Site Hydrogeologic Study

Prepared for

Iredell County Landfill, Steele Property
Statesville, Iredell County, North Carolina

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 6/6/2011 BY Brian Webster
ID# 14084 Hydrogeologist

MESCO Project Number: G08002.5

Completed on 5/30/2011

Municipal Services Garner, NC
Engineering Company, P.A. Boone, NC
P.O. BOX 97
Garner, NC 27529
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1 INTRODUCTION

1.1 Purpose and Scope of Study

This study was undertaken to assess the geologic and hydrologic characteristics of the uppermost aquifer at the proposed addition to the Iredell County Municipal Solid Waste Landfill Facility (MSWLF) by utilizing borings, piezometers and laboratory testing. Field information collected for this study was used to determine hydrogeologic and engineering properties of the subsurface with appropriate field and laboratory tests, perform evaluations of hydrogeologic and geologic conditions and identify base grade elevations for compliance with vertical separation requirements. This report was prepared to fulfill the requirements for the Site Hydrogeologic Study as described in the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Solid Waste Section Rule 15A NCAC 13B .1623 (a).

1.2 Site Description

The Facility is located at 354 Twin Oaks Road, S.R. 2319, Statesville, North Carolina, approximately one mile east of the Statesville city limits in the Piedmont physiographic province. Gently rolling hills and drainage features with moderate slopes are characteristic of this province. Slopes of 10-50% are common across the property. The facility operates under Permit No. 49-03 and is comprised of two Municipal Solid Waste (MSW) units, a Construction and Demolition (C&D) unit with associated buffers and the operational portion of the facility; including leachate lagoon, scale house, baler, recycling, tire storage and white goods processing. A facility map is included as Plate 1.

1.2.1 Drainage

Iredell County is located within two drainage basins; the Catawba River Basin in the western part of the county and the Yadkin River Basin in the eastern part of the county. The facility is located within the Yadkin River Basin.[22] The South Yadkin River flows through the center of the county and is primarily responsible for draining the region. The South Yadkin River originates in Alexander County and continues on to become the border of Davie and Rowan Counties before connecting with the Yadkin River. Third Creek and Fourth Creek flow, almost parallel to one another, through Iredell County and drain into the South Yadkin River.[22] Fourth Creek is located slightly north of the facility and Third Creek is located south of the facility. Several small surface drains carry surface runoff southward towards an unnamed easterly-flowing creek and the interconnected creeks in and around the facility are responsible for surficial drainage. The unnamed creeks converge and ultimately feed Fourth Creek.

1.2.2 Site History

The facility was acquired through multiple property transactions beginning February 1987, with the most recent acquisition, including the Steele Property, completed in April 2008. Historically, the site has been farmland and forest.

2 FIELD INVESTIGATION

Fourteen (14) borings were utilized to investigate and characterize subsurface conditions for the proposed landfill unit. Boring locations were determined based on topographical features and information from alternate Design Hydrogeologic Studies and Site Studies. Boring B-79 was the proposed location for P-79 and was terminated at rock, no PVC was ever set and the well was properly abandoned with grout. With the exception of boring B-79, piezometers were installed in all of the borings and their locations were surveyed by MESCO personnel in accordance with 15A NCAC 13B .1632. The borings were numbered sequentially from P-76 through P-86. Wells P-78S/P-78D and P-84S/P-84D were installed as clustered pairs. Seven (7) existing monitoring wells (MW-1A, MW-1B, MW-1C, MW-25, MW-26S/D and CD3-11M) located on the adjoining property were also included in this investigation.

Borings were drilled to characterize subsurface conditions and to provide groundwater sampling and monitoring points. Elevations established from piezometers were used to define potentiometric surface and groundwater flow characteristics. Piezometer and boring locations are depicted on Plate 2. Piezometer construction details are presented in Table A-1. Boring logs, field boring notes, well construction records and well abandonment records are included in Appendix A.

The 13 piezometers were installed February 2008 by Derry's Well Drilling (Albemarle, NC) under the supervision of MESCO personnel. Piezometers P-77, P-78S, P-79, P-80, P-81, P-83, P-85 and P-86 were drilled to completion with 7.75-inch outer diameter (OD) Hollow Stem Auger (HSA) drilling technology. P-76 was drilled to completion using a 6.5-inch OD HSA, P-82 was drilled to completion using a 8.25-inch OD HSA and P-84S was drilled to completion using a 8.5-inch OD HSA. Piezometers P-78D and P-84D were continued into rock using NQ2 rock core technology. Standard penetration tests (SPT) were conducted in accordance with ASTM Test Procedure D 1586-84, using a 2-inch OD split barrel sampler at approximately five-foot intervals. Samples collected in split barrel samplers were visually field classified by MESCO personnel and logged for field boring notes.

Piezometers were installed in borings using 2" schedule 40 PVC riser pipe and 0.010" slotted screen. Screen intervals were constructed to intercept the uppermost aquifer in water-bearing zones or observed fractures. A filter sand pack was established to approximately two feet above the screen interval followed by approximately two feet of hydrated bentonite, as a sealer. Lastly, a slurry grout mixture of cement and 5% bentonite was pumped from the top of the bentonite to the ground surface. Deep piezometers, P-78D and P-84D were constructed with an outer casing terminated at top of competent rock. Piezometers were fitted with adjustable locking expansion caps to protect the integrity of the wells.

Groundwater levels were observed and recorded during the drilling procedure and again approximately 24 hours after piezometer installation to allow for equilibration of the groundwater. The 24-hour stabilized groundwater levels are displayed on boring logs. Following installation, water levels were measured on a monthly basis from March 2008 through August 2008. Water levels were also measured on a monthly basis in monitoring wells MW-1A, MW-1B, MW-1C, MW-25, MW-26S, MW-26D and CD3-11M. Water level data was employed to construct a potentiometric surface map representing a single day stabilized water table surface. This potentiometric surface is presented as Plate 3.

Undisturbed soil samples were collected from select borings using Shelby tube samplers and sent to Geotechnics[*] for laboratory testing of soil properties including grain size distribution, permeability and soil classification. Details of the geotechnical laboratory analyses are further discussed in Section 2.1. In addition to the laboratory tests, MESCO personnel conducted field slug tests on the majority of the piezometers to determine hydraulic conductivity values for the saturated portion of the aquifer within the study area. Details of the slug tests are discussed in Section 4.4.2. MESCO field personnel logged all borings according to the Unified Soil Classification System (USCS). Boring logs were created based on field boring notes, well construction records, retained soil samples and laboratory results. Boring logs are included in Appendix A.

2.1 Laboratory Tests

Soil samples collected from the borings described in Section 2 were visually inspected and classified by MESCO field personnel. In addition to classifying soils by texture, several soil samples were selected for testing by an approved geotechnical laboratory to help define the hydrogeologic and engineering properties necessary for landfill characterization.

Shelby tubes were collected from three borings, P-78S, P-82 and P-84S. Shelby tube samples were tested in accordance with ASTM Standards for the following soil properties:

1. Grain size analysis either by sieve or with hydrometer (ASTM D-422)
2. Water content (ASTM D-854 92)
3. Atterberg limits (ASTM D-4318 96)
4. Specific gravity (ASTM D-854 92)
5. Permeability and total porosity (ASTM D-5084 90)

Table B-1 summarizes the laboratory test results for the tested specimens. The original laboratory test report submitted by Geotechnics is included in Appendix B. Shelby tube samples were classified by USCS as Silty Sand (SM) and Sandy Silt (ML). Laboratory results are further discussed throughout this report as applicable.

[*] 2200 Westinghouse Blvd, Suite 105, Raleigh, NC 27604. Ph. (919) 876-0405

3 GEOLOGY

3.1 Regional Geology

Iredell County is located within the Inner Piedmont belt of the Appalachian Piedmont physiographic province. The Inner Piedmont is bounded by the Chauga and Blue Ridge belts to the northwest and by the Kings Mountain and Charlotte belts to the southeast.[8] The geologic history of the area began with Pre-Cambrian sedimentary deposition and igneous activity followed by three periods of concurrent and subsequent metamorphism and Paleozoic folding and faulting.[18] The final period of geological activity is believed to have occurred during the Mesozoic[22] and consisted of normal and shear faulting along the pre-existing Paleozoic faults. This final period of activity erased nearly all evidence of thrust faulting resulting in the approximately 2 km wide Eufola Fault Zone.[18]

Rocks of the Inner Piedmont consist of thinly-layered mica schist and biotite gneiss with interlayered amphibolite, calc-silicate rock, hornblende, gneiss, quartzite and marble. The mica schist is thinly laminated and interlayered with various other rocks occurring in northeastern trending belts. A schist/granite complex composed of alternating bands of schist and granite, with thicknesses ranging from centimeter (cm) to kilometer (km), formed as a result of the granite intrusions. Granite from the late Paleozoic intruded after the metamorphism of the existing rock.[22] Composite gneiss, the primary rock below the landfill property, and most of Iredell County, formed when intrusions assimilated the schist, forming gneiss and schist of granitic composition. The composite gneiss is often seen in contact with the schist/granite complex; however, it is difficult and arbitrary to distinguish between the two. Hornblende gneiss is also common in large bodies throughout the county.

The Eufola Shear Fault zone is thought to be a product of Mesozoic faulting along the pre-existing faults from the Paleozoic. Its relationship to the facility is discussed in more detail in Section 3.2. The fault zone marks the boundary between the Inner Piedmont rocks of the west and the Kings Mountain Belt or Charlotte Belt rocks to the east. These rocks are distinctively different which is important in identifying the boundary and the fault. The fault was not identified in the field due to lack of rock exposure; however, it might be possible to locate the fault during the boring process using the presence or absence of mylonitic texture and rock type. The fault strikes east–west within the vicinity of the landfill and consists of silicified microbreccia overprinting on earlier mylonitic rock fabric.[26]

North of the shear zone, the basal unit of Inner Piedmont rock is composed of interlayered biotite gneiss, hornblende gneiss, amphibolite and mica schist (Czbga). This unit is overlain by layered grey to dark grey biotite, quartz, feldspar gneiss (CZbg) interlayered with mica, sillimanite-mica schist and amphibolite. South

of the shear zone, rocks of the Kings Mountain suite include fine-grained biotite gneiss of granodiorite composition (bgf) and metavolcanics (mvm) of fine-to-medium grained metamorphosed tuffs. Foliation trends vary from due north to due east and N25^{o}W to N50^{o}W with dips between 10°-70° to the south or southwest.[30]

3.2 Local Geology

The facility is located on the southeast limb of the Newton Anticline, in the composite gneiss.[26] Rock core samples examined from previous site and design studies confirmed the presence of mica schist, amphibolite and medium to coarse-grained hornblende to biotite gneiss. These rock types represent typical rocks located north of the fault zone. Cores showed decreased weathering with increased depth as well as increasing rock quality and recovery with increased depth. Fractures tend to run parallel to the compositional layering.

A review of available geologic maps indicate no recently active faults lie within two hundred feet of the property; however, the Eufola Shear Fault Zone is located southeast of the property and was last active in the Mesozoic. This fault location is based on detailed work performed by Michie and the results of the core drillings undertaken at the facility; therefore, it is in a slightly different location than shown on the USGS regional characterization map, Plate 5.[23] In addition, no evidence of mylonitization was observed, further implying the facility is located north of the fault.

The facility is located within a seismic impact zone defined as having a greater than 10 percent probability that the maximum expected horizontal acceleration expressed as a percentage of the earth's gravitational pull (g) will exceed 0.10g in 250 years.[1]

3.2.1 Subsurface Soil Conditions

Soils within the study area are classified as Cecil clay loam, which consists of moderately well-drained soils, underlain by weathered gneiss.[34] Regolith encountered in borings during the subsurface investigation included sandy silt/silty sand and sandy clay/clayey sand. Laboratory results confirm this classification.

Standard Penetration Tests (SPT) were conducted in all of the borings. No significant downward increase in blow counts was observed. Blow counts generally ranged from 5 to 20 blows per foot classifying the boring soils as “medium dense”. Competent rock, further discussed in Section 3.2.2, was based on auger refusal. Plate 8 depicts cross-sections of the study area with identified soil stratigraphy and lithology information compiled from the field boring data.

Subsurface soils encountered during the design study identified clayey silt/silty clay from ground surface to approximately four feet below ground surface (bgs). Visual inspection of the subsurface material established

that clayey silt graded into silty sand/sandy silt (SM) with some saprolite. The silty sand/sandy silt is dominant with a thickness up to approximately 60 feet.

3.2.2 Subsurface Lithological Conditions

The geological characterization of the study area was determined by rock core, facility visits to locate outcrops and review of geologic literature.[15][22]

Lithology encountered beneath the study area consisted of gray, foliated, medium-grain, biotite gneiss and is consistent with the Regional Characterization Map (Goldsmith, et al, 1988) and the geology as reported by LeGrand (1954)[22]. In addition to rock core, several borings were drilled to auger refusal at the top of competent rock surface (P-78D, P-79, P-81, P-84D and B-79). Top of competent rock (TOR) surface, on average, is 53.8 feet below existing ground surface in the proposed disposal area. An estimated TOR surface is depicted on Plate 7.

Rock cores collected from piezometers P-78D and P-84D were utilized to help characterize the subsurface conditions and indicated that schist is prevalent throughout the study area. Rock Quality Designation values (RQD)[2] were generally classified as “poor to fair”.

4 HYDROGEOLOGY

4.1 Stream Trace Analysis

A stream trace analysis was performed within a 3-mile radius of the facility. Structural control features were traced from the 7.5 min USGS Statesville East quadrangle. Plate 6 depicts the stream trace analysis. A Rose Diagram portrays the lengths and orientations of linear segments representing streams and drainages. Dominant directional trends are N 0°-5^oW, N 20°-25^oW and N 30°-35^oE. Structural geological features, such as strike and dip of bedding and foliation, as seen on the Regional Characterization Map, do not seem to play a role in primary stream drainage. The N50^o-55^oE directional trend is attributed to the Eufola Fault.

4.2 Total Porosity

Porosity, a macroscopic porous medium property, is defined as the ratio of volume of the void space to the bulk volume of a porous medium.[2] In this report, the term *total porosity* is used to signify the total pore space within a porous medium regardless of interconnectivity of pore space.

The total porosity of soil samples was calculated from their respective void ratios as determined in laboratory testing, and discussed in Section 2.1. Table B-1 demonstrates the total porosities in the study area ranged from 48% to 53%. Void ratio (e) for each sample is converted to its total porosity counterpart (n) using the following formula:

$$n = \frac{e}{1+e} \tag{1}$$

Porosity values are comparable to the values published by Domenico and Schwartz (1997) who suggest that a typical silt and fine sand yield a total porosity of 34-61% and 26-53% respectively.[11] Bear (1972) states that sand and gravel, whether uniform or mixed with other sedimentary material, typically exhibits a total porosity of 30-40%.[2] Freeze and Cherry (1979) give more inclusive ranges of 25-50% for sand material and 35-50% for silt.[14] The porosity can become considerably lower when the material is poorly sorted. Bear mentions that a poorly sorted material can have porosity as low as 17%.[2] Porosity of unconsolidated materials also depends upon the packing of the grains, their shape, arrangement and size distribution. The degree of compaction also affects porosity. Since compaction forces vary with depth porosity will also vary with depth, especially in clay and shale.[2]

4.3 Effective Porosity

The term *effective porosity* is defined as the volume of the void spaces through which water or other fluids can travel in a rock or sediment, divided by the total volume of the solid matrix.[13] Effective porosity differs from

the total porosity in that the effective porosity does not take into account disconnected or dead-end pores, while the total porosity is inclusive of all such pores. The effective porosity of a porous medium, therefore, never exceeds the total porosity of the same medium and it is not uncommon in many natural settings to find the effective porosity of a soil being less than 50% of its total porosity counterpart.

Grain size has a direct influence on effective porosity and the soil's responsiveness to fluid flow. Smaller grain sizes, such as clays, have more surface area available for the surface tension of water to adhere, reducing the soil's responsiveness to fluid flow. This is reflected in the fact that clays, which consist of a mass of very fine particles, exhibit a gap between the total and effective porosities much larger than silt or sand.

Occasionally the term *specific yield* is used in lieu of *effective porosity*, especially in older literature. For the purposes of this report the two terms are equivalent.

4.3.1 Subsurface Soil Effective Porosity Method

There is no standard approach to determine effective porosity; however, one viable and commonly used approach is to use a published relationship between effective porosity values and grain-size distributions. Johnson (1967) compiled a number of published effective porosity values and developed a relation between effective porosity values and grain size distribution. The effort of his compilation, plotting percent sand, silt and clay created the "trilinear graph of textural classification" or Johnson Diagram.[21] The Johnson diagram does not cover a large portion of sandy clay and clay material; however, only P-3 fell into the "area of no samples". Published results were used to determine the effective porosities of this soil sample.

The ASTM method used for grain size analysis uses different particle-size categories than the Johnson diagram. The percent composition of each soil sample was recalculated according to the following particle-size classification system:

Particle size (millimeters)	
Sand	2 – 0.0625
Silt	0.0625 – 0.004
Clay	<0.004

This system conforms to the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology and is widely adopted in many USGS publications.[20] Table B-2 shows the manner in which the new particle size boundaries of the soil samples were interpolated from their grain size distribution table provided by the laboratory.

Calculation of the accumulated percentage of soil particles finer than 0.0625 mm, using P-3 as an example, was performed using the accumulated percentages for the particle size boundaries of 0.0750 mm and 0.0311 mm taken from the laboratory provided wash sieve and hydrometer analyses (referred to as the Ref_1 and Ref_2, respectively, in Table B-2). Target accumulated percentage of the 0.0625 mm particle-size threshold was calculated from Ref_1 and Ref_2 via log-linear interpolation as follows:

$$C_{0.0625} = C_{0.0750} - (C_{0.0750} - C_{0.0311}) \times \frac{\log_{10} 0.0750 - \log_{10} 0.0625}{\log_{10} 0.0750 - \log_{10} 0.0311} \quad (2)$$

where

$C_{0.0625}$ is the target-accumulated percentage

$C_{0.0750}$ is the % of grains sized 0.0750 mm retained

$C_{0.0311}$ is the % of grains sized 0.0311 mm retained

The new boundary was determined graphically by plugging the recalculated grain-size distributions into the Johnson trilinear graph to determine a corresponding effective porosity value. Values for all samples were calculated in this fashion.

4.3.2 Fractured Rock Effective Porosity

Fractured rock formations are made up of two porosity systems, the inter-granular or matrix porosity formed by inter-granular void spaces and the secondary porosity developed due to fracture and solution cavities, often termed as fracture porosity. Fracture porosity is considerably less than matrix porosity. Matrix porosity generally reported to vary from 0.1% to 8% and fracture porosity from 0.001% to 0.01%.[32] Most crystalline and carbonate rock aquifers in North America are permeable primarily because of the effective porosity provided by the fractures within the rock rather than that of the rock matrix, which is relatively impervious.[32]

Although the porosities of igneous and metamorphic rocks are usually less than 1% when no fractures are present, and for most practical purposes can be considered zero,[16] intense weathering can result in excessively higher porosities.[12] The depth of weathering is usually less than 50 feet, and in many terrains is less than 4 feet, but in regions of intense weathering such as humid tropics it may extend over 300 feet.[9] The following table shows representative values of porosity (n) and effective porosity (n_e) of crystalline rocks in three different forms by the degree of fracture/weathering.

Representative Value of Porosity (*n*) and Specific Yield {Effective Porosity (n_e)}
(Selected values - after Singhal and Gupta, 1999)[32]

Rock Type	*n* (%)	*Specific Yield* (%)
Dense crystalline rock	0 – 5	0 – 3
Fractured crystalline rock	5 – 10	2 – 5
Weathered crystalline rock	20 – 40	10 – 20

Note: Singhal and Gupta (1999, page 153) state "Effective porosity (n_e) or kinematic porosity. This is the same as specific yield."

This table suggests that the effective porosity of crystalline rock is typically 40% to 50% of the corresponding total porosity.

4.3.3 Results

The effective porosity for soils collected in the study area ranges from 17% to 27.4% with the primary type of silty sand, yielding an average of 23.1%. The effective porosity appears to be roughly proportional to the content of sand and inversely proportional to the content of clay. Singhal and Gupta (1999) state that sand typically yields an effective porosity of between 10-30% while silt yields 5-20%[32], comparable to the numbers given in Table C-1. Johnson (1967) states the average effective porosity from compiled studies as:[21]

Material	Average Specific Yield
Clay	2
Silt	8
Sandy Clay	7
Fine Sand	21
Medium Sand	26
Coarse Sand	27

Observations of recovered core samples indicate zones of high-degree fracturing and weathering in the uppermost portion of the fractured bedrock unit. Based on these observations, published values for the fractured crystalline rock, in respect to the gneiss and schist observed in the subsurface, are estimated to be 5%; and estimated effective porosity for PWR and weathered rock encountered in the borings is 20%.

4.4 Hydraulic Conductivity

The hydraulic conductivity (*K*) of the saturated portion of the unconfined aquifer at the proposed site was determined from field slug test results performed on 12 piezometers: P-76, P-77, P-78S, P-78D, P-80, P-81, P-82, P-83, P-84S, P-84D, P-85 and P-86. Piezometers were selected based on location, stratigraphic material and accessibility. MESCO conducted the slug tests in May 2008. Prior to slug testing, the wells were developed to remove residual sediment caused by drilling activities clearing the annular space to encourage a hydraulic connection with the aquifer.

Each slug test was performed by creating nearly instantaneous changes in hydraulic head in the test wells and recording the subsequent time recovery data using an electronic data logger with built-in pressure transducer. The resulting time recovery data was analyzed using the methods of Bouwer & Rice (1976)[5] and Bouwer (1989)[6] to determine *K* values.

Hydraulic conductivity of unsaturated samples collected from the study area was determined through laboratory testing on Shelby tubes collected during drilling and discussed in Section 2.1.

4.4.1 Field Method

Several different field methods were used depending on the initial conditions of the piezometers. The appropriate field method was chosen based principally on the following two initial conditions:

1. Recharge rate of the well on which the test was being performed
2. Position of the static water on which the test was being performed

The static water level was measured prior to proceeding with the test to ensure that the most current static water level is used for data analysis. When the static water level was slightly above the top of the screen, water was added to the piezometer to create an initial head change; this procedure is referred to as “The Injection Method”. When the static water level was recorded within the screened section or the distance between the static water level and the top of the screened section was significant, a pump was used to withdraw water; this procedure is referred to as “The Pump Method”. “The Pump Method” was employed by inserting a submersible pump small enough to fit into a 2-inch diameter well. The equipment selected to withdraw water was based on the rate of recharge: a low-yield portable pump was used when the recharge rate was relatively low and a high-yield pump was used for a piezometer with a higher recharge rate. When a piezometer yielded a high recharge rate, in which a significant draw down would not occur with “The Pump Method”, a solid slug was used. The solid slug was inserted into the piezometer and once static water level was achieved, the rapid removal of the slug followed causing water level displacement. This procedure is referred to as “The Slug Method”.

It is particularly important to note that, under any circumstances, efforts were made not to inject water into a well when the static water level was below the top of the screen. Such an action would create an outflow of water into the vadose zone through the sand pack, leading to an overestimation of hydraulic conductivity.[6]

An electronic data logger with a built-in pressure transducer recording real-time data was used in each method to record the water level rebound. The collected rebound data was subsequently analyzed per the Bouwer &

Rice mathematical model to determine the K value. It is noteworthy that the Bouwer & Rice method in theory allows either an addition of water to, or a withdrawal of water from, a piezometer without significantly affecting the resulting *K* value.

4.4.2 Slug Test Results

The hydraulic conductivity of the saturated portion of the study area, as determined in-situ with slug tests, ranged from a minimum of 7.94 x 10^{-5} cm/sec (P-82) to a maximum of 5.81 x 10^{-4} cm/sec (P-4), with an average of (2.90 ± 1.69) x 10^{-4} cm/sec.* The average hydraulic conductivities for each lithology were calculated based on piezometers which had screen intervals within those lithologies. Schist had an average hydraulic conductivity of 2.32 x 10^{-4} cm/sec, sandy silt measured 2.87 x 10^{-4} cm/sec and PWR measured 3.57 x 10^{-4} cm/sec. The average hydraulic conductivity of the unsaturated portion of the study area, as calculated by laboratory analysis, ranged from a low of 5.2 x 10^{-5} cm/sec to high of 2.2 x 10^{-4} cm/sec. Both the in-situ measured and laboratory calculated hydraulic conductivities fall within the published ranges.

Published Hydraulic Conductivity Ranges:

Material	(K) Range	Source
Silty Clay/Clayey Silt (MC)	10^{-9} – 10^{-6}	Fetter [13]
Silty Sand/Sandy Silt (SM)	10^{-3} – 10^{-5}	Fetter [13]
Silty Sand (SM)	10^{-1} – 10^{-5}	Freeze [14]
Fractured Igneous and Metamorphic Rock	10^{-2} – 10^{-6}	Freeze [14]

Field slug tests results and subsequent K- value calculations are summarized in Table C-1. Figure C-1 displays a graphical representation of the *K* values at individual piezometer locations where tests were conducted. Hydraulic properties of identified soils and rock lithologies identified are summarized in B-1.

* An average value in this report is typically expressed of the form (mean ± standard error) unless indicated otherwise.

5 HYDROLOGY

5.1 Regional Hydrology

The western part of Iredell County is located in the Catawba Drainage Basin and the eastern part is located in the Yadkin River Basin. Drainage in the Statesville area is eastward along Third and Fourth Creeks, which converge and enter the South Yadkin River on the Davie/Rowan County border. The South Yadkin River flows southeast and becomes part of the Yadkin River at the Davie/Rowan/Davidson County borders.

Regionally the landfill is located in the Piedmont groundwater region of the United States.[17] This area typically has characteristics of two hydrogeological units, the fractured crystalline bedrock and the overlying regolith comprising all the unconsolidated sediments/saprolitic soils. The bedrock inherently has low porosity and permeability due to the crystalline nature of the rock having small, disconnected pore spaces; therefore, interconnected joints, fractures and faults are the primary means of water transport through the bedrock. The water-bearing capacity for the regolith relies on the pore space between grains storing the majority of groundwater due to its high porosity and permeability. The two units are interconnected hydrogeologically through the fractures and faults of the bedrock.

Recharge occurs in upland regions between creeks and drainage ravines through the infiltration of precipitation into the unsaturated regolith. Discharge occurs through surface seepage base flow into creeks. Infiltration occurs when precipitation reaches the land surface and penetrates the unsaturated soil, then moves laterally and downward through a temporary saturated zone. Ultimately, water will move to the water table and be transported to the point of discharge.[17] It is possible for the top portion of the water table to be recharged from both precipitation and the underlying fractured bedrock when the deeper part of the aquifer has greater hydraulic potential. The facility geology is conducive for this flow condition; having the discharge zone within close proximity lowers the hydraulic potential of the aquifer towards areas of discharge, creating hydraulic gradient in the direction of the deeper to shallower portions of the aquifer.[26]

5.2 Groundwater Regime

Locally the several small unnamed creeks, which are responsible for surficial drainage, are the most influential features affecting groundwater. Groundwater encountered in the uppermost aquifer occurs in the unconsolidated regolith and varies in depth from 5 to 37 feet bgs, which is topographically dependent on the proximity to the unnamed creeks. A single-day potentiometric map with projected flow directions for the uppermost aquifer based on groundwater readings collected on March 20, 2008 is shown on Plate 3. Groundwater flow follows a general northerly trend across the study area. Hydraulic gradient ranges across

the site from 0.02 to 0.07, tending to be slightly steeper to the east. Groundwater recharge occurs south of the study area. Discharge is into the tributaries of Fourth Creek, located east and west of the study area.

5.3 Groundwater Flow Components

A single-day potentiometric map with projected flow directions for the uppermost aquifer was generated based on groundwater elevations collected on March 20, 2008. A single-day map is shown on Plate 3. Flow directions were used to calculate the average linear velocity defined as:

$$v_x = \frac{K}{n_e}\frac{dh}{dl} \tag{13}$$

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 horizontal hydraulic gradient at a piezometer was calculated graphically by first drawing a perpendicular line from each piezometer location to the nearest equipotential contour. The differences in hydraulic head (*dh*) were calculated by subtracting the contour elevation from the static groundwater elevation measured in the corresponding piezometer. The lateral distance (*dl*) was the horizontal length of the line segment from the well to the associated contour. Calculation of hydraulic gradient at a given piezometer location was determined by dividing *dh* by *dl*. Table 2 summarizes the calculated flow rates in units of feet per year and the parameters used in the calculations. Average linear flow velocities range from a low of 8.11 ft/yr (P-82) to a high of 201.64 ft/yr (MW-26S).

5.3.1 Vertical Flow

Vertical hydraulic gradients for clustered multilevel wells were calculated using the EPA Vertical Gradient with Well Screen Effects Calculator, with the *dl* value being that of the mid-point of the saturated screen length.[12] In general, water table fluctuations in the nested wells mimic their counterpart well. A slight downward vertical gradient was observed in wells P-78S/D (-0.01551ft/ft). Slight upward gradients were observed in wells P-84S/D (0.0336 ft/ft) and MW-26S/D (0.02167 ft/ft). This upward gradient represents transition of groundwater flow towards an area of discharge, in this case a tributary of Fourth Creek, implying the preferential flow area is localized. Calculated vertical flow components are shown in Table 3.

5.4 Water Table Fluctuation

5.4.1 On Site Piezometers/Monitoring Wells

Water level data, from fourteen on-site piezometers and monitoring wells, was collected on a semi-monthly basis from March 2008 through August 2008 and April 2010 through April 2011and is tabulated in Table 1 as elevations above mean sea level (MSL). Table 1 also contains:

1. Ground Surface and Datum Elevations
2. Northing and Easting locations
3. Screen Base Elevation
4. Top of Competent Rock Elevation
5. Observed Seasonal High
6. Observed Seasonal Low
7. Seasonal Fluctuation
8. Long-Term Seasonal High Correction Factor and Estimated Long-Term Seasonal High

The seasonal high elevation was recorded for 2008 water level measurements in April and May. Seasonal lows were recorded in August. The 2008 groundwater fluctuation ranged from 0.17 to 3.26 feet and averaged 1.17 feet. The highest fluctuation using the extended date range was observed in P-76 and CD3-11M with a fluctuation of 8.48 and 6.16 feet, respectively. The lowest fluctuation was observed in MW-26S and MW-26D with a fluctuation of 1.37 and 1.78 feet, respectively.

Additional wells (MW-21S, MW-25 and MW-26D) located across the Iredell County Landfill were selected for observation based on subsurface lithology and historic data available. Because 2008 water levels in the site study piezometers appeared lower than average, existing well data was reviewed for trends across the landfill. The recorded average of MW-21S was 790.13 feet and had a recorded low of 788.08 feet, in January 2005. Fluctuation was about 2.2 feet. The 2008 elevation data trends closely with this recorded low and appears to be a below average season. MW-25 has a recorded average of 844.28 feet and experienced its recorded minimum in August 2008. Well fluctuation was approximately 1.39 feet. Additional water level data collected in 2008 correlates to a below average season. MW-26D experienced minimal fluctuation of 1.07 feet and had a recorded average of 820.94 feet. The minimum groundwater elevation was recorded in July 2009 at 819.59. Reported 2008 data ranges from average to slightly below average. Reported water level values for these additional wells can be found in Appendix D.

Water table fluctuation can be impacted by groundwater recharge through precipitation. During summer months, the level of evapotranspiration and vegetation consumption increase with the increased temperature, decreasing the percentage of water able to recharge the groundwater. In the absence of plant uptake infiltrated water, the effect of precipitation on the fluctuation of the water table becomes visible with many of the observed high readings occurring in spring months (March, April and May); corresponding to the growing

season of grasses and plants. The growing season is typically considered "when the normal mean daily temperature rises above 50 to 55 degrees Fahrenheit."[31] [page 14]

5.4.2 USGS Monitoring Wells

USGS data was used to determine general groundwater trends across North Carolina and to help determine if 2008 was a below average year. Supplemental data was collected from the USGS website for wells NC-142 (355359080331701) located in Davie County and NC-193 (35405780362601) located in Rowan County. NC-142 was drilled approximately 0.5 miles northeast of Mocksville to 30.8 feet bgs in unconfined Paleozoic weathered granite. NC-193 was drilled to 24 feet bgs in unconfined alluvial silt.

The highest groundwater elevation in NC-142 was reported at 824.70 feet amsl in April 1993, the lowest was reported at 812.78 feet amsl in August 2002. The average groundwater elevation in NC-142, based on data since 1981, is 818.69 feet amsl with a margin of error +/- 2.28 feet. In general, the 2008 elevation data averaged 816.56 feet amsl with a margin of error +/- 0.91feet, suggesting it is representative of a below average season. The highest groundwater elevations are generally observed from March to May and the lowest in October and November.

The highest groundwater elevation in NC-193 was reported at 676.28 feet amsl in March 1993, the lowest was reported at 670.25 feet amsl in September 2002. The average groundwater elevation in NC-193 is 673.83 feet amsl with a margin of error +/- 1.08 feet. In general, the 2008 elevation data averaged 672.53 feet amsl with a margin of error +/- 0.59 feet, suggesting it may represent a slightly below average season. The highest groundwater elevations are generally observed in March and April and the lowest from August to October.

Historic water level data, graphs, tables and charts is provided in Appendix D.

5.5 Local Precipitation

5.5.1 Introduction

North Carolina ranks sixth in the nation in annual average precipitation, with about 50 inches per year. Iredell County receives approximately 46 inches of precipitation annually. The precipitation received by the Statesville area is distributed relatively evenly over the year. Roughly 72% of the precipitation is returned to the atmosphere through the process of evapotranspiration, while another 20% recharges groundwater systems.

Two climate stations located in Statesville and Turnersburg, North Carolina, provided precipitation data used to characterize the regional climate in the vicinity of the facility, courtesy of the State Climate Office of North Carolina (SCONC)[33]. The Statesville climate station, COOP ID *Statesville 2 NNE*, is located on the northern

side of the City of Statesville. The Turnersburg climate station, COOP ID *Turnersburg,* is located eight miles north of the Statesville station. Both stations provided records from 1960 up to most recent time of data retrieval.

5.5.2 Climate Stations

Recorded data from the Statesville and Turnersburg stations is consistent with regional data, presenting annual precipitation ranging from forty to fifty inches. The Statesville station recorded a high of 62.73 inches in 2003, and a low of 27.29 inches in 1986. The Turnersburg station recorded 2007 as the lowest year for precipitation with 29.24 inches. The recorded high from a full year was 61.84 inches in 1989; however, 2008 exceeded the 1989 high reaching 63.12 inches; including only records through mid-August.

Statesville averages around 3.7 inches of rain per month, recording the most precipitation in June and the least in October and November. Turnersburg averages about 3.8 inches per month, recording its maximum precipitation in June and its minimum in November. In general, precipitation was consistent showing minimal fluctuation between weeks, months and seasons. Appendix D contains precipitation tables and graphs showing the annual and monthly breakdown

5.6 Long-Term Seasonal High Groundwater Estimation

5.6.1 Seasonal High Groundwater

Groundwater levels used to evaluate seasonal high groundwater levels for this design study were collected on roughly a monthly basis from March 2008 until August 2008. Supplementary water levels measured from April 2010 until April 2011 have also been included, in addition to historic well data from three on-site monitoring wells. In general, the 2008 on-site water level data appears to have lower groundwater elevations than the more recent 2010 and 2011 water level data. The supplementary data extended the observed groundwater elevations, allowing for a greater fluctuation range. Due to the low recorded precipitation for the 2007 season, it is possible the groundwater was unable to fully recharge; thus creating slightly lower than average groundwater elevations.

Seasonal high and low as well as the calculated fluctuations have been presented in Table 1. Based on the observed site specific data and supplementary data from USGS wells with similar subsurface lithology, 2008 appears to be a below average year for groundwater elevations. Most observed low elevations occurred in 2008 and the majority of those were measured in August 2008. Only one seasonal high was measured in 2008.

5.6.2 Prediction of Long Term Seasonal High

Long-term seasonal high estimations were based on local characterization of the facility, water levels recorded from on-site monitoring wells and piezometers, and precipitation data. The method incorporates a sufficient "margin of error" to account for varying levels of uncertainty.

Seasonal high groundwater elevations were observed for on-site wells in April and May of 2010 in association with the growing season; followed by August and September of 2010. Average fluctuation was approximately 3.67 feet, including 2008 data. Normal daily mean temperature exceeds 55 degrees at the Statesville Station in April, suggesting the start of the growing season. The 2008 precipitation data corresponds to an average season. As a conservative estimate, a correction factor of four feet was applied to the observed seasonal high values to represent the estimated long-term seasonal high elevations. Estimated long-term seasonal high elevations were used to generate a map included as Plate 4B.

6 SITE SUITABILITY

The proposed site of the Iredell County Landfill is geologically and hydrogeologically suitable for development as a Subtitle D Municipal Solid Waste Landfill facility based on previously presented information summarized below.

The proposed site is located in the Inner Piedmont Belt of the Piedmont physiographic province and groundwater region. Typically, the region is divided into two hydrogeologic units, the fractured crystalline bedrock and the overlying unconsolidated sediment or regolith. Unconsolidated sediment, saprolitic soil and partially-weathered rock compose the surface soil. The basement rock is generally fractured parallel to compositional layering and granite intrusions that alter schist into “composite gneiss” composed of granitic schist and gneiss are present throughout the county. Groundwater encountered in the uppermost aquifer occurs in the unconsolidated sediment from a depth of five to thirty-seven feet below ground surface.

Groundwater appears to flow in a northerly direction beneath the site. Hydraulic gradient calculations range from 0.02 to 0.07. Average linear flow velocities range from 8.11 ft/yr (P-82) towards the site center to 201.64 ft/yr (MW-26S) near the eastern boundary. No faults, mines, significant lithological contacts or other geologic features which influence groundwater flow have been located on site.

