feet of bentonite seal above the sand pack, and grouted to the surface. They also were installed with a dedicated sampling system.

TABLE 3

INFORMATION ON CONDITION OF GROUNDWATER MONITORING WELLS
AS OF FEBRUARY 7,1994

| Well Number | Depth of Water Below Ground Surface (ft) | Total Depth Below Ground Surface (ft) |
|---|---|---|
| 1 | 2.90 | 17.23 |
| 2 | 3.47 | 15.77 |
| 3 | 11.45 | 19.45 |
| 4 | 5.02 | 16.17 |

The wells had steel caps and were locked. The wells were grouted to the surface inside and outside the 4 inch square steel casing around a 2 inch diameter PVC standpipe. The standpipes had vented PVC lids with a dedicated sampling system installed. All the wells had tags, however, there were no obvious well numbers or statement that the wells are for monitoring groundwater. The well locations reportedly have not been surveyed. The dedicated sampling systems made measuring the well depth difficult without their removal. The measured well depths are considered minimum depths, because the sampling systems were not removed.

**TABLE 4**

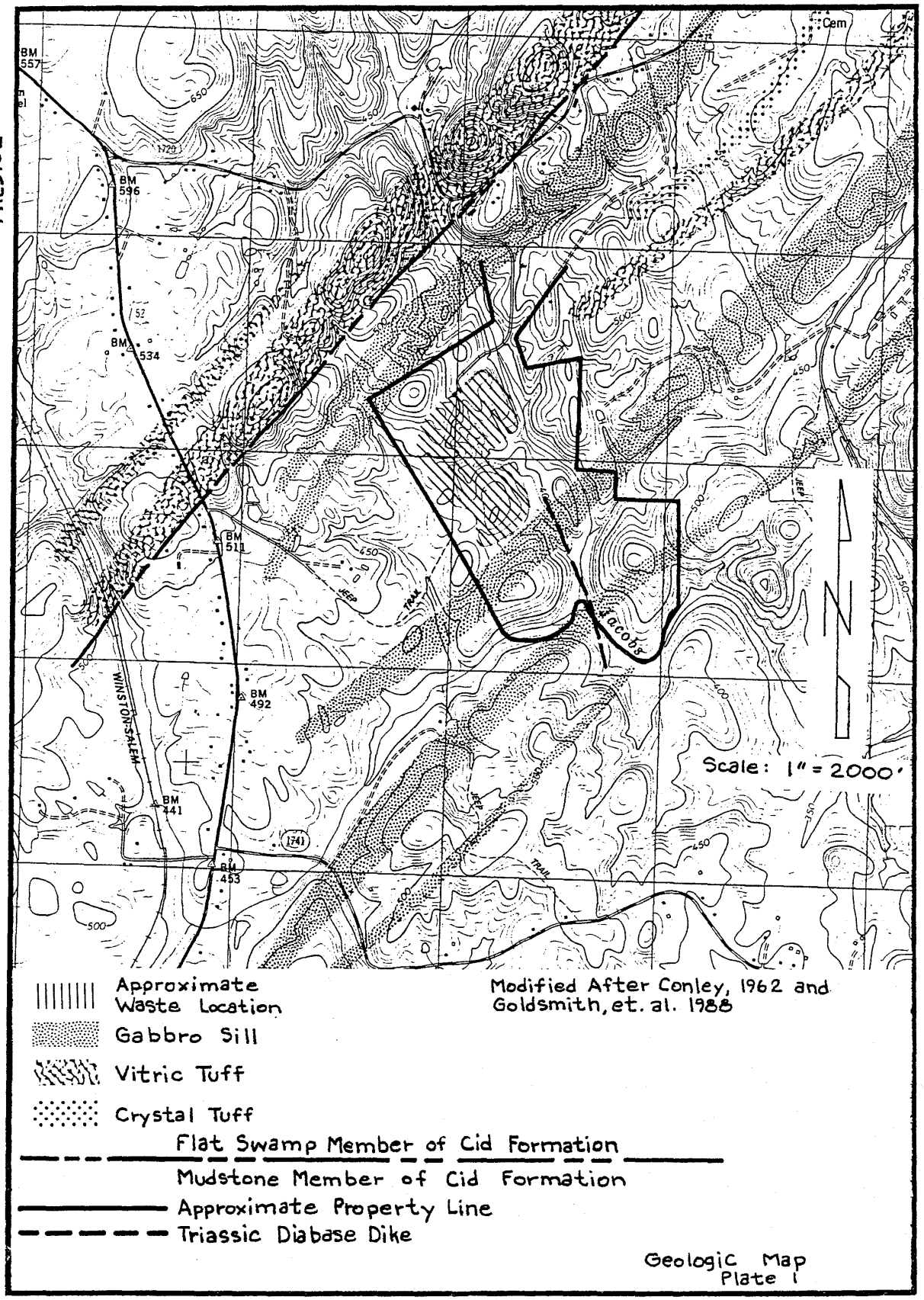
**PLANNED GROUNDWATER MONITORING WELL INSTALLATIONS**

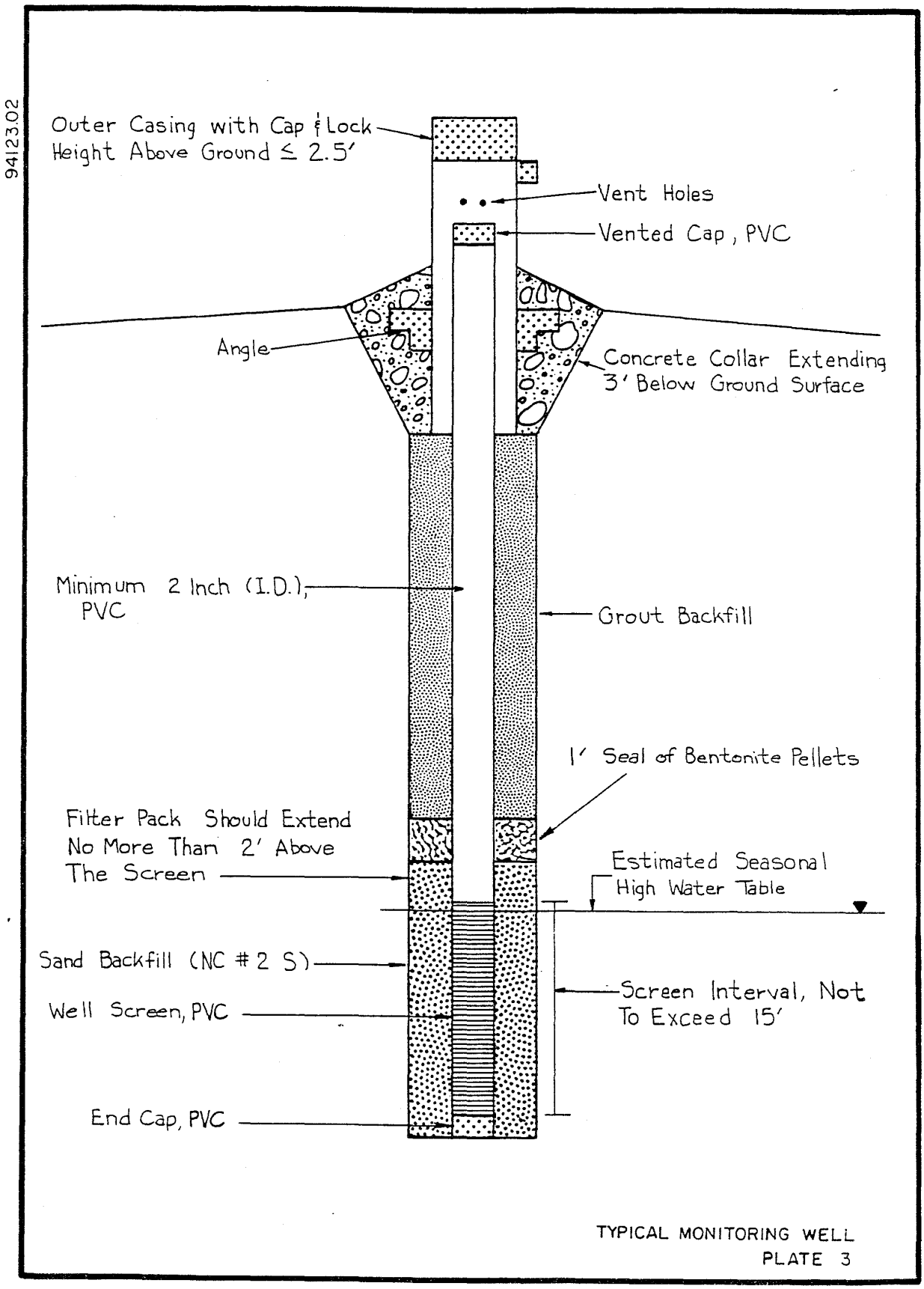
| Monitoring Well | Ground Surface Elevation (ft) | Groundwater Elevation (ft) | Screen Elevation (ft) Top | Screen Elevation (ft) Bottom | Well Depth (ft) |
|---|---|---|---|---|---|
| 4R | 407 | 402 | 402 | 387 | 21 |
| 5 | 417 | 412 | 412 | 397 | 21 |
| 6 | 441 | 436 | 437 | 422 | 20 |
| 7 | 452 | 442 | 443 | 428 | 25 |
| 8 | 482 | 472 | 473 | 458 | 25 |
| 9 | 426 | 423 | 423 | 408 | 19 |
| 10 | 415 | 412 | 412 | 397 | 19 |
| 11 | 405 | 397 | 398 | 383 | 23 |
| 12 | 413 | 410 | 410 | 395 | 19 |
| 13 | 411 | 406 | 406 | 391 | 21 |

Note: All elevations were estimated from a topographic map and are approximate. The well depth is planned to have approximately one foot of sand pack below and above the screen in the well. Mounding of soil around the wells will be done to achieve one foot of bentonite and four feet of grout above the sand around the screens.