Review of the geologic and hydrogeologic characteristics of the site indicate the location is suitable for solid waste management activities.

The groundwater flows towards discharge features. Iredell County owns the property to the discharge point; therefore, the groundwater from the site can be monitored. The potential impact of off-site pollution and impact to the groundwater on-site can be monitored.

7 CLOSURE

In accordance with Rule 15A NCAC 13B .1623.(a) this report documents MESCO's assessment of the geologic and hydrogeologic characteristics of the proposed site to determine: suitability for solid waste management activities, the best site locations for MSWLF units and general groundwater flow paths and rates for the uppermost aquifer. Geological and hydrological data, information and conclusions contained herein indicate no hindrance to the development of the described MSW landfill.

All temporary piezometers installed during subsurface investigation not converted to permanent monitoring wells or piezometers will be abandoned in accordance with the procedures for permanent abandonment of wells as described in 15A NCAC 13B Rule 0113 (a)(2).

Respectfully submitted,

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

NORTH CAROLINA LICENSED SEAL 5 5/30/2011 GEOLOGIST MADELINE GERMAN

Madeline German, PG
Geoscientist

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TABLES

Table 1: Groundwater Elevation Summary

Name	Date Installed	Date Surveyed	Ground	Datum	Northing	Easting	Drilled Depth	Completion Elevation	Top of Rock
P-76	02/25/2008	04/18/2008	852.26	855.33	738554.3982	1455981.9478	40.90	811.36	-
P-77	02/20/2008	04/18/2008	881.92	884.90	738402.4003	1457046.9031	40.50	841.42	-
P-78S	02/28/2008	04/18/2008	890.86	893.57	738169.8834	1456497.4076	48.22	842.64	-
P-78D	02/28/2008	04/18/2008	891.61	894.54	738164.3541	1456505.1331	75.81	815.80	826.61
P-79	02/27/2008	04/18/2008	877.18	880.13	738146.2743	1455995.5270	36.52	840.66	840.68
P-80	02/27/2008	04/18/2008	882.86	885.87	737978.3532	1457061.7883	35.00	847.86	-
P-81	02/21/2008	04/18/2008	871.82	874.75	737558.0123	1456064.1161	55.00	816.82	816.82
P-82	02/21/2008	04/18/2008	894.27	897.29	737678.0658	1456716.4738	40.20	854.07	-
P-83	02/25/2008	04/18/2008	898.16	901.10	737067.8107	1456519.3157	50.25	847.91	-
P-84S	02/21/2008	04/18/2008	897.74	900.36	737368.4562	1456947.9100	53.47	844.27	-
P-84D	02/29/2008	04/18/2008	897.83	900.45	737369.5642	1456943.2138	101.52	796.31	806.83
P-85	02/25/2008	04/18/2008	875.52	878.67	737457.5295	1457307.0334	38.86	836.66	-
P-86	02/27/2008	04/18/2008	898.08	901.15	737006.0426	1457216.6479	61.26	836.82	-
B-79	02/25/2008	04/18/2008	862.67	-	738146.2022	1455761.0086	21.50	841.17	841.17
MW-1A	04/27/1993	-	865.94	867.74	738678.3235	1457340.5810	40.00	825.94	-
MW-1B	04/28/1993	-	866.03	867.93	738675.4058	1457343.0930	20.00	846.03	-
MW-1C	10/20/2003	10/22/2003	863.44	866.25	738682.2760	1457340.3922	34.00	829.44	-
MW-25	12/08/2004	01/14/2005	861.81	865.16	737855.1445	1457370.4749	24.93	836.88	-
MW-26S	12/15/2004	01/14/2005	830.54	833.54	737768.2280	1457756.0848	20.25	810.29	-
MW-26D	12/17/2004	01/14/2005	830.93	833.94	737767.4568	1457750.6175	61.76	769.17	784.86
CD3-11M	12/15/2004	01/14/2005	831.64	834.35	737777.0404	1457753.0961	34.27	797.37	-

Table 1: Groundwater Elevation Summary

Name	Time of Boring	24 Hours After	7 Days After	03/20/08	04/30/08	05/29/08	07/03/08	07/21/08	08/05/08	04/19/10	05/13/10
P-76	821.26	823.88	-	825.46	826.58	825.53	823.45	-	823.32	831.74	831.80
P-77	851.92	853.32	853.28	853.55	854.35	854.27	853.70	-	853.13	856.18	856.18
P-78S	857.86	856.07	-	855.54	855.42	855.39	855.26	-	855.07	857.78	858.02
P-78D	-	855.29	-	854.96	854.95	854.94	854.82	-	854.63	857.62	857.77
P-79	842.18	844.90	-	845.10	845.70	845.41	844.95	-	843.93	848.42	848.04
P-80	856.86	854.30	-	854.40	854.97	854.89	854.55	-	854.21	856.89	857.02
P-81	857.82	857.34	857.23	857.73	857.58	856.83	855.17	-	854.60	858.39	858.53
P-82	864.27	859.77	859.78	859.58	859.94	860.09	859.98	-	859.66	861.46	861.60
P-83	858.16	858.77	-	858.41	858.43	858.37	858.29	-	858.20	860.06	860.31
P-84S	857.74	855.42	855.05	854.82	855.83	854.86	854.85	-	854.71	856.96	857.21
P-84D	-	857.53	-	856.64	856.68	856.77	856.80	-	856.65	858.62	858.90
P-85	850.52	843.12	-	843.45	843.67	843.49	843.23	-	842.96	846.31	846.29
P-86	849.08	848.43	-	848.38	848.08	847.95	847.67	-	847.81	849.56	849.88
B-79	-	-	-	-	-	-	-	-	-	-	-
MW-1A	-	-	-	841.47	842.69	842.55	842.03	841.73	841.67	844.27	844.08
MW-1B	-	-	-	-	-	-	-	-	-	-	-
MW-1C	-	-	-	839.97	840.93	840.79	840.28	839.50	839.43	842.48	842.29
MW-25	-	-	-	843.15	843.26	842.48	842.01	841.74	841.65	845.69	845.87
MW-26S	-	-	-	820.03	819.79	819.24	818.99	818.91	819.39	819.59	819.77
MW-26D	-	-	-	820.93	820.89	819.70	820.02	819.79	820.63	821.05	821.23
CD3-11M	-	-	-	820.55	820.44	819.63	819.63	819.4	820.14	820.45	820.63

Table 1: Groundwater Elevation Summary

Name	06/23/10	07/29/10	08/12/10	09/24/10	10/19/10	11/18/10	12/15/10	01/20/11	02/21/11	03/25/11	04/20/11
P-76	826.03	-	830.60	827.72	825.44	824.37	824.49	826.94	827.05	828.82	829.68
P-77	-	-	-	855.02	855.58	855.56	855.70	855.32	855.45	855.51	855.80
P-78S	857.90	-	858.22	857.87	857.09	856.95	857.08	857.06	857.11	857.15	857.55
P-78D	857.69	-	857.81	857.40	856.98	856.70	856.83	856.64	856.68	856.75	857.17
P-79	847.42	-	846.84	845.63	845.79	845.63	845.75	845.92	846.17	846.64	847.23
P-80	-	-	-	856.79	856.73	859.74	859.73	856.57	856.52	856.60	856.86
P-81	857.35	-	857.69	856.07	856.94	857.28	857.39	857.08	858.09	858.29	858.50
P-82	-	-	-	862.10		861.89	862.01	861.70	861.80	861.74	861.84
P-83	860.65	-	861.08	861.12	861.06	861.06	861.18	861.24	861.22	861.07	861.05
P-84S	-	-	-	857.88	857.69	857.66	857.68	857.84	857.77	857.54	857.56
P-84D	-	-	-	859.62	859.49	859.45	859.44	859.60	859.53	859.35	859.37
P-85	-	-	-	845.75	845.73	845.74	845.83	845.60	845.88	845.96	846.13
P-86	-	-	-	851.13	851.11	851.11	851.12	851.05	851.16	851.00	850.93
B-79	-	-	-	-	-	-	-	-	-	-	-
MW-1A	843.89	-	843.75	843.45	843.25	843.23	843.36	843.00	843.26	843.49	843.98
MW-1B	-	-	-	-	-	-	-	-	-	-	-
MW-1C	842.11	841.96	841.99	841.66	840.93	841.40	841.53	841.22	841.47	841.71	842.20
MW-25	844.56	844.01	844.65	843.47	843.79	843.83	843.91	843.75	843.87	843.86	844.24
MW-26S	819.06	819.67	819.46	818.66	819.00	819.05	819.18	819.20	819.32	819.36	819.67
MW-26D	820.25	820.65	820.71	819.45	819.79	819.90	820.03	819.89	820.01	820.05	820.36
CD3-11M	819.91	825.4	820.21	819.24	819.6	819.64	819.77	819.63	819.75	819.79	820.1

Table 1: Groundwater Elevation Summary

Name	Observed Seasonal High	Observed Seasonal Low	Fluctuation	Long-Term Seasonal High Correction Factor	Estimated Long-Term Seasonal High
P-76	831.80	823.32	8.48	4.00	835.80
P-77	856.18	853.13	3.05	4.00	860.18
P-78S	858.22	855.07	3.15	4.00	862.22
P-78D	857.81	854.63	3.18	4.00	861.81
P-79	848.42	843.93	4.49	4.00	852.42
P-80	859.74	854.21	5.53	4.00	863.74
P-81	858.53	854.60	3.93	4.00	862.53
P-82	862.10	859.58	2.52	4.00	866.10
P-83	861.24	858.20	3.04	4.00	865.24
P-84S	857.88	854.71	3.17	4.00	861.88
P-84D	859.62	856.64	2.98	4.00	863.62
P-85	846.31	842.96	3.35	4.00	850.31
P-86	851.16	847.67	3.49	4.00	855.16
B-79	-	-	-	-	-
MW-1A	844.27	841.47	2.80	4.00	848.27
MW-1B	-	-	-	-	-
MW-1C	842.48	839.43	3.05	4.00	846.48
MW-25	845.87	841.65	4.22	4.00	849.87
MW-26S	820.03	818.66	1.37	4.00	824.03
MW-26D	821.23	819.45	1.78	4.00	825.23
CD3-11M	825.40	819.24	6.16	4.00	829.40

Table 2: Flow Rate Calculations

Piezometer	h_1 (ft)	h_2 (ft)	dh (ft)	dl (ft)	i	K (cm/sec)	n_e (%)	Q (ft/yr)	v (ft/yr)	Lithology
P-76	825.46	830.00	4.54	86.03	0.05	1.01E-4	17.0%	5.51	32.44	Sandy Silt
P-77	853.55	850.00	3.55	50.33	0.07	3.64E-4	17.0%	26.56	156.26	Sandy Silt
P-78S	855.54	850.00	5.54	139.29	0.04	2.01E-4	17.0%	8.27	48.66	Sandy Silt
P-78D	854.96	Deep Wells not contoured				3.18E-4	5.0%	-	-	Schist
P-79	845.10	840.00	5.10	90.97	0.06	4.77E-4	17.0%	27.67	162.75	Sity Sand
P-80	854.40	850.00	4.40	110.76	0.04	5.69E-4	17.0%	23.39	137.57	Sandy Silt
P-81	857.73	855.00	2.73	94.37	0.03	3.21E-4	20.0%	9.61	48.04	PWR
P-82	859.58	855.00	4.58	260.59	0.02	7.94E-5	17.0%	1.44	8.49	Sandy Silt
P-83	858.41	855.00	3.41	210.25	0.02	2.64E-4	17.0%	4.43	26.06	Sandy Silt
P-84S	854.82	850.00	4.82	173.32	0.03	1.39E-4	17.0%	4.00	23.53	Sandy Silt
P-84D	856.64	Deep Wells not contoured				1.46E-4	5.0%	-	-	Schist
P-85	843.45	845.00	1.55	38.42	0.04	5.81E-4	17.0%	24.25	142.66	Sandy Silt
P-86	848.38	850.00	1.62	106.35	0.02	3.92E-4	20.0%	6.18	30.89	PWR
MW-1A	841.47	845.00	3.53	192.46	0.02	3.35E-5	6.0%	0.64	10.60	Silty Clayey Sand
MW-1C	839.97	845.00	5.03	184.88	0.03	3.35E-5	6.0%	0.94	15.72	Silty Sandy Clay
MW-25	843.15	840.00	3.15	53.18	0.06	2.44E-3	17.0%	149.54	879.62	Silty Sand
MW-26S	820.03	825.00	4.97	76.93	0.06	5.96E-5	6.0%	3.98	66.40	Sandy Clay
MW-26D	920.93	Deep Wells not contoured				1.46E-6	5.0%	-	-	Gneiss
CD3-11M	820.55	825.00	4.45	82.37	0.05	3.61E-5	17.0%	2.02	11.87	Sandy Silt

NOTES:

1. Parameters *dh* and *dl* denote the difference in hydraulic head and horizontal distance, respectively, between two measurement points. A line is constructed from a piezometer to a perpendicular of the potentiometric contour in Plate 3 *Single day potentiometric map with flow directions.* The hydraulic head is the absolute value of the difference between groundwater elevation at the piezometer, h_1, and the elevation of the corresponding potentiometric contour, h_2. The horizontal distance, *dh,* is the length of the line.

2. Parameter *i* denotes the hydraulic gradient associated with the line, and is defined by the equation:

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

3. Parameter n_e denotes the effective porosity. Soil effective porosities were derived by calculating the average effective porosity for each lithology. The effective porosity for rock, including schist and gneiss, was estimated at 5%, based on published values.

4. *K* denotes the hydraulic conductivity determined from field slug tests. A lithological average hydraulic conductivity value was used as a substitute for those piezometers on which slug tests were not performed. Values for MW-1A and MW-1C were taken from past site studies. Hydraulic conductivity is shown on Table C-1.

5. Parameters *Q* and *v* denote the specific discharge and the average linear velocity, respectively. The specific discharge is defined by the equation:

$$Q = -K\frac{dh}{dl}$$

The average linear velocity, denoted by *v*, is defined by the equation:

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

6. Displayed flow direction are derived from the water level data taken on March 20, 2008.

Table 3: Vertical Flow Compontents

Date	P-78S	P-78D	dh	dl (mid-point of saturated screen)	Vertical Gradient (dh/dl)
03/20/08	855.54	854.96	-0.58	30.79	-0.01884
04/30/08	855.42	854.95	-0.47	30.73	-0.01529
05/29/08	855.39	854.94	-0.45	30.72	-0.01465
07/03/08	855.26	854.82	-0.44	30.65	-0.01436
08/05/08	855.07	854.63	-0.44	30.56	-0.01440
		Average	**-0.48**		**-0.01551**

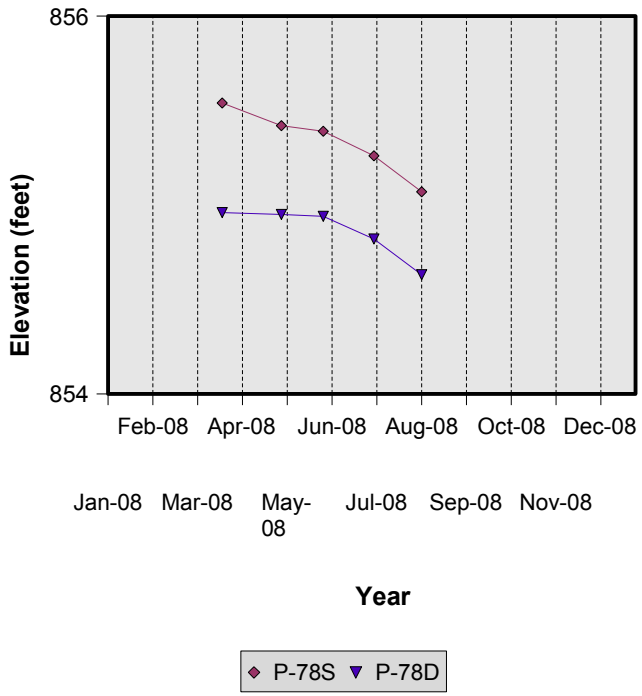


Table 3: Vertical Flow Compontents

Date	P-84S	P-84D	dh	dl (mid-point of saturated screen)	Vertical Gradient (dh/dl)
03/20/08	854.82	856.64	1.82	50.73	0.03588
04/30/08	855.83	856.68	0.85	51.24	0.01659
05/29/08	854.86	856.77	1.91	50.75	0.03764
07/03/08	854.85	856.80	1.95	50.75	0.03843
08/05/08	854.71	856.65	1.94	50.68	0.03828
		Average	**1.69**		**0.03336**

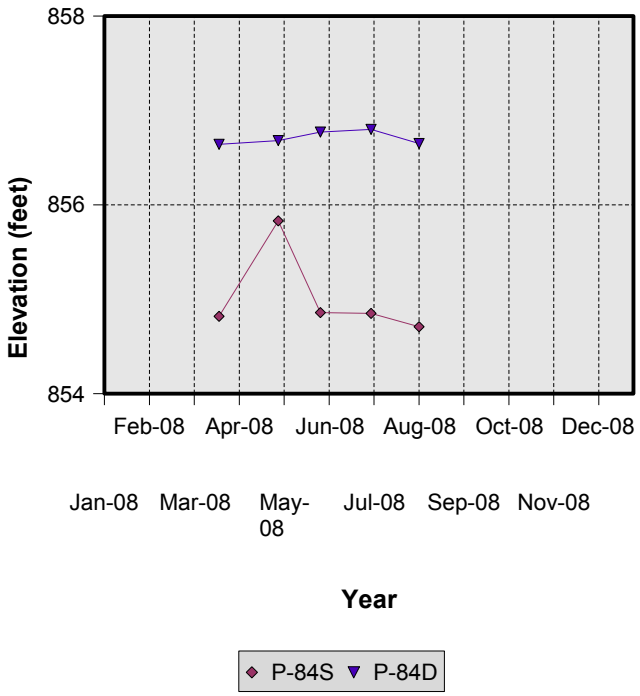
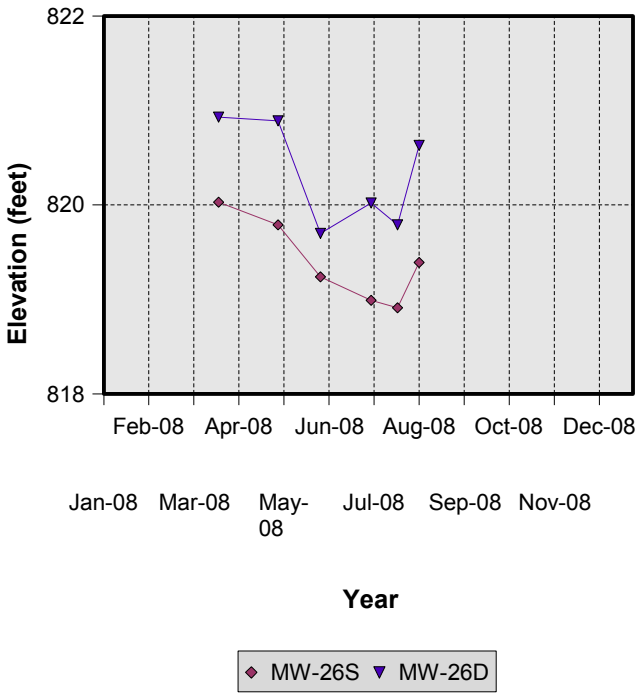


Table 3: Vertical Flow Compontents

Date	MW-26S	MW-26D	dh	dl (mid-point of saturated screen)	Vertical Gradient (dh/dl)
03/20/08	820.03	820.93	0.90	43.23	0.02082
04/30/08	819.79	820.89	1.10	43.23	0.02545
05/29/08	819.24	819.70	0.46	43.16	0.01066
07/03/08	818.99	820.02	1.03	43.03	0.02394
07/21/08	818.91	819.79	0.88	42.99	0.02047
08/05/08	819.39	820.63	1.24	43.23	0.02868
		Average	**0.94**		**0.02167**



PLATES

PLATE 1

LICENSE NUMBER: C-0281

Municipal Services
P.O. BOX 97 GARNER, N.C. 27529
(919) 772-5393

Engineering Company, P.A.
P.O. BOX 349 BOONE, N.C. 28607
(828) 262-1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557
(252) 726-9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

FACILITY MAP

SCALE:	1" = 400'
DATE:	05/13/2009
DRWN. BY:	E. CALDWELL
CHKD. BY:	E. CALDWELL
PROJECT NUMBER	G08002.0
DRAWING NO.	PLATE 1
SHEET NO.	1 of 1

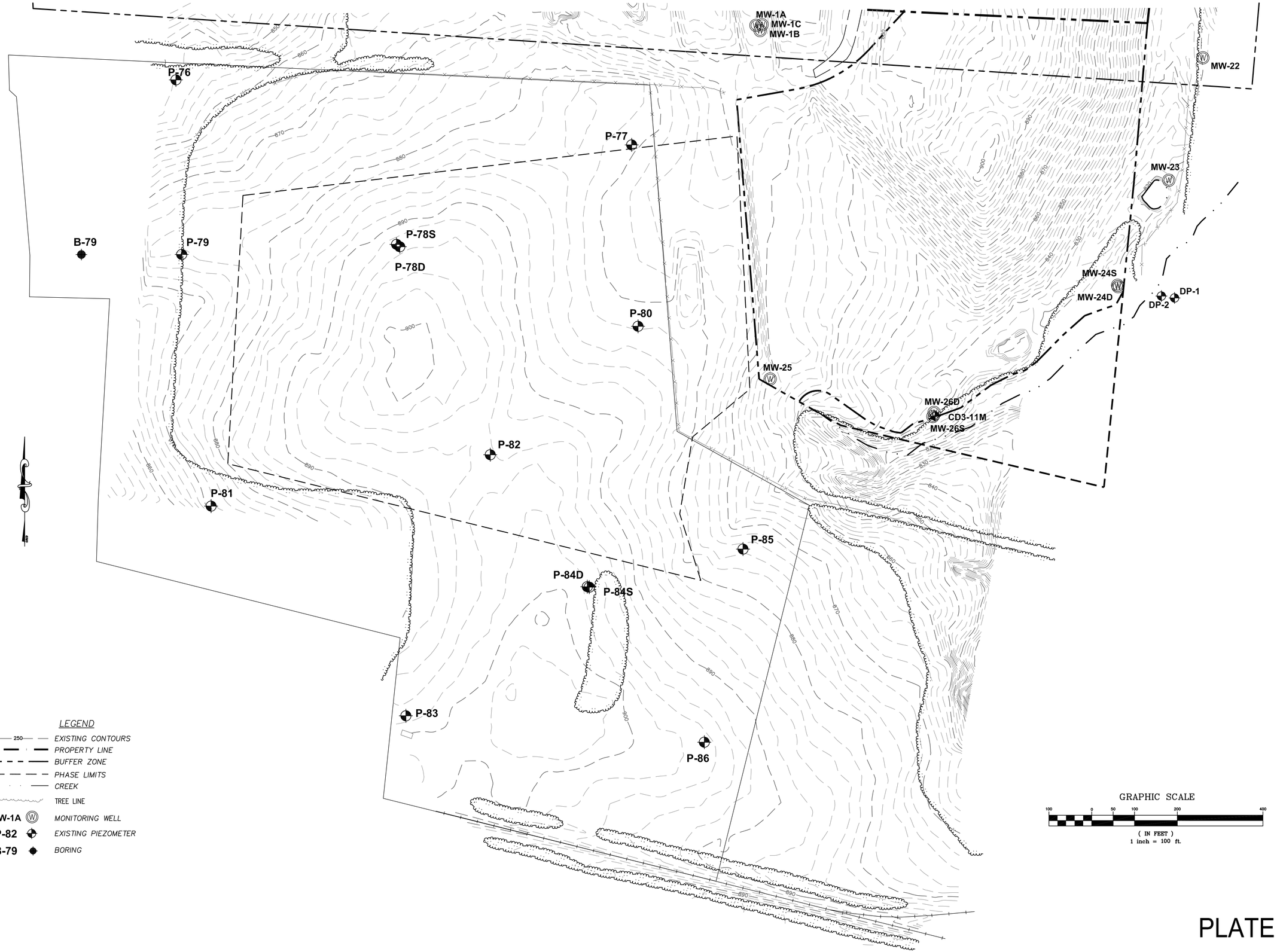


PLATE 2

Municipal Services Engineering Company, P.A.

LICENSE NUMBER: C-0281

P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393

P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767

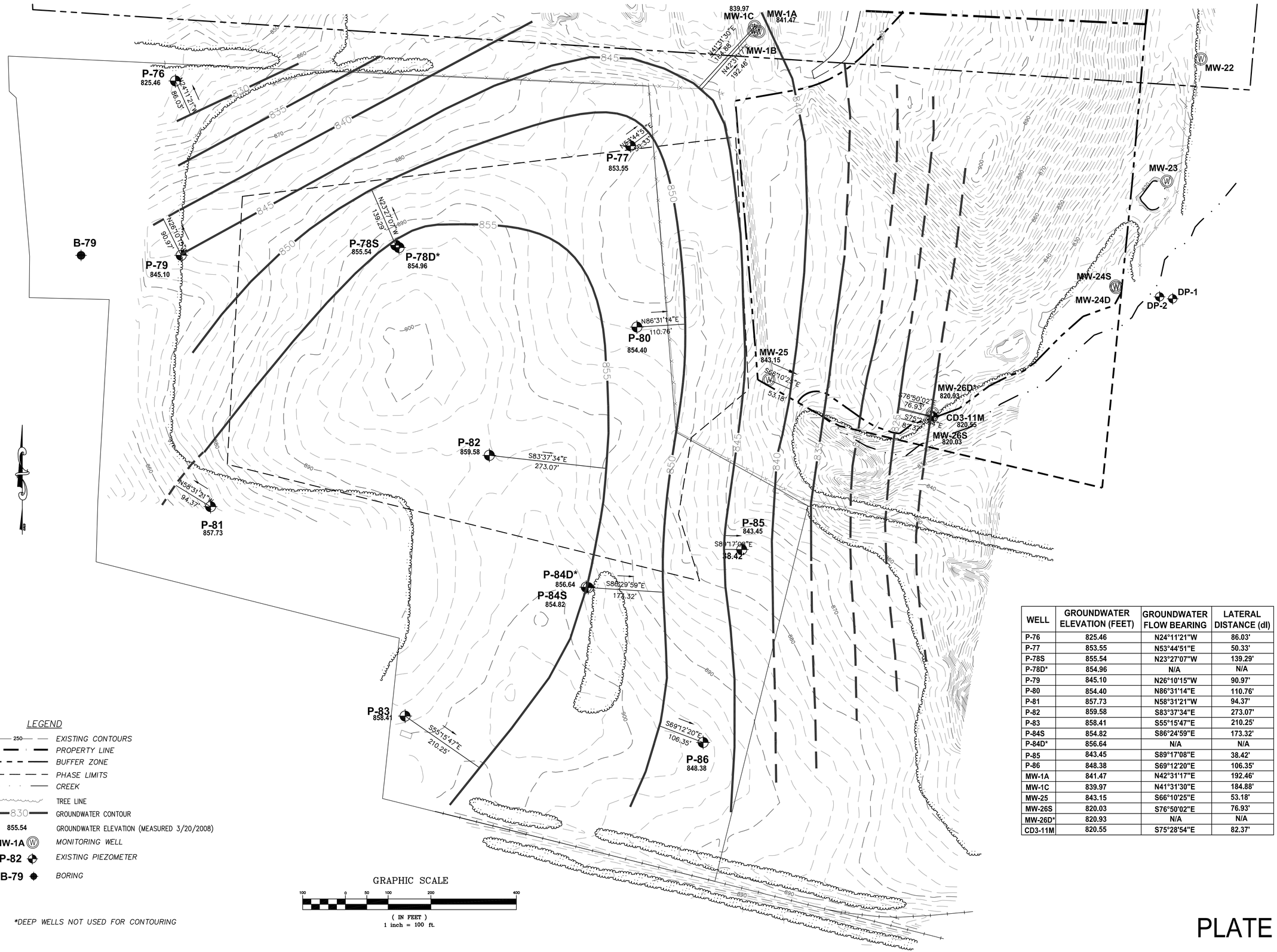
P.O. BOX 828 MOREHEAD CITY, N.C. 28557 (252) 726-9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

GENERAL SITE MAP

DATE	BY	REV.	DESCRIPTION

SCALE: 1" = 100'
DATE: 05/13/2009
DRWN. BY: M. GERMAN
CHKD. BY: M. GERMAN
PROJECT NUMBER G08002.0
DRAWING NO. PLATE 2
SHEET NO. 1 of 1



WELL	GROUNDWATER ELEVATION (FEET)	GROUNDWATER FLOW BEARING	LATERAL DISTANCE (dl)
P-76	825.46	N24°11'21"W	86.03'
P-77	853.55	N53°44'51"E	50.33'
P-78S	855.54	N23°27'07"W	139.29'
P-78D*	854.96	N/A	N/A
P-79	845.10	N26°10'15"W	90.97'
P-80	854.40	N86°31'14"E	110.76'
P-81	857.73	N58°31'21"W	94.37'
P-82	859.58	S83°37'34"E	273.07'
P-83	858.41	S55°15'47"E	210.25'
P-84S	854.82	S86°24'59"E	173.32'
P-84D*	856.64	N/A	N/A
P-85	843.45	S89°17'08"E	38.42'
P-86	848.38	S69°12'20"E	106.35'
MW-1A	841.47	N42°31'17"E	192.46'
MW-1C	839.97	N41°31'30"E	184.88'
MW-25	843.15	S66°10'25"E	53.18'
MW-26S	820.03	S76°50'02"E	76.93'
MW-26D*	820.93	N/A	N/A
CD3-11M	820.55	S75°28'54"E	82.37'

LEGEND

- 250 — EXISTING CONTOURS
- PROPERTY LINE
- BUFFER ZONE
- PHASE LIMITS
- CREEK
- TREE LINE
- 830 — GROUNDWATER CONTOUR
- 855.54 — GROUNDWATER ELEVATION (MEASURED 3/20/2008)
- MW-1A — MONITORING WELL
- P-82 — EXISTING PIEZOMETER
- B-79 — BORING

*DEEP WELLS NOT USED FOR CONTOURING

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PLATE 3

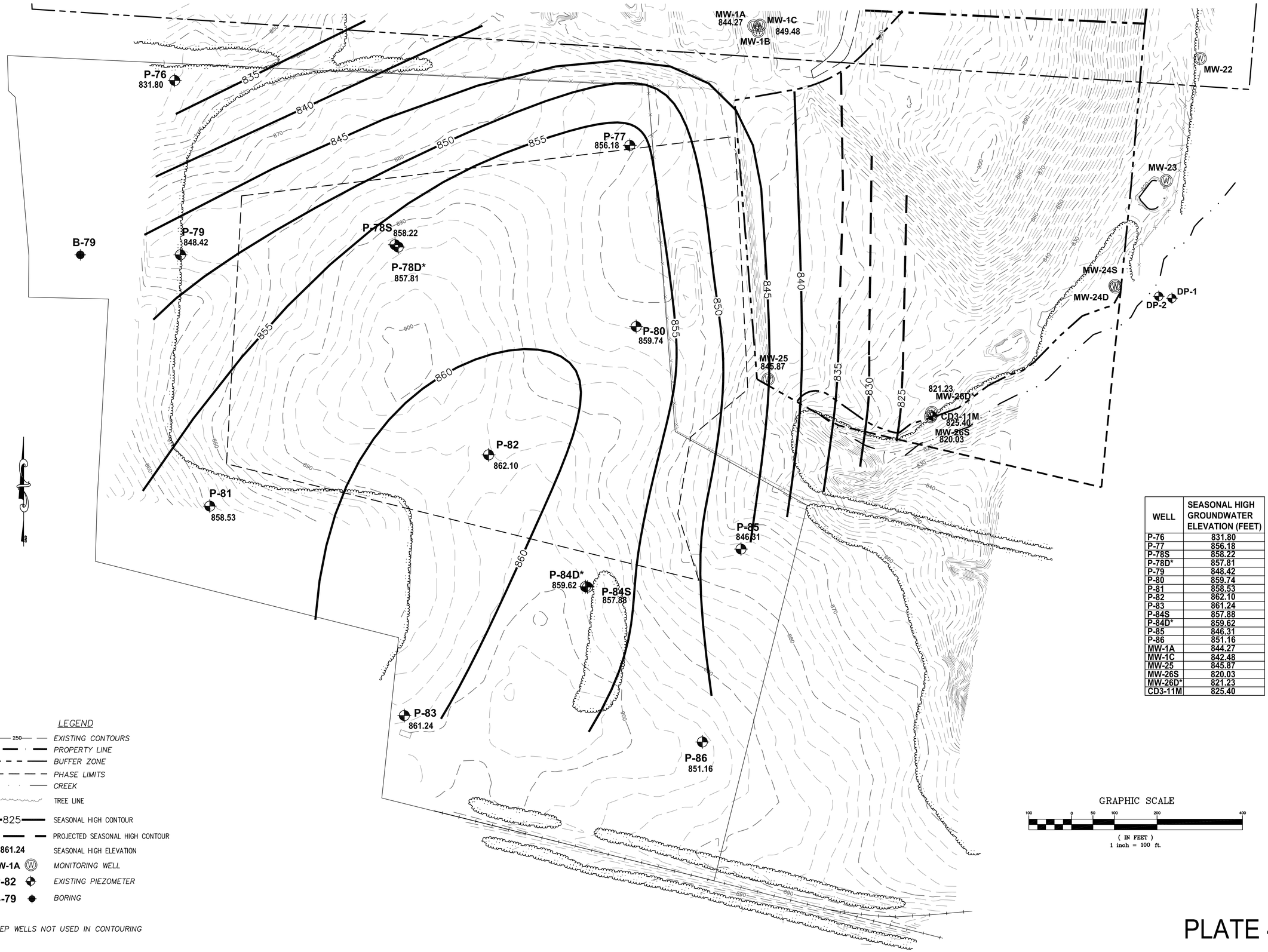
Municipal Engineering Services Company, P.A.
LICENSE NUMBER: C-0281
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557 (252) 726-9481

STEELE PROPERTY
LANDFILL FACILTIY
IREDELL COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

SINGLE DAY POTENTIOMETRIC MAP
WITH FLOW DIRECTIONS

SCALE: 1" = 100'
DATE: 05/13/2009
DRWN. BY: M. GERMAN
CHKD. BY: M. GERMAN
PROJECT NUMBER G08002.0
DRAWING NO. PLATE 3
SHEET NO. 1 of 1



WELL	SEASONAL HIGH GROUNDWATER ELEVATION (FEET)
P-76	831.80
P-77	856.18
P-78S	858.22
P-78D*	857.81
P-79	848.42
P-80	859.74
P-81	858.53
P-82	862.10
P-83	861.24
P-84S	857.88
P-84D*	859.62
P-85	846.31
P-86	851.16
MW-1A	844.27
MW-1C	842.48
MW-25	845.87
MW-26S	820.03
MW-26D*	821.23
CD3-11M	825.40

PLATE 4A

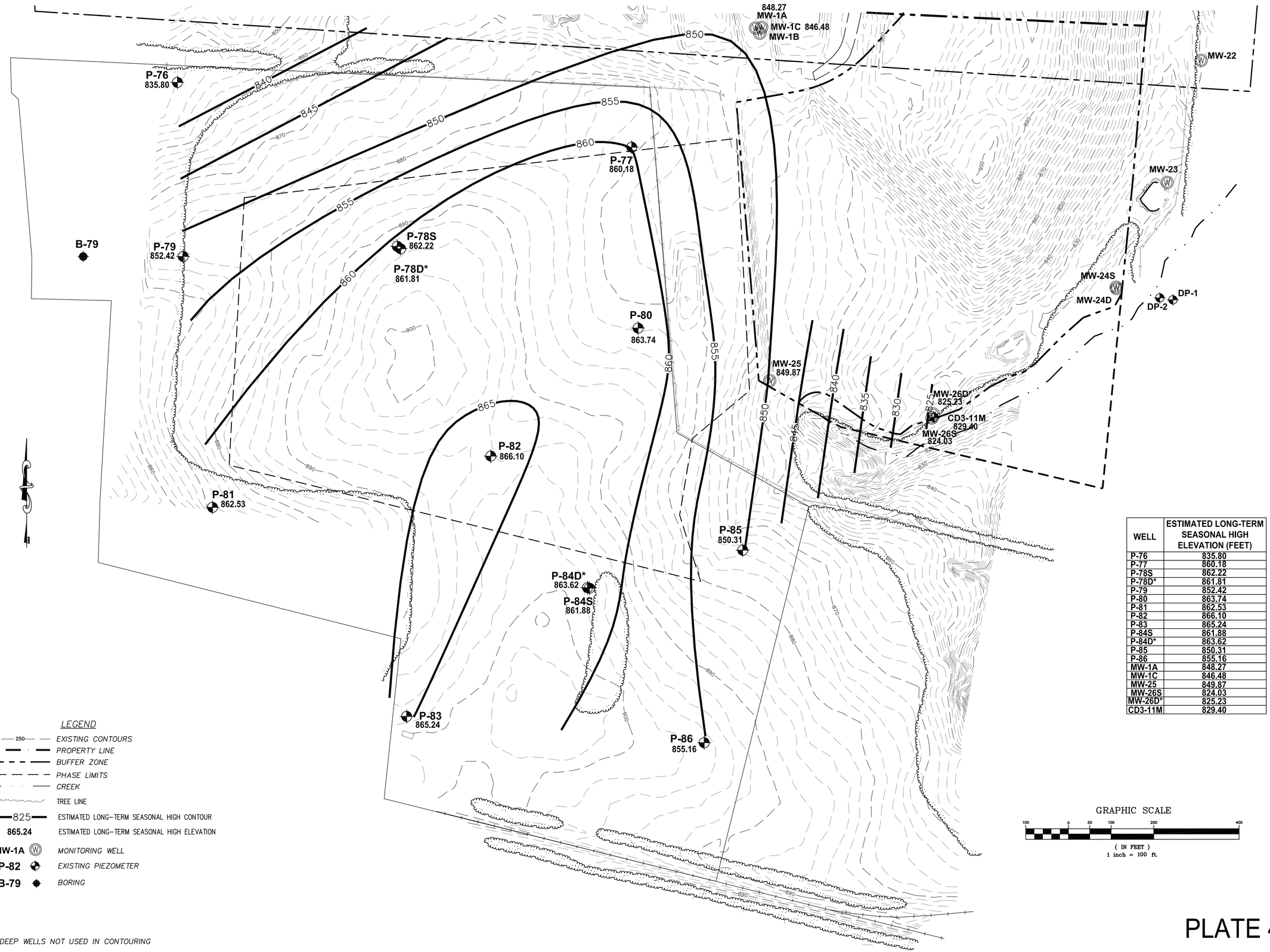
LICENSE NUMBER: C-0281
Municipal Services Engineering Company, P.A.
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557 (252) 726-9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

SEASONAL HIGH WATER TABLE

SCALE: 1" = 100'
DATE: 05/13/2009
DRWN. BY: M. GERMAN
CHKD. BY: M. GERMAN
PROJECT NUMBER G08002.0
DRAWING NO. PLATE 4A
SHEET NO. 1 of 1



WELL	ESTIMATED LONG-TERM SEASONAL HIGH ELEVATION (FEET)
P-76	835.80
P-77	860.18
P-78S	862.22
P-78D*	861.81
P-79	852.42
P-80	863.74
P-81	862.53
P-82	866.10
P-83	865.24
P-84S	861.88
P-84D*	863.62
P-85	850.31
P-86	855.16
MW-1A	848.27
MW-1C	846.48
MW-25	849.87
MW-26S	824.03
MW-26D*	825.23
CD3-11M	829.40

LEGEND

- 250 — EXISTING CONTOURS
- PROPERTY LINE
- BUFFER ZONE
- PHASE LIMITS
- CREEK
- TREE LINE
- 825 — ESTIMATED LONG-TERM SEASONAL HIGH CONTOUR
- 865.24 — ESTIMATED LONG-TERM SEASONAL HIGH ELEVATION
- MW-1A — MONITORING WELL
- P-82 — EXISTING PIEZOMETER
- B-79 — BORING

* DEEP WELLS NOT USED IN CONTOURING

PLATE 4B

Municipal Services Engineering Company, P.A.
LICENSE NUMBER: C-0281
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 828 MOREHEAD CITY, N.C. 28557 (252) 726-9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

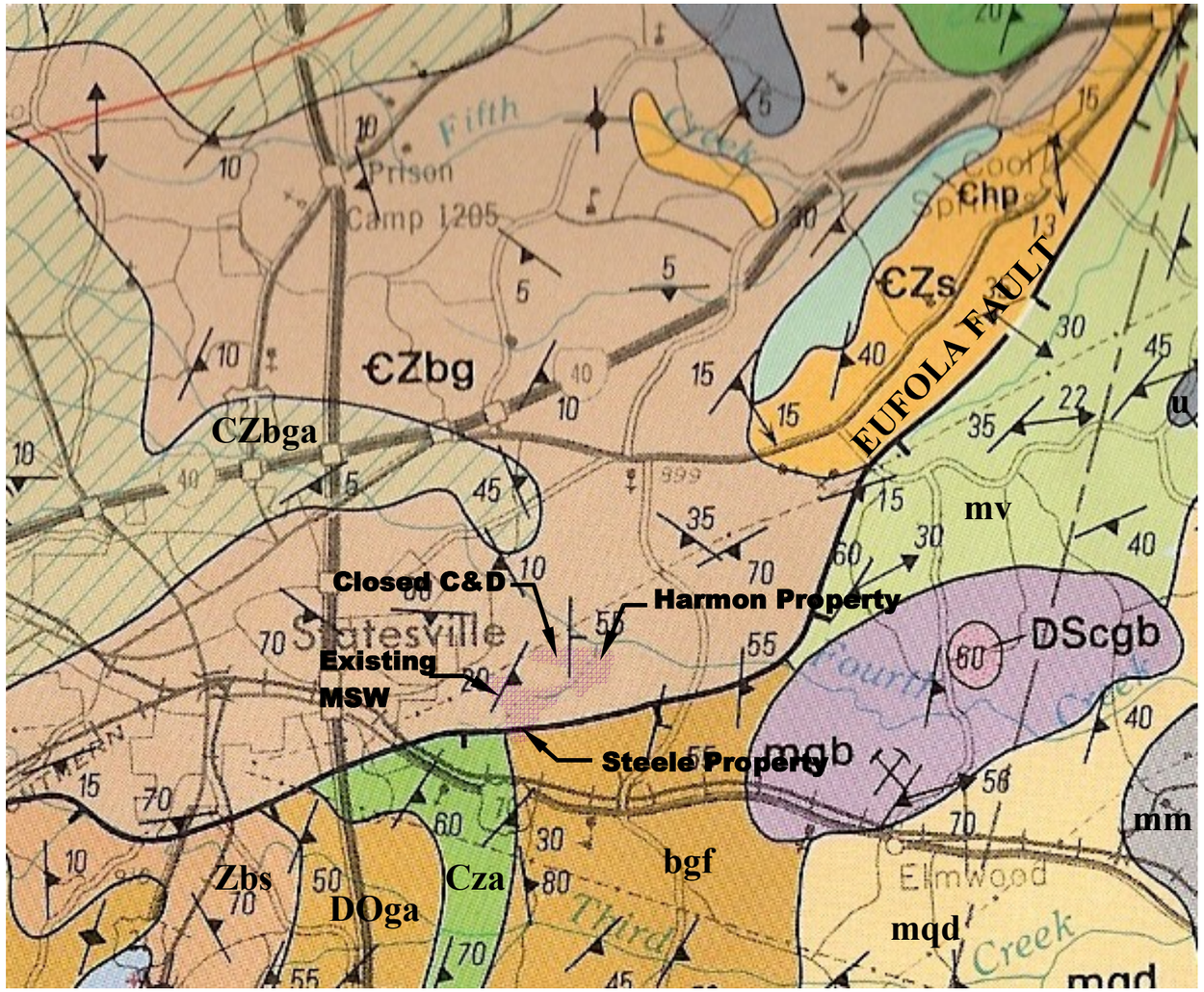
DATE	BY	REV.	DESCRIPTION

ESTIMATED LONG-TERM SEASONAL HIGH WATER TABLE

SCALE:	1" = 100'
DATE:	05/13/2009
DRWN. BY:	M. GERMAN
CHKD. BY:	M. GERMAN
PROJECT NUMBER	G08002.0
DRAWING NO.	PLATE 4B
SHEET NO.	1 of 1

Regional Characterization Map

Site Suitability – Iredell County, Steele Property



5 0 5 MILES

Date Completed	4/16/2008
Created By	M. German
Project Name	Site Suitability Study
Site Name	Iredell County, Steele Property
Project Number	G08002.0

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

FORMATION DESCRIPTION

Inner Piedmont Belt

Chp: Henderson Gneiss- Cambrian, fine grained, with subhedral megacrysts, commonly have rapakivi texture, and tend to be arranged in a flow pattern, commonly containing garnet.

CZs: White Mica Schist- Yellow grey to blue grey, medium to coarse grained schist composed of white mica, quartz, minor biotite and local oligoclase. Garnet secondary chlorite and tourmaline are common, staurolite and kyanite are sporadic, Typically, coarse grained and quartz rich near the Cherryville Granite.

CZbg: Biotite Gneiss – Grey to dark grey, thin to thick layered biotite, quartz, feldspar gneiss, garnetiferous, locally inequigranular and porphyroblastic, interlayered with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite.

CZa: Amphibolite- Dark grey, fine to medium grained, thin to thick layered amphibolite composed mostly of plagioclase, hornblende and smaller amounts of diopside, epidote, and quartz. pods and thin layers of calc-silicate rock are present. Small non-layered masses of metadiorite and metagabbro are included in the unit.

CZbga: biotite gneiss and amphibolite- Interlayered biotite gneiss, hornblende, gneiss, amphibolite, metagabbro, and subordinate mica schist. Locally contains much granitoid rock, forms migmatite resembling migmatic granitoid gneiss.

Kings Mountain Belt

Zbs: Quartz-Sericite Schist- Battleground formation, very fine to medium grained quartz sericite schist and phyllite, very light grey light blueish grey, light brown or yellow grey in color. Typically greater than 50% quartz with sericitic white mica; accessory minerals include chloritoid, biotite, pyrite, hematite, kyanite, andelusite, sillmanite, staurolite, garnet, albite, chlorite, tourmaline, zircon, and graphite.

Charlotte Belt

DScgb: Gabbro of Concord Plutonic Suite-Devonian and Silurian, Gabbro, norite, gabrronorite and hornblende gabbro. Major minerals are plagioclase, clinopyroxene and orthopyroxene, hornblende, biotite, and olivine or quartz.

bfg: Fine Grained Biotite Gniess- dominantly of granodiorite composition, probably metamorphosed dacitic volcanics.

mv: undivided metavolcanic rock-Commonly interbedded felsic metavolcanic and mafic, with intermediate metavolcanic type, those in the Charlotte Belt probably correlative, in part with the Battleground Formation

mgb: Metagabbro- Dark coarse grained, abundant amphibole replaces olivine and pyroxene, epidote is common, biotite and spinel may be present, plagioclase is less abundant than mafic minerals, quartz is rare or absent.

mqd: Metamorphosed quartz diorite and tonalite- Grey, medium to coarse grained, foliated rock composed dominantly of plagioclase, quartz, biotite, hornblende, and epidote. Biotite, hornblende, and epidote occur in clots replacing the original mafic phenocrysts.

mm: Metamorphosed mafic complex- Metamorphic equivalents of gabbroic and ultramafic intrusives, hypabyssal and extrusive basalts.

Intrusive and Altered Rock

u: Ultramafic Rock- variably altered ultramafic rocks, weakly to strongly foliated, consist of serpentine, amphibole, talc, chlorite, scapolite, opaque minerals,relict pyroxene, and rare olivine in different proportions and combinations.

Taken From: Goldsmith, R, Milton, D.J., Horton, J.W.Jr., The Charlotte 1°x2° Quadrangle, North and South Carolina, 1988.

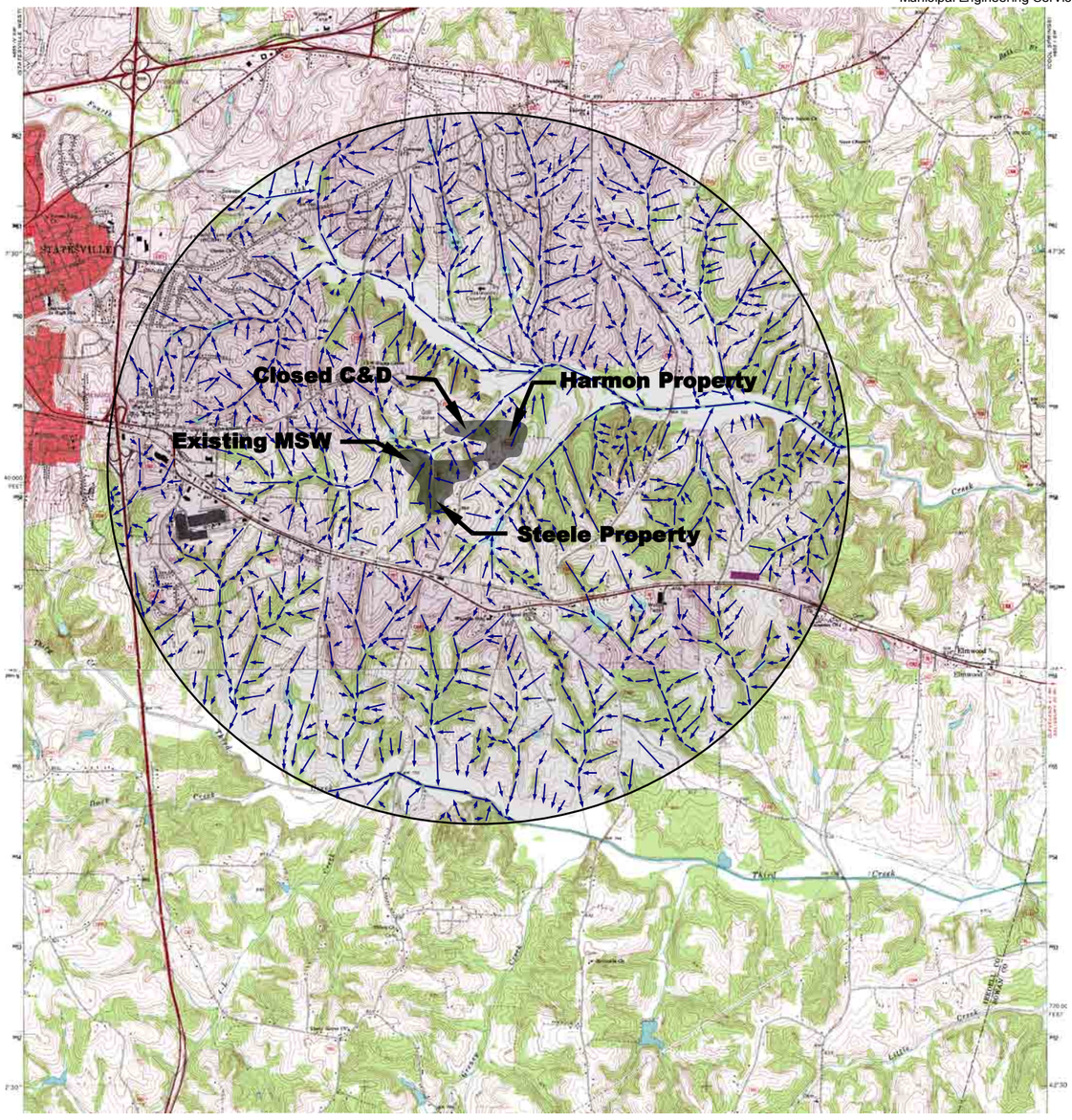
PLATE 5

Stream Trace Analysis with Rose Diagram

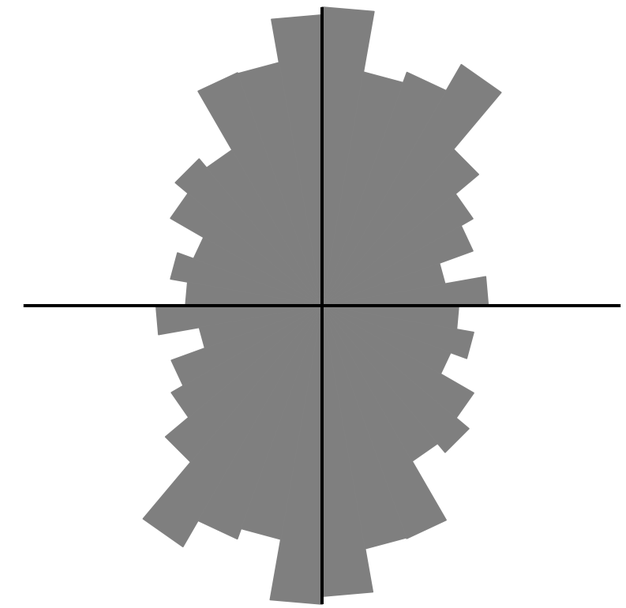
Date Completed	04/16/2008
Created By	M. German
Project Name	Site Suitability Study
Site Name	Iredell County- Steele Property
Project Number	G08002.0

Municipal Engineering Services Company, PA

Site Suitabiltiy – Iredell County, Steele Property

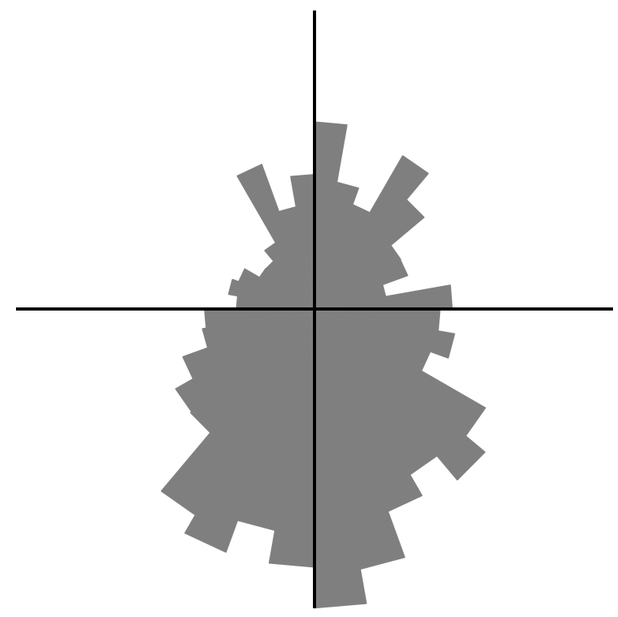


Symmetric Mode



Range	Score
N80-90W	46%
N70-80W	52%
N60-70W	46%
N50-60W	59%
N40-50W	64%
N30-40W	60%
N20-30W	83%
N10-20W	83%
N0-10W	97%
N0-10E	100%
N10-20E	79%
N20-30E	83%
N30-40E	93%
N40-50E	69%
N50-60E	58%
N60-70E	54%
N70-80E	42%
N80-90E	56%

Asymmetric Mode



Range	Score
N80-90W	26%
N70-80W	29%
N60-70W	27%
N50-60W	21%
N40-50W	21%
N30-40W	26%
N20-30W	52%
N10-20W	35%
N0-10W	45%
N0-10E	63%
N10-20E	43%
N20-30E	37%
N30-40E	59%
N40-50E	48%
N50-60E	33%
N60-70E	33%
N70-80E	24%
N80-90E	46%

Range	Score
S80-90E	42%
S70-80E	48%
S60-70E	41%
S50-60E	66%
S40-50E	75%
S30-40E	64%
S20-30E	72%
S10-20E	88%
S0-10E	100%
S0-10W	86%
S10-20W	75%
S20-30W	87%
S30-40W	80%
S40-50W	54%
S50-60W	53%
S60-70W	47%
S70-80W	38%
S80-90W	37%

QUADRANGLE LEGEND

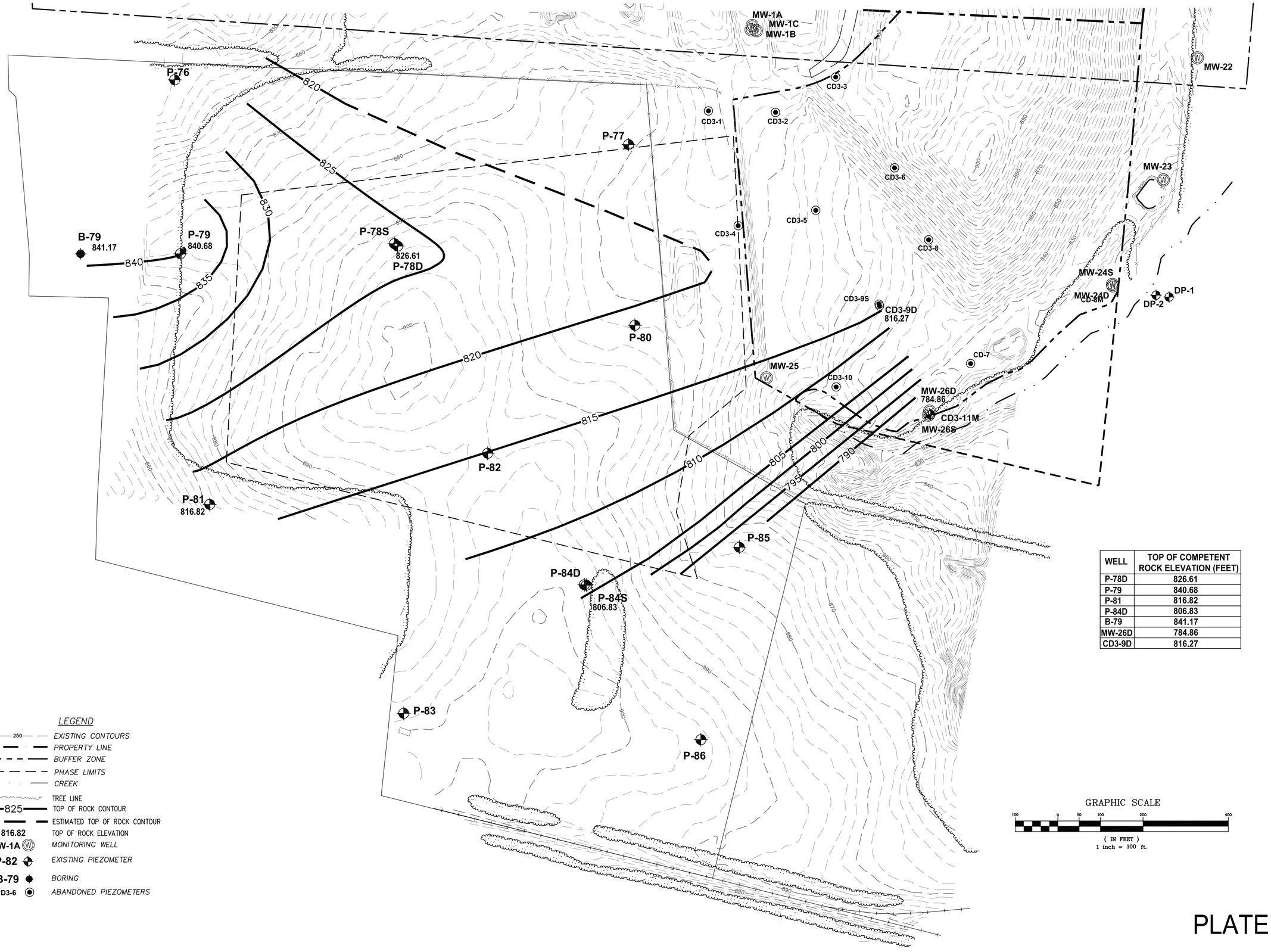
1 0 1 MILES

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.

PLATE 6



WELL	TOP OF COMPETENT ROCK ELEVATION (FEET)
P-78D	826.61
P-79	840.68
P-81	816.82
P-84D	806.83
B-79	841.17
MW-26D	784.86
CD3-9D	816.27

LEGEND

- 250 — EXISTING CONTOURS
- PROPERTY LINE
- BUFFER ZONE
- PHASE LIMITS
- CREEK
- TREE LINE
- 825 — TOP OF ROCK CONTOUR
- ESTIMATED TOP OF ROCK CONTOUR
- 816.82 — TOP OF ROCK ELEVATION
- MW-1A — MONITORING WELL
- P-82 — EXISTING PIEZOMETER
- B-79 — BORING
- CD3-6 — ABANDONED PIEZOMETERS

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PLATE 7

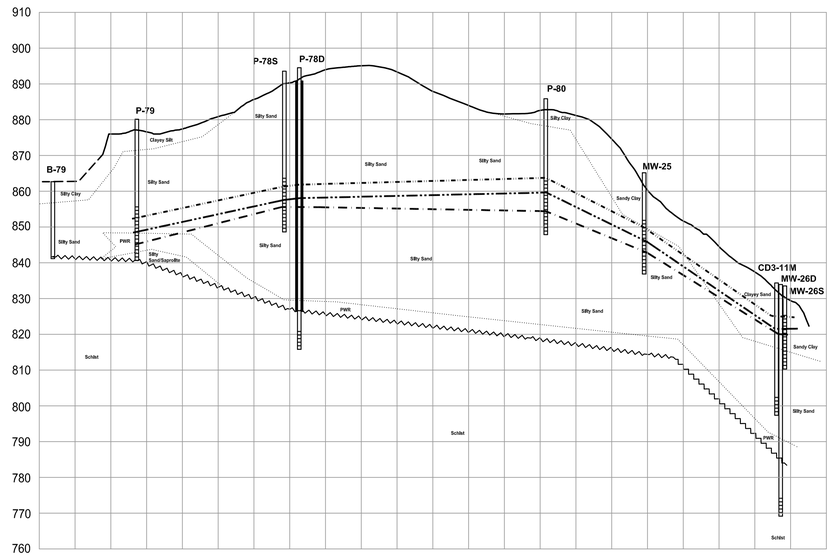
Municipal Services Engineering Company, P.A.
LICENSE NUMBER: C-0281
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557 (252) 726-9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

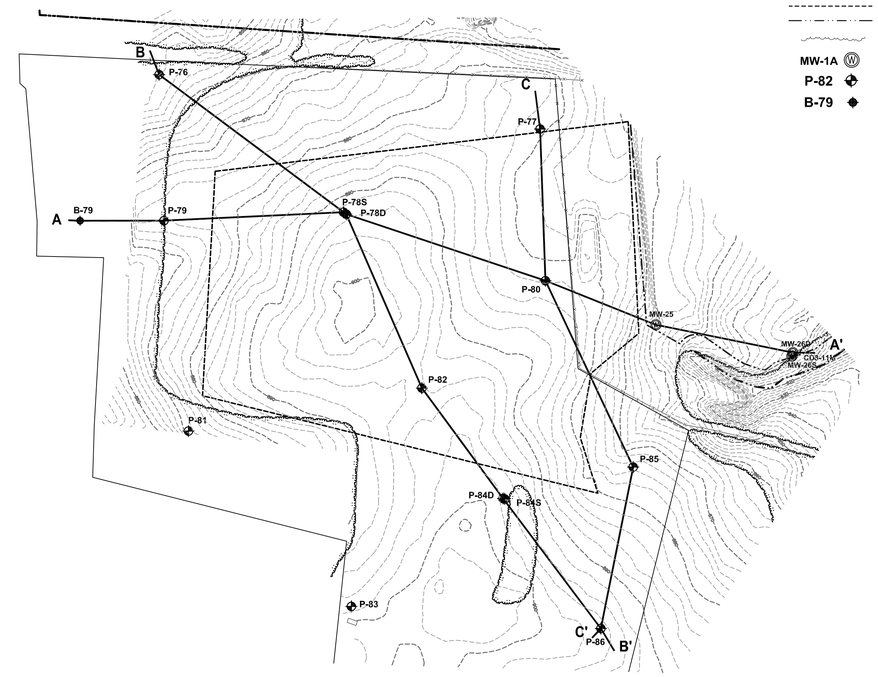
TOP OF COMPETENT ROCK

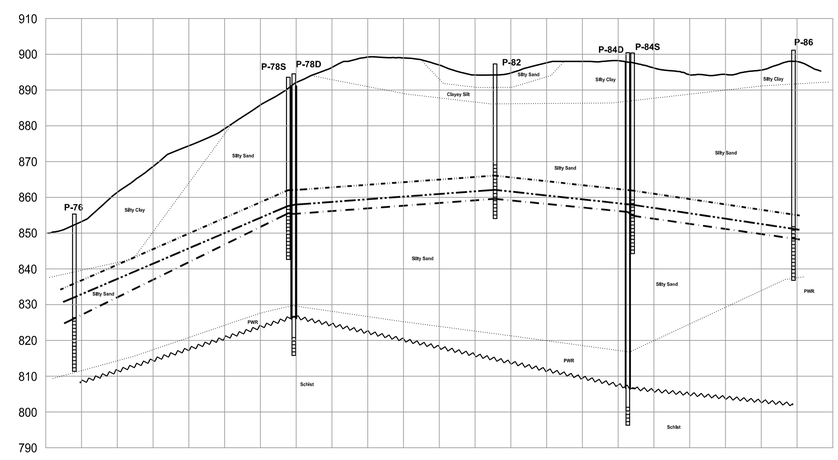
SCALE: 1" = 100'
DATE: 05/13/2009
DRWN. BY: M. GERMAN
CHKD. BY: M. GERMAN
PROJECT NUMBER G08002.0
DRAWING NO. PLATE 7
SHEET NO. 1 of 1



SECTION A-A'

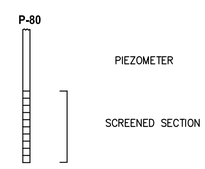
SCALE HORIZ. 1" = 100'
VERT. 1" = 10'





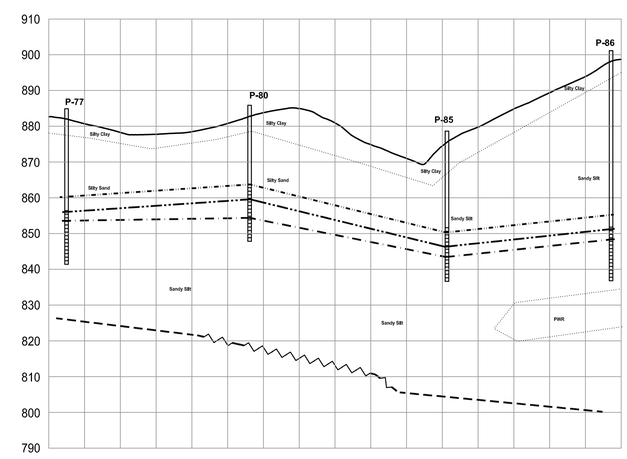
SECTION B-B'

SCALE HORIZ. 1" = 100'
VERT. 1" = 10'



LEGEND:

- EXISTING GROUND SURFACE
- ESTIMATED STRATIGRAPIC CONTACT
- TOP OF COMPETENT ROCK
- ESTIMATED TOP OF COMPETENT ROCK
- SINGLE DAY
- OBSERVED SEASONAL HIGH
- ESTIMATED LONG–TERM SEASONAL HIGH



SECTION C-C'

SCALE HORIZ. 1" = 100'
VERT. 1" = 10'

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.
- SINGLE DAY WATER TABLE AND TOP OF ROCK SURFACES WERE DERIVED FROM THEIR RESPECTIVE CONTOUR SURFACES IN PLATES 3 AND 7.

PLATE 8

LICENSE NUMBER: C–0281
Municipal Services
P.O. BOX 97 GARNER, N.C. 27529
(919) 772–5393
Engineering Company, P.A.
P.O. BOX 349 BOONE, N.C. 28607
(828) 262–1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557
(252) 726–9481

STEELE PROPERTY
LANDFILL FACILITY
IREDELL COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

CROSS SECTIONS

SCALE:	AS SHOWN
DATE:	05/13/2009
DRWN. BY:	M. GERMAN
CHKD. BY:	M. GERMAN
PROJECT NUMBER	G08002.0
DRAWING NO.	PLATE 8
SHEET NO.	1 of 1

APPENDIX A

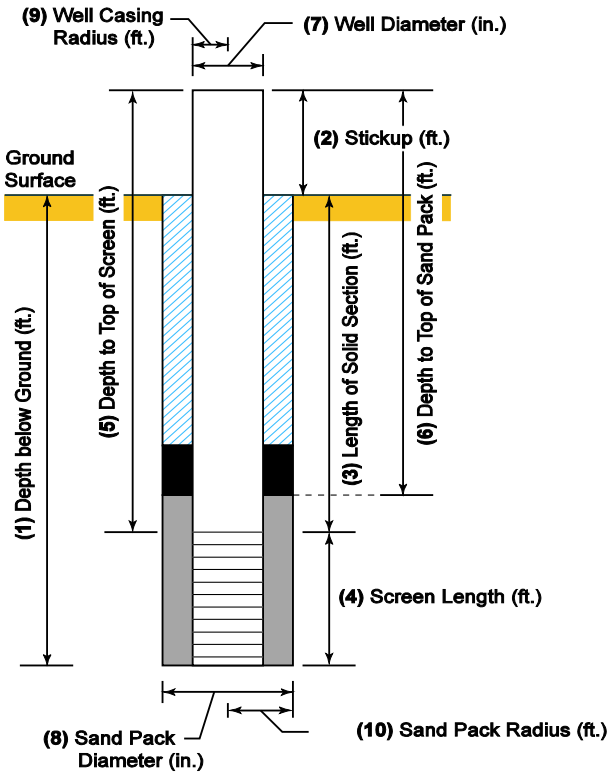
Table A-1. Piezometer geometry summary

Well	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
P-76	40.90	3.07	25.90	15	28.97	27.63	2	6.5	0.08	0.27
P-77	40.50	2.98	25.50	15	28.48	27.08	2	7.75	0.08	0.32
P-78S	48.22	2.71	33.22	15	35.93	34.56	2	7.75	0.08	0.32
P-78D	75.81	2.93	70.81	5	73.74	72.46	2	6	0.08	0.25
P-79	36.52	2.95	21.52	15	24.47	23.05	2	7.75	0.08	0.32
P-80	35.00	3.01	20.00	15	23.01	21.56	2	7.75	0.08	0.32
P-81	23.90	2.93	8.90	15	11.83	10.43	2	7.75	0.08	0.32
P-82	40.20	3.02	25.20	15	28.22	26.82	2	8.25	0.08	0.34
P-83	50.25	2.94	35.25	15	38.19	36.82	2	7.75	0.08	0.32
P-84S	53.47	2.63	38.47	15	41.10	39.73	2	8.25	0.08	0.34
P-84D	101.52	2.62	96.52	5	99.14	97.87	2	6	0.08	0.25
P-85	38.86	3.15	23.86	15	27.01	25.27	2	7.75	0.08	0.32
P-86	61.26	3.08	46.26	15	49.34	48.26	2	7.75	0.08	0.32

NOTE:

1. Parameters in this table are numbered (1) through (10), and correspond to the numbers in the diagram adjacent to the table.

2. All data in this table is in units of feet except for well diameter (7) and and pack diameter (8) which are in units of inches.