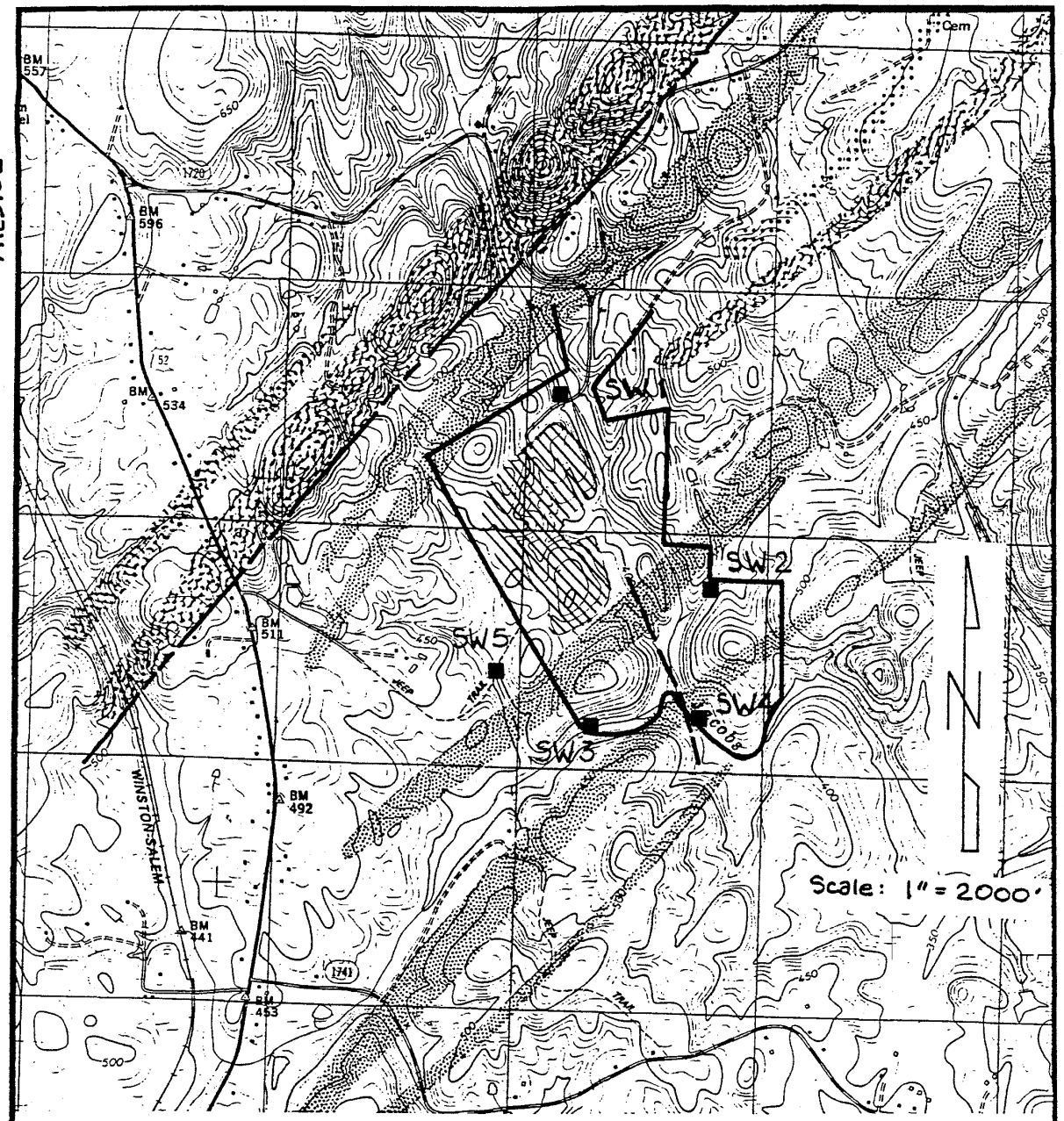
PLATES

94123.02


BM 557
BM 596
BM 534
BM 511
BM 492
BM 441
BM 453
WINSTON-SALEM
JEEP TRAIL
Jacobs
Cem
Scale: 1" = 2000'
Approximate Waste Location
Gabbro Sill
Vitric Tuff
Crystal Tuff
Flat Swamp Member of Cid Formation
Mudstone Member of Cid Formation
Approximate Property Line
Triassic Diabase Dike
Modified After Conley, 1962 and Goldsmith, et. al. 1988
Geologic Map
Plate 1


94123.02
Outer Casing with Cap & Lock
Height Above Ground ≤ 2.5'
Vent Holes
Vented Cap, PVC
Angle
Concrete Collar Extending
3' Below Ground Surface
Minimum 2 Inch (I.D.),
PVC
Grout Backfill
1' Seal of Bentonite Pellets
Filter Pack Should Extend
No More Than 2' Above
The Screen
Estimated Seasonal
High Water Table
Sand Backfill (NC # 2 S)
Well Screen, PVC
Screen Interval, Not
To Exceed 15'
End Cap, PVC
TYPICAL MONITORING WELL
PLATE 3

94123.02




Approximate Waste Location

Gabbro Sill

Vitric Tuff

Crystal Tuff

Flat Swamp Member of Cid Formation

Mudstone Member of Cid Formation

Approximate Property Line

Triassic Diabase Dike

Surface Water Sampling Locations

Modified After Conley, 1962 and Goldsmith, et. al. 1988

Surface Water Monitoring Plan
Plate 4

# APPENDIX A

## WELL CONSTRUCTION RECORDS AND BORING LOGS

MW1

pg. 18

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 — RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat. _____ Long _____ Pg. _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent _____

# WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.

WELL REGISTRATION NUMBER: N.C. # 270

STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0034

WELL LOCATION: (Show sketch of the location below)

Nearest Town: Albemarle N.C.

Road, Community, or Subdivision and Lot No.: Albemarle Landfill (Stoney Creek Rd)

Owner: City of Albemarle

Address: P.O. Box 190 (Street or Route No.)

Albemarle N.C. 28002-0190
City or Town — State — Zip Code

County: Stanly

DATE DRILLED: 3/20/91 USE OF WELL: Monitoring

TOTAL DEPTH: 18.0 CUTTINGS COLLECTED: [X] Yes [ ] No

DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No

STATIC WATER LEVEL: 5 Ft. [ ] above [X] below TOP OF CASING

TOP OF CASING IS 2 Ft. ABOVE LAND SURFACE

YIELD (gpm): NA METHOD OF TEST: N.A.

SCREEN ZONES (depth): -3 to -18 ft.

CHLORINATION: Type NA Amount NA

CASING:

| | Depth | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|
| From +2 | To -3 Ft. | 2" | Sch 40 | PVC |
| From | To | Ft. | | |
| From | To | Ft. | | |

GROUT:

| | Depth | Material | Method |
|---|---|---|---|
| From +6" | To 1.5 Ft. | Type I Cement | |
| From 1.5 | To 2.5 Ft. | Bentonite | |

SCREEN:

| | Depth | Diameter | Slot Size | Material |
|---|---|---|---|---|
| From -3 | To -18 Ft. | 2" | .010 in. | PVC |
| From | To Ft. | | in. | |
| From | To Ft. | | in. | |

GRAVEL PACK:

| | Depth | Size | Material |
|---|---|---|---|
| From -2.5 | To -18 Ft. | #8 M | Gravel |
| From | To Ft. | | |

REMARKS:

DRILLING LOG

| From | To | Formation Description |
|---|---|---|
| 0 | 5 | Brown silty clay |
| 5 | 10 | Tan silty fine w/ rock |
| 10 | 15 | " " |
| 15 | 18 | Gray fine grained rock |

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I (WE) HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett A. Higgins — 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT — DATE

Revised 5/88

To be submitted to Division of Environmental Management within 30 days of completion of well.

E.E.T.L. LOG OF BORING PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-1 LOCATION: SEE PLAN

DATE: 3/20/91
JOB NO: CLT-1288
SURFACE ELEVATION: 442 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" 0 10 20 30 40 50 60 70 80 |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | LIGHT GRAY TO TAN SILT WITH FINE SAND AND SOME SMALL ROCK PARTICLES. (ML) | |
| | 3 | | | |
| | 4 | | WATER ENCOUNTERED @ 3.5 FT. | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | (ML) | |
| | 8 | | | |
| | 9 | | | |
| | 10 | | LIGHT GRAY TO TAN SILT WITH FINE SANDS AND GRAVEL. (ML) | |
| | 11 | | | |
| | 12 | | | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 17 | | | |
| | 18 | | BORING TERMINATED @ 18 FT. | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water: 3.5 FT. Time:13:50 Date: 3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

#MW2

pg. 19

N. CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat _____ Long _____ Pg _____
Mbrs Basin _____
Basin Code _____
Header Ful. _____ GW-1 Ent. _____

# WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Whitley Drilling Co.

DRILLER REGISTRATION NUMBER N.C. # 2270

STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-003

WELL LOCATION: (Show sketch of the location below)

Nearest Town: Albemarle N.C.

Road, Community, or Subdivision and Lot No.: Albemarle Landfill (Stoney Gap Rd.)

County: _____

OWNER: City of Albemarle

ADDRESS: P.O. Box 190 (Street or Route No.)

Albemarle N.C. 28002-0190
City or Town State Zip Code

DATE DRILLED 3/21/91 USE OF WELL MONITOR

TOTAL DEPTH 17.5 CUTTINGS COLLECTED [X] Yes [ ] No

DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No

STATIC WATER LEVEL 6.75 FT [ ] above [X] below TOP OF CASING

TOP OF CASING IS 2.5 FT ABOVE LAND SURFACE

YIELD (gpm) NA METHOD OF TEST NA

SCREEN ZONES (depth) -4.25 to -17.5 ft

DISINFECTION: Type NA Amount NA

CASING:

| | Depth | Diameter | Wall Thickness or Weight/FT. | Material |
|---|---|---|---|---|
| From | +2.5 to -2.5 FT | 2" | Sch 40 | PVC |
| From | to FT | | | |
| From | to FT | | | |

GROUT:

| | Depth | Material | Method |
|---|---|---|---|
| From | +6" to -1.5 FT | Type I Cement | |
| From | -1.5 to -2.0 FT | Bentonite | |

SCREEN:

| | Depth | Diameter | Slot Size | Material |
|---|---|---|---|---|
| From | -2.5 to -17.5 FT | 2" in | .010 in | PVC |
| From | to FT | in | in | |
| From | to FT | in | in | |

GRAVEL PACK:

| | Depth | Size | Material |
|---|---|---|---|
| From | -2.0 to -17.5 FT | 78 M | Gravel |
| From | to FT | | |

REMARKS: _____

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Red Clayey silt |
| 5 | 10 | Tan sandy silt |
| 10 | 15 | Tan silt |
| 15 | 17.5 | Tan sandy silt w/ rock |
| | | Bedrock |

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Robert L. Higgins 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 Revised 6/88

Submit original to Division of Environmental Management and copy to owner

E.E.T.L. LOG OF BORING PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-2 LOCATION: SEE PLAN

DATE: 3/21/91
JOB NO: CLT-1288
SURFACE ELEVATION: 421 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" (0 10 20 30 40 50 60 70 80) |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | | |
| | 3 | | TAN TO LIGHT BROWN SILT WITH SOME FINE SAND. (ML) | |
| | 4 | | | |
| | 5 | | | |
| | 6 | | WATER ENCOUNTERED @ 6 FT. | |
| | 7 | | LIGHT GRAY TO TAN SILT WITH FINE SAND AND SMALL ROCK FRAGMENTS. (ML) | |
| | 8 | | | |
| | 9 | | | |
| | 10 | | | |
| | 11 | | | |
| | 12 | | (ML) | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 17 | | | |
| | 18 | | BORING TERMINATED @ 17.5 FT | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water: 6.0 FT. Time:11:30 Date: 3/21/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

# MW 3

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pg. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.
DRILLER REGISTRATION NUMBER: N.C. # 270
STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0024

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle N.C.
Albemarle Landfill (Stoney Gap Rd)
(Road, Community, or Subdivision and Lot No.)
County: _____
2. OWNER: City of Albemarle
ADDRESS: P.O. Box 190 (Street or Route No.)
Albemarle N.C. 28002-0190
City or Town State Zip Code
3. DATE DRILLED: 3/20/91 USE OF WELL: Monitoring
4. TOTAL DEPTH: 22.5 CUTTINGS COLLECTED: [X] Yes [ ] No
5. DOES WELL REPLACE EXISTING WELL? [ ] Yes [X] No
6. STATIC WATER LEVEL: 13.5 FT. [ ] above [X] below TOP OF CASING.
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE
7. YIELD (gpm): NA METHOD OF TEST: NA
8. WATER ZONES (depth): -11 to -22.5 ft
9. CHLORINATION: Type NA Amount NA

CASING:

| | Depth | Diameter | Wall Thickness or Weight/Ft. | Material |
|---|---|---|---|---|
| From +2.5 | to -7.5 ft | 2" | Sch 40 | PVC |
| From | to ft | | | |
| From | to ft | | | |

GROUT:

| | Depth | Material | Method |
|---|---|---|---|
| From +6" | to -5.5 ft | Type I Cement | |
| From -5.5 | to -6.5 ft | Bentonite | |

12. SCREEN:

| | Depth | Diameter | Slot Size | Material |
|---|---|---|---|---|
| From -7.5 | to -22.5 ft | 2" | .010 in. | PVC |
| From | to ft | | in. | in. |
| From | to ft | | in. | in. |

GRAVEL PACK:

| | Depth | Size | Material |
|---|---|---|---|
| From 6.5 | to 22.5 ft | Coarse | Sand pak |
| From | to ft | | |

13. REMARKS: _____

| DRILLING LOG | |
|---|---|
| From – To | Formation Description |
| 0-5 | Brown sandy silt w/ rock |
| 5-10 | Brown/Gray silty sand w/ rock |
| 10-15 | " " " " " |
| 15-22.5 | Gray fine grained rock |
| | Bedrock |

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett L. Higgins 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 (Revised 6/88)
Submit original to Division of Environmental Management and copy to well owner.