LOG OF BORING: P-76

Iredell Landfill Steele Property **Project No. G08002.0**

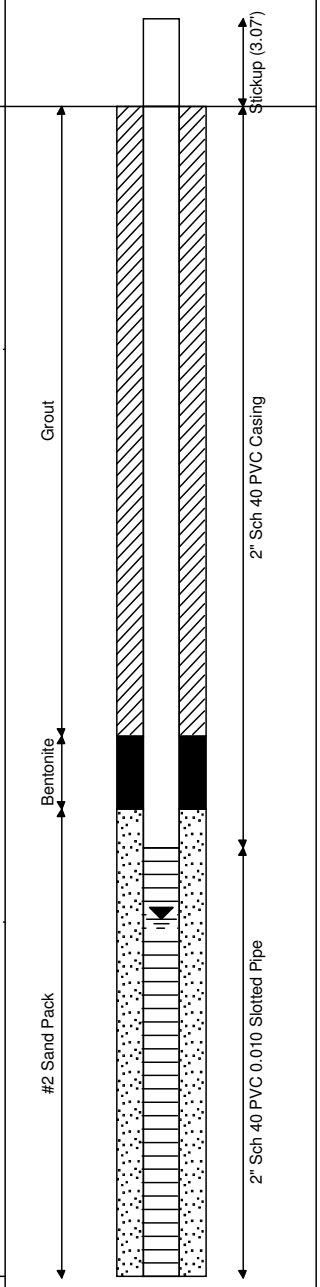
Drilling contractor: Derry's Well Drilling
Drill rig & method: 6.5" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/25/2008
Date ended: 2/25/2008
Completion depth: 40.90 ft
Stickup height: 3.07 ft

Surface elevation: 852.26 ft (MSL)
Top of pipe elevation: 855.33 ft (MSL)
Depth to water (TOB): 31.00 ft
Depth to water (24hrs): 28.38 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	6			Silty Clay; red, cohesive, trace sand and mica, moist
	15			Silty Clay; red, same as above, trace quartz fragments
5				
	8			Silt with Clay; red, cohesive, few cobble sized quartz fragments, few black silt partings, slightly micaceous, dry
10				
	5			Silt; red, trace fine grained sand, black organic silt partings, few feldspar partings, dry
15				
	5			Silt; same as above, feldspar partings
20				
	5			Silt; same as above, wet
25				
	6			Sandy Silt; dark brown, micaceous silt with tan, poorly sorted sand, feldspar, black silt striations, relict structure, moist
30				
	6			Sandy Silt; same as above
35				
	4			Silty Sand; same as above, wet
40				
				Boring terminated at 40.9 feet
45				

Well Diagram



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LOG OF BORING: P-77

Iredell Landfill Steele Property **Project No. G08002.0**

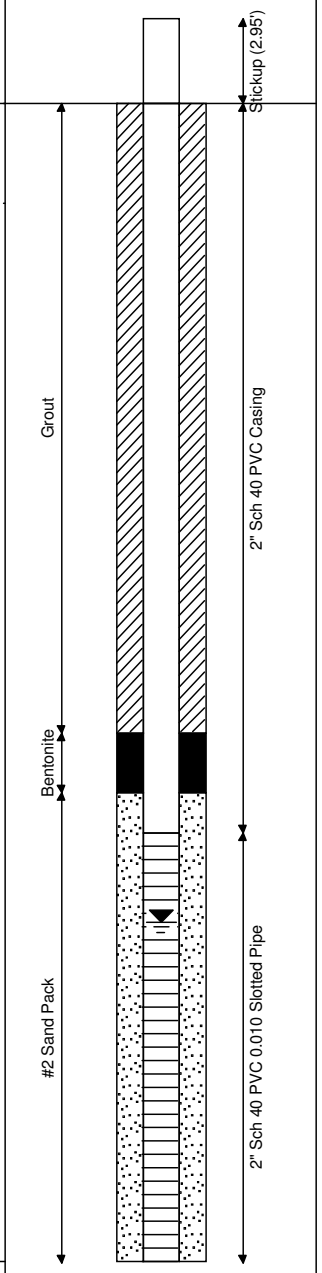
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" HSA w/ SS
Logged by: J. Pfohl

Date started: 2/20/2008
Date ended: 2/20/2008
Completion depth: 40.50 ft
Stickup height: 2.95 ft

Surface elevation: 881.95 ft (MSL)
Top of pipe elevation: 884.90 ft (MSL)
Depth to water (TOB): 30.00 ft
Depth to water (24hrs): 28.60 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	8			Silty Clay; red, cohesive, moist
	11			Sandy Silt with Clay; red, dry
5				
	7			Silty Sand; red brown, poorly sorted sand laminated with tan and olive grey, micaceous silt, dry
10				
	7			Silty Sand; same as above
15				
	8			Silty Sand; same as above, distinct foliation
20				
	5			Silty Sand; same as above, distinct relict structure, black silt nodules
25				
	5			Sandy Silt; olive grey, micaceous silt laminated with poorly sorted red brown sand, black and white silt nodules, moist
30				
	6			Sandy Silt; same as above
35				
	4			Sandy Silt; same as above, wet
40				Boring terminated at 40.5 feet
45				

Well Diagram



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LOG OF BORING: P-78S

Iredell Landfill Steele Property **Project No. G08002.0**

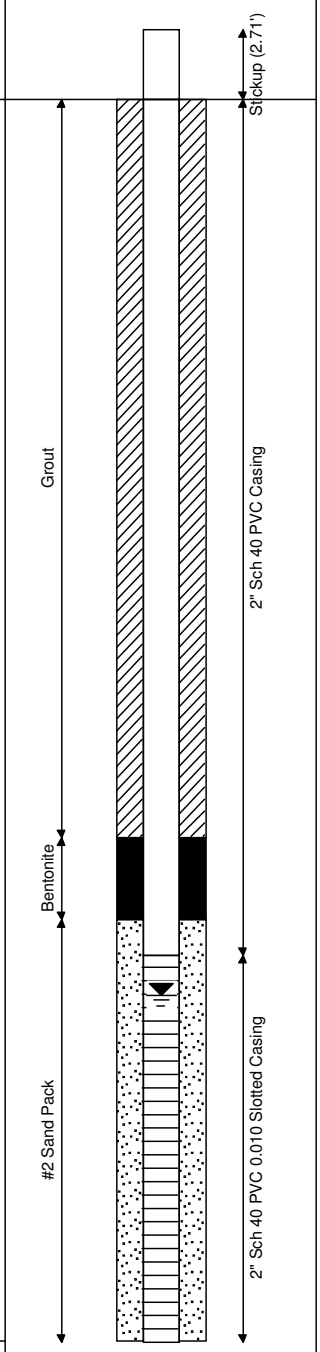
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ STP
Logged by: J. Pfohl

Date started: 2/28/2008
Date ended: 2/28/2008
Completion depth: 48.22 ft
Stickup height: 2.71 ft

Surface elevation: 890.86 ft (MSL)
Top of pipe elevation: 893.57 ft (MSL)
Depth to water (TOB): 33.00 ft
Depth to water (24hrs): 34.79 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	6			Silty Sand; dark red poorly sorted sand with olive grey micaceous silt, moist
5	9			Silty Sand; dark red, poorly sorted sand laminated with micaceous, olive grey silt and tan silt partings, gravel sized quartz fragments, dry
10	10			Silty Sand; same as above, angular quartz seams
15	7			Silty Sand; olive grey, micaceous silt laminated with dark red sand, relict structure, dry
20				Silty Sand (SM); Gravel = 0.00%, Sand = 64.49%, Silt & Clay = 35.51%, Non-Plastic
25	10			Silty Sand; same as above
30	8			Sandy Silt; grey with white feldspar and black silt partings, few quartz fragments, very micaceous, moist
35	8			Sandy Silt; same as above
				Silty Sand; yellow orange, coarse grained, wet
40	8			Silty Sand; olive grey, micaceous silt, gravel size quartz grains, wet
45	9			Sandy Silt; same as above
50				Boring terminated at 48.2 feet

Well Diagram



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LOG OF BORING: P-78D

Iredell Landfill Steele Property **Project No. G08002.0**

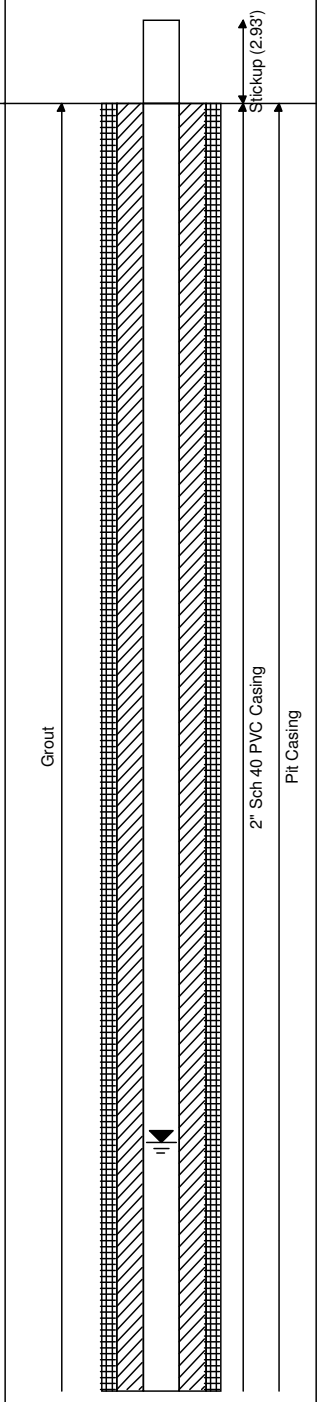
Drilling contractor: Derry's Well Drilling
Drill rig & method: HSA w/SPT, NQ Core, 6"DTH Ream
Logged by: J. Pfohl

Date started: 2/28/2008
Date ended: 2/28/2008
Completion depth: 75.81 ft
Stickup height: 2.93 ft

Surface elevation: 891.61 ft (MSL)
Top of pipe elevation: 894.54 ft (MSL)
Depth to water (TOB):
Depth to water (24hrs): 36.32 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	6			Silty Sand; dark red, poorly sorted sand with olive grey, micaceous silt, moist
5	9			Silty Sand; dark red, poorly sorted sand laminated with micaceous, olive grey silt and tan silt partings, gravel sized quartz fragments, dry
10	10			Silty Sand; same as above, angular quartz seams
15	7			Silty Sand; olive grey, micaceous silt laminated with dark red sand, relict structure, dry
20				Silty Sand (SM); Gravel = 0.00%, Sand = 64.49%, Silt & Clay = 35.51%, Non-Plastic
25	10			Silty Sand; same as above
30	8			Sandy Silt; grey with white feldspar and black silt partings, few quartz fragments, very micaceous, moist
35	8			Sandy Silt; same as above Silty Sand; yellow orange, coarse grained, wet
40	8			Silty Sand; olive grey, micaceous silt, gravel size quartz grains, wet
45	9			Sandy Silt; same as above

Well Diagram



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LOG OF BORING: P-78D

Iredell Landfill Steele Property **Project No. G08002.0**

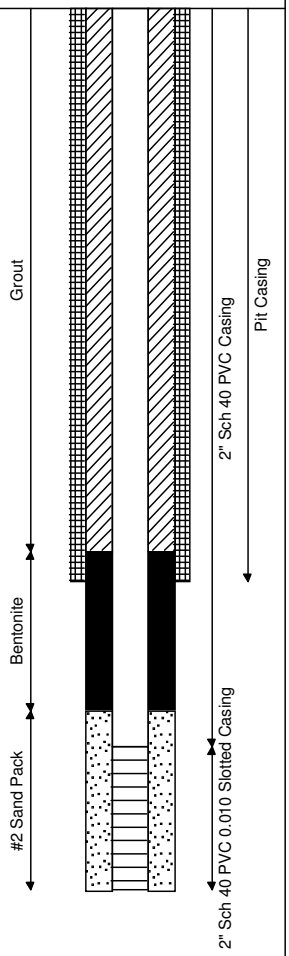
Drilling contractor: Derry's Well Drilling
Drill rig & method: HSA w/SPT, NQ Core, 6"DTH Ream
Logged by: J. Pfohl

Date started: 2/28/2008
Date ended: 2/28/2008
Completion depth: 75.81 ft
Stickup height: 2.93 ft

Surface elevation: 891.61 ft (MSL)
Top of pipe elevation: 894.54 ft (MSL)
Depth to water (TOB):
Depth to water (24hrs): 36.32 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
50	14		X	Silty Sand; yellow orange and dark brown, poorly sorted sand laminated with olive grey, micaceous silt, gravel size quartz fragments, black silt nodules, moist
55	28		X	Silty Sand/Saprolite; same as above, relict structure, moist
60	30		X	Silty Sand/Saprolite; yellow orange and dark brown, poorly sorted sand laminated with olive grey, micaceous silt, gravel sized quartz, black silt nodules, well defined relict structure, iron stains, moist
				PWR Top of Competent Rock = 826.61 ft AMSL
65				Run #1: (65.0' - 69.0') REC = 2.42'/4.00' = 60.5%, RQD = 0/4.00' = 0% Schist; light grey, quartzose, foliation w/ 10 degree dip
70				Run #2: (69.00' - 75.50') REC = 6.5'/6.5' = 100%, RQD = 2.5'/6.5' = 38.46% Schist; light grey, quartzose, foliated with 10 degree dip
75				Boring terminated at 75.8 feet
80				
85				
90				

Well Diagram



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LOG OF BORING: P-79

Iredell Landfill Steele Property **Project No. G08002.0**

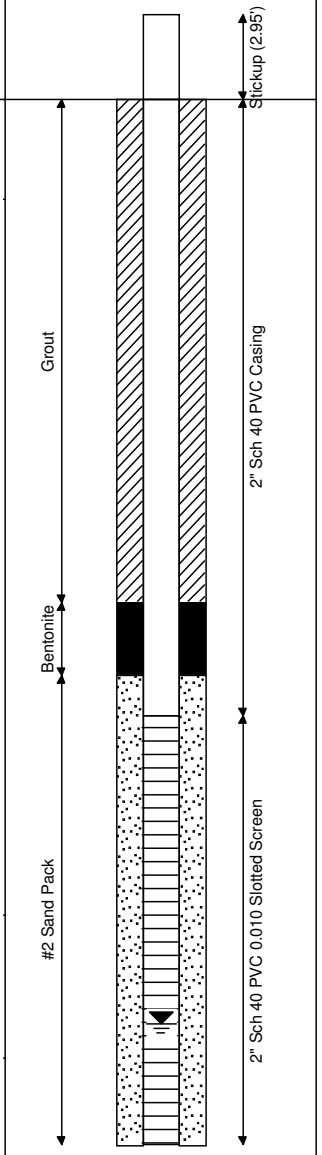
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/27/2008
Date ended: 2/27/2008
Completion depth: 36.52 ft
Stickup height: 2.95 ft

Surface elevation: 877.18 ft (MSL)
Top of pipe elevation: 880.13 ft (MSL)
Depth to water (TOB): 35.00 ft
Depth to water (24hrs): 32.28 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	13			Clayey Silt; red, cohesive, moist
	18			Silty Sand with Clay; red, poorly graded, dry
5				
	9			Silty Sand; yellow orange, poorly graded, black silt partings, dry
10				
	8			Silty Sand; same as above
15				
	11			Sandy Silt; olive grey, micaceous silt laminated with yellow orange poorly graded sand with gravel size quartz fragments, black silt nodules, dry
20				
	8			Sandy Silt; same as above, relict structure
25				
				PWR; no recovery
30				
	10			Silty Sand/Saprolite; olive grey, micaceous silt laminated with yellow orange sand, few angular PWR fragments, relict structure, moist
35				HSA Refusal - Top of Competent Rock = 840.68 ft AMSL
				Boring terminated at 36.5 feet
40				
45				

Well Diagram



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LOG OF BORING: P-80

Iredell Landfill Steele Property **Project No. G08002.0**

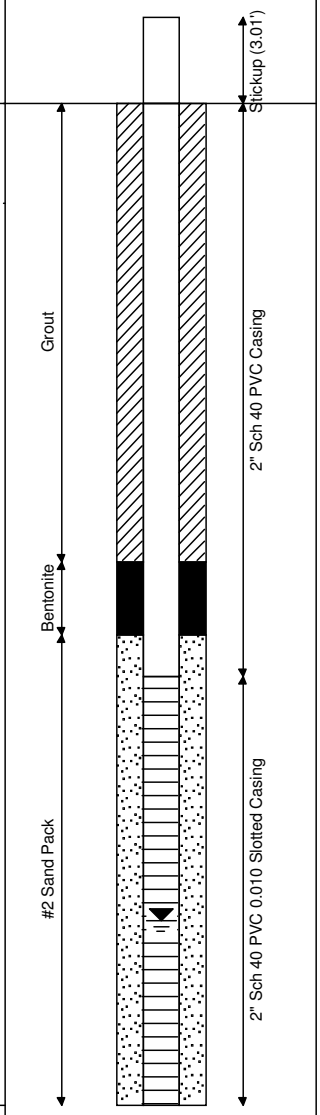
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/27/2008
Date ended: 2/27/2008
Completion depth: 35.00 ft
Stickup height: 3.01 ft

Surface elevation: 882.86 ft (MSL)
Top of pipe elevation: 885.87 ft (MSL)
Depth to water (TOB): 26.00 ft
Depth to water (24hrs): 28.56 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	11			Silty Clay; red, cohesive, moist
	12			Silty Sand with Clay; red, dry
5				
	8			Silty Sand; red brown, poorly sorted, tan and olive grey, micaceous silt, faint structure, dry
10				
	7			Silty Sand; same as above
15				
	7			Silty Sand; same as above, distinct structure, dry
20				
	5			Silty Sand; red brown, poorly sorted sand laminated with olive grey, micaceous silt, dry
25				
	5			Sandy Silt; olive grey, micaceous silt mottled with poorly sorted, red brown sand, black silt nodules, moist
30				
				Sandy Silt; same as above, wet
35				Boring terminated at 35.0 feet
40				
45				

Well Diagram



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LOG OF BORING: P-81

Iredell Landfill Steele Property **Project No. G08002.0**

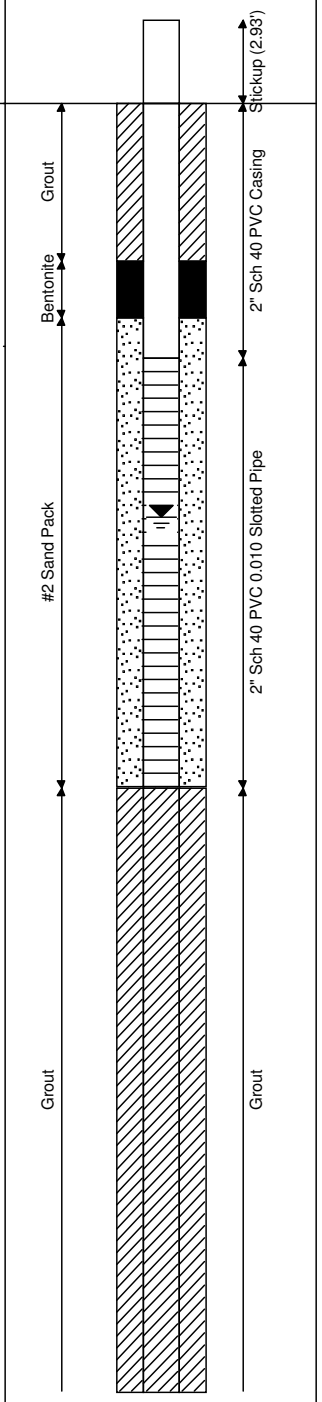
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/21/2008
Date ended: 2/21/2008
Completion depth: 55.00 ft
Stickup height: 2.93 ft

Surface elevation: 871.82 ft (MSL)
Top of pipe elevation: 874.75 ft (MSL)
Depth to water (TOB): 14.00 ft
Depth to water (24hrs): 14.48 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	15			Clayey Silt with Sand; red brown, moderately cohesive, moist
5				
	7			Silty Sand; dark brown, poorly sorted sand with olive grey, micaceous silt, faint relict structure, moist
10				
	3			Sandy Silt; olive grey, micaceous silt, moist w/ trace poorly graded sand
15				
	2			Sandy Silt; same as above, moist
20				
	4			Sandy Silt; olive grey,very micaceous silt, w/ few feldspar seams, trace poorly graded sand and quartz fragments, moist
25				
	6			Sandy Silt; olive grey, very micaceous silt laminated with yellow orange poorly graded sand, black and white silt partings, wet
30				
	7			Sandy Silt; same as above
35				
	56			Silty Sand/Saprolite; olive grey, very micaceous silt interlayered with yellow orange sand, platey PWR fragments, relict structure, moist
40				
	69			Silty Sand/Saprolite; same as above
45				

Well Diagram



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LOG OF BORING: P-81

Iredell Landfill Steele Property **Project No. G08002.0**

Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/21/2008
Date ended: 2/21/2008
Completion depth: 55.00 ft
Stickup height: 2.93 ft

Surface elevation: 871.82 ft (MSL)
Top of pipe elevation: 874.75 ft (MSL)
Depth to water (TOB): 14.00 ft
Depth to water (24hrs): 14.48 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks	Well Diagram
				PWR	Grout
50				Silty Sand/Saprolite; olive grey, micaceous silt interlayered with poorly graded sand, few angular PWR schistose layers, feldspar partings, moist	
				PWR	
55				HSA Refusal - Top of competent rock = 916.82 ft AMSL	
				Boring terminated at 55.0 feet	
60					
65					
70					
75					
80					
85					
90					

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LOG OF BORING: P-82

Iredell Landfill Steele Property **Project No. G08002.0**

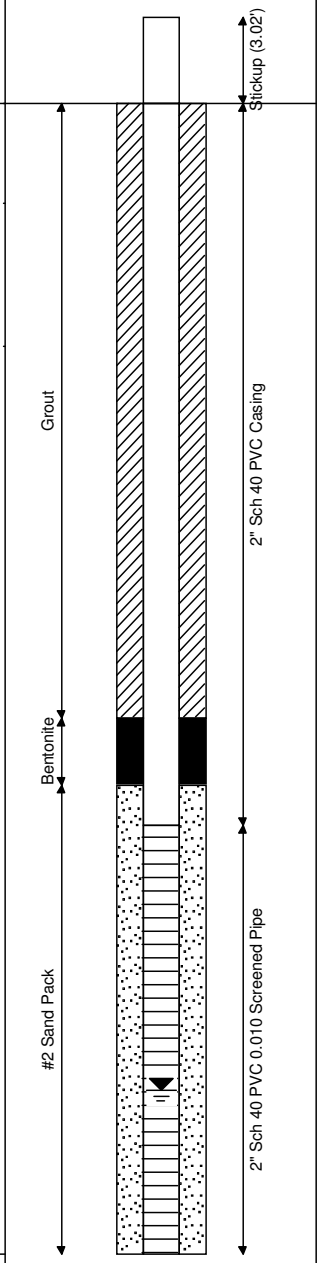
Drilling contractor: Derry's Well Drilling
Drill rig & method: 8.25" OD HSA w/ SS
Logged by: J. Pfohl

Date started: 2/21/2008
Date ended: 2/21/2008
Completion depth: 40.20 ft
Stickup height: 3.02 ft

Surface elevation: 894.27 ft (MSL)
Top of pipe elevation: 897.29 ft (MSL)
Depth to water (TOB): 30.00 ft
Depth to water (24hrs): 34.50 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	12			Silty Sand; dark brown, coarse grained sand with black top soil, root debris, moist
5	13			Clayey Silt with Sand; red, micaceous silt with cohesive clay, moist
10	13			Silty Sand; red, micaceous silt laminated with tan sand, dry
15	8			Silty Sand; yellow orange and tan sand laminated with white and black micaceous silt, defined relict structure, dry
20	9			Silty Sand; same as above
25	9			Silty Sand; same as above
30	9			Sandy Silt; olive grey, micaceous silt laminated with yellow orange and tan sand, black silt nodules, relict structure, moist
35				Sandy Silt (ML); Gravel = 0.66%, Sand = 49.60%, Silt & Clay = 52.44%, LL = 48, PL = 37, PI = 11
40	9			Sandy Silt; same as above, wet
				Boring terminated at 40.2 feet
45				

Well Diagram



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LOG OF BORING: P-83

Iredell Landfill Steele Property **Project No. G08002.0**

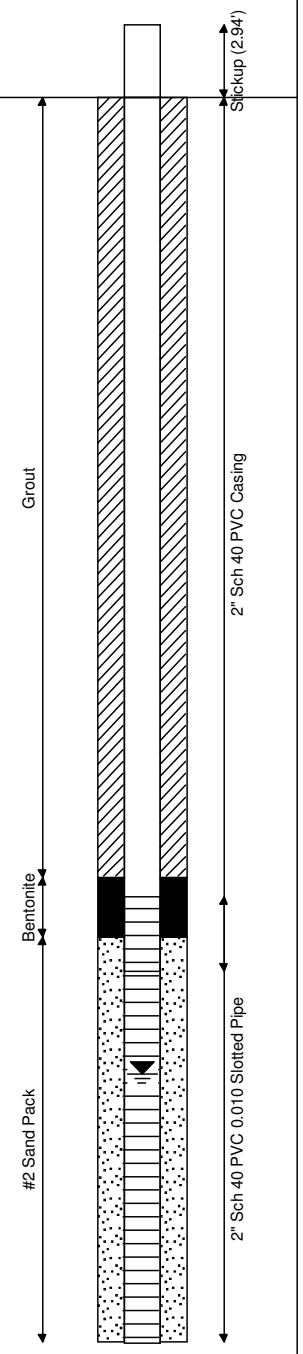
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/25/2008
Date ended: 2/25/2008
Completion depth: 50.25 ft
Stickup height: 2.94 ft

Surface elevation: 898.16 ft (MSL)
Top of pipe elevation: 901.10 ft (MSL)
Depth to water (TOB): 40.00 ft
Depth to water (24hrs): 39.39 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	7			Silty Clay; red, cohesive, moist
5	14			Silty Clay; same as above
10	8			Silty Sand; yellow orange poorly sorted sand laminated with olive grey silt, coarse grained quartz layer, micaceous, dry
15	7			Silty Sand; red, micaceous, trace dark brown silt nodules, dry
20	8			Silty Sand; yellow orange sand, few black silt nodules, coarse quartz layers, micaceous, relict structure, dry
25	10			Silty Sand; same as above, greater % silt
30	12			Silty Sand; yellow orange poorly sorted sand mottled with black and white silt nodules, relict structure, very micaceous, dry
35	8			Silty Sand; olive grey, micaceous silt laminated with poorly graded sand, highly micaceous, black organic silt partings, dry
40	8			Silty Sand; yellow orange poorly sorted sand mottled with black, white and olive grey silt, very micaceous, relict structure, moist
45	5			Sandy Silt; olive grey silt laminated with yellow orange poorly sorted sand, relict structure, very micaceous, wet
50	5			Sandy Silt; same as above
				Boring terminated at 50.3 feet

Well Diagram



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LOG OF BORING: P-84S

Iredell Landfill Steele Property **Project No. G08002.0**

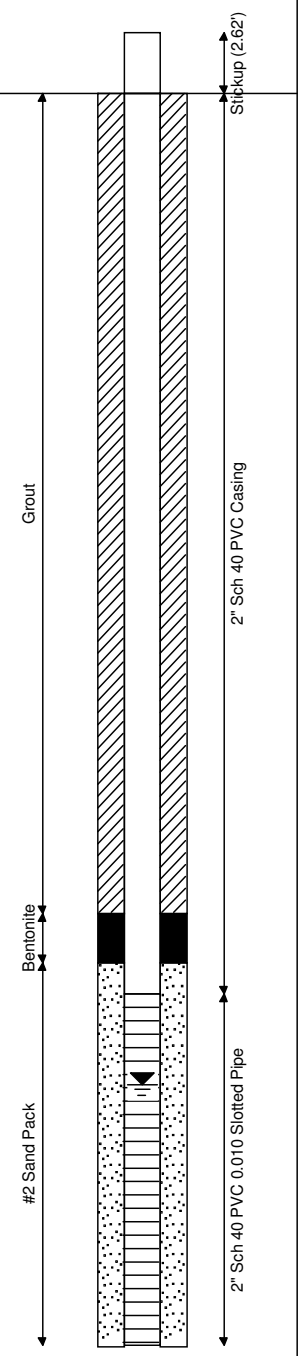
Drilling contractor: Derry's Well Drilling
Drill rig & method: 8.5" OD HSA w/ SS
Logged by: J. Pfohl

Date started: 2/21/2008
Date ended: 2/21/2008
Completion depth: 53.47 ft
Stickup height: 2.63 ft

Surface elevation: 897.74 ft (MSL)
Top of pipe elevation: 900.36 ft (MSL)
Depth to water (TOB): 40.00 ft
Depth to water (24hrs): 42.32 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	4			Silty Clay; red, very cohesive, micaceous, moist
5	10			Clayey Silt; red, cohesive, highly micaceous, moist
10	9			Sandy Silt; brown, fine grained sand laminated with olive grey, micaceous silt
15	8			Sandy Silt; same as above
20	9			Sandy Silt; olive grey, micaceous silt laminated with white feldspathic partings, brown sand, dry
25	11			Sandy Silt; same as above w/ greater % poorly sorted sand, less % feldspar
30	11			Silty Sand; brown sand laminated with olive grey, micaceous silt, feldspar partings, dry
35				Silty Sand (SM); Gravel = 0.97%, Sand = 60.16%, Silt & Clay = 38.87%, LL = 40, PL = 39, PI = 1
40	10			Silty Sand; same as above, w/ slightly more micaceous silt
45	6			Silty Sand; yellow orange sand with olive grey, micaceous silt, feldspar partings, black silt pockets, moist
50	7			Silty Sand; same as above
55				Boring terminated at 53.5 feet

Well Diagram



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LOG OF BORING: P-84D

Iredell Landfill Steele Property **Project No. G08002.0**

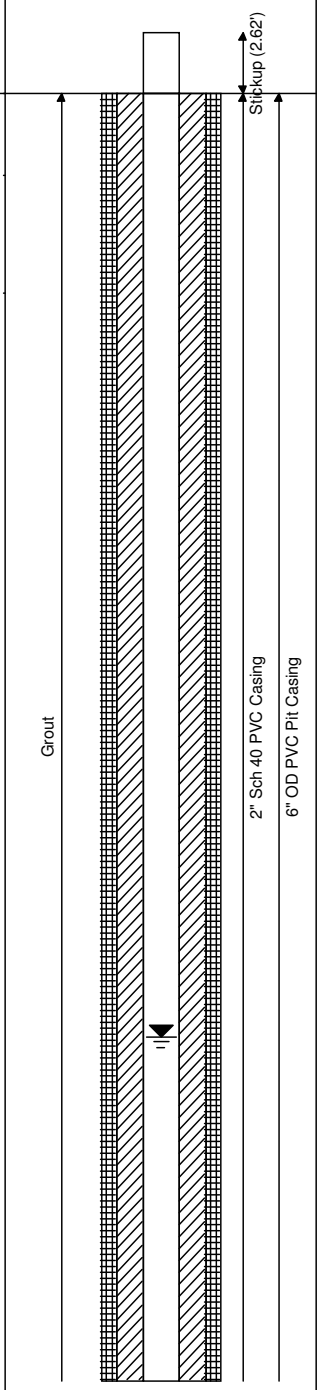
Drilling contractor: Derry's Well Drilling
Drill rig & method: HSA w/SPT, NQ core, 6"DTH Ream
Logged by: J. Pfohl

Date started: 2/29/2008
Date ended: 2/29/2008
Completion depth: 101.52 ft
Stickup height: 2.62 ft

Surface elevation: 897.83 ft (MSL)
Top of pipe elevation: 900.45 ft (MSL)
Depth to water (TOB): dry
Depth to water (24hrs): 40.30 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	4			Silty Clay; red, very cohesive, micaceous, moist
5	10			Clayey Silt; red, cohesive, highly micaceous, moist
10	9			Sandy Silt; brown, fine grained sand laminated with olive grey, micaceous silt
15	8			Sandy Silt; same as above
20	9			Sandy Silt; olive grey, micaceous silt laminated with white feldspathic partings, brown sand, dry
25	11			Sandy Silt; same as above, w/ greater % poorly sorted sand, less % feldspar
30	11			Silty Sand; brown sand laminated with olive grey, micaceous silt, feldspar partings, dry
35				Silty Sand (SM); Gravel = 0.97%, Sand = 60.16%, Silt & Clay = 38.87%, LL = 40, PL = 39, PI = 1
40	10			Silty Sand; same as above, w/ slightly more micaceous silt
45	6			Silty Sand; yellow orange sand with olive grey, micaceous silt, feldspar partings, black silt pockets, moist
50	7			Silty Sand; same as above
55	10			Silty Sand; yellow orange poorly sorted sand with trace olive grey, micaceous silt, few feldspar partings, few quartz fragments, wet

Well Diagram



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Page 1 of 2

LOG OF BORING: P-84D

Iredell Landfill Steele Property **Project No. G08002.0**

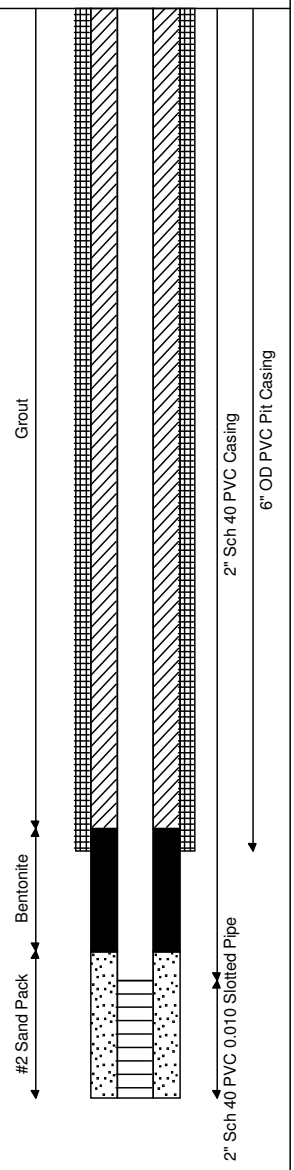
Drilling contractor: Derry's Well Drilling
Drill rig & method: HSA w/SPT, NQ core, 6"DTH Ream
Logged by: J. Pfohl

Date started: 2/29/2008
Date ended: 2/29/2008
Completion depth: 101.52 ft
Stickup height: 2.62 ft

Surface elevation: 897.83 ft (MSL)
Top of pipe elevation: 900.45 ft (MSL)
Depth to water (TOB): dry
Depth to water (24hrs): 40.30 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
60	13			Silty Sand; same as above
65	14			Silty Sand; same as above
70	22			Silty Sand; same as above
75	25			Silty Sand; yellow orange poorly sorted sand with olive grey, micaceous silt, few black silt nodules, moist
80	45			Silty Sand/Saprolite; yellow orange sand with trace olive grey, micaceous silt, few black silt pockets, gravel sized, angular PWR fragments, moist
85				Partially Weathered Rock; no recovery
90				Top of Competent Rock = 806.83 ft AMSL
95				Run #1: (91.00' - 96.45') RQD = 0'/5.45' = 0% REC = 3.26'/5.45 = 59.8% Schist; highly weathered, brown 92.4' grey
100				Run #2: (96.45' - 101.45') RQD = 0.354'/4.7' = 7.53% REC = 4.70'/4.7' = 100% Schist; heavily weathered, grey, micaceous, 30 degree foliation
105				Boring terminated at 101.5 feet
110				

Well Diagram



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LOG OF BORING: P-85

Iredell Landfill Steele Property **Project No. G08002.0**

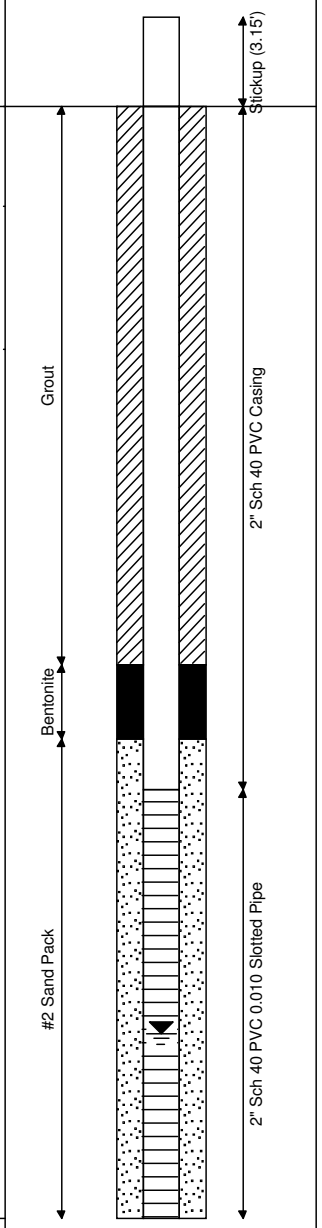
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/27/2008
Date ended: 2/27/2008
Completion depth: 38.86 ft
Stickup height: 3.15 ft

Surface elevation: 875.52 ft (MSL)
Top of pipe elevation: 878.67 ft (MSL)
Depth to water (TOB): 25.00 ft
Depth to water (24hrs): 32.40 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	7			Silty Clay; red, cohesive, moist
	12			Clayey Silt; red, trace micas, moist
5				
	8			Silty Sand; medium brown, poorly sorted, sand laminated with red sand and olive grey micaceous silt, dry
10				
	7			Sandy Silt; red brown silt with olive grey, micaceous silt and red sand, black clay nodules, dry
15				
	7			Sandy Silt; same as above
20				
	5			Sandy Silt; olive grey, micaceous silt interlayered with black organic silt partings, moist
25				
	5			Sandy Silt; olive grey, micaceous silt laminated with yellow, fine grained sand and white feldspathic silt, quartz seams, moist
30				
	5			Sandy Silt; same as above, wet
35				
40				Boring terminated at 38.9 feet
45				

Well Diagram



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LOG OF BORING: P-86

Iredell Landfill Steele Property **Project No. G08002.0**

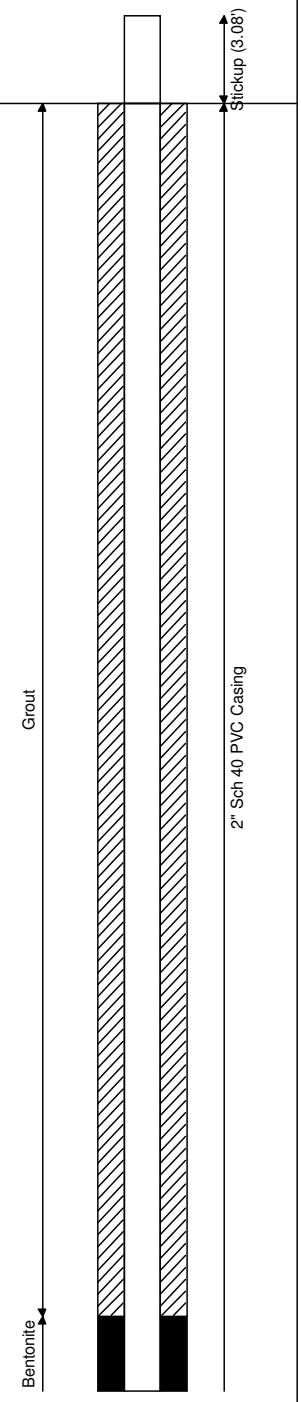
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/27/2008
Date ended: 2/27/2008
Completion depth: 70.00 ft
Stickup height: 3.08 ft

Surface elevation: 898.08 ft (MSL)
Top of pipe elevation: 901.15 ft (MSL)
Depth to water (TOB): 49.00 ft
Depth to water (24hrs): 49.65 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	9			Silty Clay; red, cohesive, w/ trace sand moist
	10			Silty Sand; red brown sand with tan and olive grey, micaceous silt, dry
5				
	11			Silty Sand; same as above
10				
	5			Sandy Silt; tan and olive grey, micaceous silt laminated with red brown poorly sorted sand, dry
15				
	6			Sandy Silt; same as above
20				
	11			Silty Sand; red brown sand with tan and olive grey, micaceous silt, black silt nodules, dry
25				
	10			Silty Sand; same as above
30				
	11			Silty Sand; same as above
35				
	11			Silty Sand; same as above, relict structure
40				
	7			Silty Sand; same as above
45				

Well Diagram



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LOG OF BORING: P-86

Iredell Landfill Steele Property **Project No. G08002.0**

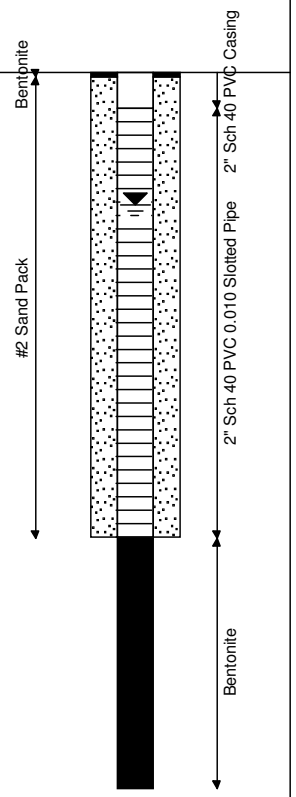
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/27/2008
Date ended: 2/27/2008
Completion depth: 70.00 ft
Stickup height: 3.08 ft

Surface elevation: 898.08 ft (MSL)
Top of pipe elevation: 901.15 ft (MSL)
Depth to water (TOB): 49.00 ft
Depth to water (24hrs): 49.65 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
50	14		X	Silty Sand; dark brown poorly sorted sand laminated with olive grey, micaceous silt, few quartz fragments, moist
55	11		X	Silty Sand; same as above, wet
60	15		X	Silty Sand/Saprolite; dark brown poorly sorted sand laminated with olive grey, micaceous silt, quartz fragments, angular PWR fragments, moist
65	50/2"			PWR; dark brown, saprolite interlayered w/ PWR, moist
70	50/2"			PWR; no recovery
				Boring terminated at 70.0 feet
75				
80				
85				
90				

Well Diagram



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LOG OF BORING: B-79

Iredell Landfill Steele Property **Project No. G08002.0**

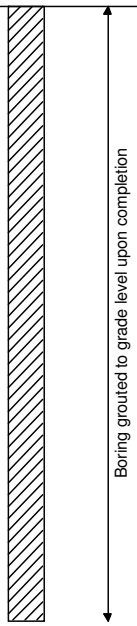
Drilling contractor: Derry's Well Drilling
Drill rig & method: 7.75" OD HSA w/ SPT
Logged by: J. Pfohl

Date started: 2/25/2008
Date ended: 2/25/2008
Completion depth: 21.50 ft
Stickup height:

Surface elevation: 862.67 ft (MSL)
Top of pipe elevation:
Depth to water (TOB):
Depth to water (24hrs):

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	13			Silty Clay with Sand; brown clay with olive grey silt, medium grained sand, moist
	15			Silty Sand; yellow orange sand with olive grey, micaceous silt, black silt partings, relict structure, dry
5				
	15			Silty Sand/Saprolite; yellow orange, poorly sorted sand laminated with olive grey, micaceous silt, relict structure, black silt nodules, few quartz fragments, dry
10				
	9			Silty Sand; same as above, few cobble size PWR fragments
15				
	19			Silty Sand/Saprolite; yellow orange, poorly sorted sand mottled with black silt nodules, feldspar nodules, quartz fragments, dry
20				HSA Refusal - Top of Competent Rock = 841.17 ft AMSL
				Boring terminated at 21.5 feet
25				
30				
35				
40				
45				

Well Diagram



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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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)- 982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-76

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/25/08

TIME COMPLETED 12:00 AM☐ PM■

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76547

LONGITUDE 80.83392

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)- 878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 40.90'

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

c. **WATER LEVEL** Below Top of Casing: 31.38 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 28.38 To >40.90 From To
From To From To
From To From To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	25.90	2"		scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	3		Neat Cement	Tremie
3	22		Cement Bent.	Tremie
22	24.56		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter in.	Slot Size in.	Material
25.90	40.90		2	0.01	PVC

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
24.56	40.90		#2	Silica Filter San

11.DRILLING LOG

From	To	Formation Description
0	6	Silty Clay;Red
6	12	Silt w/ Clay;Red
12	27	Silt; Red
27	40.9	Sandy Silt;Dark Brown
		No Refusal

12. REMARKS:

~~Unconfined.~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704) 982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-77

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/20/08

TIME COMPLETED 3:00 AM☐ PM■

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76511

LONGITUDE 80.84699

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704) 878-5430
Area code - Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 40.50'

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

c. WATER LEVEL Below Top of Casing: 31.60 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 28.60 To >40.50 From To
From To From To
From To From To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	25.50		2"	scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	3		Neat Cement	Tremie
3	22		Cement Bent.	Tremie
22	24.10		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter in.	Slot Size in.	Material
25.50	40.50		2	0.01	PVC

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
24.10	40.50		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	3	Silty Clay;Red
3	5	Sandy Silt w/ Clay;Red
5	27	Silty Sand; R. Brown
27	40.5	Sandy Silt;Olive Gray
		No Refusal

12. REMARKS:

~~Unconfined.~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-78S

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/28/08

TIME COMPLETED 10:00 AM■ PM☐

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76444

LONGITUDE 80.84882

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 48.22'

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

c. **WATER LEVEL** Below Top of Casing: 37.79 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 34.79 To >48.22 From To
From To From To
From To From To

7. CASING:

	Depth		Diameter	Thickness/Weight	Material
From +3	To 33.22	Ft.	2"	scH40	PVC
From	To	Ft.			
From	To	Ft.			