E.E.T.L. LOG OF BORING PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-3 LOCATION: SEE PLAN

DATE: 3/20/91
JOB NO: CLT-1288
SURFACE ELEVATION: 396 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" (0 10 20 30 40 50 60 70 80) |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | | |
| | 3 | | | |
| | 4 | | GRAY TO DARK BROWN SILT-ROCK MIXTURE WITH SOME SAND AND ORGANICS. (ML) | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | (ML) | |
| | 9 | | | |
| | 10 | | | |
| | 11 | | WATER ENCOUNTERED @ 10.5 FT | |
| | 12 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | | |
| | 17 | | | |
| | 18 | | | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | BORING TERMINATED @ 22.5 FT | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water:10.5 FT. Time: 17:50 Date:3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 25.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

pg. 21

# MW4

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT — GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3221

FOR OFFICE USE ONLY
Quad No. ____ Serial No. ____
Lat ____ Long ____ Pc ____
Minor Basin ____
Basin Code ____
Header Ent. ____ GW-1 Ent. ____

## WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Whitley Well Drilling Co.
DRILLER REGISTRATION NUMBER: N.C. # 2701

STATE WELL CONSTRUCTION PERMIT NUMBER: 83-0129-WM-0034

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Albemarle N.C.
Road, Community, or Subdivision and Lot No.: Albemarle Landfill (Stoney Gap Rd.)
County: Stanly
WHERE: City of Albemarle
ADDRESS: P.O. Box 190 (Street or Route No.)
Albemarle N.C. 28002-0190 (City or Town, State, Zip Code)

COMPLETED: 3/21/91 USE OF WELL: Monitoring
TOTAL DEPTH: 18.5 CUTTINGS COLLECTED: [X] Yes [ ] No
IS WELL REPLACE EXISTING WELL? [ ] Yes [X] No
STATIC WATER LEVEL: 6.35 FT. [ ] above [ ] below TOP OF CASING: -3.85
TOP OF CASING IS: 2.5 FT. ABOVE LAND SURFACE
YIELD (gpm): NA METHOD OF TEST: NA
DRAWDOWN (depth): -3.85 to -18.5 ft

DISINFECTION: Type: NA Amount: NA

CASING:

| | Depth From | Depth To | Diameter | Wall Thickness or Weight/FT | Material |
|---|---|---|---|---|---|
| | +2.5 | -18.5 | 2" | Sch. 40 | PVC |
| | | | | | |
| | | | | | |

GROUT:

| | Depth From | Depth To | Material | Method |
|---|---|---|---|---|
| | +6" | -2 | Type I Cement | |
| | -2 | -3 | Bentonite | |

SCREEN:

| | Depth From | Depth To | Diameter | Slot Size | Material |
|---|---|---|---|---|---|
| | -3.5 | -18.5 | 2" | .010 in. | PVC |
| | | | | in. | in. |
| | | | | in. | in. |

GRAVEL PACK:

| | Depth From | Depth To | Size | Material |
|---|---|---|---|---|
| | -3 | -18.5 | 7&M | Gravel |
| | | | | |

REMARKS:

DRILLING LOG

| Depth From | Depth To | Formation Description |
|---|---|---|
| 0 | 5 | Tan silt w/rock |
| 5 | 10 | Brown Clayey silt |
| 10 | 15 | Brown silt w/rock |
| 15 | 18.5 | Bedrock |

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brett A. Hilgard 3/28/91
SIGNATURE OF CONTRACTOR OR AGENT DATE

Revised 6/88
Submit original to Division of Environmental Management

E.E.T.L. LOG OF BORING

PAGE 1 OF 1

PROJECT: ALBEMARLE SANITARY LANDFILL
CLIENT: CAMP DRESSER & McKEE
BORING NO: MW-4 LOCATION: SEE PLAN

DATE: 3/21/91
JOB NO: CLT-1288
SURFACE ELEVATION: 386 M.S.L

| ELEV. IN FT | DEPTH IN FT | P R | MATERIAL DESCRIPTION | STANDARD PENETRATION RESISTANCE Blows/ft on 2" sampler - 140# @ 30" (0 10 20 30 40 50 60 70 80) |
|---|---|---|---|---|
| | 1 | | AUGER CUTTINGS SAMPLED EVERY 5 FT. | |
| | 2 | | DARK BROWN CLAYEY, ORGANIC SILT WITH SOME SAND AND SMALL ROCK FRAGMENTS. (OL) | |
| | 3 | | | |
| | 4 | | WATER ENCOUNTERED @ 4 FT. | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | 9 | | (OL) | |
| | 10 | | | |
| | 11 | | | |
| | 12 | | | |
| | 13 | | | |
| | 14 | | | |
| | 15 | | | |
| | 16 | | | |
| | 17 | | (BEDROCK) DARK GRAY TO GREEN GRAY FINE GRAINED ROCK. | |
| | 18 | | BORING TERMINATED @ 18.5 FT | |
| | 19 | | | |
| | 20 | | | |
| | 21 | | | |
| | 22 | | | |
| | 23 | | | |
| | 24 | | | |
| | 25 | | | |

Depth Ground Water:4.0 FT. Time: 13:50 Date: 3/20/91 Drill-Fluid: YES
Drill Rod Size: N/A Casing Size: 2.0 IN. Length of Casing: 20.0 FT.
Driller: WHITLEY CO. Asst.: WHITLEY CO. Bit Diameter: 6.0 IN.

# WATER QUALITY SAMPLING AND ANALYSIS PLAN

GAI CONSULTANTS

# GROUND AND SURFACE WATER SAMPLING AND ANALYSIS PLAN

FOR INCLUSION IN

EXISTING MUNICIPAL SANITARY LANDFILL TRANSITION PLANS
NORTH CAROLINA

FEBRUARY 1994

# GROUND AND SURFACE WATER SAMPLING AND ANALYSIS PLAN

## INTRODUCTION

The objective of the ground and surface water sampling and analysis plan is to provide clear guidelines and procedures to be followed by field and laboratory personnel when obtaining and testing ground and surface water samples.

The goal of the sampling plan is to obtain the desired sample while neither adding nor subtracting any constituent to or from the sample or the monitoring well. The plan details described below, when followed, are considered adequate to eliminate any cross-contamination or contamination from external sources of the wells sampled. These guidelines are drawn, in part, directly from and are intended to be used in conjunction with the N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities (Guidance Document), copy enclosed.

The goal of the analysis plan is to test and detect, if present, selected chemical constituents (Appendix I constituents) in the ground and surface water. Testing will be conducted to the desired detection levels with accuracy and precision under controlled testing procedures such that chemical constituents not present are neither added to the water nor detected.

## SAMPLING EQUIPMENT

Groundwater samples will be obtained in the field using a dedicated, laboratory-cleaned, stainless steel bailer. Each bailer will be cleaned in a laboratory controlled environment prior to sampling in accordance with the following steps.

1. Completely disassemble bailer.
2. Phosphate-free, laboratory grade, soap and deionized or distilled water wash.
3. Deionized or distilled water rinse.
4. Isopropyl alcohol rinse.
5. Deionized or distilled water rinse.
6. Air dry.
7. Wrap bailer in aluminum foil, shiny side out.
8. Wrap bailer in plastic.

In addition to laboratory cleaned bailers for each well sampled, standard equipment necessary to conduct the sampling includes sample containers, including trip blanks and equipment blanks, wide-mouth container, at least two 600-ft spools of ¼-inch nylon rope, at least two boxes of latex gloves, one box of large plastic bags, temperature indicator, pH indicator, conductivity indicator, water level indicator, storage coolers, and ice. In case

of emergency, supplies to clean bailers as described above may also be brought to the site. If the total depth of all wells to be sampled exceeds 1200 feet, additional spools of rope will be obtained to complete the sampling. If the number of wells to be sampled exceeds one third of the number of pairs of gloves in stock, additional boxes of gloves will be obtained.

The bailers, wrapped in foil and plastic, will be transported between pieces of peaked foam rubber to prevent damage to the wrappings. Other equipment subject to damage and contamination will be transported in sealed, plastic bags. The water level indicator will be cleaned in accordance with Steps 3 through 5 described above prior to placement in a clean plastic bag.

## SAMPLE CONTAINERS

Various sample containers are required for a complete sampling and analysis effort. Routine groundwater and surface water monitoring may include the following:

- Volatile organic analysis (VOA),
- Total organic halogens (TOX), and
- Inorganic analysis, such as heavy metals or general chemistry.

Samples will be collected for the various analyses in the containers described below in the order listed.

Samples to be analyzed for VOA and/or TOX will be collected first in two 40-ml glass vials with teflon caps. The sample vials will be completely filled with no air left in the vials.

Samples to be analyzed for inorganic contamination will be collected next in two 1-quart/1-liter plastic containers.

Samples to be analyzed for complete organics, including acid-base neutrals, will be collected in a ½-gallon/2-liter glass jar with aluminum foil or teflon-lined caps.

Samples to be analyzed for radiologic parameters will be collected next in 1-gallon/4-liter plastic containers.

Samples to be analyzed for bacteriological parameters will be collected in one 120-ml plastic vial.

All sample containers will be obtained from an independent laboratory in a sterilized condition. Some of the containers will have a premeasured amount of preservative in them as necessary. In this event, care will be taken not to rinse the container or allow the preservative to wash out during sampling.

## GROUNDWATER SAMPLING

Preparation. Sampling a groundwater monitoring well begins with unlocking and opening the locking cap and removing the PVC well cap. The depth to water will be determined using the water level indicator. Before storage and/or reuse, the water level indicator will be cleaned in accordance with Steps 3 through 5 described above and replaced in a clean plastic bag.

The total well depth read from the well tag and the measured depth to water will be used to compute the depth of water in the well. Using the chart in the Guidance Document, the quantity of water in the well will be determined. For example, if a two-inch well is 29 feet deep and has a measured depth to water of 10 feet, there are 19 feet of standing water or 3.3 gallons in the well. Each well will be purged three to five well volumes (quantity of water in the well), or until dry, prior to sampling. In the example, 10 gallons would be adequate. Purged water will be measured in 5-gallon buckets until the desired amount is purged. Care will be taken not to bring the bailer into contact with the bucket during purging.

Based on the number of wells to be sampled and their proximity to each other, all the wells may be purged one after another with sampling to follow. In this manner, if a well is purged dry, it will have time to recharge prior to sampling.

Purging. After the amount of water to be purged from a well is determined, the equipment necessary for purging will be assembled at the well including rope, 5-gallon bucket, bailer, and gloves. With the wrapped bailer maintained in a stable, upright position, the top portion of aluminum foil will be pulled away exposing only the eyelet used for securing the rope to the bailer. After the rope has been secured to the bailer with gloved hands, the bailer will be suspended as the aluminum foil and plastic are removed. The gloved hand used to remove the aluminum foil and plastic will be considered contaminated and may not come into contact with the bailer or rope. The bailer will be lowered slowly into the well using the uncontaminated, gloved hand that suspended the bailer until the bailer contacts the water. The rope will be cut to an adequate length and secured to prevent losing the bailer in the well. The gloves will be discarded and a new pair used during the purging.

In order not to allow the rope to touch the ground during purging, the rope will be gathered when raising the

bailer either by gathering in loops in one hand or by the wind mill method. The wind mill method requires hooking the rope with alternating thumbs as the rope is pulled from the well. When purging deep wells, the ground around the well head may be covered with a clean plastic bag or sheet of plastic with a slit cut to allow the plastic to slide over the well head. The plastic will be placed over the sampler's boots to allow the rope to fall on the plastic without contamination. Alternatively, the rope may be lowered into an open bag placed in a 5-gallon bucket beside the well head. In any case, the rope will not contact anything considered contaminated including ground, boots, dirtied plastic, etc.

If purging and sampling of a well is performed at separate times, the bailer will be left suspended in the well and the rope secured. The remaining rope will be doubled and grasped in a tight loop in one hand. With the free hand, the glove on the hand holding the rope will be removed by pulling away from the hand and over the rope in an inside-out position until rope is encased in the glove. The rope will be transferred to the opposite hand and the procedure repeated to cover any portion of rope remaining uncovered. The glove-encased rope will be set on top of the well head until time to sample. Alternatively, the rope remaining after securing may be gathered in a tight loop and pushed into the 2-inch PVC well pipe and left. If sampling immediately follows purging, new gloves will not be necessary.

Sampling. Prior to sampling the well, the necessary equipment will be assembled at the well, including pH, conductivity, and temperature indicators, sampling jars, a thoroughly cleansed wide mouthed container, and a box of latex gloves. An equipment blank will be prepared prior to sampling each well by rinsing distilled water through the bailer into the equipment blank container.

With gloves on, the bailer will be lowered into the well slowly. To avoid releasing any volatiles from the groundwater, care will be exercised while the bailer is lowered so that it does not splash or smack the water surface. Once full, the bailer will be retrieved and containers filled in the order described above. The containers will be filled by inverting the bailer until water issues from the small holes at the top of the bailer. In addition to collecting the samples, water will be collected in the wide-mouth container for pH, temperature, and conductivity measurements. Following completion of the sampling, the containers, including the equipment blank, will be stored and transported on ice. The used latex gloves and rope will be discarded.

## SURFACE WATER SAMPLING

Surface water samples will be obtained from adjacent rivers, streams or brooks upstream and downstream of the landfill at designated surface water sampling sites. Actual collection points for surface water sampling will

be selected with consideration given to minimal turbulence and aeration.

Surface water sample containers will be handled with one hand near the base. The container will be rinsed with the water to be sampled prior to filling the container unless the container contains a premeasured amount of preservative. When collecting surface water samples, sample containers will be dipped at location points with extreme caution in order to avoid contamination at the mouth of the container. The container will be pushed rapidly into the water to a depth of about six inches, mouth down, and tilted towards the stream current to fill. Care will be taken not to let the mouth of the container breech the surface while filling. If there is little current movement, the container will be moved slowly through the water laterally. During times of drought, if the water is not deep enough to allow submersion of the container, a pool may be scooped out of the bottom of the stream to obtain a sample. The pool will be allowed to clear before sampling. The container will be lifted from the water and sealed with the cap, leaving an airspace at the top of about ½ inch. Glass vial containers collected for VOA and TOX analyses will be filled completely as described above. The samples will be stored and transported on ice.

## SAMPLE TRANSPORT AND CHAIN-OF-CUSTODY

Sample containers will be clearly labeled as the samples are obtained and stored on ice along with the equipment blanks and trip blanks. Trip blanks will remain in the condition they are received from the laboratory and will not be opened or tampered with during the sampling. A chain-of-custody record will be completed for each day's samples, indicating the date and time, sample location, sample matrix (soil, water, etc.), and laboratory analyses to be conducted. In addition, a field sampling data sheet will be completed indicating the depth to water measured in each well sampled and the pH and temperature of the sample measured in the field. Sample copies of the chain-of-custody record and field sampling data sheet are enclosed.

## GROUND AND SURFACE WATER ANALYSIS

Water samples obtained in the field will be maintained in the sample containers on ice and transported to an approved laboratory for analysis. If the individual transporting the samples is different from the individual that did the sampling, the chain of custody forms will be used to document the transfer of custody from the water sampler to the water transporter. When the water samples reach the laboratory, they will be transferred to a sample custodian who will sign the chain of custody documentation for receipt of the samples. Internal control of the water samples in the laboratory will be in accordance with QA/QC procedures for the laboratory. Copies of QA/QC manuals for approved laboratories are on file with the Division of Solid Waste.

Ground and surface water samples will be analyzed for Subtitle D Appendix I constituents. Table 1 contains a list of the Appendix I constituents as well as a list of EPA methods to be utilized in detection of the constituents. References where these test methods are documented are also presented in Table 1. In addition, detection levels for each of the constituents and a list of the equipment that will be used in the laboratory testing are presented in Table 1. QA/QC procedures utilized during the testing will be in conformance with the laboratory QA/QC manual.

TABLE

**TABLE 1**
**GROUND AND SURFACE WATER ANALYSES METHODOLOGY**

| Inorganic Constituent | Test Method | Equipment | Detection Level, µg/L |
|---|---|---|---|
| Antimony | EPA 7041 | GF/AA | 2 |
| Arsenic | EPA 7060A | GF/AA | 1 |
| Barium | EPA 6010A | ICP | 1 |
| Beryllium | EPA 6010A | ICP | 1 |
| Cadmium | EPA 7131A | GF/AA | 0.2 |
| Chromium | EPA 6010A | ICP | 6 |
| Cobalt | EPA 6010A | ICP | 5 |
| Copper | EPA 6010A | ICP | 3 |
| Lead | EPA 7421 | GF/AA | 2 |
| Nickel | EPA 6010A | ICP | 20 |
| Selenium | EPA 7740 | GF/AA | 1 |
| Silver | EPA 6010A | ICP | 4 |
| Thallium | EPA 7841 | GF/AA | 1 |
| Vanadium | EPA 6010A | ICP | 5 |
| Zinc | EPA 6010A | ICP | 2 |
| Organic Constituent | | | |
| Acetone | EPA 8240A | GC/MS | 100 |
| Acrylonitrile | EPA 8240A | GC/MS | 200 |
| Benzene | EPA 8020A | GC/PID | 2.00 |
| Bromochloromethane | EPA 8240A | GC/MS | 5.00 |
| Bromodichloromethane | EPA 8010A | GC/ELCD | 1.00 |
| Bromoform | EPA 8010A | GC/ELCD | 2.00 |
| Carbon disulfide | EPA 8240A | GC/MS | 100 |
| Carbon tetrachloride | EPA 8010A | GC/ELCD | 1.00 |
| Chlorobenzene | EPA 8010A | GC/ELCD | 2.00 |
| Chloroethane | EPA 8021 | GC/ELCD | 1.00 |
| Chloroform | EPA 8010A | GC/ELCD | 0.50 |
| Dibromochloromethane | EPA 8010A | GC/ELCD | 1.00 |
| 1,2-Dibromo-3-chloropropane | EPA 8010A | GC/ELCD | 30.0 |

**TABLE 1**
(continued)

| Organic Constituent | Test Method | Equipment | Detection Level, μg/L |
|---|---|---|---|
| 1,2-Dibromoethane | EPA 8021 | GC/ELCD | 10.0 |
| 1,2-Dichlorobenzene | EPA 8021 | GC/ELCD | 0.50 |
| 1,4-Dichlorobenzene | EPA 8240A | GC/MS | 5.00 |
| Trans-1,4-dichloro-2-butene | EPA 8240A | GC/MS | 100 |
| 1,1-Dichloroethane | EPA 8021 | GC/ELCD | 0.50 |
| 1,2-Dichloroethane | EPA 8010A | GC/ELCD | 0.50 |
| 1,1-Dichloroethylene | EPA 8021 | GC/ELCD | 0.50 |
| Cis-1,2-dichloroethylene | EPA 8010A | GC/ELCD | 0.50 |
| Trans-1,2-dichloroethylene | EPA 8021 | GC/ELCD | 0.50 |
| 1,2-Dichloropropane | EPA 8010A | GC/ELCD | 0.50 |
| Cis-1,3-dichloropropene | EPA 8240 | GC/MS | 10.0 |
| Trans-1,3-dichloropropene | EPA 8010A | GC/ELCD | 5.00 |
| Ethylbenzene | EPA 8020A | GC/PID | 2.00 |
| 2-Hexanone | EPA 8240A | GC/MS | 50.0 |
| Methyl bromide | EPA 8021 | GC/ELCD | 10.0 |
| Methyl chloride | EPA 8021 | GC/ELCD | 10.0 |
| Methylene bromide | EPA 8240A | GC/MS | 10.0 |
| Methylene chloride | EPA 8010A | GC/ELCD | 5.00 |
| Methyl ethyl ketone | EPA 8240A | GC/MS | 100 |
| Methyl iodide | EPA 8240 A | GC/MS | 10.0 |
| 4-Methyl-2-pentanone | EPA 8240A | GC/MS | 100 |
| Styrene | EPA 8020A | GC/PID | 1.00 |
| 1,1,1,2-Tetrachloroethane | EPA 8010A | GC/ELCD | 0.50 |
| 1,1,2,2-Tetrachloroethane | EPA 8010A | GC/ELCD | 0.50 |
| Tetrachloroethylene | EPA 8021 | GC/ELCD | 0.50 |
| Toluene | EPA 8020A | GC/PID | 2.00 |
| 1,1,1-Trichloroethane | EPA 8240A | GC/MS | 5.00 |
| 1,1,2-Trichloroethane | EPA 8240A | GC/MS | 5.00 |
| Trichloroethylene | EPA 8010A | GC/ELCD | 1.00 |
| Trichlorofluoromethane | EPA 8240A | GC/MS | 5.00 |

**TABLE 1**
(continued)

| Organic Constituent | Test Method | Equipment | Detection Level, µg/L |
|---|---|---|---|
| 1,2,3-Trichloropropane | EPA 8021 | GC/ELCD | 5.00 |
| Vinyl acetate | EPA 8240A | GC/MS | 50.0 |
| Vinyl chloride | EPA 8240A | GC/MS | 10.0 |
| Xylenes | EPA 8020A | GC/PID | 5.00 |