8. GROUT:

	Depth		Material	Method
From 0	To 3	Ft.	Neat Cement	Tremie
From 3	To 28.65	Ft.	Cement Bent.	Tremie
From 28.65	To 31.85	Ft.	Bent. Chips	Gravity

9. SCREEN:

	Depth		Diameter		Slot Size		Material
From 33.22	To 48.22	Ft.	2	in.	0.01	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

10. SAND/GRAVEL PACK:

	Depth		Size	Material
From 31.85	To 48.22	Ft.	#2	Silica Filter Sand
From	To	Ft.		
From	To	Ft.		

11.DRILLING LOG

From	To	Formation Description
0	12	Silty Sand; Dark Red
12	48.22	Sandy Silt;Gray
		No Refusal

12. REMARKS:

~~Unconfined.~~

Shallow counterpart to adjacent deeper P-78D

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-78D

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) Temp. Piez. for Hydro Stud

DATE DRILLED 2/28/08

TIME COMPLETED 5:00 AM☐ PM■

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76444

LONGITUDE 80.84882

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 75.81'

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

c. **WATER LEVEL** Below Top of Casing: 39.32 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 36.32 To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

7. CASING:

Depth		Diameter	Thickness/Weight	Material
From +3	To 33.22 Ft.	2"	scH40	PVC
From 0	To 65 Ft.	6"	scH40	PVC
From	To Ft.			

8. GROUT:

Depth		Material	Method
From 0	To 3 Ft.	Neat Cement	Tremie
From 3	To 64 Ft.	Cement Bent.	Tremie
From 64	To 69.53 Ft.	Bent. Chips	Gravity

9. SCREEN:

Depth		Diameter	Slot Size	Material
From 70.81	To 75.81 Ft.	2 in.	0.01 in.	PVC
From	To Ft.	in.	in.	
From	To Ft.	in.	in.	

10. SAND/GRAVEL PACK:

Depth		Size	Material
From 69.53	To 75.81 Ft.	#2	Silica Filter Sand
From	To Ft.		
From	To Ft.		

11. DRILLING LOG

From	To	Formation Description
0	12	Silty Sand; Dark Red
12	48	Sandy Silt;Gray
48	63	Silty Sand; Y. O Saprolite
63	65	PWR;
65	75.81	Rock; Schist, Light Gray, fractured, Cored
65		Auger Refusal

12. REMARKS:

Deeper counterpart to adjacent shallow P-78S

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704) 982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-79

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/27/08

TIME COMPLETED 11:00 AM■ PM☐

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76435

LONGITUDE 80.83385

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704) 878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 36.52'

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

c. **WATER LEVEL** Below Top of Casing: 35.28 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
32.28	>36.52		

7. CASING:

Depth From	To	Ft.	Diameter	Thickness/Weight	Material
+3	21.52		2"	scH40	PVC

8. GROUT:

Depth From	To	Ft.	Material	Method
0	3		Neat Cement	Tremie
3	17.58		Cement Bent.	Tremie
17.58	20.10		Bent. Chips	Gravity

9. SCREEN:

Depth From	To	Ft.	Diameter	in.	Slot Size	in.	Material
21.52	36.52		2		0.01		PVC

10. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
20.10	36.52		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	3	Clayey Silt;Red
3	8	Silty Sand w/ Clay;Red
8	18	Silty Sand; Y. O
18	27	Sandy Silt;Olive Gray
27	31	PWR; Quartz Layer
31	36.52	Silty Sand; Saprolite
36.52		Rock; Auger refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-80

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/27/08

TIME COMPLETED 5:00 AM☐ PM■

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76395

LONGITUDE 80.84691

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 35'

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

c. **WATER LEVEL** Below Top of Casing: 31.56 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 28.56 To >35 From To
From To From To
From To From To

7. CASING:

	Depth		Diameter	Thickness/Weight	Material
From +3	To 20	Ft.	2"	scH40	PVC
From	To	Ft.			
From	To	Ft.			

8. GROUT:

	Depth		Material	Method
From 0	To 3	Ft.	Neat Cement	Tremie
From 3	To 16	Ft.	Cement Bent.	Tremie
From 16	To 18.55	Ft.	Bent. Chips	Gravity

9. SCREEN:

	Depth		Diameter		Slot Size		Material
From 20	To 35	Ft.	2	in.	0.01	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

10. SAND/GRAVEL PACK:

	Depth		Size	Material
From 18.55	To 35	Ft.	#2	Silica Filter Sand
From	To	Ft.		
From	To	Ft.		

11.DRILLING LOG

From	To	Formation Description
0	2	Silty Clay;Red
2	8	Sandy Silt w/ Clay;Red
8	27	Silty Sand; R. Brown
27	35	Sandy Silt;Olive Gray
35		No Refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-81

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/21/08

TIME COMPLETED 2:00 AM☐ PM☒

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76274
LONGITUDE 80.83358

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 23.90'

b. **DOES WELL REPLACE EXISTING WELL?** YES☐ NO☒

c. **WATER LEVEL** Below Top of Casing: 17.48 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 14.48 To 55 From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	8.90		2"	scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	5.5		Neat Cement	Tremie
5.5	7.5		Bent. Chips	Gravity
23.90	55		Cement Bent.	Tremie

9. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
8.90	23.90		2 in.	0.01 in.	PVC
			in.	in.	
			in.	in.	

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
7.50	23.90		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	8	Clayey Silt w/ Sand; Reddish Brown
8	13	Silty Sand; Dark Brown
13	37	Sandy Silt; Olive Gray
37	46	Silty Sand; Olive Gray Saprolite
46	47	PWR; Olive Gray, harder
47	53	Silty Sand; Olive Gray Saprolite
53	55	PWR; Olive Gray, harder
55		Rock; Auger refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-82

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/21/08

TIME COMPLETED 5:00 AM☐ PM☒

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76310

LONGITUDE 80.84805

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 40.20'

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

c. WATER LEVEL Below Top of Casing: 37.50 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 34.50	To >40.20	From	To
From	To	From	To
From	To	From	To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	25.20		2"	scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	21.50		Neat Cement	Tremie
21.50	23.80		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter in.	Slot Size in.	Material
25.20	40.20		2	0.01	PVC

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
23.80	40.20		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	0.5	Top Soil
0.5	3	Silty Sand;Red
3	7	Clayey Silt w/ Sand; Red
7	27	Silty Sand; Red to Y.O w/ depth
27	40.2	Sandy Silt;Olive Gray
		No Refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-83

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/25/08

TIME COMPLETED 5:00 AM☐ PM☒

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76142

LONGITUDE 80.84868

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 50.25 '

b. **DOES WELL REPLACE EXISTING WELL?** YES☐ NO☒

c. **WATER LEVEL** Below Top of Casing: 42.39 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 39.39 To >50.25 From To
From To From To
From To From To

7. CASING:

Depth		Diameter	Thickness/Weight	Material
From +3	To 35.25	Ft. 2"	scH40	PVC
From	To	Ft.		
From	To	Ft.		

8. GROUT:

Depth		Material	Method
From 0	To 31.50	Ft. Neat Cement	Tremie
From 31.50	To 33.38	Ft. Bent. Chips	Gravity
From	To	Ft.	

9. SCREEN:

Depth		Diameter	Slot Size	Material
From 35.25	To 50.25	Ft. 2 in.	0.01 in.	PVC
From	To	Ft. in.	in.	
From	To	Ft. in.	in.	

10. SAND/GRAVEL PACK:

Depth		Size	Material
From 33.38	To 50.25	Ft. #2	Silica Filter Sand
From	To	Ft.	
From	To	Ft.	

11.DRILLING LOG

From	To	Formation Description
0	8	Silty Clay;Red
8	18	Silty Sand;Red
18	32	Silty Sand; Y. O
32	38	Silty Sand; Olive Gray
38	43	Silty Sand; Y. O
43	50.25	Sandy Silt; Olive Gray, soft
		No Refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-84S

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/21/08

TIME COMPLETED 10:00 AM☑ PM☐

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76227

LONGITUDE 80.84727

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 53.47'

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

c. **WATER LEVEL** Below Top of Casing: 45.32 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 42.32 To >53.47 From To
From To From To
From To From To

7. CASING:

Depth		Diameter	Thickness/Weight	Material
From +3	To 38.47 Ft.	2"	scH40	PVC
From	To Ft.			
From	To Ft.			

8. GROUT:

Depth		Material	Method
From 0	To 3 Ft.	Neat Cement	Gravity
From 3	To 35.02 Ft.	Cement Bent.	Tremie
From 35.02	To 37.10 Ft.	Bent. Chips	Gravity

9. SCREEN:

Depth		Diameter	Slot Size	Material
From 38.47	To 53.47 Ft.	2 in.	0.01 in.	PVC
From	To Ft.	in.	in.	
From	To Ft.	in.	in.	

10. SAND/GRAVEL PACK:

Depth		Size	Material
From 37.10	To 53.47 Ft.	#2	Silica Filter Sand
From	To Ft.		
From	To Ft.		

11.DRILLING LOG

From	To	Formation Description
0	2	Silty Clay;Red
2	7	Clayey Silt; Red
7	18	Sandy Silt;Brown
18	26	Sandy Silt;Olive Gray
26	43	Silty Sand; Brown
43	53.47	Silty Sand; Y. O
		No Refusal

12. REMARKS:

~~Unconfined. Counterpart to adjacent deep well P-84D.~~

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

Albemarle NC 28002
City or Town State Zip Code

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-84D

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/29/08

TIME COMPLETED 5:00 AM☐ PM■

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76227

LONGITUDE 80.84727

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville NC 28625
City or Town State Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville NC 28625
City or Town State Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 101.52'

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

c. WATER LEVEL Below Top of Casing: 43.30 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 46.30 To >101.52 From To
From To From To
From To From To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	96.52	2"		scH40	PVC
0	91	6"		scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	90		Neat Cement	Tremie
90	95.25		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter in.	Slot Size in.	Material
96.52	101.52	2		0.01	PVC

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
95.25	101.52		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	2	Silty Clay;Red
2	7	Clayey Silt; Red
7	18	Sandy Silt;Brown
18	26	Sandy Silt;Olive Gray
26	43	Silty Sand; Brown
43	77	Silty Sand; Y. O
77	83	Silty Sand; Y. O, Saprolite
83	91	PWR; Hard, Fractured
91	101.52	Rock; Schist, Brown to Gray (Cored)
91		Auger Refusal

12. REMARKS:

Deeper counterpart to adjacent shallow P-84S

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

Albemarle NC 28002
City or Town State Zip Code

(704)- 982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-85

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/25/08

TIME COMPLETED 10:00 AM☒ PM☐

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76253

LONGITUDE 80.84605

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville NC 28625
City or Town State Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville NC 28625
City or Town State Zip Code

(704)- 878-5430
Area code - Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 38.86'

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

c. WATER LEVEL Below Top of Casing: 35.40 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 32.40 To >38.86 From To
From To From To
From To From To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	23.86	2"		scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	19.50		Neat Cement	Tremie
19.50	22.12		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
23.86	38.86		2 in.	0.01 in.	PVC
			in.	in.	
			in.	in.	

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
22.12	38.86		#2	Silica Filter Sand

11.DRILLING LOG

From	To	Formation Description
0	2	Silty Clay;Red
2	8	Clayey Silt; Red
8	13	Silty Sand; Med. Brown
13	23	Sandy Silt;Red. Brown & Olive Gray
23	38.86	Sandy Silt;Olive Gray, micas.
		No Refusal

12. REMARKS:

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 3/10/08

Derry 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.12/07

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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704)-982-3070
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) P-86

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) Temp. Piez. for Hydro Study

DATE DRILLED 2/27/08

TIME COMPLETED 9:00 AM■ PM☐

4. WELL LOCATION:

CITY: Statesville COUNTY Iredell

(Previous Steele Farm) 3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35.76128

LONGITUDE 80.84633

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 Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

CONTACT PERSON David Lambert (S.Waste Director)

MAILING ADDRESS 3260 Twin Oaks Rd.

Statesville | NC | 28625
City or Town | State | Zip Code

(704)-878-5430
Area code - Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 61.26'

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

c. **WATER LEVEL** Below Top of Casing: 52.65 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 49.65	To >70	From	To
From	To	From	To
From	To	From	To

7. CASING:

From	To	Ft.	Diameter	Thickness/Weight	Material
+3	46.26	2"		scH40	PVC

8. GROUT:

From	To	Ft.	Material	Method
0	42.38		Neat Cement	Tremie
42.38	45.18		Bent. Chips	Gravity
61.26	70		Bent. Chips	Gravity

9. SCREEN:

From	To	Ft.	Diameter in.	Slot Size in.	Material
46.26	61.26	2		0.01	PVC

10. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
45.18	61.26		#2	Silica Filter Sand

11. DRILLING LOG

From	To	Formation Description
0	3	Silty Clay;Red
3	13	Silty Sand; Reddish Brown
13	22	Sandy Silt;Tan & Olive Gray
22	55	Silty Sand; Reddish Brown
55	63	Silty Sand; Dark Brown, saprolite
63	70	PWR; Layered
70		Auger Refusal

12. REMARKS:

~~Unconfined~~

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 3/10/08

Derry 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.12/07

WELL ABANDONMENT 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 Inc.
Well Contractor Company Name

STREET ADDRESS 44283-A NC 24/27/73

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

(704) - 982-3070
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) B-79 (Dry Boring NOT Well)

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Check applicable use): ☐ **Monitoring** ☐ **Residential**
☐ **Municipal/Public** ☐ **Industrial/Commercial** ☐ **Agricultural**
☐ **Recovery** ☐ **Injection** ☐ **Irrigation**
☑ Other (list use) Dry Boring Hit Rock so well not set

3. WELL LOCATION:

COUNTY Iredell QUADRANGLE NAME Statesville East

NEAREST TOWN: Statesville

(Previous Steele Farm) 3260 Twin Oaks Rd. 28687

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☑ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(Check appropriate setting)

LATITUDE 35.76434
LONGITUDE 80.83463

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.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable)

NAME OF FACILITY Iredell Co. Landfill (Proposed)

STREET ADDRESS 3260 Twin Oaks Road

Statesville | NC | 28687
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME David Lambert (Solid Waste Director)

STREET ADDRESS 3260 Twin Oaks Rd. Statesville NC

5. WELL DETAILS:

a. Total Depth: 21.50 ft. Diameter: 0 in.
b. Water Level (Below Measuring Point): Dry ft.
Measuring point is na ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	None ft.	0 in.
b. Casing Removed:	None ft.	0 in.

7. DISINFECTION: na

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement
Cement 650 lb.
Water 35 gal.

Sand Cement
Cement lb.
Water gal.

Bentonite
Bentonite lb.
Type: ☑ Slurry ☐ Pellets
Water 24 gal.

Other
Type material DSI "Easy Grout" Gran. Bent.
Amount

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Dry Geotechnical Boring terminated at Rock 21.5'
No PVC ever set.
Pressure tremie cement & bentonite slurry grout
from bottom to top.

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 2/25/08

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

3/10/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR **DATE**

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL **DATE**
(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

Derry Huneycutt
PRINTED NAME OF PERSON ABANDONING THE WELL

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

Form GW-30
Rev. 5/06

LOG OF BORING NO. P-76

Project: Iredell LF- Steele Project No.: 608002.0

Type: 6.5" OD HSA w/ CT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
	2-3-3	(6)	0-1.5	X	Silty Clay; Red, cohesive, trace sand, trace micas, moist.	0-6 Silty clay 6-12 Silt w/ clay 12-27 Silt
5	4-6-9	(15)	3.5-5	X	Silty Clay; Red, Same as above, trace translucent qtz. fragments, cohesive	moist 27-40.90 Sandy Silt
10	3-3-5	(8)	8.5-10	X	Silt w/ clay; Red, slightly cohesive few cobble size white qtz fragments, few black silt partings, slightly micaceous, dry	
15	2-2-3	(5)	13.5-15	X	Silt; Red, trace fine grained sand, several black organic silt partings, few feldspar partings, dry.	
20	2-2-3	(5)	18.5-20	X	Silt; Same as above but more white feldspar partings, dry	
25	2-2-3	(5)	23.5-25	X	Silt; Same as above but wet	Well Dimensions screen 25.90-40.90 Sand 24.56-40.90 Bent 22.00-24.56 Grout 0-22.00 Stickup 3.00' TM
30	2-3-3	(6)	28.5-30	X	Sandy Silt; Dark Brown micaceous silt w/ poorly sorted tan sand, white feldspar & black organic silt striations, relict structure, moist.	▽ 31' BGS WD
35	3-3-3	(6)	33.5-35	X	Sandy Silt; Same as above, moist; Likely < ▽.	
40	3-2-2	(4)	38.5-40	X	Sandy Silt; Same as above, wet.	No Refusal

Completion Depth 40.90 BGS Depth to Water in Boring 31.38 BTOP ☐ Set ☑ 24 Hrs (unconfined)

Date 2/25/08 Field Agent J. Pfohl

1 of 1

LOG OF BORING NO. P-77

Project: Iredell LF - Steele Project No.: 608002.0

Type: 7.75" HSA w/SS Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Environmental Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
	3-3-5	(8)	0-1.5'	X	Silty Clay; Red, cohesive, Some top soil tilled in, homogeneous, moist.	0-3 Silty clay 3-5 Sandy Silt w/clay 5-27 Silty Sand 27-40.50 Sandy Silt
5	5-5-6	(11)	3.5-5	X	Sandy Silt w/ Clay; Red; homogeneous, dry	
10	3-3-4	(7)	8.5-10	X	Silty Sand; R. Brown poorly sorted sand laminated w/ tan & olive gray micaceous silt, dry	
15	3-3-4	(7)	13.5-15	X	Silty Sand; R. Brown same as above, dry.	
20	3-4-4	(8)	18.5-20	X	Silty Sand; Same as above, slightly more distinct foliations.	Well Dimensions Screen: 25.50-40.50 Sand 24.10-40.50 Bent 22.00-24.10 Stickup 3.00' TM Grout 0-22.00
25	2-3-2	(5)	23.5-25	X	Silty Sand; Reddish Brown poorly sorted sand laminated w/ tan & olive gray micaceous silt, distinct relict structure, trace black silt nodules, dry.	
30	1-2-3	(5)	28.5-30	X	Sandy Silt; Olive gray micaceous silt laminated w/ poorly sorted Reddish Brown sand, few black & white silt nodules, moist.	
35	1-3-3	(6)	33.5-35	X	Sandy Silt; Same as above, moist	No Refusal No Rock encountered
40	2-2-2	(4)	38.5-40	X	Sandy Silt; Same as above, wet 40.50' Terminated No Refusal	

Completion Depth 40.50' BGS Depth to Water in Boring 31.60 BTOP ☐ Set ☑ 24 Hrs (unconfined)

Date 2/20/08 Field Agent J. Pfohl

1 of 1

LOG OF BORING NO. P- 78s

Project: Iredell LF- Steele Project No.: 608002.0

Type: Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
					No Topsoil in Borrow Zone	
	3-3-3	(6)	0-1.5'	X	Silty Sand: Dark Red poorly sorted sand w/ Olive gray micaceous silt, some tilled black top soil, moist.	0-12 Silty Sand 12-
5	3-4-5	(9)	3.5-5'	X	Silty Sand: Poorly sorted Dark red sand laminated w/ micas, olive gray silt + tan silt partings, few gravel size qtz. fragments, dry	
10	3-4-6	(10)	8.5-10	X	Silty Sand; Same as above few White angular qtz. seams.	
15	3-3-4	(7)	13.5-15	X	Silty Sand Olive Gray micaceous silt laminated w/ dark red poorly graded sand, relict structure, dry	
20			18-20.17'		Silty Sand	ST 18-20.17' Dry tube
25	3-4-6	(10)	23.5-25	X	Silty Sand; Same as above	
30	3-3-5	(8)	28.5-30	X	Sandy Silt, Gray, w/ white feldspathic partings & black organic silt partings, few qtz. fragments, very micaceous, moist,	
35	2-3-5	(8)	33.5-35	X	33.5-34.5' Sandy Silt, Gray Same as above 34.5-35' silty sand; Y. Orange coarse grained & wet	
40	2-3-5	(8)	38.5-40	X	Sandy Silt; Olive gray micas. silt, few gravel size opaque qtz. fragments, wet.	

Completion Depth 48.22 BGS Depth to Water in Boring 37.79 BTOP ☐ Set ☑ 24 Hrs

Date 2/28/08 Field Agent J. Pfohl

LOG OF BORING NO. P-78s

Project: Iredell LF- Steele Project No.: G08002.0

Type: 7.75 OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
					Sandy	
	2-4-5	(9)	43.5-45	X	Silt, Same as above, wet	
45						
					Terminated @ 48.22' BGS (NOT Refusal)	
50						
55						
					Well Dimensions	
					Screen 33.22 - 48.22	
60					Sand 31.85 - 48.22 #2	
					Bent 28.65 - 31.85 3/8 chips	
					Grout 0 - 28.65 Bent/cement slurry	
					Stickup 3.00' TM	
65						
70						
75						
80						

Completion Depth 48.22 BGS Depth to Water in Boring 37.79 BTOP ☐ Set ☑ 24 Hrs (unconfined)

Date 2/28/08 Field Agent J. Pfahl

2 of 2

LOG OF BORING NO. P-78D

Project: Iredell LF- Steele Project No.: 608002.0

Type: 2 1/4" ID HSA w/SPT, 8" DTH, NQ core, 6" DTH Ream Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments screen thickness of diameter 6"
						5' Screen
5						
10					No SPT until 48.5' See Log for adjacent P-78S for soil Descriptions.	
15						
20						
25						
30						
35						
40						

Completion Depth 75.81 BGS Depth to Water in Boring 39.32 BTOP ☐ Set ☑ 24 Hrs

Date 2/28/08 Field Agent J. Pfohl

1 of 2

LOG OF BORING NO. P-78D

Project: Iredell LF-Steele Project No.: 608002.0

Type: 2¼" HSA, 8" DTH, NQ core, 6" DTH Ream Drilling Company: Deity's Well Drilling

Municipal Services, Garner, N.C. — Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
45						
50	3-6-8	(14)	48.5-50	X	Silty Sand; Y. Orange & Dark Brown poorly sorted sand laminated w/ Olive Gray micaceous silt, trace gravel size qtz. fragments & black silt nodules, moist	
55	8-13-15	(28)	53.5-55	X	Silty Sand; Saprolite; Same as above but more dense & more relict structure, moist.	
60	9-14-16	(30)	58.5-60	X	Silty Sand; Saprolite, Y orange & Dark Brown poorly sorted sand laminated w/ Olive gray micac. silt, trace gravel size white qtz., few black silt nodules & partings, well defined relict structure, few iron stains, moist.	63' PWR starts grinding
					63' PWR	
					65' Rock	HSA refusal 65' BGS
65					Run #1 (65.00' - 69.00') REC = 2.42'/4.00' = 60.5% RQD = 0/4.00 = 0%	
					Schist; Light Gray, Quartzose, foliated w/ 10° dip,	
70					Run #2 (69.00 - 75.50') REC = 6.5/6.5 = 100% RQD = 2.5/6.5' = 38.46%	
75					Terminated Core @ 75.50 Terminated 6" DTH 75.81	
					Well Dimensions	
					Outer Pit Case 0 - 65' 6" OD	
					Screen: 70.81 - 75.81 2"	
					Sand: 69.53 - 75.81 #2	
80					Bent: 64.00 - 69.53' Stickup = 3.00' Tape Measured	

Completion Depth 75.81 BGS Depth to Water in Boring 39.32 BTOP ☐ Set ☑ 24 Hrs

Date 2/28/08 Field Agent J. Pfohl

2 of 2

LOG OF BORING NO. P-79

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
					offset from original P-79 Location for Elev ~200' due East since B-79 hit Rock	
	4-6-7	(13)	0-1.5'	X	Clayey Silt; Red, cohesive, homogeneous, moist	
5	5-8-10	(18)	3.5-5'	X	Silty Sand w/ Clay; Red, poorly graded sand, homogeneous, dry	
10	3-4-5	(9)	8.5-10	X	Silty Sand; Y. Orange poorly graded sand, trace black silt particles, homogeneous, dry	Well Dimensions Screen 21.52-36.52 Sand 20.10-36.52 Bent 17.58-20.10 Grout 0-17.58 Stickup 3.00' AGL
15	3-3-5	(8)	13.5-15	X	Silty Sand; Same as above, dry	
20	3-5-6	(11)	18.5-20	X	Sandy Silt; Olive Gray micaceous silt laminated w/ Y. orange poorly graded sand ~~w/ flake~~ w/ Gravel size white qtz. fragments, black organic silt nodules, dry	
25	3-4-4	(8)	23.5-25	X	Sandy Silt; Same as above, relict structure.	
						27-30' Hard quartz. Seam. Able to Grind through very slowly.
30	50/1"	No Recovery	28.5		PWR; No Recovery; Hard weathered Rock	
35	2-5-5	(10)	33.5-35	X	Saprolite Silty Sand; Olive Gray micaceous Silt laminated w/ Y. orange poorly graded sand, few angular PWR fragments, relict structure,	moist
					HSA Refusal 36.52' BGS Terminated	36.5' Real Hard Again immediately
40						

Completion Depth 36.52' BGS Depth to Water in Boring 35.28 BTOP ☐ Set ☑ 24 Hrs

Date 2/27/08 Field Agent J. Pfohl

Set on Top of Rock per Driller as to Abt

LOG OF BORING NO. P-80

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" OD HSA w/SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Beg. Depth	Retr.	Description of Material	Comments
	3-5-6	(11)	0-1.5'	X	Top Soil 0-0.5' Silty Clay; Red; cohesive, some tilled in Top soil, homogeneous, moist	
5	5-5-7	(12)	3.5-5	X	Sandy Silt w/ Clay; Red; homogeneous, dry.	
10	3-3-5	(8)	8.5-10	X	Silty Sand; Reddish Brown, poorly sorted, tan & olive gray micaceous silt, faint structure, dry.	
15	2-3-4	(7)	13.5-15	X	Silty Sand; Same as above	Well Dimensions Screen 20-35 Sand 12.55-35 Bent 16-12.55 Grout 0-16 Stickup 3.00' TM
20	3-3-4	(7)	18.5-20	X	Silty Sand; Same as above more distinct structure, dry	
25	2-3-2	(5)	23.5-25	X	Silty Sand; Reddish Brown Poorly sorted sand laminated w/ Olive Gray micaceous silt, dry.	
30	1-2-3	(5)	28.5-30	X	Sandy Silt; Olive Gray micaceous silt mottled poorly sorted Reddish Brown sand, several black organic silt nodules, moist.	
35	1-2-3	(5)	33.5-35	X	Sandy Silt, Same as above, wet	
					No Refusal terminated 35.00' BGS	
40						

Completion Depth 35.00 BGS Depth to Water in Boring 31.56 BTOP ☐ Set ☑ 24 Hrs

Date 2/27/08 Weds. Field Agent J. Pfohl

1 of 1

LOG OF BORING NO. P-81

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75"OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
			0-1.5'	X		
5	5-6-9	(15)	3.5-5	X	Clayey Silt w/sand; Reddish Brown, moderately cohesive, homogeneous, moist	
10	3-3-4	(7)	8.5-10	X	Silty Sand; Dark Brown Poorly sorted sand w/ Olive gray micaceous silt, faint relict structure, moist	
15	1-2-1	(3)	13.5-15	X	Sandy Silt; Olive Gray micaceous silt w/ trace poorly graded sand, very soft, moist	
20	1-1-1	(2)	18.5-20	X	Sandy Silt; Same as above, moist	
25	1-2-2	(4)	23.5-25	X	Sandy Silt; Olive gray very micaceous silt w/ trace poorly graded sand, very soft, few white feldspar seams, trace qtz. fragments, moist.	
30	1-3-3	(6)	28.5-30	X	Sandy Silt; Olive gray very micaceous silt laminated w/ Y. orange poorly graded sand, black & white silt partings, wet.	
35	1-3-4	(7)	33.5-35	X	Sandy Silt; Same as above, wet	
						37' harder saprolite begins
40	9-21-35	(56)	38.5-40	X	Silty Sand; Saprolite; Olive gray highly micas., silt interlayered w/ Y. orange sand, platy PWR fragments, defined relict structure, moist	

Completion Depth 23.90 Screen 25.00 Drill BGS Depth to Water in Boring 17.48 BTOP ☐ Set ☑ 24 Hrs

Date 2/21/08 Field Agent J. Pfohl

LOG OF BORING NO. P-81

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" ID HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
				X	Silty Sand; Same as above, saprolite, moist	
45	7-23-46	(69)	43.5-45			
						46-47' PWR layer
					46-47' PWR	tough drilling
				X	Silty Sand; Olive gray micaceous silt interlayered w/ poorly graded saprolite	
50	12-22-50/5"		48.5-50		sand, few angular PWR schistose layers, trace white feldspar pottings, moist	
						~53' PWR grinding
					53-55' PWR	
55			55			
					55.00' BGS HSA Refusal (Top of Rock)	
60						
					Well Dimensions	
					Screen 8.90 - 23.90	
65					Sand 7.50 - 23.90	
					Bent 5.50-7.50	
					Grout 0-5.50 & 23.90-55.00	
					Stickup 3.00' Tape Measured	
70						
75						
80						

Completion Depth 23.90 Screen / 55.00 Drill BGS Depth to Water in Boring 17.48 BTOP ☐ Set ☑ 24 Hrs

Date 2/21/08 Field Agent J. Pfohl

2 of 2

LOG OF BORING NO. P-82

Project: Iredell LF- Steele
Project No.: 608002.0
Type: 3.25" OD HSA w/ SS
Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
	3-6-8	(12)	0-1.5	X	Silty Sand; Dark Brown coarse grained sand tilled w/ Black organic top soil, root debris, moist	0-0.5 Top Soil 0.5-3 Silty Sand
	4-5-8	(13)	3.5-5	X	Clayey Silt w/sand; Red micaceous silt w/cohesive clay, moist.	3-7 Clayey Silt 7-27 Silty Sand 27-40.20 Sand, Silt
5						
10	3-5-8	(8)	8.5-10	X	Silty Sand; Red micaceous silt laminated w/ tan poorly sorted sand, dry.	
15	3-3-5	(8)	13.5-15	X	Silty Sand; Y. orange & tan poorly sorted sand laminated w/ White & black micaceous silt, defined relict structure, dry.	
						Well Dimensions Screen 25.20-40.20 Sand 23.80-40.20 Bent 21.50-23.80 Grout 0-21.50 Stickup 3.00' TM
20	3-4-5	(9)	18.5-20	X	Silty Sand; Same as above, dry	
25	3-4-5	(9)	23.5-25	X	Silty Sand; Same as above, dry.	
30	3-4-5	(9)	28.5-30	X	Sandy Silt; Olive gray micaceous silt laminated w/ poorly sorted Y orange & tan sand, trace black organic silt nodules, relict structure, moist	
						ST 33.5-35.67 wet tube
35			33.5-35.67		Sandy Silt;	
40	3-5-4	(9)	38.5-40	X	Same as above, wet	No Refusal

Completion Depth 40.20 BGS
Depth to Water in Boring 37.50 BTOP ☐ Set ☑ 24 Hrs
Date 2/21/08 Field Agent J. Pfohl

1 of 1

LOG OF BORING NO. P-83

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
	2-3-4	(7)	0-1.5'	X	Silty clay; Red, cohesive, homogeneous, moist	
5	6-7-7	(14)	3.5-5'	X	Silty clay; Red; slightly cohesive, homogeneous, moist	
10	3-3-5	(8)	8.5-10'	X	Silty Sand; Y. Orange poorly sorted sand laminated w/ olive gray silt white coarse grain qtz. layer, micaceous, dry.	
15	3-3-4	(7)	13.5-15	X	Silty Sand; Red; very little structure, micaceous, dry, trace dark Brown organic silt nodules, dry.	
20	3-3-5	(8)	18.5-20'	X	Silty Sand; Y. Orange poorly sorted sand, few black silt nodules white coarse quartz layers, micaceous, dry, relict structure	
25	3-4-6	(10)	23.5-25'	X	Silty sand Same as above but more silt	
30	4-5-7	(12)	28.5-30	X	Silty Sand; Y. orange poorly sorted sand mottled w/ black & white silt nodules, relict structure, dry, very micaceous	
35	3-4-4	(8)	33.5-35	X	Silty Sand; Olive gray micaceous silt laminated w/ poorly graded sand. Purple clay, extremely micaceous, several black organic silt partings, dry	
40	2-3-5	(8)	38.5-40	X	Silty Sand; Y. orange poorly sorted sand mottled w/ black, white & Olive gray silt Damp, very micaceous, relict structure, moist.	

Completion Depth 50.25 BGS Depth to Water in Boring 42.39 BTOP ☐ Set ☑ 24 Hrs

Date 2/25/08 Field Agent J. Pfohl

1 of 2

LOG OF BORING NO. P-83

Project: Iredell LF-Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
					Sandy	
45	2-2-3	(5)	43.5-45		Silt; Olive Gray silt laminated w/ Y. orange poorly sorted sand, relict structure very micaceous, wet.	
50	2-2-3	(5)	48.5-50	—	Sandy silt; Same as above., loose, wet. 50.25' BGS terminated (No Refusal)	
55						
					Well Dimensions	
					Screen 35.25-50.25 (0.01")	
					Sand 33.88-50.25 (#2)	
60					Bent 31.50-33.88 (1/4" chips)	
					Grout 0-31.50 (Bent/cement slurry)	
					Stickup 3.00' TM	
65						
70						
75						
80						No Rock/Refusal

Completion Depth 50.25 BGS Depth to Water in Boring 42.39 BTOP ☐ Set ☑ 24 Hrs

Date 2/25/08 Field Agent J. Pfohl

2 of 2

LOG OF BORING NO. P-84S

Project: Iredell LF- Steele Project No.: 608002.0

Type: 8.5 OD HSA w/ SS Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
	2-2-2	(4)	0-1.5	X	Silty Clay; Red, very cohesive, micas., moist.	0-2 silty clay 2-7 Clayey Silt 7-26 Sandy Silt 26- Silty Sand
5	4-5-5		3.5-5	X	Clayey Silt; Red; cohesive, highly micas., moist.	
10	3-4-5	(9)	8.5-10	X	Sandy Silt; Brown fine grained sand laminated w/ Ol. gray micas. silt, dry	
15	3-4-4	(8)	13.5-15	X	Sandy Silt; Same as above.	
20	3-4-5	(9)	18.5-20	X	Sandy Silt; Olive gray micas. silt laminated w/ white feldspathic partings & Brown poorly sorted sand, dry.	
25	3-5-6	(11)	23.5-25	X	Sandy Silt; Same as above but more poorly sorted sand & less feldspar partings. dry	
30	4-5-6	(11)	28.5-30	X	Silty Sand; Brown poorly sorted sand laminated w/ olive gray micas. silt, few white feldspar partings, dry	
35			33.5		Silty Sand; Same as above	ST 33.5-35.67
40	3-4-6	(10)	38.5-40	X	Silty Sand; Same as above slightly more micas. silt.	