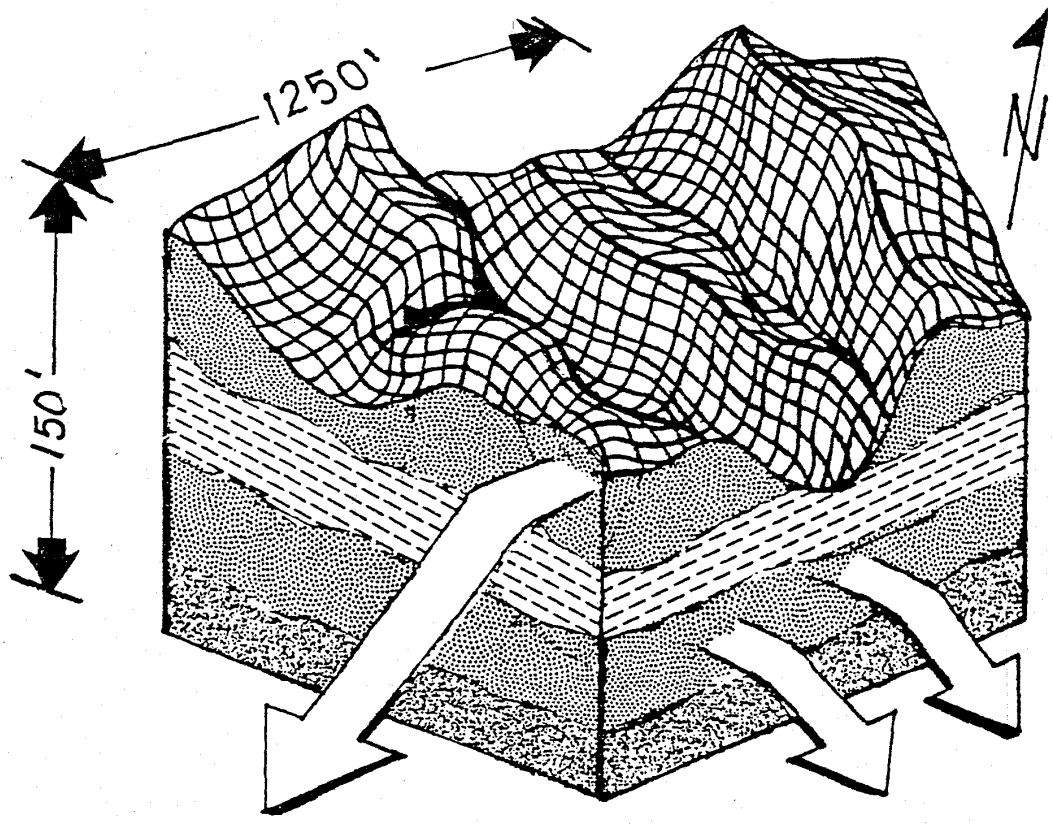
EPA Test Methods from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA Publication SW-846, 3rd Edition, September 1986, Amended by Update I, July 1992. Update I methods are designated with the letter "A" on the end of the method numbers. Update I was promulgated by 58 FR, August 31, 1993.

Equipment:

ICP Inductively Coupled Plasma - Atomic Emission Spectrophotometer
GF/AA Graphite Furnace - Atomic Absorption Spectrophotometer
GC/MS Gas Chromatograph - Mass Spectrometer
GC/PID Gas Chromatograph - Photoionization Detector
GC/ELCD Gas Chromatograph - Electrolytic Conductivity Detector

APPENDIX A
N.C. WATER QUALITY MONITORING GUIDANCE DOCUMENT

NORTH CAROLINA WATER QUALITY
MONITORING GUIDANCE DOCUMENT FOR SOLID WASTE FACILITIES




GROUND-WATER FLOW
DIRECTION OF UPPER
AQUIFER

GROUND-WATER FLOW
DIRECTION OF LOWER
AQUIFER

Prepared by the
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH
ENVIRONMENTAL HEALTH SECTION
DIVISION of HEALTH SERVICES
DEPARTMENT of HUMAN RESOURCES
1987
SW-1001-87

# NORTH CAROLINA WATER QUALITY
# MONITORING GUIDANCE DOCUMENT FOR SOLID WASTE FACILITIES

Prepared by the
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH
ENVIRONMENTAL HEALTH SECTION
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DEPARTMENT of HUMAN RESOURCES

1987

SW-1001-87

LIST OF FIGURES

FIGURE PAGE

1. Typical Ground-Water Monitoring Well Schematic Diagram . . . . . .2
2. Graphical Plot of Standing Water Volumes . . . . . .4
3. Laboratory Analysis Request Sheet . . . . . 9
4. Chain of Custody Form . . . . . .10
5. Typical Ground-Water Monitoring Well Nest Schematic . . . . . .14

TABLE OF CONTENTS

PAGE

ACKNOWLEDGEMENTS . . . . . i
DEFINITIONS . . . . . ii
GENERAL INTRODUCTION . . . . . iii
INTRODUCTION . . . . . 1
SPECIFIC MONITORING WELL CONSTRUCTION REQUIREMENTS . . . . . 1
GROUND-WATER MONITORING . . . . . .5
PORTABLE MONITORING . . . . . .5
PURGING METHODS . . . . . .5
SAMPLING METHODS . . . . . .6
DEDICATED MONITORING . . . . . .7
EQUIPMENT CLEANING PROCEDURES . . . . . .7
SAMPLE CONTAINERS . . . . . 8
TRANSPORT AND STORAGE OF SAMPLES . . . . . 11
ADMINISTRATIVE PROCEDURES . . . . . .11
SURFACE WATER MONITORING . . . . . .12
FRACTURED WATER MONITORING . . . . . .13
REFERENCES CITED . . . . . .16

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Michael L. Babuin, 1987

DEFINITIONS

Monitoring Well - any well constructed for the primary or incidental purpose of obtaining subsurface samples of water or other liquids. This definition excludes lysimeters, tensiometers, and other devices used to investigate the characteristics of the unsaturated zone.

Observation Well - any well constructed for the purpose of obtaining ground-water level information only

Permittee - an individual, corporation, company, association, partnership, unit of local government, State agency, Federal agency or other legal entity upon which a permit to operate a sanitary landfill has been issued.

Water Table - the upper limit of the portion of the ground wholly saturated with water.

# GENERAL INTRODUCTION

The purpose of this report is to provide a simple, clear and thorough overview of acceptable methods regarding ground and surface-water monitoring at solid waste facilities. The procedures and techniques outlined in this report have been compiled in response to the need for reliable, accurate and consistent data for ground-water and surface-water quality evaluation of sanitary landfills. The standardization of these methods of data collection will undoubtedly clarify proper ground-water monitoring techniques required by the State for all solid waste facilities, and subsequently, minimize much of the subjectivity associated with landfill evaluation. Clearly, it is in the best interests of each facility to utilize these guidelines whereas the probability of contamination is significantly reduced by following the steps outlined in this document.

INTRODUCTION

In order to fully acknowledge the scope and purpose of ground-water monitoring, it is of the utmost importance to fully understand and define the difference between a ground-water monitoring well and a public water supply well. This distinction is very obvious when comparing well construction techniques characteristic of various geologic formations throughout the State. For instance, the western part of North Carolina is dominated by a series of crystalline and metamorfic rocks. Subsequently, water supply wells in these regions typically are constructed by drilling through the saprolite (weathered rock) and into very hard, resistant rock bodies below the true water table. Because of the resistant lithologic character of these units, many well drillers feel that it is unnecessary to case a well characteristic of these type of conditions. This rationale may hold true for drinking water supply wells but is clearly unacceptable for ground-water monitoring purposes due to contamination problems associated with uncased or partially-cased holes and to possible logistic problems. For instance, monitoring equipment may become entangled on the bottom of a well casing which does not span the entire depth of the borehole. Subsequently, this office requires completely cased boreholes in all ground-water monitoring wells.

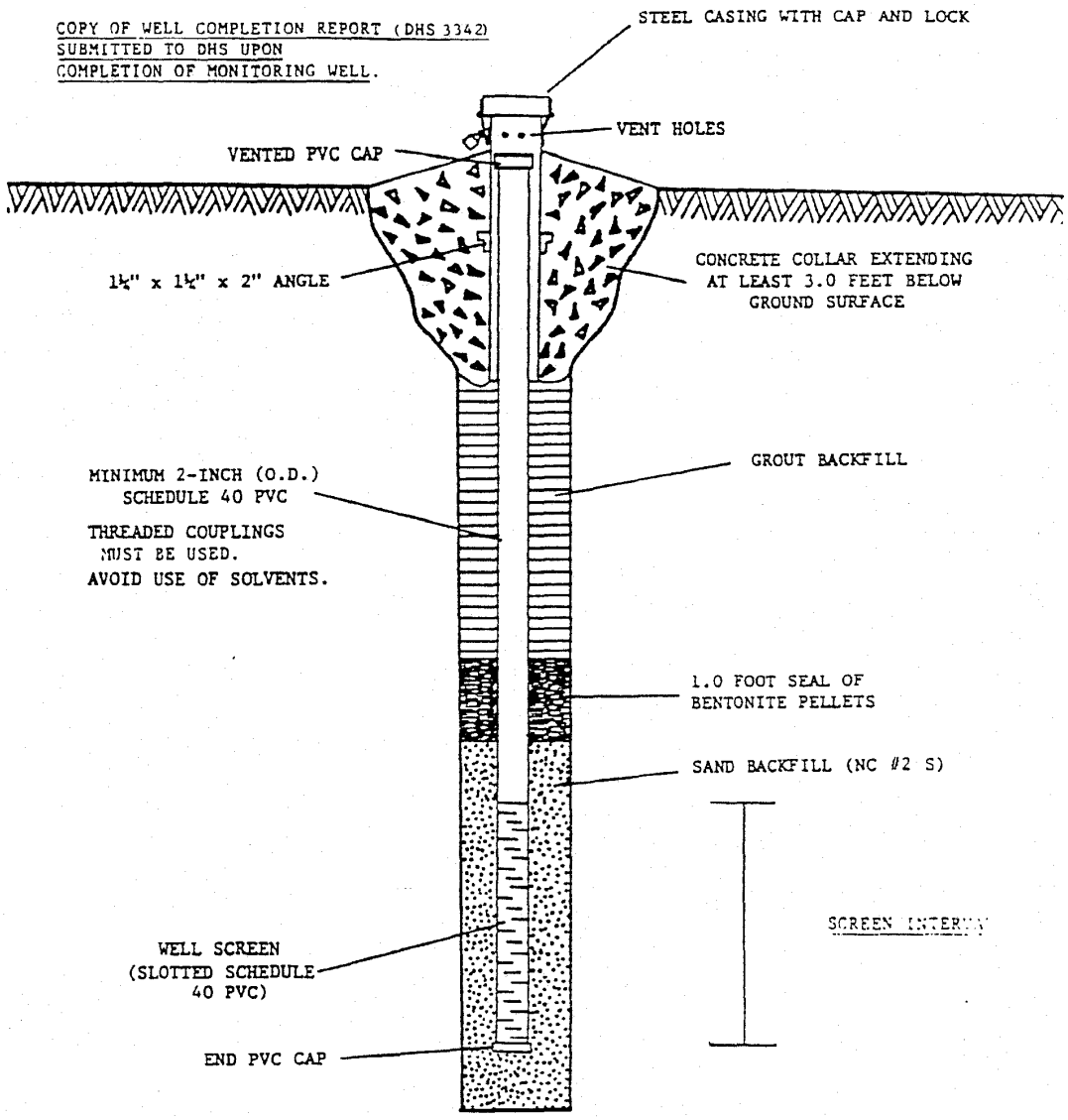
This office strongly urges all contractors and consultants to become familiar with well construction techniques and specifications illustrated on the ground-water monitoring well schematic (Figure 1). Further information regarding construction standards of other types of wells may be found in 15 NCAC 2C "Well Construction Standards: Criteria and Standards Applicable to Water Supply and Certain Other Types of Wells".

A. Specific Monitoring Well Construction Requirements

Because the location of ground-water monitoring wells at the proposed landfill is one of the most crucial phases of site development, the importance of a thorough hydrogeologic evaluation which clearly delineates ground water elevation and flow characteristics is of the highest significance. In order to assure consistent and thorough installation techniques which are in accordance with EPA regulations, all deviations to the following methods, or questions regarding materials, monitoring well locations or other techniques, should be directed to the Solid Waste Hydrogeologist at (919) 733-2178, c/o the Solid and Hazardous Waste Management Branch P.O. Box 2091 Raleigh, North Carolina 27602-2091. Additionally, the Solid and Hazardous Waste Management Branch reserves the right to evaluate in the field, the actual well installation techniques and procedures.

Drilling through the unsaturated soil mantle to the water bearing formation is a standard procedure with most consulting and well-drilling firms. Utmost caution and discretion in minimizing the use of drilling fluids (bentonite-gel mixture), flocculants (mixtures of sodium pyrophosphate) and excessive use of lubricants is highly recommended. If any of these products, or related products, are used in the drilling process the hole should be flushed to remove as much of the contaminants as possible.

Installation of the monitoring well and subsequent placement of the well screen is critical to assure that the ground water sample represents the




Rev. 5/86

Figure 1. Typical ground-water monitoring well schematic diagram.

portion of the aquifer where contaminants may migrate. The minimum length of the screened interval is 10 feet and will be placed at a depth specified as a condition of the permit based upon hydrogeologic data collected during the site investigation. Recommended screen depths will be submitted by the applicant under the heading "proposed comprehensive ground-water monitoring plan" as part of the site plan application as per section .0504 (1)(G)(iv). Well-sorted sand used as a pre-screening of influent ground water should be washed to remove all fines and prevent clogging of the well screen. Finally, in connecting sections of PVC pipe, clamps or threaded pipe fittings are required whereas various types of epoxy cement and other PVC glues have the potential for contaminating the ground-water reservoirs. For these reasons they are not authorized for construction of ground-water monitoring wells.

Various drilling methods and casing sizes are available for installation of monitoring wells. Generally, the most common size bore holes include those which are drilled with an eight inch hollow-stem auger. The casings which are placed in these holes are typically 4" or 2" I.D., and composed of PVC, stainless steel or teflon materials. For reasons which are discussed later under the "Ground-Water Monitoring" heading, this office recommends the use of 2" I.D. casings for wells drilled 100' or less. Ground-water monitoring wells drilled to depths exceeding 100' such as wells designed to monitor water quality through possible fracture patterns, should be cased with a 4" or 6" I.D. casing to readily promote rapid purging via jet pumps. Casings and screens may be composed of PVC or stainless steel. Teflon casings and screens are relatively maleable and may not hold-up under various conditions.

As mentioned above, this office recommends the installation of 2" I.D. cased wells for shallow and semi-shallow ground-water monitoring purposes. The use of 2" I.D. casings readily promotes rapid purging via teflon bailers. For example, a 2" I.D, cased well drilled 20 feet deep may contain up to approximately 3.3 gallons of standing water. Because three to five times the volume must be purged to avoid contamination (EPA, 1977), it is foreseeable that 9.9 to 16.5 gallons of water must be purged prior to sampling (Figure 2) in the above example. Assuming a purging minimum of 9.9 gallons of water, and also assuming that a 3' long bailer (which holds 1-liter of water) will be used for purging of the wells, it will take approximately 40 bails of water to adequately purge this well. Comparatively, a 4" I.D. cased well drilled to an extremely shallow depth of 16' will contain approximately 10.5 gallons of water, and subsequently, require between 31.5 and 52.5 gallons of purged water. Attempts to purge 52.5 gallons of water with a 1-liter bailer will require 210 bails of water-- which will undoubtly displease the field personnel and more importantly, occupy additional hours of expensive and needless labor as well.

An obvious difference shown on the schematic of a typical ground-water monitoring well (Figure 1), compared to other types of wells, is the concrete collar surrounding the stick-up (or outer casing) above the ground surface. This collar should contain small angle-irons attached to the outer casing as outlined on the diagram (Figure 1). The purpose of this set-up is to prevent accidental (or willfull) damage to the well whereas the stick-up could otherwise be pulled loose at the surface without the use of angle-irons to support the collar.

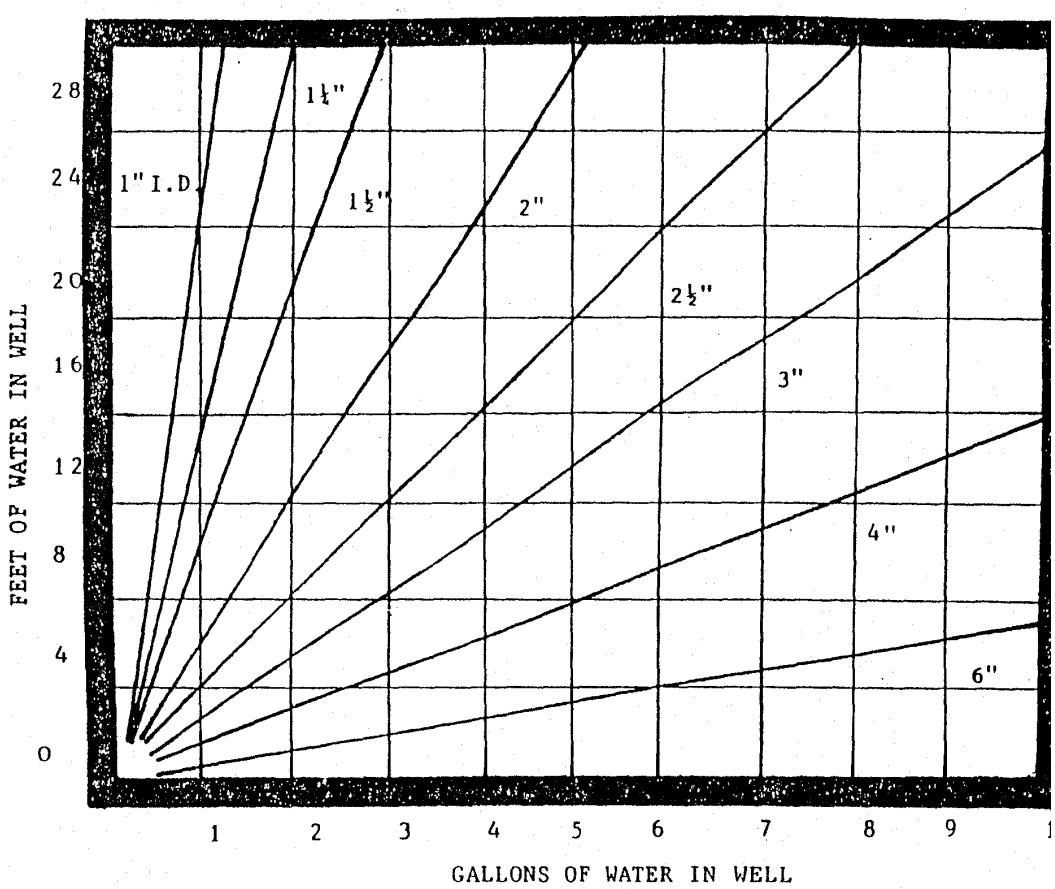



Figure 2. Graphical plot of standing volumes of water.

Because accidental or natural events may influence the status and condition of pre-existing ground-water monitoring wells, an on-going well inspection program is being conducted by personnel of the Solid andHazardous Waste Management Branch. Some of the items which must be regularily maintained by the facility after the wells are installed include: 1) ensuring that all caps are rust-free and locked at all times, 2) ensuring that all inner casings are securely fit with a threaded cap, 3) ensuring that the outer casing is upright and undamaged from equipment or vehicles which may inadvertently back-up into the well, 4) ensuring that a clear unobstructed path, free from dense vegetation exists leading to each well. These maintenance factors are critical to the implementation of proper ground-water monitoring.

B. Ground-Water Monitoring

Because a tremendous liability is associated with water quality data obtained from analytical laboratory results, it is of the utmost importance to ensure the validity and integrity of sampling techniques and methodology. Two distinct monitoring systems exist which may be used to purge and subsequently sample a monitoring well. These systems include the portable monitoring system and the dedicated monitoring system.

Portable Monitoring

The portable monitoring system is by far the most common method of monitoring ground-water quality. This method includes purging the total standing water within the well and subsequent sampling of a representative portion of the aquifer. Purging is required in all instances in order to avoid sampling of stagnant, possibly stratified water above the well screen. In many cases, however, the recharge rate may meet or exceed the purging rate. For these instances three to five times the volume of standing water must be purged prior to sampling. Several methods exist for removing the standing water within a well. Among these methods are various types of automated pumps, compressed air, hand pumps and bailers, each of which has several advantages and disadvantages which will be discussed below.

In some instances dependant upon the hydrogeologic setting, the recharge rate may be exceptionally slow (EPA, 1977), subsequently, sampling may not be possible until the next day when the well is recharged. Generally however, all attempts should be made to purge the wells dry or purge until the necessary three to five times the well volume is extracted. In other settings where the soils are relatively permeable purging and subsequent sampling may be possible in the same day.

1. Purging Methods

Depending upon time constraints and spatial variability of the monitoring wells, the decision whether to purge and sample a facility on the same day must be made by the field personnel performing the monitoring operation. Additional concerns regarding the depth of the well, water volumes, well access and inclement weather are all important in determining which type of device to use in purging the well. For instance, if fully automated, effortless purging is desired and time is not a major concern, the use of an automated pump may be in order. The major disadvantage of

these pumps, however, include slow pumping rates (typically a maximum of 0.5 gallons/minute) and the potential for cross contamination from well to well.

The hand pump is another type of purging device which is available invarious lengths and pumping rates (typically 2.75 gallons/minute). This device has the advantage of easy assembly, low cost and relatively high pumping rates. An obvious disadvantage, however, is the need for a thorough cleaning in the field before purging from one well to the next.

Another popular purging device is the teflon bailer. Teflon is considered to be the preferred material to use for ground water monitoring because of its relatively inert chemical character. Stainless steel is also an acceptable purging/sampling mechanism for similar reasons. Regardless of the composition, bailers are available in various lengths, the most popular being the 3' bailer which holds a volume of water equal to 1 liter or 0.26 gallons.

2. Sampling Methods

Thus far the focus of this discussion has primarily been upon purging techniques, subseqently, a short discussion which addresses sampling procedures is now in order. The use of automated pumps for sampling purposes requires considerable effort to avoid contamination. Many automated pumps are designed to remain on the ground surface while a specified length of flexible tubing is placed into the well. For sampling purposes if this technique is to be used, it is mandatory that the flexible tubing be composed of teflon and adequately cleaned prior to sampling from one well to another. The inevitable question arises, however, whether or not adequate cleaning is possible in the field for these types of automated pumps.

Because laboratory analyses evaluate water quality in terms of parts per million and parts per billion, it is not recommended to clean and prepare sampling devices in the field when a laboratory cleaning will undoubtedly produce a higher quality final product. Other types of automated pumps (called bladder pumps) are designed to fit down the borehole and are typically composed of teflon and stainless steel. One inherent difficulty associated with some bladder pumps in addition to possible sample contamination problems is the inability of many bladder pumps to adequately control and regulate the rate at which the flow of water leaves the flexible tubing. This is critical for samples to be analyzed for volatile organic analysis (VOA) whereas a rapid flow rate will cause aeration which subsequently volatilizes certain chemicals. For these reasons this office urges that the utmost consideration and thought be given to the feasibility of whether or not to utilize traditional automated pumps for sampling purposes.

Hand pumps are useful tools for purging wells in a relatively short period of time but, unfortunately, are highly unsuitable for sampling. The main reason being the likelihood of contamination and the unavailability of teflon or stainless steel hand-pumps in the commercial market. Additionally, no present technology exists for regulating the effluent discharge of water from a hand pump which, as mentioned before, presents a volatilization problem for certain samples.

The overall preferred method of acquiring ground-water samples via portable monitoring is by the use of telfon bailers. In a properly established and equipped laboratory setting, a standardized cleaning and preparation procedure may be followed. The obvious advantage of laboratorycleaning includes minimal generation of contaminants and consistency in preparatory procedures.