Completion Depth 53.47 BGS Depth to Water in Boring 45.32 BTOP ☐ Set ☑ 24 Hrs

Date 2/21/08 Field Agent J. Pfohl

LOG OF BORING NO. P-84S

Project: Iredell LF-Steele Project No.: 608002.0

Type: 8.25" OD HSA w/SS Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
45	2-3-3	(6)	BS 45	X	Silty Sand; Y. Orange poorly sorted sand w/trace olive gray micaceous silt, few white feldspar partings, few black organic silt pockets, moist	
50	4-3-4	(7)	BS 50	X	Silty sandy Same as above but more moist.	
					53.47' Terminated Not Refusal	
					Well Dimensions	
					Screen 38.47 - 53.47	
					Sand 37.10 - 53.47	
					Bent 35.02 - 37.10	
					Grout 0 - 35.02	
					Stickup 3.00' T.M	

Completion Depth 53.47' BGS Depth to Water in Boring 45.32 BTOP ☐ Set ☑ 24 Hrs

Date 2/21/08 Field Agent J. Pfahl

2 of 2

LOG OF BORING NO. P-84 D

Project: Iredell LF- Steele Project No.: 608002.0

Type: 2¼" ID HSA w/ SPT 8" DTH, NQ core, 6" DTH Ream Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
						Screen Annulus Diameter 6"
						5' Screen
5					No SPT until 53.5' BGS See log for adjacent P-84S for soil Descriptions	
10						
15						
20						
25						
30						
35						
40						

Completion Depth 101.52 BGS Depth to Water in Boring 43.30 BTOP ☐ Set ☑ 24 Hrs

Date 2/29/08 Field Agent J. Pfohl

1 of 3

LOG OF BORING NO. P-84D

Project: Iredell LF-Steele Project No.: 608002.0

Type: 2¼" ID HSA w/SPT, 8" DTH, NQ core, 6" DTH Ream Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
45					No SPT until 53.5' BGS. See log for adjacent P-84S for Soil Descriptions	
50						
55	3-5-5	(10)	53.5-55	X	Silty Sand; Y. Orange poorly sorted sand w/ trace olive gray micas. silt, few white feldspar fragments, few qtz. fragments, wet.	
60	6-6-7	(13)	55-60	X	Silty Sand; Same as above	
65	7-7-7	(14)	65-65	X	Silty Sand; Same as above.	
70	9-10-12	(22)	68.5-70	X	Silty Sand; Y. Orange Same as above lower sand %.	
75	10-12-13	(25)	73.5-75	X	Silty Sand; Y. Orange poorly sorted sand w/ olive gray micas. silt, few black silt nodules, moist.	
80	18-21-24	(45)	78.5-80	X	Silty Sand; Saprolite; Y. Orange poorly sorted sand w/ trace olive gray micas, silt, few black organic silt pockets & gravel size angular Rock Fragments moist	

Completion Depth 101.52 BGS Depth to Water in Boring 43.30 BTOP ☐ Set ☑ 24 Hrs

Date 2/29/08 Field Agent J. Pfohl

LOG OF BORING NO. P-84D

Project: Iredell LF- Steele Project No.: 608002.0

Type: 2 1/4" ID HSA w/ 5FT, 8" OD DTH, NQ core, 6" DTH Ream Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
						83' PWR Begins much harder grinds very slow HSA
	46-50/1"	(50/1")	83.5		Hard Weathered Rock; No Recovery	
85						
90					HSA Refusal @ 91' BGS	
91					Run #1 (91.00 - 96.45) RQD = 0 / 5.45 = 0% REC = 3.26 / 5.45 = 59.812%	
					Schist;	
					91-92.6' Very Weathered Brown, 92.6' Gray	
95						
					Run #2 (96.45 - 101.15) REC = 4.70 / 4.70 = 100% RQD = 0.354 / 4.70 = 7.53%	
					Schist; Heavily weathered, Gray 30° Foliations, Slightly micaceous,	
100						
105						
					Well Dimensions	
110					Outer Pit Casing 0 - 91 — 6" OD PVC	
					Screen 96.52 - 101.52 — 2" PVC	
					Sand 95.25 - 101.52 — #2	
					Bentonite 90.00 - 95.25 — 3/8" chips	
					Grout 0 - 90.00 — Cement/Bent Slurry	
115					Stickup = 3.00' Tape Measured	
120						

Completion Depth 101.52 BGS Depth to Water in Boring 43.30 BTOP ☐ Set ☑ 24 Hrs

Date 2/29/08 Field Agent J. Pfohl

3 of 3

LOG OF BORING NO. P-85

Project: Iredell LF- Steele Project No.: 608002.0

Type: 4¼" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
	4-3-4	(7)	0-1.5'	X	Silty Clay; Red; cohesive, homogeneous, moist	
5	4-5-7	(12)	3.5-5	X	Clayey Silt; Red; very homogeneous, trace micas., moist Very homogeneous,	
10	3-4-4	(8)	8.5-10	X	Silty Sand; Med. Brown poorly sorted sand laminated w/ red sand & olive gray micaceous silt, dry.	
15	2-3-4	(7)	13.5-15	X	Sandy Silt; Reddish Brown Silt w/ olive gray micaceous silt & poorly sorted red sand, few black silt nodules, dry	
20	2-3-4	(7)	18.5-20	X	Sandy Silt; Same as above	
25	2-2-3	(5)	23.5-25	X	Sandy Silt; Olive gray micaceous silt interlayered w/ black organic silt partings, moist	Well Dimensions Screen: 23.86-38.86 Sand: 22.12-38.86 Bent: 19.50-22.12 Grout: 0-19.50 Stickup: 3.00' TM
30	1-2-3	(5)	28.5-30	X	Sandy Silt; Olive gray micaceous silt laminated w/ fine grained yellow sand & white feldspathic silt; few white qtz. seams, moist.	
35	1-2-3	(5)	33.5-35	X	Sandy Silt; Same as above, wet	
40					Terminated @ 38.86' BGS NO Refusal Not even hard at all	

Completion Depth 38.86 BGS Depth to Water in Boring 35.40 BTOP ☐ Set ☑ 24 Hrs

Date 2/27/08 Field Agent J. Pfohl

1 of 1

LOG OF BORING NO. P-86

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — AE Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Retr.	Description of Material	Comments
	3-4-5	(9)	0-15	X	Silty Clay; Red, cohesive, homogeneous, trace sand, moist	
5	3-5-5	(10)	5-5	X	Silty Sand; Reddish Brown poorly sorted sand w/ Tan & Olive gray micaceous silt, dry	
10	3-5-6	(11)	5-10	X	Silty Sand; Same as above	
15	3-2-3	(5)	15-15	X	Sandy Silt; Tan & Olive Gray micaceous silt laminated w/ Reddish brown poorly sorted sand, soft, dry	
20	2-3-3	(6)	15-20	X	Sandy Silt; Same as above	
25	3-5-6	(11)	25-25	X	Silty Sand; Reddish Brown poorly sorted sand w/ Tan & olive gray micaceous silt, few black organic silt nodules, dry	
30	3-5-5	(10)	25-30	X	Silty Sand; Same as above, dry	
35	3-5-6	(11)	35-35	X	Silty Sand; Same as above, dry	
40	3-5-6	(11)	35-40	X	Silty Sand; Same as above, more relict structure, dry.	

Completion Depth 61.26 screen 70.00 drilled BGS Depth to Water in Boring 52.65 BTOP ☐ Set ☑ 24 Hrs

Date 2/27/08 Field Agent J. Pfohl

1 of 2

LOG OF BORING NO. P-86

Project: Iredell LF-Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Refr.	Description of Material	Comments
45	3-2-4	(7)	43.5-45	X	Silty Sand; Same as above, dry	48.5' Little Header
50	6-7-7	(14)	48.5-50	X	Silty Sand; Dark Brown poorly sorted sand laminated w/ olive gray micaceous silt, few white qtz. fragments, moist.	
55	4-5-6	(11)	53.5-55	X	Silty Sand; Same as above, wet	55' Header PWR 63'
60	6-7-8	(15)	58.5-60	X	Saprolite Silty Sand; Dark Brown poorly sorted sand laminated w/ Olive gray micaceous silt, few white angular quartz fragments, few angular PWR fragments, moist Screen set 61.26' BGS	65 Header
63 64 65	32-50/2"	(50/2")	63.5-64	X	~~Silty Sand~~ PWR; Dark Brown, saprolite, friable PWR in layers, moist	
	39-50/2"	50/2"	68.5-		PWR No Recovery	
70					Hole Refusal @ 70' BGS	
75					Well Dimensions Screen 46.26 - 61.26 (0.01) Sand 45.18 - 61.26 (#2) Bentonite 42.38 - 45.18 + 61.26 - 70.00 (3/8" chips) Grout 0 - 42.38 (Bentonite/cement slurry Tremie) Stickup 3.00' Tape Measured	
80						

Completion Depth 61.26' Screen / 70.00' Drill BGS Depth to Water in Boring 52.65 BTOP ☐ Set ☑ 24 Hrs

Date 2/27/08 Field Agent J. Pfohl

2 of 2

LOG OF BORING NO. B-79

Project: Iredell LF- Steele Project No.: 608002.0

Type: 7.75" OD HSA w/ SPT Drilling Company: Derry's Well Drilling

Municipal Services, Garner, N.C. — Engineering Company, P.A., Boone, N.C.

Depth (ft.)	Blows per Foot	Samples #	Samples Beg. Depth	Samples Retr.	Description of Material	Comments
					original B-79 Location but hit Rock B4 ▽ so offset per Ethan	
	6-6-7	(13)	0-1.5	X	0-0.5' Topsoil Silty Clay w/ sand; Brown clay w/ olive gray silt, med. grained sand, moist,	
5	4-6-9	(15)	3.5-5'	X	Silty Sand; Y. Orange poorly graded sand w/ Olive gray micaceous silt, several black organic silt partings, relict structure, dry	
					Saprolite	
10	6-8-7	(15)	8.5-10'	X	Silty Sand; Y. orange poorly sorted sand laminated w/ Olive gray micas. silt, relict structure, several black silt nodules, few white qtz. fragments, dry.	11'-13' Mucu Harder layer White Qtz layer 11-11.5'
15	4-4-5	(9)	13.5-15'	X	Silty Sand; Same as above, dry, few cobble size PWR fragments	
						18' Qtz. again
20	3-6-13	(19)	18.5-20'	X	Silty Sand; Saprolite, Y. Orange poorly sorted sand mottled w/ black silt nodules & white feldspar nodules, several gravel size white qtz. fragments, dry. HSA Refusal 21.5' BGS (Dry) Piece of Qtz. kept from cuttings	
25					DRY No Piez. Set. So properly abandoned.	
30						
35						
40						

Completion Depth 21.50 BGS Depth to Water in Boring DRY BTOP ☐ Set ☐ 24 Hrs

Date 2/25/08 Field Agent J. Pfohl

1 of 1

APPENDIX B

Table B-1: Summary of Laboratory Analysis of Soil Samples

Sample No.	Depth (ft)	Laboratory	USCS Grain Size Distribution (%)			USCS Classification	USCS Symbol	Specific Gravity	Atterberg Limit		
			Gravel	Sand	Silt & Clay				LL	PL	PI
P-78S	18 - 20.17	Geotechnics	0.00	69.49	35.51	Silty Sand	SM	2.71	NPL	NPL	NPL
P-82	33.5 - 35.67	Geotechnics	0.66	46.90	52.44	Sandy Silt	ML	2.70	48	37	11
P-84S	33.5 - 35.67	Geotechnics	0.97	60.16	38.87	Silty Sand	SM	2.72	40	39	1

Sample No.	Depth (ft)	Dry Density (pcf)	Moisture Content	Conductivity (cm/sec)	Total Porosity
P-78S	18 - 20.17	80.8	17.0%	3.20E-04	52%
P-82	33.5 - 35.67	79.4	39.2%	5.20E-05	53%
P-84S	33.5 - 35.67	88.9	15.8%	2.20E-04	48%

NOTE:

1. Atterberg Limit LL is liquid limit, PL is plastic limit, and PI is plasticity index.
2. Porosity was calculated from its corresponding void ratio by using the Equation n = e/(e+1) where n and e denote the porosity and void ratio.

Table B-2. Recalculation of Grains Size Distribution

Sample No.	Depth (ft)	% Finer than 0.0625 mm						% Finer than 0.004 mm					
		Ref_1		Ref_2		Target		Ref_1		Ref_2		Target	
		Size (mm)	%	Size (mm)	%	Size (mm)	%	Size (mm)	%	Size (mm)	%	Size (mm)	%
P-78S	18 - 20.17	0.0750	35.5%	0.0322	21.6%	0.0625	**32.5%**	0.0066	3.6%	0.0032	1.8%	0.004	**2.4%**
P-82	33.5 - 35.67	0.0750	52.4%	0.0279	38.5%	0.0625	**49.9%**	0.0061	16.1%	0.0031	9.3%	0.004	**11.9%**
P-84S	33.5 - 35.67	0.0750	38.9%	0.0307	26.7%	0.0625	**36.4%**	0.0064	6.3%	0.0032	2.5%	0.004	**3.7%**

Sample No.	Depth (ft)	Sand	Silt	Clay
P-78S	18 - 20.17	**67.5%**	**30.2%**	**2.4%**
P-82	33.5 - 35.67	**50.1%**	**38.0%**	**11.9%**
P-84S	33.5 - 35.67	**63.6%**	**32.7%**	**3.7%**

NOTE:

Accumulative percentages of the target grain sizes (0.0625mm and 0.004mm) were interpolated form the grain-size percentages at either end of a specific segment (denoted Ref1 and Ref2, respectively) in which a target grain size falls. The numbers were taken from the grain size analysis report submitted by Geotechnics.

Table B-3. Effective Porosity Summary

Sample No.	Depth (ft)	AGU Classification	AGU Grain Size Distribution			Effective Porosity
			Sand	Silt	Clay	
P-78S	18 - 20.17	Silty Sand	67.5%	30.2%	2.4%	**27.4%**
P-82	33.5 - 35.67	Silty Sand	50.1%	38.0%	11.9%	**17.0%**
P-84S	33.5 - 35.67	Silty Sand	63.6%	32.7%	3.7%	**25.0%**

NOTE:

1. The proportions of sand, silt, and clay displayed in Table C-3 are in accordance with the recommendation made by the America Geophysical Union (AGU) Subcommittee on Sediment Terminology. This particle-size classification system is widely adopted in recent USGS publications. Because the AGU soil classification system is different for that defined in the Unified Soil Classification System (USCS), the grain sizes for a soil sample were recalculated in Table C-2. Note that determining particle-size distribution by the AGU classification system is a prerequisite for using Johnson's trilinear graph for effective porosity calculation.
2. Johnson's trilinear graphs was used to graphically determine the effective porosity of a soil sample.

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SPECIFIC GRAVITY

ASTM D 854-00 (SOP - S5)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO C&D LF	Depth (ft)	8.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Visual Description	**RED SILTY SAND**
			(MInus No.4 sieve material, airdried)

Replicate Number		**1**		**2**
Pycnometer ID	R	280	R	242
Weight of Pycnometer + Soil + Water (gm)		716.51		701.33
Temperature, T (°Celsius)		22.2		22.4
Weight of Pycnometer + Water (gm)		685.58		670.28
Tare Number		203		201
Weight of Tare + Dry Soil (gm)		220.29		219.83
Weight of Tare (gm)		171.13		170.7
Weight of Dry Soil (gm)		49.16		49.13
Specific Gravity of Soil @ T		2.696		2.718
Specific Gravity of Water @ T		0.9978		0.9977
Conversion Factor for Temperature T		0.9995		0.9995
Specific Gravity @ 20° Celsius		2.698		2.719

Average Specific Gravity @ 20° Celsius	2.71

Tested By JBD *Date* 4/2/2007 *Checked By* GBM *Date* 3-17-08

DCN: CT-S5 Date: 03/24/05 Revision: 10R *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 Specific Gravity .xls]Sheet1*

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ATTERBERG LIMIT

ASTM D 4318-00 (SOP - S4)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO.LF	Depth (ft)	18.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Visual Description	**RED SILTY SAND**
			(MInus No. 40 sieve material, Wet Method)

NON - PLASTIC MATERIAL

Tested By JBD *Date* 3/4/2008 *Checked By* GBM *Date* 3-17-08

page 1 of 1 DCN: CT-S4C DATE: 7-11-97 REVISION : 2 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 Limit-(NP).xls]Sheet1*

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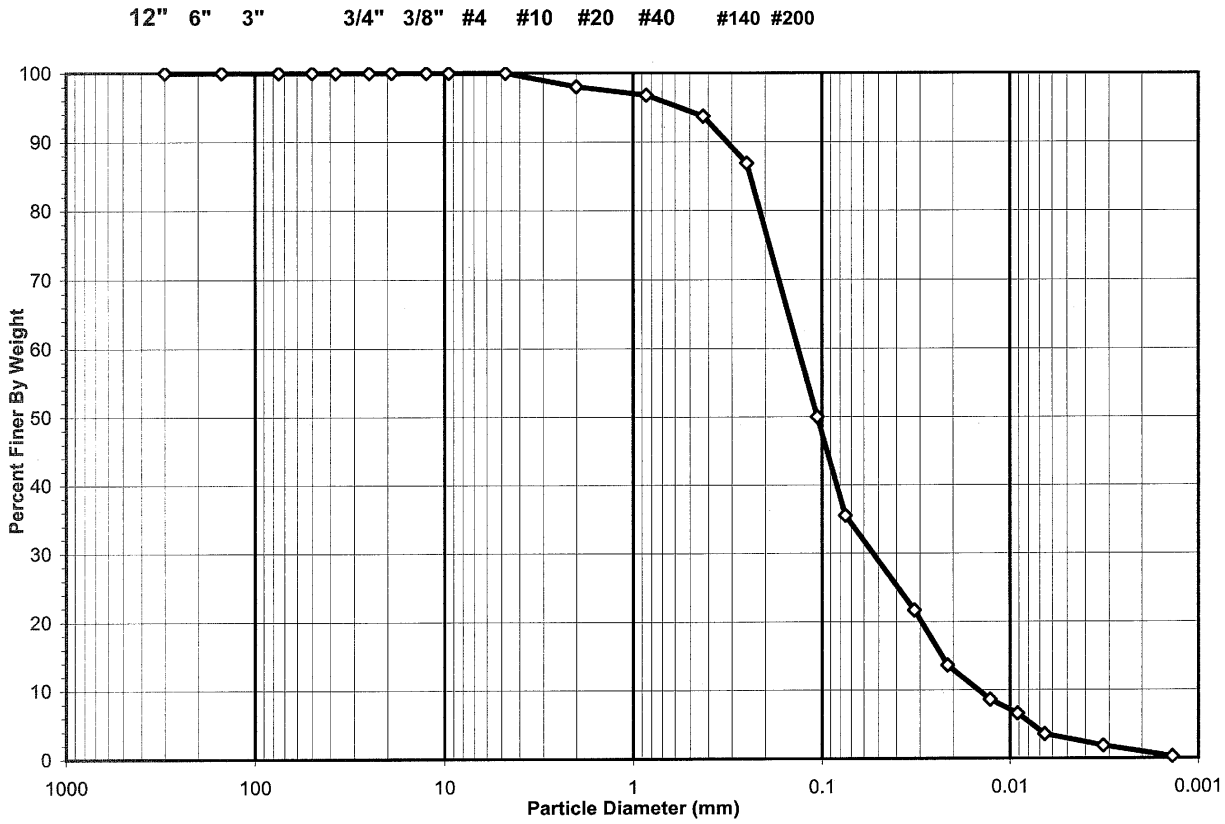
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO. LF	Depth (ft)	18.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Soil Color	**RED**

	SIEVE ANALYSIS					HYDROMETER
USCS	cobbles	gravel	sand			silt and clay fraction
USDA	cobbles	gravel	sand		silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	64.49
Finer Than #200	*Silt & Clay*	35.51

USCS Symbol ***SM, TESTED (NON PLASTIC FINES)***

USCS Classification ***SILTY SAND***

DCN: CT-S3P DATE:02/15/05 REVISION:8 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 #10 Split Hydro rev 8.xls]Sheet1*

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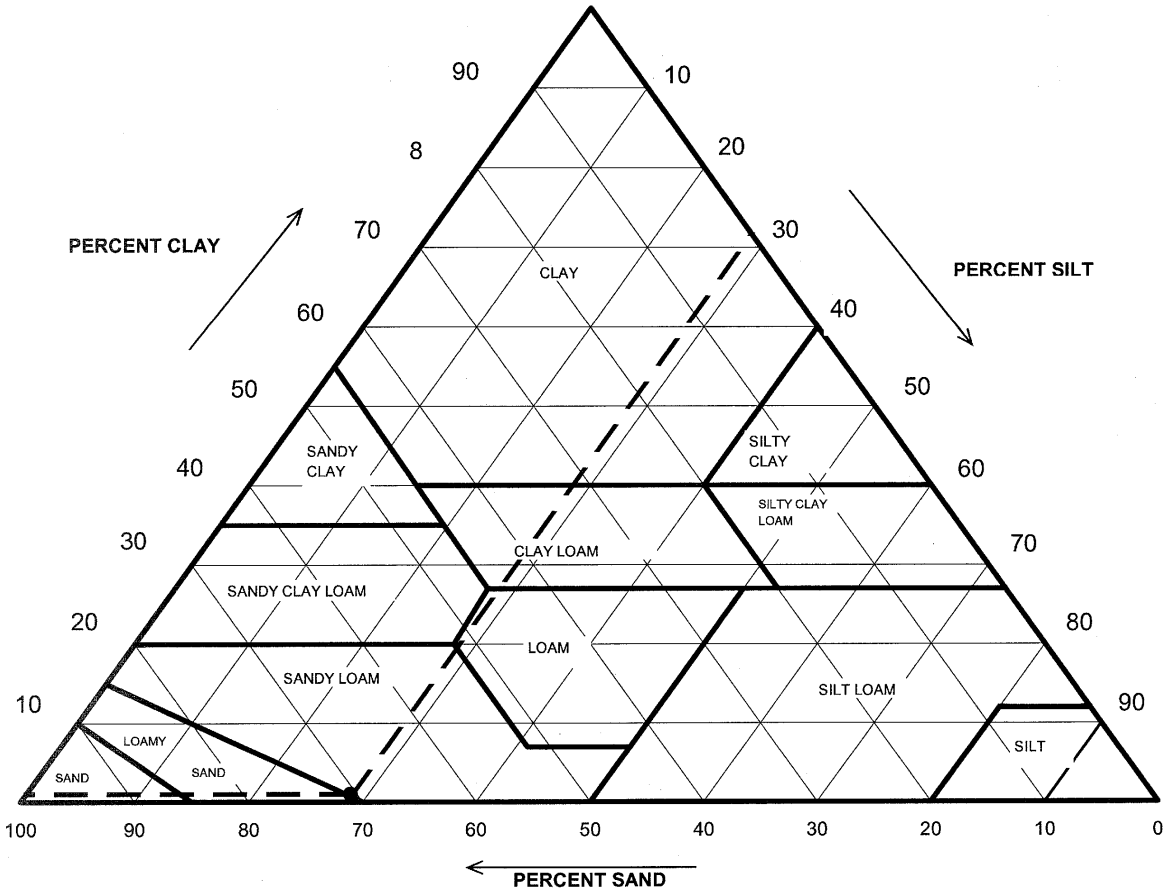
INTEGRITY IN TESTING

USDA CLASSIFICATION CHART

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO. LF	Depth (ft)	18.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Soil Color	RED



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	1.98	**0.00**
2	98.02	*Sand*	69.16	**70.56**
0.05	28.86	*Silt*	27.90	**28.46**
0.002	0.96	*Clay*	0.96	**0.98**

USDA Classification: ***SANDY LOAM***

page 2 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:8Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 #10 Split Hydro rev 8.xls]Sheet1

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INTEGRITY IN TESTING

WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO. LF	Depth (ft)	18.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Soil Color	**RED**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	208	Tare No.	B-1
Wgt.Tare + Wet Soil (gm)	527.45	Wgt.Tare + Wet Soil (gm)	41.78
Wgt.Tare + Dry Soil (gm)	457.09	Wgt.Tare + Dry Soil (gm)	41.10
Weight of Tare (gm)	169.76	Weight of Tare (gm)	22.04
Weight of Water (gm)	70.36	Weight of Water (gm)	0.68
Weight of Dry Soil (gm)	287.33	Weight of Dry Soil (gm)	19.06
Moisture Content (%)	**24.5**	**Moisture Content (%)**	**3.6**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	357.69	Weight of the Dry Sample (gm)	383.89
Dry Weight +#10 Material(gm)	287.3	Weight of minus #200 material (gm)	34.99
Wet Weight Hydro. Material.(gm)	100.00	Weight of plus #200 material (gm)	348.90
Dry Weight Hydro. Material (gm)	96.56		
Total Dry Weight Sample (gm)	383.89	**J-FACTOR (%FINER THAN #10)**	**0.9802**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	5.70	1.98	1.98	98.02	**98.02**
#20	0.85	1.22	1.26	1.26	98.74	**96.78**
#40	0.425	3.00	3.11	4.37	95.63	**93.73**
#60	0.250	6.77	7.01	11.38	88.62	**86.86**
#140	0.106	36.35	37.65	49.03	50.97	**49.96**
#200	0.075	14.23	14.74	63.77	36.23	**35.51**
Pan	-	34.99	36.23	100.00	-	-

Notes :

Tested By TMS Date 3/7/2008 Checked By GEM Date 3-17-07

page 3 of 4 DCN: CT-S3P DATE:02/15/05 REVISION:E *Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 #10 Split Hydro rev 8.xls]Sheet1*

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INTEGRITY IN TESTING

HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Reference	IREDELL CO. LF	Depth (ft)	18.0-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID	2008-508-15-01	Soil Color	**RED**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	26.0	26.0	21.8	4.43	21.6	22.1	0.01312	0.0322	**21.6**
5		18.0	21.8	4.43	13.6	13.9	0.01312	0.0214	**13.6**
15		13.0	21.8	4.43	8.6	8.8	0.01312	0.0127	**8.6**
30		11.0	21.8	4.43	6.6	6.7	0.01312	0.0091	**6.6**
60		8.0	21.8	4.43	3.6	3.6	0.01312	0.0066	**3.6**
250		6.0	22.7	4.17	1.8	1.9	0.01298	0.0032	**1.8**
1440		5.0	20.8	4.72	0.3	0.3	0.01328	0.0014	**0.3**

Soil Specimen Data		Other Corrections	
Tare + Dry Material (gm)	96.56	a - Factor	0.988
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	98.02
Weight of Dry Material (gm)	96.56		
		Specific Gravity	2.71 Measured

Note:

Tested By SGH Date 3/7/2008 Checked By GEM Date 3-17-07

page 4 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:6 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 #10 Split Hydro rev 8.xls]Sheet1*

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INTEGRITY IN TESTING

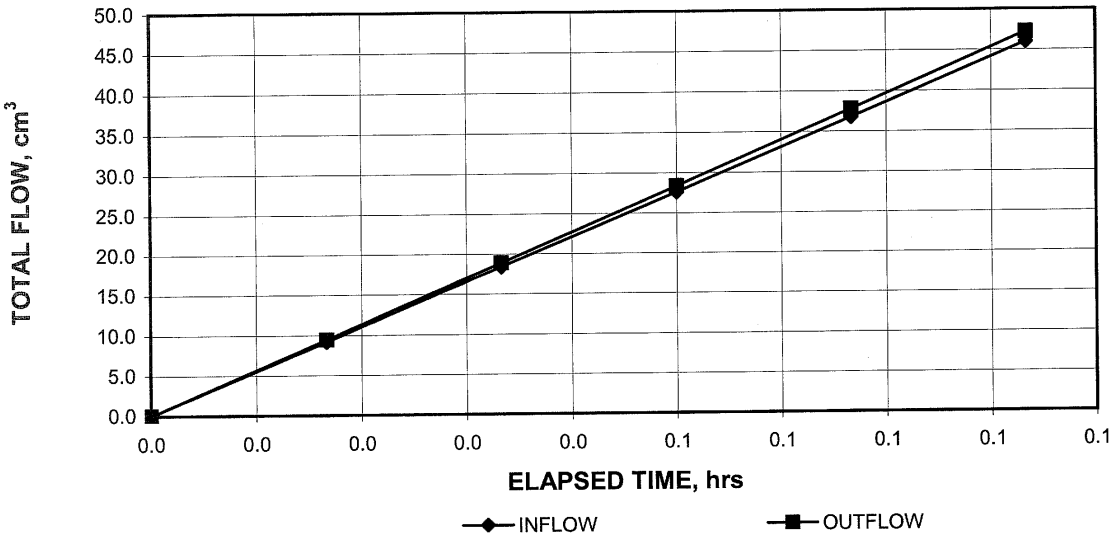
PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

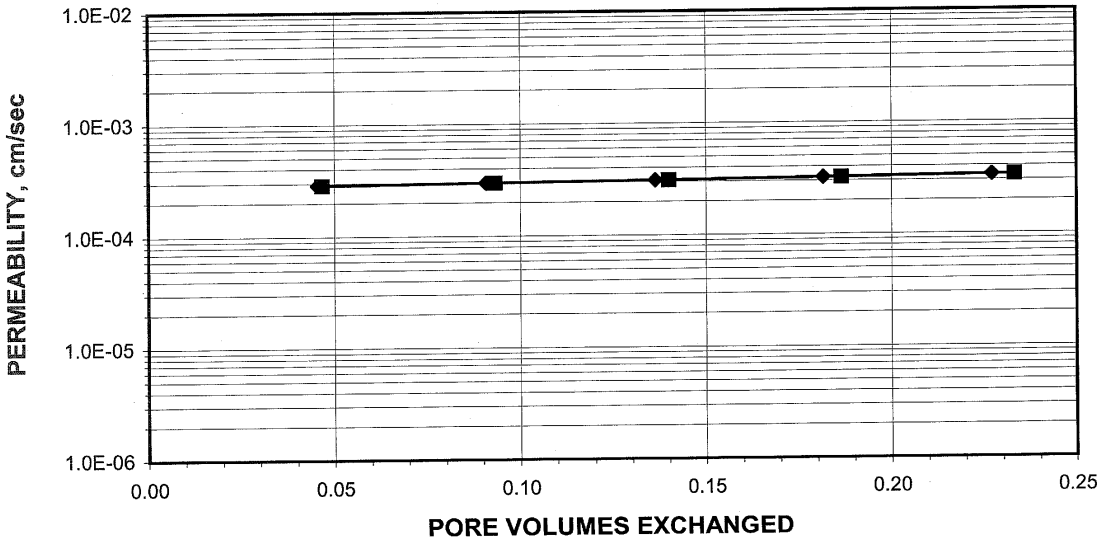
Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Project	IREDELL CO. LF.	Depth (ft.)	18.00-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID No.	2008-508-15-01		

AVERAGE PERMEABILITY = 3.2E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.2E-06 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: TMS Date: 3/4/2008 Checked By: GEM Date: 3-17-08

DCN: CT-22 DATE: 01-08-99 REVISION: 2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 PERM.xls]Sheet1
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INTEGRITY IN TESTING

PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Project	IREDELL CO. LF.	Depth (ft.)	18.00-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID No.	2008-508-15-01		
		Specific Gravity	2.71 Measured
		Sample Condition	Undisturbed

Visual Description: RED SILTY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	B-1	307
Wt. of Tare & WS (gm.)	259.12	476.02
Wt. of Tare & DS (gm.)	236.06	377.02
Wt. of Tare (gm.)	100.50	111.11
Wt. of Water (gm.)	23.06	99.00
Wt. of DS (gm.)	135.56	265.91
Moisture Content (%)	**17.0**	**37.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	578.42	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	578.42	678.37
Length 1 (in.)	3.685	3.726
Length 2 (in.)	3.690	3.635
Length 3 (in.)	3.680	3.674
Top Diameter (in.)	2.839	2.870
Middle Diameter (in.)	2.840	2.865
Bottom Diameter (in.)	2.835	2.818
Average Length (in.)	3.69	3.68
Average Area (in.^{2})	6.33	6.38
Sample Volume (cm^3)	381.99	384.80
Unit Wet Wt. (gm./ cm^3)	1.51	1.76
Unit Wet Wt. (pcf)	94.5	110.0
Unit Dry Wt. (pcf)	80.8	80.2
Unit Dry Wt. (gm./ cm^3)	1.29	1.28
Void Ratio, e	1.09	1.11
Porosity, n	0.52	0.53
Pore Volume (cm^3)	199.6	202.4

Tested By: TMS Date: 3/4/2008 Checked By: GBM Date: 3-17-08

 DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 PERM.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

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INTEGRITY IN TESTING

Client	MUNICIPAL ENGINEERING	Boring No.	P-78S
Client Project	IREDELL CO. LF.	Depth (ft.)	18.00-20.17
Project No.	2008-508-15	Sample No.	NA
Lab ID No.	2008-508-15-01		

Pressure Heads (Constant)		Final Sample Dimensions	
Top Cap (psi)	48.6	Sample Length (cm), L	9.34
Bottom Cap (psi)	50.0	Sample Diameter (cm)	7.24
Cell (psi)	60.0	Sample Area (cm^2), A	41.19
Total Pressure Head (cm)	98.4	Inflow Burette Area (cm^2), a-in	4.430
Hydraulic Gradient	10.53	Outflow Burette Area (cm^2), a-out	4.569
		B Parameter (%)	95

AVERAGE PERMEABILITY = 3.2E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.2E-06 m/sec @ 20°C

DATE (mm/dd/yy)	TIME (hr)	TIME (min)	ELAPSED TIME t (hr)	TOTAL INFLOW (cm^3)	TOTAL OUTFLOW (cm^3)	TOTAL HEAD h (cm)	FLOW (0 flow) (1 stop)	TEMP. (°C)	INCREMENTAL PERMEABILITY @ 20°C (cm/sec)
3/4/2008	12	18	0.0	0.0	0.0	119.1	0	22.0	NA
3/4/2008	12	19	0.0	9.2	9.4	114.9	0	22.0	2.9E-04
3/4/2008	12	20	0.0	18.4	18.9	110.8	0	22.0	3.0E-04
3/4/2008	12	21	0.0	27.6	28.3	106.7	0	22.0	3.1E-04
3/4/2008	12	22	0.1	36.8	37.8	102.5	0	22.0	3.2E-04
3/4/2008	12	23	0.1	46.0	47.2	98.4	1	22.0	3.3E-04

Tested By: TMS Date: 3/4/2008 Checked By: GBM Date: 3-17-08

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-15-01 PERM.xls]Sheet1

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INTEGRITY IN TESTING

SPECIFIC GRAVITY

ASTM D 854-00 (SOP - S5)

Client	MESCO	Boring No.	P-82
Client Reference	IREDELL CO C&D LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Visual Description	**ORANGE BROWN SANDY SILT** (MInus No.4 sieve material, airdried)

Replicate Number		**1**		**2**
Pycnometer ID	R	280	R	242
Weight of Pycnometer + Soil + Water (gm)		715.18		699.62
Temperature, T (°Celsius)		21.5		21.5
Weight of Pycnometer + Water (gm)		685.66		670.38
Tare Number		211		203
Weight of Tare + Dry Soil (gm)		218		219.03
Weight of Tare (gm)		171.24		172.46
Weight of Dry Soil (gm)		46.76		46.57
Specific Gravity of Soil @ T		2.712		2.687
Specific Gravity of Water @ T		0.9979		0.9979
Conversion Factor for Temperature T		0.9997		0.9997
Specific Gravity @ 20° Celsius		2.713		2.688

Average Specific Gravity @ 20° Celsius	2.70

Tested By TMS *Date* 2/27/2008 *Checked By* GM *Date* 3-6-08

DCN: CT-S5 Date: 03/24/05 Revision: 10R *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 Specific Gravity Soils 1Raleigh.xls]Sheet1*

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	MUNICIAPAL ENGINEERING	Boring No.	P-82
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Soil Description	**ORANGE BROWN SILT**

***Note: The* USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.** (Minus No. 40 sieve material, Airdried)

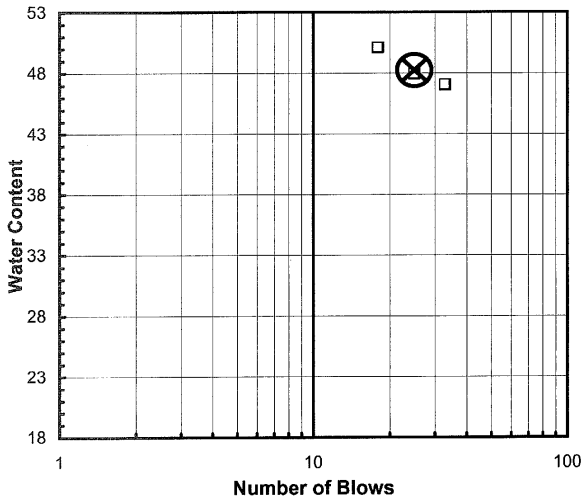
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	A-O	M	A-B	**MULTIPOINT**
Wt. of Tare & WS (gm)	31.32	26.84	30.39	
Wt. of Tare & DS (gm)	26.05	23.06	25.66	
Wt. of Tare (gm)	15.52	15.17	15.60	
Wt. of Water (gm)	5.3	3.8	4.7	
Wt. of DS (gm)	10.5	7.9	10.1	
Moisture Content (%)	**50.0**	**47.9**	**47.0**	
Number of Blows	**18**	**25**	**33**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	P	M	
Wt. of Tare & WS (gm)	22.49	23.31	
Wt. of Tare & DS (gm)	20.51	21.10	
Wt. of Tare (gm)	15.23	15.16	
Wt. of Water (gm)	2.0	2.2	
Wt. of DS (gm)	5.3	5.9	
Moisture Content (%)	**37.5**	**37.2**	**0.3**