Dedicated Monitoring

Thus far the previous discussions have all focused upon techniques and procedures related to portable ground-water monitoring systems. At this time, a short overview of dedicated systems is in order. Dedicated well monitoring differs from portable monitoring primarily by the permanency of the set-up and the higher initial cost. Because portable systems require the use of much of the same equipment from well to well, great care must be exercised in avoiding cross contamination. Dedicated systems, however, require no between-well cleaning procedures. These systems offer permanently affixed down-well and well-head components which are capped after initial set-up.

Because ground water is not in contact with incompatible constituents that otherwise may enter the well from the surface, virtually no contamination is possible from an extrinsic source during times between sampling intervals. As with all sampling methods the competency and integrety of the individual extracting the sample is of the utmost importance. For instance, a great deal of manual dexterity must be exercised in regulating the flow of water leaving the flexible tubing from dedicated systems when collecting VOA samples in order to avoid unnecessary volatilization. In conclusion, dedicated systems have the potential for accurate and reliable ground-water monitoring and are therefore recommended for consideration.

In contrast to this, many individuals are under the false impression that bailers which are initially cleaned in a laboratory and permanently placed in monitoring wells are considered dedicated systems and subsequently are acceptable for ground-water monitoring purposes. Unfortunately, this is not true due to the possibility of extrinsic contamination during sampling intervals, such as decomposition of the bailer line, airborne dirt and dust, or other accidentally induced contaminants. Because the detection limits for the various parameters are measured in terms of parts per million and parts per billion, the utmost discretion is required in selecting sampling procedures which will accomodate these analyses.

1. Equipment Cleaning Procedures

If automatic pumps and flexible tubing are used, a minimum field cleaning procedure will entail using a phosphate-free soap/deionized water solution followed by a deionized water rinse. This method constitutes an absolute minimum field cleaning procedure and should only be used if sampling one G.W. monitoring well. These pumps are not recommended or authorized for sampling more than one well due to probable contamination problems.

Stainless steel bailers require the following minimum cleaning techniques prior to groundwater sample collection:

1. Phosphate-free soap and tap water wash
2. Tap-water rinse
3. Deionized or distilled water rinse
4. Isopropyl alcohol rinse
5. Deionized or distilled water rinse
6. Air dry
7. Wrap bailer to prevent contamination before use (specify the material used for wrapping the bailer, example: aluminum foil shiny side out).

Teflon bailers require the following minimum cleaning techniques prior to ground water sample collection:

1. Phosphate-free soap and tap water wash
2. Tap water rinse
3. 10% nitric or 10% hydrochloric acid rinse
4. Deoinized or distilled water rinse
5. Isopropyl alcohol rinse
6. Deionized or distilled water rinse
7. Air dry
8. Wrap to prevent contamination before use (specify material used for wrapping for wrapping the bailer, example: aluminum foil, shiny side out).

The bailer line which attaches to the teflon or stainless steel bailers should consist of either 1) teflon coated wire, 2) single-strand stainless-steel wire, 3) other monofilament line or 4) nylon rope. In order to avoid contamination, a new segment of one of the above approved types of line should be used at each well. Reusing old line will increase the probability of cross contamination (even if the line is cleaned) and therefore is not approved. Any variation to the above cleaning procedures should be submitted to this office for approval.

Condition

The above cleaning procedures were obtained from EPA Region IV. If changes occur in any procedure specified above, the facility will be notified and be requested to make the necessary ammendments to the sampling and analysis plan.

Sample Containers

Because water samples are analyzed for various parameters, several types of containers are required for a complete sampling scheme. Routine ground-water monitoring should include (in the following order as extracted from the well): 1) VOA samples (for TOX analysis), and 2) heavy metal (inorganic) analysis. If additional analyses are required, the samples should be collected in the order listed below.

For instance, samples which are analyzed for volatile organic analysis (VOA) and/or total organic halogens (TOX) should be collected first in 40 ml glass vials with teflon caps. Two full vials per sample are required.

9

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number _____ Field Sample Number _____

Name of Site _____ Site Location _____

Collected By _____ ID# _____ Date Collected _____ Time _____

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ____ Groundwater (1) | ____ Solid (5) | _____ |
| ____ Surface Water (2) | ____ Liquid (6) | _____ |
| ____ Soil (3) | ____ Sludge (7) | _____ |
| ____ Other (4) | ____ Other (8) | _____ |

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/l | Parameter | Results mg/l | Parameter | Results mg/l |
| ____ Arsenic | _____ | ____ Arsenic | _____ | ____ Silver | _____ |
| ____ Barium | _____ | ____ Barium | _____ | ____ Sulfates | _____ |
| ____ Cadmium | _____ | ____ Cadmium | _____ | ____ Zinc | _____ |
| ____ Chromium | _____ | ____ Chloride | _____ | ____ Ph | _____ |
| ____ Lead | _____ | ____ Chromium | _____ | ____ Conductivity | _____ |
| ____ Mercury | _____ | ____ Copper | _____ | ____ TDS | _____ |
| ____ Selenium | _____ | ____ Fluoride | _____ | ____ TOC | _____ |
| ____ Silver | _____ | ____ Iron | _____ | ____ _____ | _____ |
| ____ _____ | _____ | ____ Lead | _____ | ____ _____ | _____ |
| ____ _____ | _____ | ____ Manganese | _____ | ____ _____ | _____ |
| ____ _____ | _____ | ____ Mercury | _____ | ____ _____ | _____ |
| ____ _____ | _____ | ____ Nitrate | _____ | ____ _____ | _____ |
| ____ _____ | _____ | ____ Selenium | _____ | ____ _____ | _____ |

## ORGANIC CHEMISTRY

| Parameter | Results mg/l | Parameter | Results mg/l | Parameter | Results mg/l |
|---|---|---|---|---|---|
| ____ P&T:GC/MS | _____ | ____ EDB | _____ | ____ Methoxychlor | _____ |
| ____ Acid:B/N Ext. | _____ | ____ PCB's | _____ | ____ Toxaphene | _____ |
| ____ TOX | _____ | ____ Petroleum | _____ | ____ 2,4-D | _____ |
| ____ _____ | _____ | ____ Endrin | _____ | ____ 2,4,5-TP (silvex) | _____ |
| ____ _____ | _____ | ____ Lindane | _____ | ____ _____ | _____ |

## MICROBIOLOGY

| Parameter |
|---|
| ____ (MF) Coliform Colonies/100mls |
| ____ (MPN) Coliform Colonies/100mls |
| ____ _____ |
| ____ _____ |

## RADIOCHEMISTRY

| Parameter | Results PCi/l |
|---|---|
| ____ Gross Alpha | _____ |
| ____ Gross Beta | _____ |
| ____ _____ | _____ |
| ____ _____ | _____ |

Date Received _____ Date Reported _____

Date Extracted _____ Date Analyzed _____

Reported By _____ Lab Number _____

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Figure 3. Laboratory analysis request sheet.

10

Chain of Custody Record

Solid & Hazardous Waste Materials

Location of Sampling: _____Generator _____Transporter _____Treatment Facility

_____Storage Facility _____Disposal Facility _____Landfill

_____Other:_____

Company's Name_____Telephone(_____)_____

Address_____

Collector's Name_____Telephone(_____)_____
signature

Date Sampled_____Time Sampled_____

Type of Process Generating Waste_____

Field Information

_____

_____

Field Sample No. _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

Chain of Possession:

1. _____ _____ _____
signature title inclusive dates

2. _____ _____ _____
signature title inclusive dates

3. _____ _____ _____
signature title inclusive dates

Results reported

_____ _____ _____
signature title date

Instuctions: Complete all applicable information including signature, and submit with analysis request forms.

Figure 4. Chain of custody record.

Samples which will be analyzed for inorganic constituents such as heavy metals should be collected following the VOA samples. These samples are collected in small, disposable, 1-quart/1-liter plastic cubes. Two full cubes per sample are required. Depending upon the source of the sample containers, particularly, containers which hold water to be analyzed for heavy metals, some containers may have a pre-measured amount of acid placed in the container to act as a preservative. In these instances do not rinse the sample container prior to use, if uncertain, consult the laboratory where the containers were purchased.

If organic contamination is suspected it may be necessary to undergo a complete organic analysis. In this event, samples which will be analyzed for organics such as an acid-base neutral analysis should be collected in one half gallon/2-liter glass jars with aluminum foil or teflon lined caps. Samples to be tested via acid-base neutral analysis require one full jar of water per sample.

Water samples to be analyzed for radiologic parameters should be collected following acid-base neutral collection. These samples must be collected in the large 1-gallon/4-liter plastic cubes.

Finally, samples which will be analyzed for bacteriological parameters should be collected last in 120ml plastic vials containing a pre-measured amount of sodium thyosulphate. One vial per sample is required to perform the analysis.

Transport and Storage of Samples

Upon completion of water sample collecting all samples will be stored and subsequently transported on ice or in a refrigerated state to the laboratory performing the analyses (APHA, 1985; EPA, 1977). The samples should be stored in such a manner as to inhibit breakage or accidental spills. Unless unusually extraordinary circumstances prevent otherwise, all samples should be delivered to the laboratory on the same day.

Administrative procedures

Samples are to be delivered to a State Certified Drinking Water Laboratory and need to be accompanied by two administrative forms. The first form is a laboratory analysis request sheet (Figure 3). This form stipulates which constituents are to be analyzed for a given sample. The other form is a chain of custody record sheet (Figure 4). This form documents who handled the sample from collection time to lab delivery. These forms (or equivalents) will be submitted to the solid waste hydrogeologist within 15 days of receipt of the analytical results.

Per 10 NCAC 10G section .0601 (a), routine ground-water monitoring shall be the responsibility of the permittee and may be State supervised at the discretion of the Division of Health Services. An exception to this being the initial sampling of newly constructed wells by personnel of the Division of Health Services. Additionally, the State may request "split" or replicate samples from the facility during any of the routine sampling intervals.

Routine ground-water monitoring which encompasses the parameters listed below shall be conducted twice during the first year of operation (for newly-permitted sites) and annually thereafter. Newly-permitted facilities are required to properly install all proposed ground-water monitoring wells and subsequently notify the State within 30 days upon completion, so that the Division of Health Services may schedule a date to initially sample the wells. As mentioned above, subsequent sampling is the responsibility of the facility. All pre-existing (permitted) facilities as of July 1, 1987 are responsible for annual ground-water monitoring activities, and shall forward a copy of the analytical laboratory results within 15 days upon receipt to the solid waste hydrogeologist P.O. Box 2091, Raleigh, North Carolina 27602-2091 c/o the Solid and Hazardous Waste Management Branch.

All facilities (newly-permitted and pre-existing) shall send written notice by July 1, 1987 designating a tentative, annual sampling date for their facility. The purpose of which is to inform State personnel as to a specific date that they may expect the annual water quality results and to accomodate scheduling purposes by State personnel.

The following total inorganic parameters will be included for routine, annual ground-water quality analysis: arsenic, barium, cadmium, chloride,chromium, copper, fluoride, iron, lead, manganese, mercury, nitrate, selenium, silver, sulphates and zinc. The following indicators should be included in all routine, annual ground-water analysis : TOX (total organic halogens), TOC (total organic carbon, TDS (total dissolved solids), BOD (biological oxygen demand), COD (chemical oxygen demand), conductivity and PH. In the event that a contaminant plume is indicated by routine analysis of the monitoring wells, further analysis may be required to adequately assess contaminant migration and extent. Such anaysis may include purge and trap analysis (utilizing the gas chromatograph and mass spectrometer) and acid base-neutral extraction. Finally, a broad level of consistency should be exercised in listing the various quanities of chemical constituents. For instance, units should be PPM (parts per million) or PPB (parts per billion) not both. It is suggested tht parts per million (PPM) be used whenever possible.