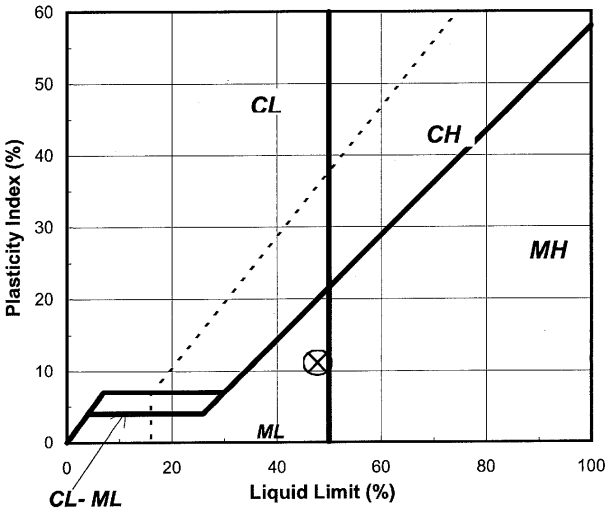
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**48**
Plastic Limit (%)	**37**
Plasticity Index (%)	**11**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By SGH *Date* 3/5/2008 *Checked By* GEM *Date* 3-6-08

page 1 of 1 **DCN:** CT-S4B **DATE:** 10/8/2001 **REVISION:** 2

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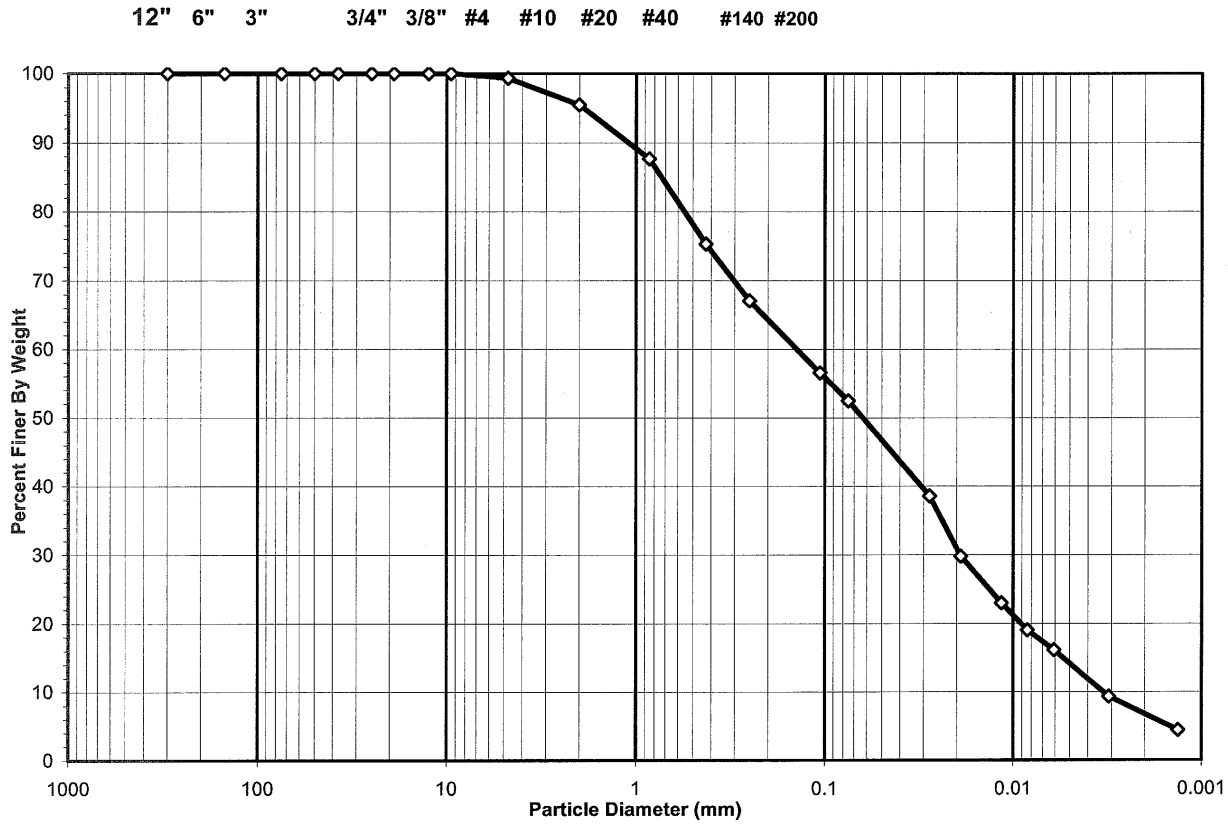
INTEGRITY IN TESTING

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-82
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Soil Color	**ORANGE BROWN**

	SIEVE ANALYSIS					HYDROMETER
USCS	cobbles	gravel	sand			silt and clay fraction
USDA	cobbles	gravel	sand		silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.66
#4 To #200	*Sand*	46.90
Finer Than #200	*Silt & Clay*	52.44

USCS Symbol ***ML, TESTED***

USCS Classification ***SANDY SILT***

page 1 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:8 *Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 #10 Split Hydro rev 8.xls]Sheet1*

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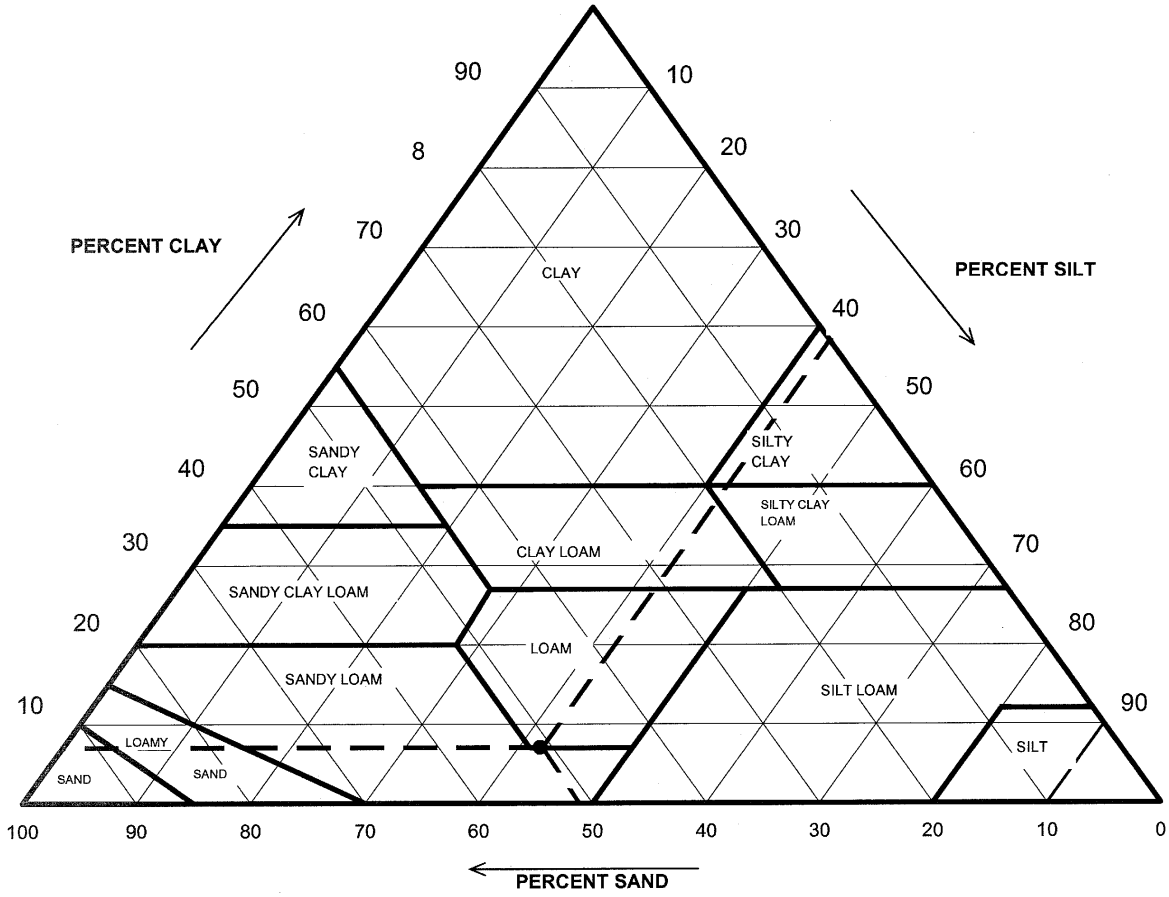
INTEGRITY IN TESTING

USDA CLASSIFICATION CHART

Client	MUNICIPAL ENGINEERING	Boring No.	P-82
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Soil Color	ORANGE BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	4.50	**0.00**
2	95.50	*Sand*	48.75	**51.05**
0.05	46.75	*Silt*	39.99	**41.88**
0.002	6.75	*Clay*	6.75	**7.07**

USDA Classification: ***LOAM***

page 2 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:8\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 #10 Split Hydro rev 8.xls]Sheet1

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INTEGRITY IN TESTING

WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-82
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Soil Color	**ORANGE BROWN**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	214	Tare No.	C-2
Wgt.Tare + Wet Soil (gm)	372.80	Wgt.Tare + Wet Soil (gm)	43.84
Wgt.Tare + Dry Soil (gm)	322.99	Wgt.Tare + Dry Soil (gm)	43.11
Weight of Tare (gm)	171.38	Weight of Tare (gm)	21.98
Weight of Water (gm)	49.81	Weight of Water (gm)	0.73
Weight of Dry Soil (gm)	151.61	Weight of Dry Soil (gm)	21.13
Moisture Content (%)	**32.9**	**Moisture Content (%)**	**3.5**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	201.42	Weight of the Dry Sample (gm)	248.28
Dry Weight +#10 Material(gm)	151.6	Weight of minus #200 material (gm)	53.09
Wet Weight Hydro. Material.(gm)	100.01	Weight of plus #200 material (gm)	195.19
Dry Weight Hydro. Material (gm)	96.67		
Total Dry Weight Sample (gm)	248.28	**J-FACTOR (%FINER THAN #10)**	**0.9550**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.00	0.66	0.66	99.34	**99.34**
#10	2.00	5.83	3.85	4.50	95.50	**95.50**
#20	0.85	7.92	8.19	8.19	91.81	**87.67**
#40	0.425	12.51	12.94	21.13	78.87	**75.31**
#60	0.250	8.36	8.65	29.78	70.22	**67.06**
#140	0.106	10.68	11.05	40.83	59.17	**56.50**
#200	0.075	4.11	4.25	45.08	54.92	**52.44**
Pan	-	53.09	54.92	100.00	-	-

Notes :

Tested By SGH Date 3/3/2008 Checked By GEM Date 3-6-08

page 3 of 4 DCN: CT-S3P DATE:02/15/05 REVISION:8 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 #10 Split Hydro rev 8.xls]Sheet1*

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INTEGRITY IN TESTING

HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-82
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-01	Soil Color	**ORANGE BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	44.0	44.0	21.8	4.43	39.6	40.4	0.01308	0.0279	**38.5**
5		35.0	21.8	4.43	30.6	31.2	0.01308	0.0190	**29.8**
15		28.0	21.8	4.43	23.6	24.0	0.01308	0.0116	**23.0**
30		24.0	21.7	4.46	19.5	19.9	0.01310	0.0084	**19.0**
60		21.0	21.7	4.46	16.5	16.9	0.01310	0.0061	**16.1**
250		14.0	21.7	4.46	9.5	9.7	0.01310	0.0031	**9.3**
1440		9.0	21.6	4.49	4.5	4.6	0.01311	0.0013	**4.4**

Soil Specimen Data		**Other Corrections**	
Tare + Dry Material (gm)	96.67	a - Factor	0.986
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	95.50
Weight of Dry Material (gm)	96.67		
		Specific Gravity	2.72 Measured

Note:

Tested By JBD Date 2/29/2008 Checked By GBM Date 3-6-08

page 4 of 4 DCN: CT-S3P DATE:02/15/05 REVISION:8 *Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 #10 Split Hydro rev 8.xls]Sheet1*

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
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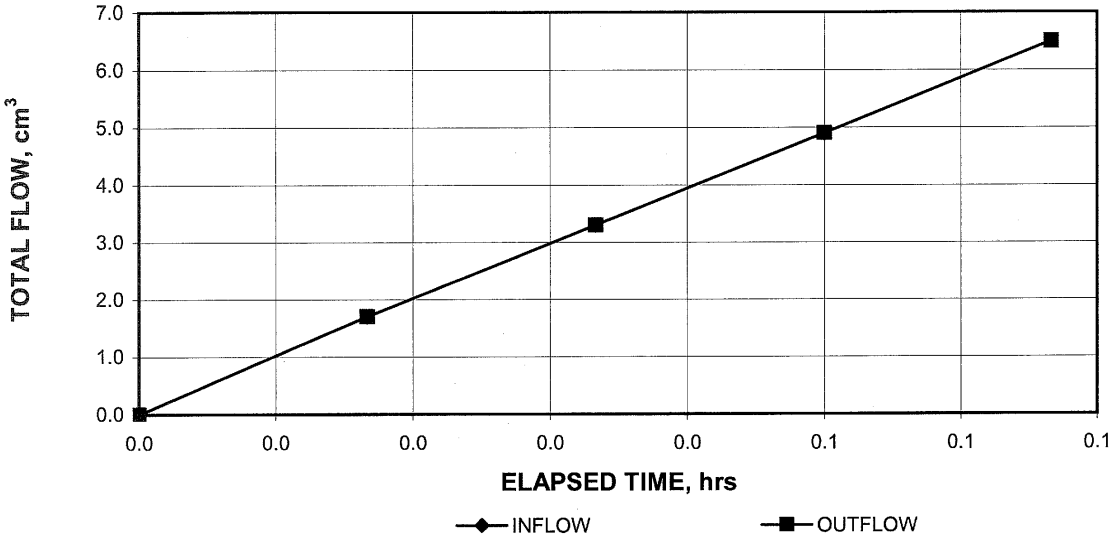
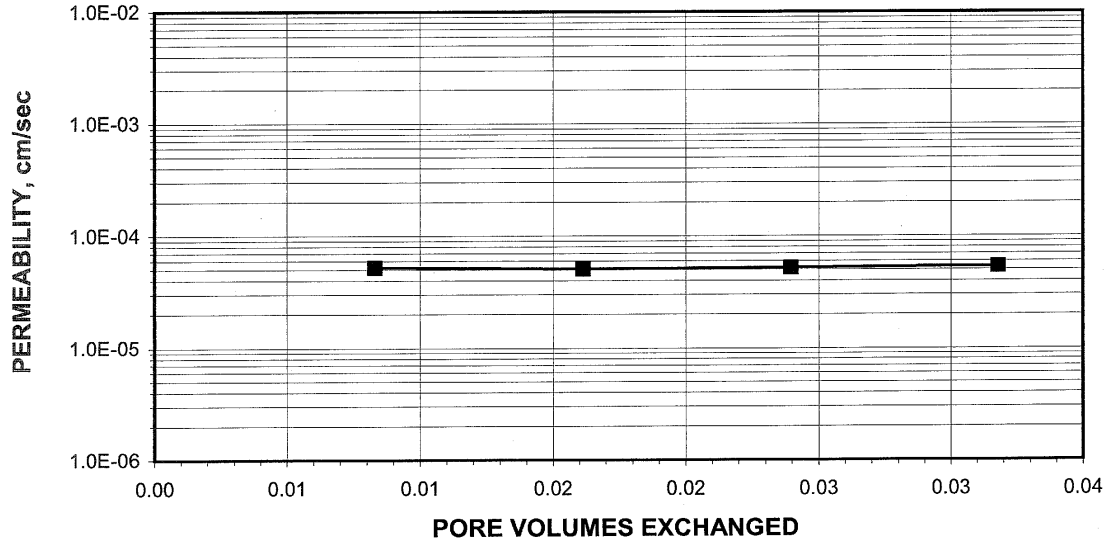
Client	MUNCIPAL ENGINEERING	Boring No.	P-82
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-01		

AVERAGE PERMEABILITY = 5.2E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.2E-07 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: TMS Date: 2/29/2008 Checked By: GEM Date: 3-6-08

DCN: CT-22 DATE: 01-08-99 REVISION: 2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 PERM.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	MUNCIPAL ENGINEERING	Boring No.	P-82
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-01		
		Specific Gravity	2.70 Measured
		Sample Condition	Undisturbed

Visual Description: ORANGE BROWN SANDY SILT

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-2	k-7
Wt. of Tare & WS (gm.)	274.55	368.91
Wt. of Tare & DS (gm.)	225.55	302.77
Wt. of Tare (gm.)	100.53	110.10
Wt. of Water (gm.)	49.00	66.14
Wt. of DS (gm.)	125.02	192.67
Moisture Content (%)	**39.2**	**34.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	707.92	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	707.92	683.17
Length 1 (in.)	3.883	3.840
Length 2 (in.)	3.886	3.827
Length 3 (in.)	3.915	3.810
Top Diameter (in.)	2.832	2.824
Middle Diameter (in.)	2.829	2.836
Bottom Diameter (in.)	2.813	2.814
Average Length (in.)	3.89	3.83
Average Area (in.^{2})	6.27	6.27
Sample Volume (cm^3)	399.94	392.86
Unit Wet Wt. (gm./ cm^3)	1.77	1.74
Unit Wet Wt. (pcf)	110.5	108.6
Unit Dry Wt. (pcf)	79.4	80.8
Unit Dry Wt. (gm./ cm^3)	1.27	1.29
Void Ratio, e	1.12	1.09
Porosity, n	0.53	0.52
Pore Volume (cm^3)	211.6	204.5

Tested By: TMS Date: 2/29/2008 Checked By: GEM Date: 3-6-08

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

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INTEGRITY IN TESTING

Client	MUNCIPAL ENGINEERING	Boring No.	P-82
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-01		

Pressure Heads (Constant)		Final Sample Dimensions	
Top Cap (psi)	48.5	Sample Length (cm), L	9.72
Bottom Cap (psi)	50.0	Sample Diameter (cm)	7.17
Cell (psi)	60.0	Sample Area (cm^2), A	40.43
Total Pressure Head (cm)	105.5	Inflow Burette Area (cm^2), a-in	0.959
Hydraulic Gradient	10.85	Outflow Burette Area (cm^2), a-out	0.983
		B Parameter (%)	95

AVERAGE PERMEABILITY = 5.2E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.2E-07 m/sec @ 20°C

DATE (mm/dd/yy)	TIME (hr)	TIME (min)	ELAPSED TIME t (hr)	TOTAL INFLOW (cm^3)	TOTAL OUTFLOW (cm^3)	TOTAL HEAD h (cm)	FLOW (0 flow) (1 stop)	TEMP. (°C)	INCREMENTAL PERMEABILITY @ 20°C (cm/sec)
2/29/2008	14	32	0.0	0.0	0.0	128.6	0	21.0	NA
2/29/2008	14	33	0.0	1.7	1.7	125.1	0	21.0	5.2E-05
2/29/2008	14	34	0.0	3.3	3.3	121.8	0	21.0	5.1E-05
2/29/2008	14	35	0.1	4.9	4.9	118.5	0	21.0	5.2E-05
2/29/2008	14	36	0.1	6.5	6.5	115.2	1	21.0	5.4E-05

Tested By: TMS Date: 2/29/2008 Checked By: GEM Date: 3-6-08

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-01 PERM.xls]Sheet1

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INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	MUNICIPAL ENGINEERING
Client Reference	IREDELL CO. LF
Project No.	2008-508-09

Lab ID	.001	.002
Boring No.	P-82	P-84S
Depth (ft)	33.5-35.67	33.5-35.67
Sample No.	NA	NA
Tare Number	SS-2	P-8
Wt. of Tare & WS (gm)	274.55	309.79
Wt. of Tare & DS (gm)	225.55	281.03
Wt. of Tare (gm)	100.53	98.47
Wt. of Water (gm)	49	28.76
Wt. of DS (gm)	125.02	182.56
Water Content (%)	**39.2**	**15.8**

Notes : *NA*

Tested By *TMS* *Date* *2/25/2008* *Checked By* GEM *Date* 3-6-08

page 1 of 1 DCN: CT-S1 DATE 6-30-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09 WATCONT.XLS]Sheet1*

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INTEGRITY IN TESTING

SPECIFIC GRAVITY

ASTM D 854-00 (SOP - S5)

Client	MESCO	Boring No.	P-84S
Client Reference	IREDELL CO C&D LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Visual Description	**BROWN SILTY SAND**
			(MInus No.4 sieve material, airdried)

Replicate Number	**1**	**2**
Pycnometer ID	R 242	R 280
Weight of Pycnometer + Soil + Water (gm)	701.32	716.47
Temperature, T (°Celsius)	22.0	22.0
Weight of Pycnometer + Water (gm)	670.32	685.60
Tare Number	214	201
Weight of Tare + Dry Soil (gm)	220.25	219.68
Weight of Tare (gm)	171.3	170.77
Weight of Dry Soil (gm)	48.95	48.91
Specific Gravity of Soil @ T	2.726	2.711
Specific Gravity of Water @ T	0.9978	0.9978
Conversion Factor for Temperature T	0.9996	0.9996
Specific Gravity @ 20° Celsius	2.728	2.712

Average Specific Gravity @ 20° Celsius	2.72

Tested By TMS *Date* 2/27/2008 *Checked By* GZM *Date* 3-6-08

DCN: CT-S5 Date: 03/24/05 Revision: 10R *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 Specific Gravity Soils 1Raleigh.xls]Sheet1*

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	MUNICIAPAL ENGINEERING	Boring No.	P-84S
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Soil Description	**BROWN SILT**

Note: The* USCS *symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

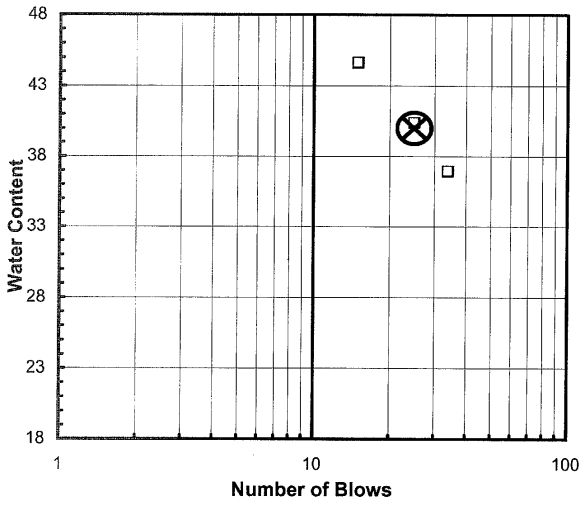
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	N	B	V	MULTIPOINT
Wt. of Tare & WS (gm)	25.24	31.36	29.27	
Wt. of Tare & DS (gm)	22.18	26.73	25.49	
Wt. of Tare (gm)	15.32	15.26	15.25	
Wt. of Water (gm)	3.1	4.6	3.8	
Wt. of DS (gm)	6.9	11.5	10.2	
Moisture Content (%)	**44.6**	**40.4**	**36.9**	
Number of Blows	**15**	**25**	**34**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	U	Q	
Wt. of Tare & WS (gm)	22.23	22.73	
Wt. of Tare & DS (gm)	20.25	20.61	
Wt. of Tare (gm)	15.22	15.18	
Wt. of Water (gm)	2.0	2.1	
Wt. of DS (gm)	5.0	5.4	
Moisture Content (%)	**39.4**	**39.0**	**0.3**

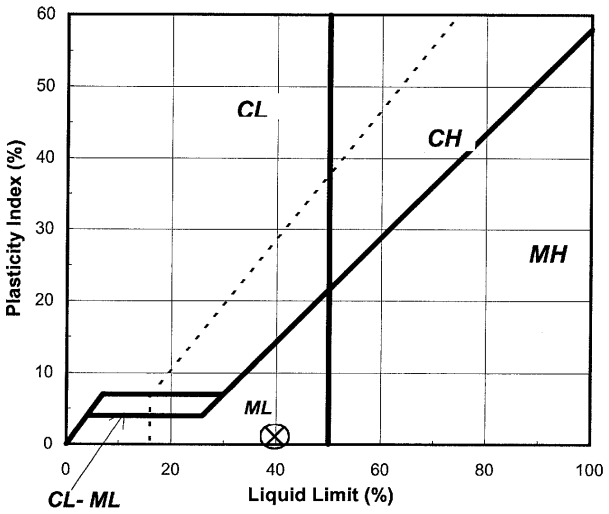
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**40**
Plastic Limit (%)	**39**
Plasticity Index (%)	**1**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By SGH *Date* 3/3/2008 *Checked By* GAM *Date* 3-6-08

page 1 of 1 **DCN:** CT-S4B **DATE:** 10/8/2001 **REVISION:** 2

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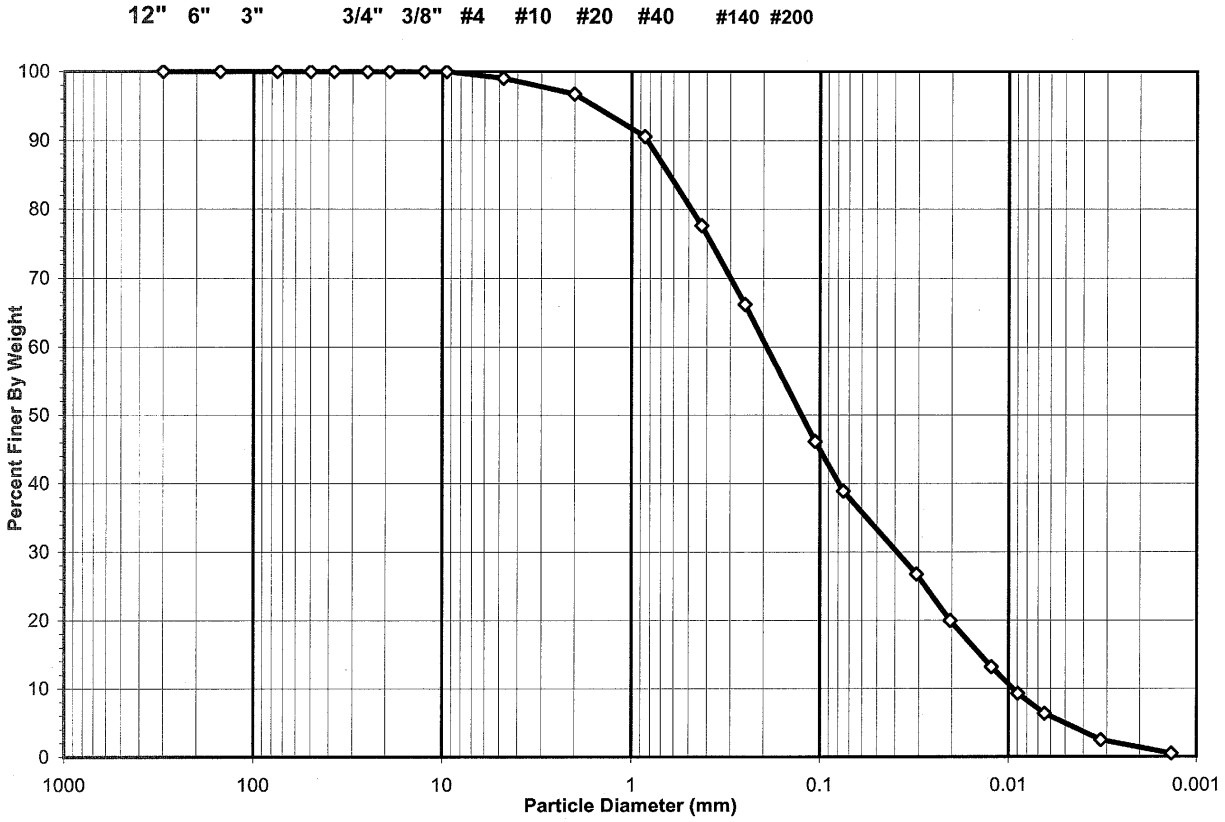
INTEGRITY IN TESTING

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-84S
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Soil Color	**BROWN**

	SIEVE ANALYSIS					HYDROMETER
USCS	cobbles	gravel	sand			silt and clay fraction
USDA	cobbles	gravel	sand		silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.97
#4 To #200	*Sand*	60.16
Finer Than #200	*Silt & Clay*	38.87

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

page 1 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:3 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 #10 Split Hydro rev 8.xls]Sheet1*

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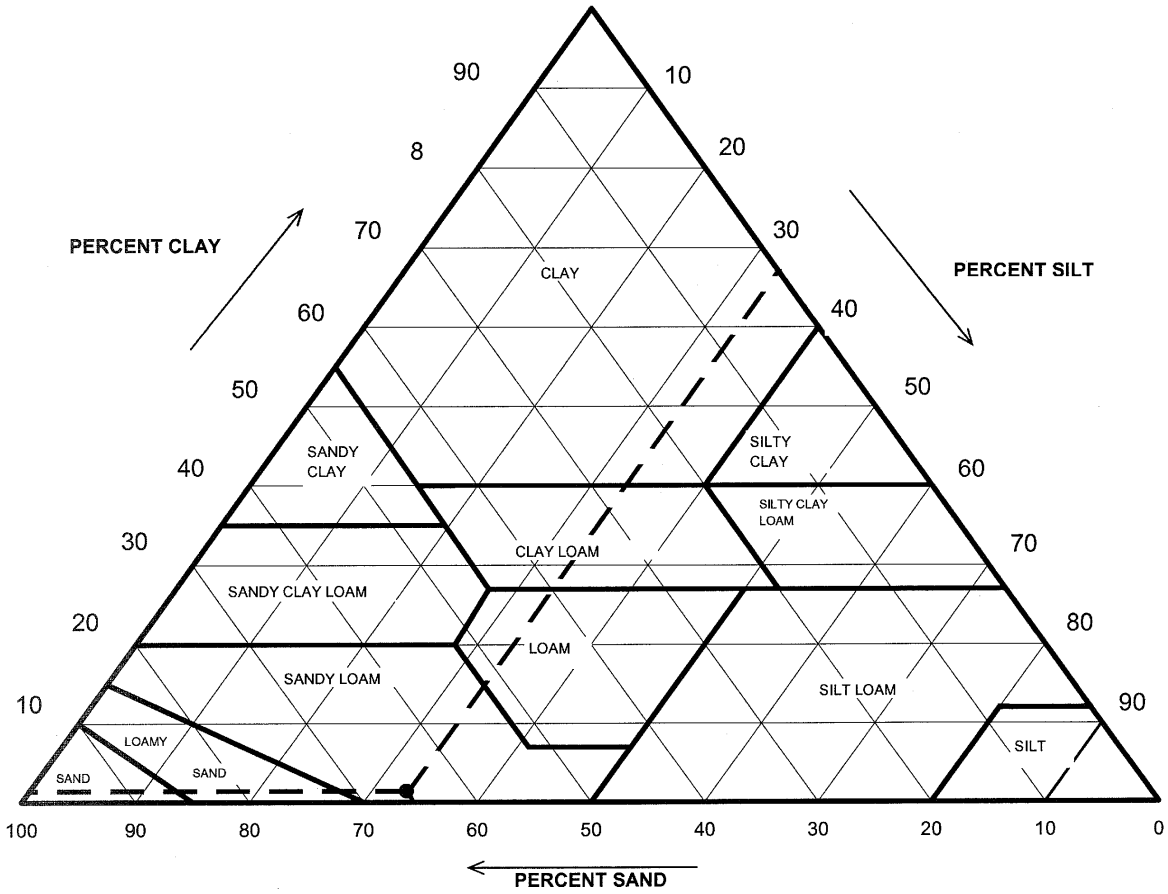
USDA CLASSIFICATION CHART

Client	MUNICIPAL ENGINEERING	Boring No.	P-84S
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	3.27	**0.00**
2	96.73	*Sand*	63.38	**65.52**
0.05	33.35	*Silt*	31.98	**33.06**
0.002	1.37	*Clay*	1.37	**1.42**

USDA Classification: ***SANDY LOAM***

page 2 of 4

DCN: CT-S3P DATE:02/15/05 REVISION:8\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 #10 Split Hydro rev 8.xls]Sheet1

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INTEGRITY IN TESTING

WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-84S
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Soil Color	**BROWN**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	201	Tare No.	L-1
Wgt.Tare + Wet Soil (gm)	381.95	Wgt.Tare + Wet Soil (gm)	45.79
Wgt.Tare + Dry Soil (gm)	328.30	Wgt.Tare + Dry Soil (gm)	45.40
Weight of Tare (gm)	170.87	Weight of Tare (gm)	22.02
Weight of Water (gm)	53.65	Weight of Water (gm)	0.39
Weight of Dry Soil (gm)	157.43	Weight of Dry Soil (gm)	23.38
Moisture Content (%)	**34.1**	**Moisture Content (%)**	**1.7**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	211.08	Weight of the Dry Sample (gm)	255.79
Dry Weight +#10 Material(gm)	157.4	Weight of minus #200 material (gm)	39.53
Wet Weight Hydro. Material.(gm)	100.00	Weight of plus #200 material (gm)	216.26
Dry Weight Hydro. Material (gm)	98.36		
Total Dry Weight Sample (gm)	255.79	**J-FACTOR (%FINER THAN #10)**	**0.9673**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.52	0.97	0.97	99.03	**99.03**
#10	2.00	3.63	2.31	3.27	96.73	**96.73**
#20	0.85	6.28	6.38	6.38	93.62	**90.55**
#40	0.425	13.15	13.37	19.75	80.25	**77.62**
#60	0.250	11.61	11.80	31.56	68.44	**66.20**
#140	0.106	20.42	20.76	52.32	47.68	**46.12**
#200	0.075	7.37	7.49	59.81	40.19	**38.87**
Pan	-	39.53	40.19	100.00	-	-

Notes :

Tested By SGH Date 3/3/2008 Checked By GEM Date 3-6-08

page 3 of 4 DCN: CT-S3P DATE:02/15/05 REVISION:8 *\\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 #10 Split Hydro rev 8.xls]Sheet1*

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INTEGRITY IN TESTING

HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	MUNICIPAL ENGINEERING	Boring No.	P-84S
Client Reference	IREDELL CO. LF	Depth (ft)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID	2008-508-09-02	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	32.0	32.0	21.8	4.43	27.6	27.6	0.01308	0.0307	**26.7**
5		25.0	21.8	4.43	20.6	20.6	0.01308	0.0204	**19.9**
15		18.0	21.8	4.43	13.6	13.6	0.01308	0.0123	**13.2**
30		14.0	21.7	4.46	9.5	9.6	0.01310	0.0089	**9.2**
60		11.0	21.7	4.46	6.5	6.6	0.01310	0.0064	**6.3**
250		7.0	21.7	4.46	2.5	2.5	0.01310	0.0032	**2.5**
1440		5.0	21.6	4.49	0.5	0.5	0.01311	0.0014	**0.5**

Soil Specimen Data		**Other Corrections**	
Tare + Dry Material (gm)	98.36	a - Factor	0.986
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	96.73
Weight of Dry Material (gm)	98.36		
		Specific Gravity	2.72 Measured

Note:

Tested By JBD Date 2/29/2008 Checked By GGM Date 3-6-08

page 4 of 4 DCN: CT-S3P DATE:02/15/05 REVISION:8 *Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 #10 Split Hydro rev 8.xls]Sheet1*

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PERMEABILITY TEST

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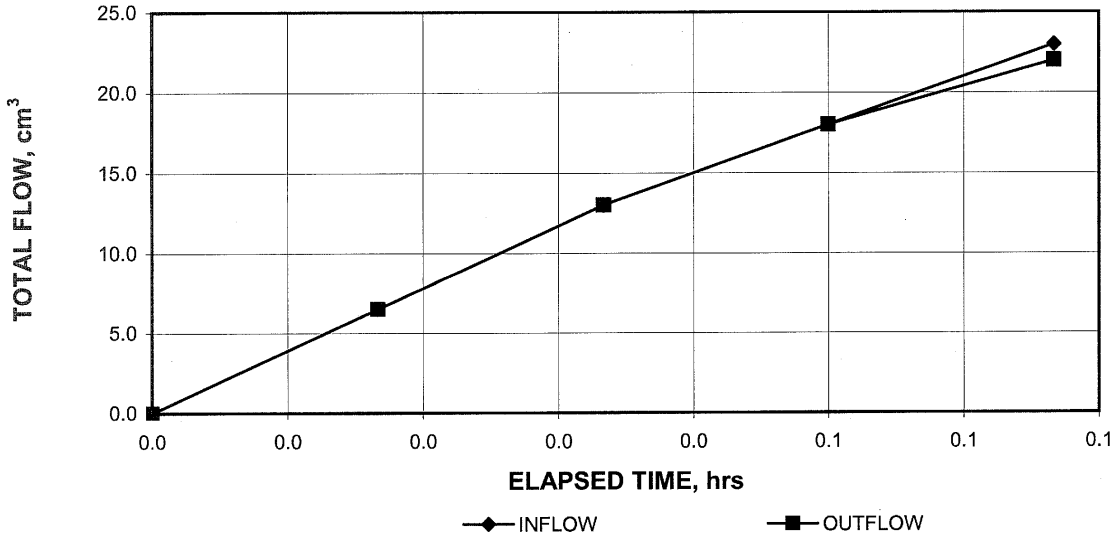
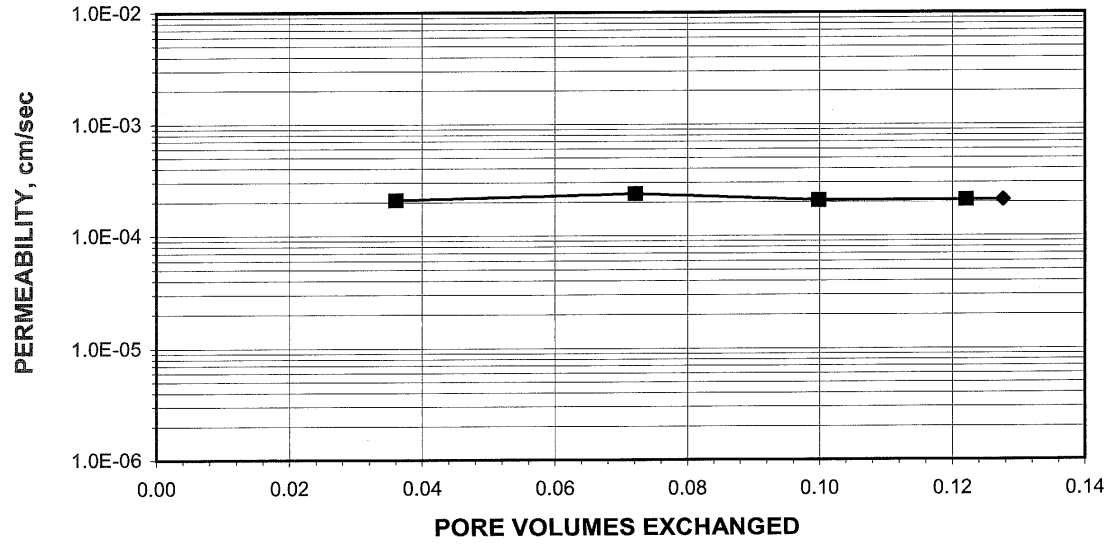
Client	MUNCIPAL ENGINEERING	Boring No.	P-84S
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-02		