C. Surface-Water Monitoring

Sites which contain and/or border small rivers, streams or branches should include within the site plan application, a prospective surface water monitoring plan. This plan will be used to gauge the effect of the landfill upon surficial flow at a given point. A simple procedure for selecting surface-water monitoring sites is to locate a point on the stream where drainage leaves the site. This promulgates detection of contamination through, and possibly downstream, of the site via discharge of surface waters. The sampling points selected should be downstream from any new, old or proposed areas which may be disturbed, including borrow and rubble areas (Babb and Glaser, 1985). An upstream surface water sample should be obtained in order to determine the water quality upstream of the influence of the sanitary landfill.

The following procedure is recommended regarding sample collection of surface water samples. Prior to collecting the sample in the appropriate

container, specific collection points should be determined. Generally, automated or semi-automated samplers or other manual devices accessible from the banks of a stream should be used whenever possible. If logistic or naturally occurring conditions inhibit this method of sample collection, the amples may be obtained manually by wading up-current (and down-stream) of the sample station. The sample should be collected in an area representative of minimal turbulence and aeration (Babb and Glaser, 1985). Because sample containers may be dipped by hand into the stream, extreme caution must be employed in avoiding contamination into the mouth of the container. The following procedures extracted from the "approved RCRA Ground-Water Sampling and Analysis Plan" (Babb and Glaser, 1985) are recommended for extraction and subsequent collection of surface water samples.

1. Hold the bottle near the base with one hand, and with the other, remove the cap.

2. Rinse the sample container with the water to be sampled prior to filling the container. One exception to this is the coliform sample bottle. This bottle may have a pre-measured amount of sodium thyosulphate to neutralize any chlorine present in the water, therefore, this container should not be rinsed prior to sampling.

3. Push the sample container rapidly into the water (mouth down) and tilt-up towards the current to fill. A depth of about six inches is satisfactory. Great care should be taken to avoid breaching the surface while filling the container.

4. During times of little current movement move the container slowly through the water laterally.

5. During times of extreme drought when stream depths are to shallow to allow submersion of the sample container, a pool may be scooped-out of the channel bottom and allowed to clear prior to sampling.

6. Lift the container from the water, and leave one-half inch of air space, and place the uncontaminated cap back-on the container.

7. Place the samples in styrofoam shipping cartons (on ice) for courier transport to the laboratory.

8. A completed Division of Health Services Form 2887 or equivalent (Figure 3) must be submitted along with the samples to the appropriate certified laboratory performing the analysis.

For additional details and further information on how to properly collect, store and transport stream samples, see N.R.C.D. draft on physical and chemical monitoring (in preparation).

D. Fractured Rock Monitoring

Many portions of Western and Central North Carolina are dominated by fractured cystalline rock. These fractures may be expressed on the surface, but more typically, are characteristic of subsurface environments. Areas

14

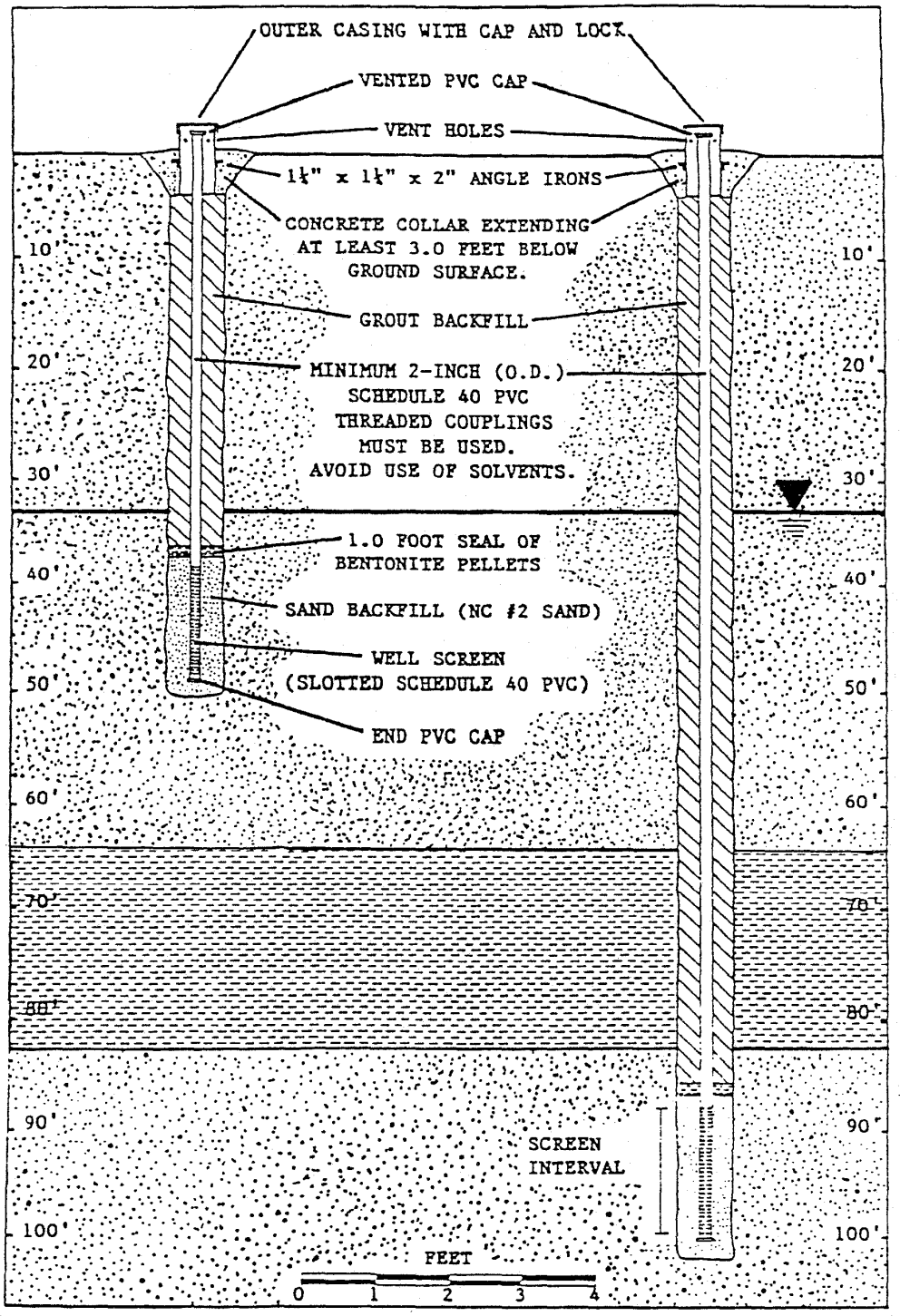



Figure 5. Typical ground-water monitoring well nest schematic.

such as these present inherent technical problems with landfill design and subsequently challenge the effectiveness and integrity of a ground-water monitoring system. The main reason being that fractured rock aquifers offer less predictability and certainty in estimating ground water flow patterns (EPA, 1977).

In order to overcome these difficulties the extent and inclination at depth of these fractures must be ascertained. The most common methods which are available to determine these factors include remote sensing and geophysical surveys. Consultants and engineering firms, may however, specifically utilize and employ these techniques as they see fit in order to adequately address the question of inclination and depth of fracture patterns.

Upon completion of a fracture trace analysis the consulting engineering firm which is responsible for submitting the site plan application will include as part of the proposed ground-water monitoring plan, tentative deep ground-water monitoring well locations at points where fractures intersect and/or at localities characteristic of pronounced lineations which may border or disect the prospective site. As with all proposed well sites, the borehole depths, screen depths and screened intervals will be defined in the report and confirmed with the Division of Health Services prior to drilling. If two aquifers exist beneath a site, a well nest (Figure 5) may be required to adequately assess the migration of potentially contaminanted ground water in both hydrologic regimes..

In most instances, fracture monitoring requires drilling 100 to 200 feet below the surface. This presents a problem for conventional purging methods as described previously in this document. For these wells, a jet pump or equivalent pump which offers a rapid displacement of water will be required for purging. Sampling is performed as described earlier via teflon bailers. A dedicated monitoring system may be used in lui of bailers if depths are not considered a major problem. Consult your industrial representative before purchasing dedicated systems to evaluate the effectiveness of the dedicated device as applied to your specific well requirements.

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December 4, 1995

Mr. Wayne Sullivan
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Re: Responses to Review Comments
City of Albemarle Landfill, Permit #84-01
Albemarle, North Carolina
Project No. 94203.02

Dear Mr. Sullivan:

**INTRODUCTION**

Responses are made herein to the review comments of Mr. Bobby Lutfy of the Division of Solid Waste Management of the Department of Environment, Health and Natural Resources made in a letter dated November 13, 1995 pertaining to the transition plan for the City of Albemarle Landfill, Permit #84-01.

**RESPONSES TO COMMENTS**

**April 28, 1995, Responses to Review Comments - Addendum A, Water Quality Monitoring System Modifications (October 3, 1994)**

Lutfy Comment: GAI is authorized to proceed with the installation of a replacement well for monitoring well MW-8 and the abandonment of existing well MW-8.

Response: Groundwater Monitoring Well 8 at the City of Albemarle Landfill is scheduled for replacement in January 1996. Existing Groundwater Monitoring Well 8 will be appropriately abandoned following installation of the replacement well. Intentions are to designate the replacement well as Groundwater Monitoring Well 8.

Lutfy Comment: The Solid Waste Section still has some concerns about the shallow construction design of monitoring wells MW-9, MW-10, and MW-11, particularly well MW-9 which has less than one foot of bentonite seal. While the Solid Waste Section will allow the continued use of these three monitoring wells as long as they are judged to be providing representative ground-water samples, in the future monitoring wells should never be installed with the top of the sand pack shallower than four feet in depth or the top of the well screen shallower than five feet in depth below ground surface.

Response: GAI certainly wants to be sure that surface water does not enter Groundwater Monitoring Wells 9, 10, and 11. At the time Groundwater Monitoring Well 8 is replaced, these three other monitoring wells will be reviewed to assure that the grading around the wells is sufficient to control and divert surface water such that no surface water will contaminate the monitoring wells. All monitoring wells by GAI are being installed with

the top of the sand pack no shallower than four feet deep or the top of the well screen no shallower than five feet below ground surface.

**Sampling and Analysis Plan (SAP)**

Lutfy Comment: The Revised Sampling And Analysis Plan (SAP), dated April 1995 appears generally okay. At the bottom of page 5, specific conductivity should be reported along with the other field test parameters.

Response: Sampling and Analysis Plan dated November 1995 submitted herewith requires reporting specific conductivity and is included in the Transition Plan.

Lutfy Comment: GAI needs to provide a separate copy of the Revised SAP to each County to be included in their copy of the Transition Plan. For the Transition Plans to be retained by the Solid Waste Section, either a sheet referencing the Revised SAP on file should be placed in each County's Transition Plan or a separate copy of the Revised SAP needs to be placed in each of the various Counties Transition Plans.

Response: The Sampling and Analysis Plan dated November 1995 is included in the Transition Plan.

**CLOSURE**

This letter responds to review comments of Mr. Bobby Lutfy on the City of Albemarle Landfill pertaining to GAI. Responses to other comments by Mr. Lutfy are considered to be the responsibility of Municipal Engineering Services Company or others.

Respectfully submitted,
GAI Consultants - NC, Inc.

Wendell W. Parker

Wendell W. Parker, Ph.D., P.E.
Vice President

WWP/kla