AVERAGE PERMEABILITY = 2.2E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-06 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: TMS Date: 2/29/2008 Checked By: GEM Date: 3-6-08

DCN: CT-22 DATE: 01-08-99 REVISION: 2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 PERM.xls]Sheet1
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PERMEABILITY TEST

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INTEGRITY IN TESTING

Client	MUNCIPAL ENGINEERING	Boring No.	P-84S
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-02		
		Specific Gravity	2.72 Measured
		Sample Condition	Undisturbed

Visual Description: BROWN SILTY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	P-8	309
Wt. of Tare & WS (gm.)	309.79	412.23
Wt. of Tare & DS (gm.)	281.03	337.29
Wt. of Tare (gm.)	98.47	109.54
Wt. of Water (gm.)	28.76	74.94
Wt. of DS (gm.)	182.56	227.75
Moisture Content (%)	**15.8**	**32.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	686.75	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	686.75	788.50
Length 1 (in.)	4.011	3.949
Length 2 (in.)	3.887	3.871
Length 3 (in.)	4.012	3.831
Top Diameter (in.)	2.853	2.847
Middle Diameter (in.)	2.852	2.861
Bottom Diameter (in.)	2.861	2.761
Average Length (in.)	3.97	3.88
Average Area (in.^{2})	6.40	6.26
Sample Volume (cm^3)	416.58	398.34
Unit Wet Wt. (gm./ cm^3)	1.65	1.98
Unit Wet Wt. (pcf)	102.9	123.6
Unit Dry Wt. (pcf)	88.9	93.0
Unit Dry Wt. (gm./ cm^3)	1.42	1.49
Void Ratio, e	0.91	0.83
Porosity, n	0.48	0.45
Pore Volume (cm^3)	198.5	180.2

Tested By: TMS Date: 2/29/2008 Checked By: GBM Date: 3-6-08

 DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 PERM.xls]Sheet1

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PERMEABILITY TEST

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(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	MUNCIPAL ENGINEERING	Boring No.	P-84S
Client Project	IREDELL CO LF	Depth (ft.)	33.5-35.67
Project No.	2008-508-09	Sample No.	NA
Lab ID No.	2008-508-09-02		

Pressure Heads (Constant)		Final Sample Dimensions	
Top Cap (psi)	48.5	Sample Length (cm), L	9.86
Bottom Cap (psi)	50.0	Sample Diameter (cm)	7.17
Cell (psi)	60.0	Sample Area (cm^2), A	40.38
Total Pressure Head (cm)	105.5	Inflow Burette Area (cm^2), a-in	0.878
Hydraulic Gradient	10.69	Outflow Burette Area (cm^2), a-out	0.871
		B Parameter (%)	95

AVERAGE PERMEABILITY = 2.2E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-06 m/sec @ 20°C

DATE (mm/dd/yy)	TIME (hr)	TIME (min)	ELAPSED TIME t (hr)	TOTAL INFLOW (cm^3)	TOTAL OUTFLOW (cm^3)	TOTAL HEAD h (cm)	FLOW (0 flow) (1 stop)	TEMP. (°C)	INCREMENTAL PERMEABILITY @ 20°C (cm/sec)
2/29/2008	14	32	0.0	0.0	0.0	128.9	0	21.0	NA
2/29/2008	14	33	0.0	6.5	6.5	114.3	0	21.0	2.1E-04
2/29/2008	14	34	0.0	13.0	13.0	99.7	0	21.0	2.4E-04
2/29/2008	14	35	0.1	18.0	18.0	88.5	0	21.0	2.1E-04
2/29/2008	14	36	0.1	23.0	22.0	78.5	1	21.0	2.1E-04

Tested By: TMS Date: 2/29/2008 Checked By: CZM Date: 3-6-08

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Server\c\2008 PROJECTS\2008-508 MESCO\[2008-508-09-02 PERM.xls]Sheet1

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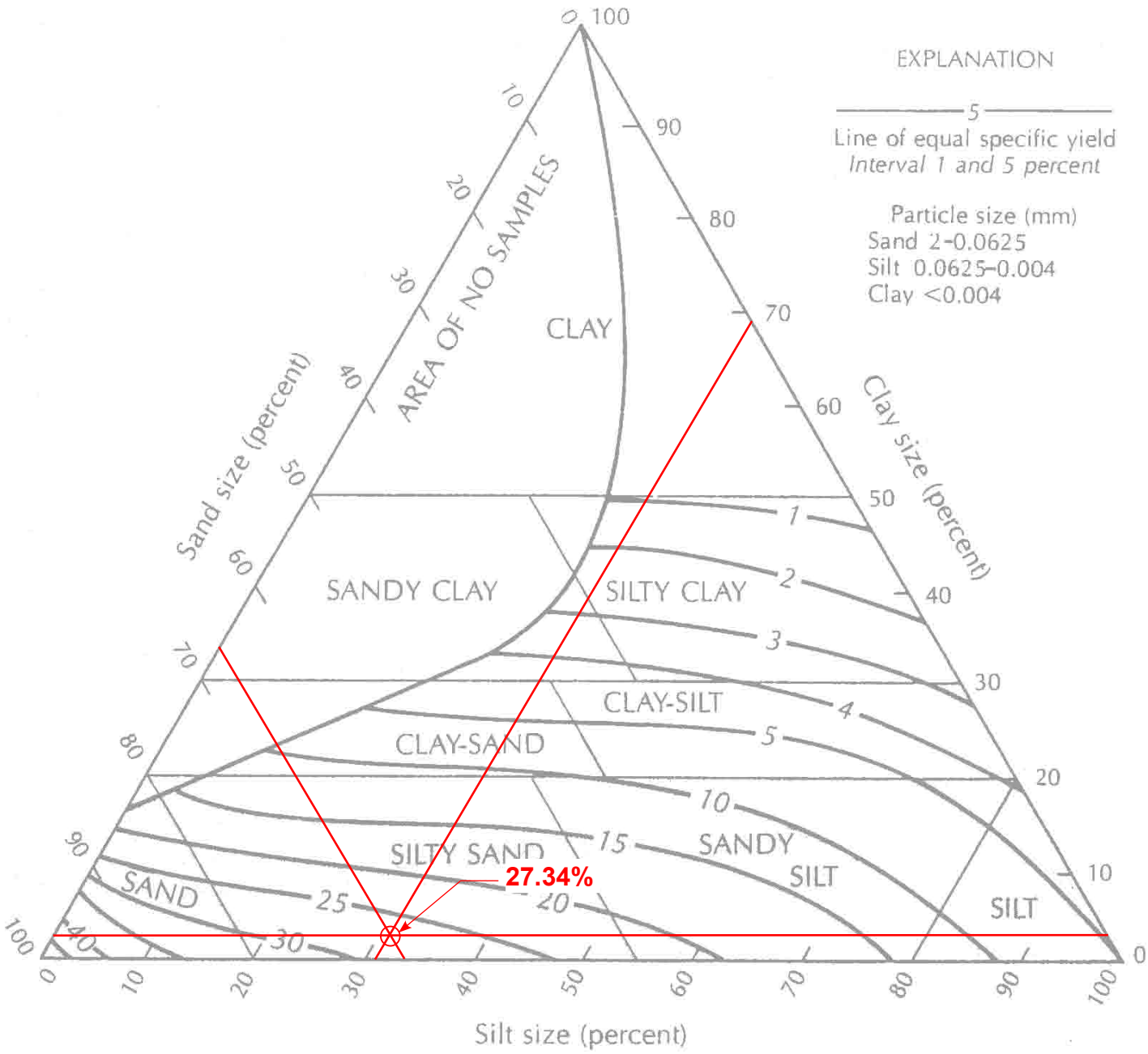
Figure B-1: Calculation of effective porosity from re-calculated grain size distribution, P-78S 18-20.17'



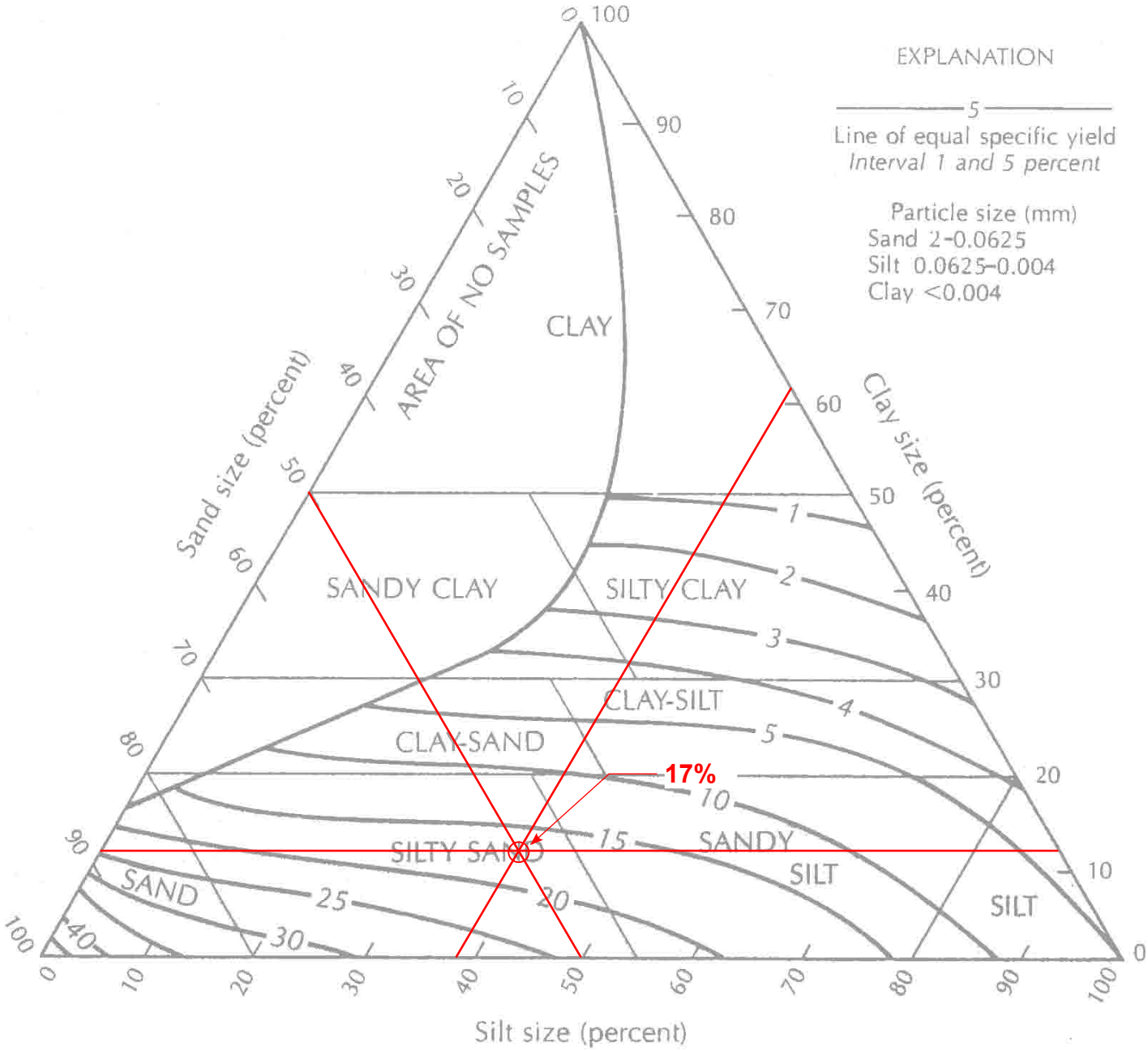
P-78S 18-20.17'

Soil Type	Proportion (%)
Sand	67.5%
Silt	30.2%
Clay	2.4%

AGU Soil Classification
Silty Sand

Effective Porosity
n_e=27.4%

Figure B-2: Calculation of effective porosity from re-calculated grain size distribution, P-82 33.5-35.67'



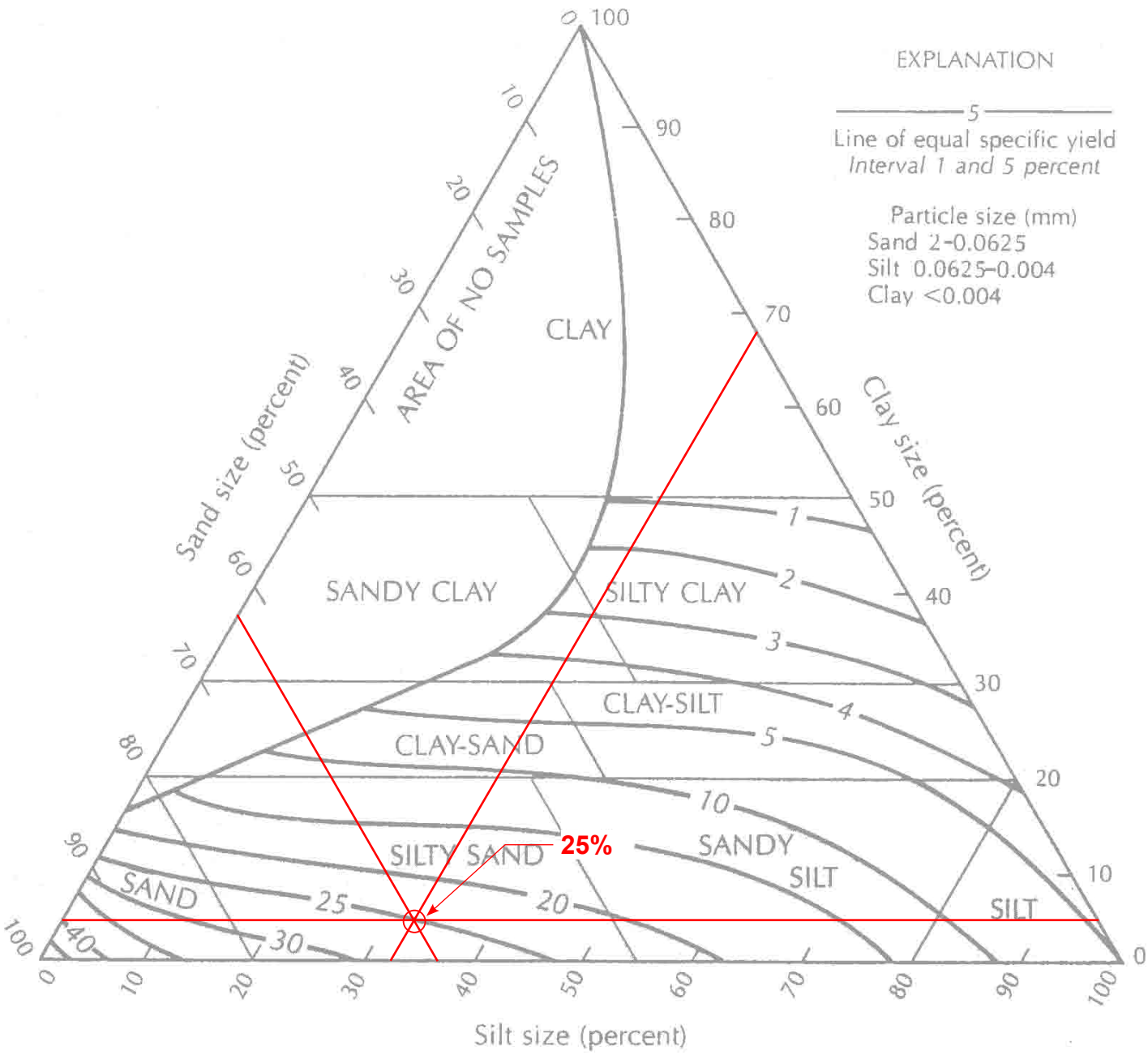
P-82 33.5-35.67'

Soil Type	Proportion (%)
Sand	50.1%
Silt	38.0%
Clay	11.9%

AGU Soil Classification
Silty Sand

Effective Porosity
n_e=17%

Figure B-3: Calculation of effective porosity from re-calculated grain size distribution, P-84S 33.5-35.67'



P-84S 33.5-35.67'

Soil Type	Proportion (%)
Sand	63.6%
Silt	32.7%
Clay	3.7%

AGU Soil Classification
Silty Sand

Effective Porosity
n_e=25%

APPENDIX C

Table C-1: Slug Test Summary

	Test Date	Initial Head Change (ft)	Depth to Top of Sand Pack (ft) BTOP	Depth to Top of Screen (ft) BTOP	Initial Depth to Water (ft) BTOP	K (cm/sec)	Displacement Method	Lithology
P-76	05/29/08	5.51	27.63	28.97	29.80	1.01E-04	Rising Head	Sandy Silt
P-77	05/29/08	5.77	27.08	28.48	30.63	3.64E-04	Rising Head	Sandy Silt
P-78S	05/29/08	5.11	34.56	35.93	38.18	2.01E-04	Rising Head	Sandy Silt
P-78D	05/29/08	10.78	72.46	73.74	39.60	3.18E-04	Falling Head	Schist
P-80	05/29/08	4.99	21.56	23.01	30.98	5.69E-04	Rising Head	Sandy Silt
P-81	05/29/08	4.96	10.43	11.83	17.92	3.21E-04	Rising Head	PWR
P-82	05/30/08	4.60	26.82	28.22	37.20	7.94E-05	Rising Head	Sandy Silt
P-83	05/29/08	5.47	36.82	38.19	42.73	2.64E-04	Rising Head	Sandy Silt
P-84S	05/30/08	5.71	39.73	41.10	45.50	1.39E-04	Rising Head	Sandy Silt
P-84D	05/30/08	6.67	97.87	99.14	43.68	1.46E-04	Falling Head	Schist
P-85	05/29/08	4.68	25.27	27.01	35.18	5.81E-04	Rising Head	Sandy Silt
P-86	05/30/08	5.52	48.26	49.34	53.20	3.92E-04	Rising Head	PWR

Summary Statistics			
Geometric Mean (GM)	2.43E-4	Count	12
Geo. Std. Deviation (GSD)	1.92	Minimum	7.94E-5
GM / GSD	1.27E-4	Maximum	5.81E-4
GM * GSD	4.65E-4		
Schist			
Geometric Mean (GM)	2.15E-4	Count	2
Geo. Std. Deviation (GSD)	1.73	Minimum	1.46E-4
GM / GSD	1.24E-4	Maximum	3.18E-4
GM * GSD	3.74E-4		
Sandy Silt			
Geometric Mean (GM)	2.27E-4	Count	8
Geo. Std. Deviation (GSD)	2.13	Minimum	7.94E-5
GM / GSD	1.07E-4	Maximum	5.81E-4
GM * GSD	4.83E-4		
PWR			
Geometric Mean (GM)	3.55E-4	Count	2
Geo. Std. Deviation (GSD)	1.15	Minimum	3.21E-4
GM / GSD	3.08E-4	Maximum	3.92E-4
GM * GSD	4.09E-4		

NOTES:

1. The Bouwer & Rice method was used for all slug test calculations performed.

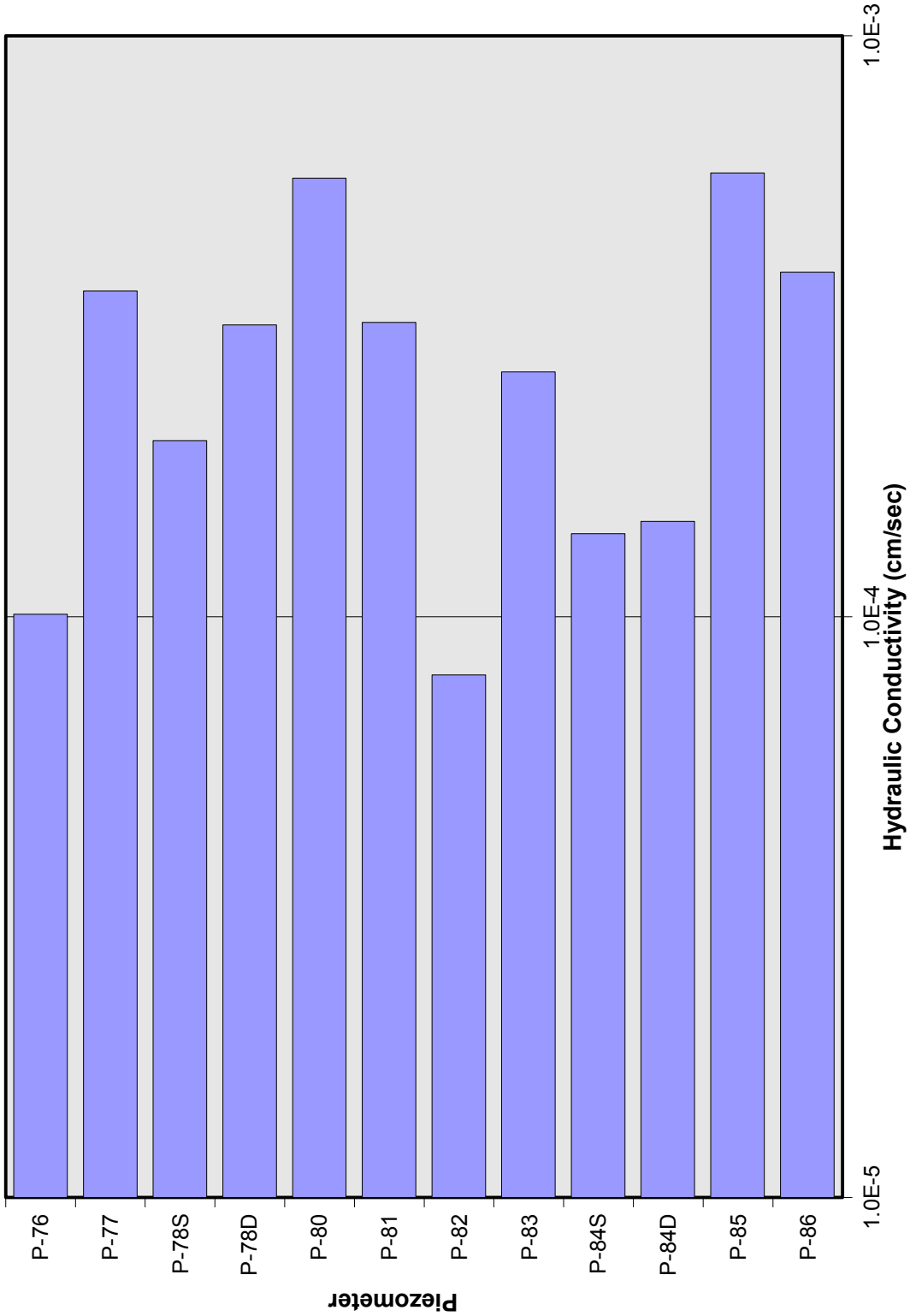
2. Initial head change refers to the maximum displacement from the initial static water level caused by prior pump pumping, falling head, or other method to perturb the initial condition.

3. The value of K represents th hydraulic conductivity derived from slug test data. All slug test data are included in this appendix.

4. The *Lithology* column gives a description of the dominant soil or rock type within the perforated section of the piezometer.

5. Water was displaced by pumping, injection of water, or removal of slug to create an initial head change. The *Displacement Method* column indicates which method was used for a given piezometer.

6.Slug test was not performed on P-79 due to insufficient water volume



Graph C-1: Hydraulic Conductivity at Piezometer Locations

Slug Test P-76

Initial offset in logger reading (feet):	0.000	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000001		
Initial depth to water table (feet):	29.8		
Depth of probe below water table (feet):	11.233		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 14:17:20	51440.5	0.0	5.7180	5.718	5.515	0.74151
5/29/2008 14:17:22	51442.5	2.0	5.9110	5.911	5.322	0.72604
5/29/2008 14:17:38	51458.0	17.5	6.0340	6.034	5.199	0.71588
5/29/2008 14:17:46	51466.5	26.0	6.1540	6.154	5.079	0.70574
5/29/2008 14:17:56	51476.5	36.0	6.2700	6.270	4.963	0.69570
5/29/2008 14:18:06	51486.5	46.0	6.3850	6.385	4.848	0.68552
5/29/2008 14:18:16	51496.0	55.5	6.4960	6.496	4.737	0.67546
5/29/2008 14:18:25	51505.0	64.5	6.6050	6.605	4.628	0.66535
5/29/2008 14:18:34	51514.0	73.5	6.7130	6.713	4.520	0.65509
5/29/2008 14:18:43	51523.0	82.5	6.8210	6.821	4.412	0.64459
5/29/2008 14:18:51	51531.5	91.0	6.9230	6.923	4.310	0.63443
5/29/2008 14:19:00	51540.5	100.0	7.0260	7.026	4.207	0.62392
5/29/2008 14:19:09	51549.5	109.0	7.1230	7.123	4.110	0.61379
5/29/2008 14:19:18	51558.5	118.0	7.2170	7.217	4.016	0.60374
5/29/2008 14:19:28	51568.5	128.0	7.3130	7.313	3.920	0.59323
5/29/2008 14:19:39	51579.0	138.5	7.4080	7.408	3.824	0.58257
5/29/2008 14:19:49	51589.5	149.0	7.4990	7.499	3.733	0.57211
5/29/2008 14:20:01	51601.0	160.5	7.5860	7.586	3.646	0.56187
5/29/2008 14:20:12	51612.0	171.5	7.6690	7.669	3.563	0.55187
5/29/2008 14:20:24	51624.0	183.5	7.7510	7.751	3.481	0.54176
5/29/2008 14:20:36	51636.5	196.0	7.8310	7.831	3.401	0.53167
5/29/2008 14:20:45	51645.0	204.5	7.9110	7.911	3.321	0.52133
5/29/2008 14:20:50	51650.0	209.5	7.9960	7.996	3.236	0.51007
5/29/2008 14:20:53	51653.5	213.0	8.0830	8.083	3.149	0.49824
5/29/2008 14:21:07	51667.5	227.0	8.1560	8.156	3.076	0.48805
5/29/2008 14:21:22	51682.0	241.5	8.2270	8.227	3.005	0.47791
5/29/2008 14:21:36	51696.5	256.0	8.2970	8.297	2.935	0.46767
5/29/2008 14:21:50	51710.5	270.0	8.3680	8.368	2.864	0.45704
5/29/2008 14:22:06	51726.0	285.5	8.4340	8.434	2.798	0.44691
5/29/2008 14:22:21	51741.0	300.5	8.5000	8.500	2.732	0.43655
5/29/2008 14:22:35	51755.5	315.0	8.5630	8.563	2.669	0.42641
5/29/2008 14:22:52	51772.0	331.5	8.6240	8.624	2.608	0.41637
5/29/2008 14:23:09	51789.5	349.0	8.6860	8.686	2.546	0.40592
5/29/2008 14:23:26	51806.5	366.0	8.7470	8.747	2.485	0.39539
5/29/2008 14:23:44	51824.0	383.5	8.8060	8.806	2.426	0.38496
5/29/2008 14:24:01	51841.0	400.5	8.8620	8.862	2.370	0.37481
5/29/2008 14:24:18	51858.0	417.5	8.9160	8.916	2.316	0.36480
5/29/2008 14:24:35	51875.0	434.5	8.9700	8.970	2.262	0.35456
5/29/2008 14:24:52	51892.0	451.5	9.0220	9.023	2.210	0.34446
5/29/2008 14:25:09	51909.0	468.5	9.0740	9.075	2.158	0.33411
5/29/2008 14:25:26	51926.0	485.5	9.1260	9.127	2.106	0.32352
5/29/2008 14:25:43	51943.5	503.0	9.1750	9.176	2.057	0.31330
5/29/2008 14:26:00	51960.0	519.5	9.2220	9.223	2.010	0.30326
5/29/2008 14:26:15	51975.5	535.0	9.2690	9.270	1.963	0.29298

Slug Test P-76

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 14:26:31	51991.5	551.0	9.3140	9.315	1.918	0.28291
5/29/2008 14:26:47	52007.5	567.0	9.3590	9.360	1.873	0.27260
5/29/2008 14:27:03	52023.0	582.5	9.4020	9.403	1.830	0.26251
5/29/2008 14:27:18	52038.5	598.0	9.4440	9.445	1.788	0.25243
5/29/2008 14:27:35	52055.5	615.0	9.4860	9.487	1.746	0.24210
5/29/2008 14:27:52	52072.0	631.5	9.5260	9.527	1.706	0.23204
5/29/2008 14:28:08	52088.0	647.5	9.5690	9.570	1.663	0.22095
5/29/2008 14:28:24	52104.5	664.0	9.6090	9.610	1.623	0.21037
5/29/2008 14:28:41	52121.0	680.5	9.6460	9.647	1.586	0.20036
5/29/2008 14:28:58	52138.5	698.0	9.6840	9.685	1.548	0.18982
5/29/2008 14:29:16	52156.0	715.5	9.7220	9.723	1.510	0.17903
5/29/2008 14:29:35	52175.0	734.5	9.7570	9.758	1.475	0.16884
5/29/2008 14:29:53	52193.5	753.0	9.7920	9.793	1.440	0.15841
5/29/2008 14:30:13	52213.5	773.0	9.8250	9.826	1.407	0.14834
5/29/2008 14:30:33	52233.0	792.5	9.8590	9.860	1.373	0.13771
5/29/2008 14:30:53	52253.5	813.0	9.8920	9.893	1.340	0.12715
5/29/2008 14:31:15	52275.0	834.5	9.9250	9.926	1.307	0.11631
5/29/2008 14:31:34	52294.0	853.5	9.9550	9.956	1.277	0.10623
5/29/2008 14:31:56	52316.5	876.0	9.9880	9.989	1.244	0.09485
5/29/2008 14:32:20	52340.5	900.0	10.0190	10.020	1.213	0.08389
5/29/2008 14:32:42	52362.0	921.5	10.0470	10.048	1.185	0.07374
5/29/2008 14:33:03	52383.5	943.0	10.0750	10.076	1.157	0.06335
5/29/2008 14:33:26	52406.0	965.5	10.1040	10.105	1.128	0.05233
5/29/2008 14:33:48	52428.0	987.5	10.1300	10.131	1.102	0.04219
5/29/2008 14:34:13	52453.5	1013.0	10.1580	10.159	1.074	0.03101
5/29/2008 14:34:37	52477.5	1037.0	10.1840	10.185	1.048	0.02036
5/29/2008 14:35:02	52502.5	1062.0	10.2100	10.211	1.022	0.00945
5/29/2008 14:35:27	52527.0	1086.5	10.2360	10.237	0.996	-0.00175
5/29/2008 14:35:55	52555.0	1114.5	10.2590	10.260	0.973	-0.01190
5/29/2008 14:36:20	52580.5	1140.0	10.2830	10.284	0.949	-0.02276
5/29/2008 14:36:45	52605.0	1164.5	10.3070	10.308	0.925	-0.03389
5/29/2008 14:37:13	52633.0	1192.5	10.3300	10.331	0.902	-0.04483
5/29/2008 14:37:44	52664.0	1223.5	10.3510	10.352	0.881	-0.05507
5/29/2008 14:38:12	52692.0	1251.5	10.3730	10.374	0.859	-0.06606
5/29/2008 14:38:40	52720.0	1279.5	10.3940	10.395	0.838	-0.07682
5/29/2008 14:39:10	52750.0	1309.5	10.4150	10.416	0.817	-0.08785
5/29/2008 14:39:38	52778.5	1338.0	10.4340	10.435	0.798	-0.09808
5/29/2008 14:40:07	52807.5	1367.0	10.4530	10.454	0.779	-0.10856
5/29/2008 14:40:40	52840.0	1399.5	10.4720	10.473	0.760	-0.11930
5/29/2008 14:41:14	52874.0	1433.5	10.4900	10.491	0.742	-0.12972
5/29/2008 14:41:46	52906.0	1465.5	10.5070	10.508	0.725	-0.13980
5/29/2008 14:42:16	52936.5	1496.0	10.5240	10.525	0.708	-0.15012
5/29/2008 14:42:56	52976.5	1536.0	10.5420	10.543	0.690	-0.16132
5/29/2008 14:43:33	53013.5	1573.0	10.5590	10.560	0.673	-0.17217
5/29/2008 14:44:08	53048.5	1608.0	10.5750	10.576	0.657	-0.18264
5/29/2008 14:44:42	53082.0	1641.5	10.5900	10.591	0.642	-0.19268
5/29/2008 14:45:25	53125.5	1685.0	10.6060	10.607	0.626	-0.20367
5/29/2008 14:46:10	53170.5	1730.0	10.6220	10.623	0.610	-0.21493
5/29/2008 14:46:53	53213.5	1773.0	10.6370	10.638	0.595	-0.22577

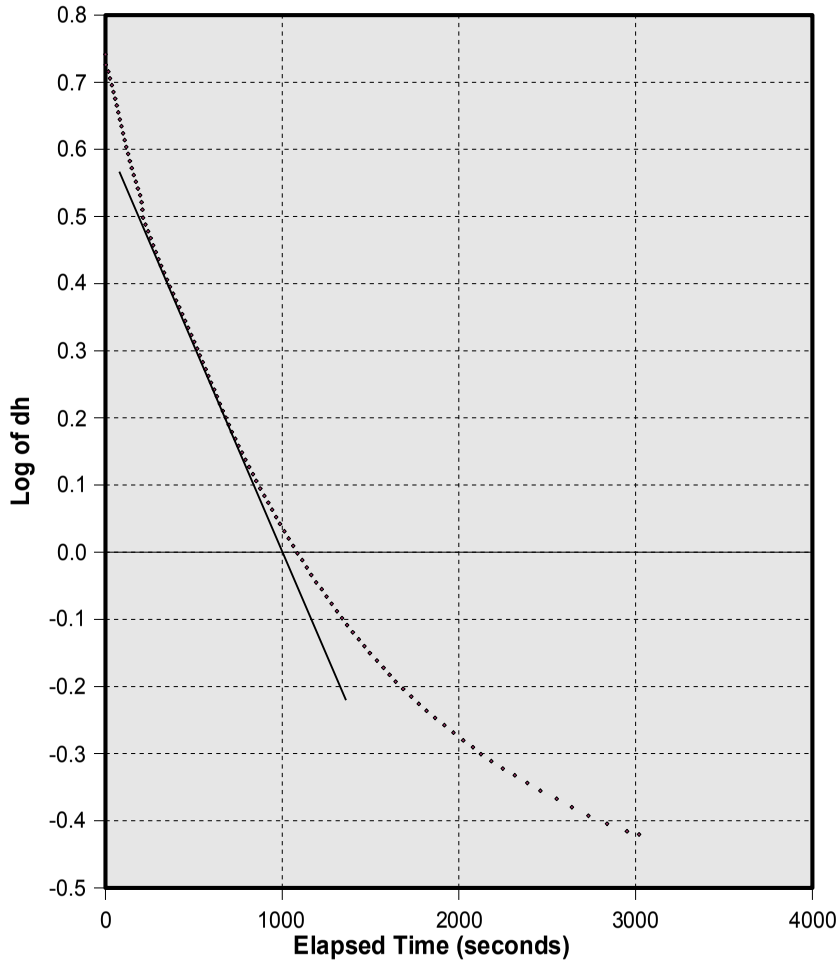
Slug Test P-76

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 14:47:37	53257.0	1816.5	10.6510	10.652	0.581	-0.23614
5/29/2008 14:48:25	53305.5	1865.0	10.6650	10.666	0.567	-0.24676
5/29/2008 14:49:19	53359.0	1918.5	10.6790	10.680	0.553	-0.25765
5/29/2008 14:50:09	53409.5	1969.0	10.6930	10.694	0.538	-0.26882
5/29/2008 14:51:05	53465.0	2024.5	10.7070	10.708	0.524	-0.28028
5/29/2008 14:52:00	53520.5	2080.0	10.7190	10.720	0.512	-0.29036
5/29/2008 14:52:45	53565.0	2124.5	10.7310	10.732	0.500	-0.30067
5/29/2008 14:53:44	53624.5	2184.0	10.7430	10.744	0.488	-0.31124
5/29/2008 14:54:49	53689.0	2248.5	10.7550	10.756	0.476	-0.32208
5/29/2008 14:55:56	53756.5	2316.0	10.7660	10.768	0.465	-0.33226
5/29/2008 14:57:07	53827.5	2387.0	10.7780	10.780	0.453	-0.34364
5/29/2008 14:58:21	53901.0	2460.5	10.7900	10.792	0.441	-0.35533
5/29/2008 14:59:54	53994.0	2553.5	10.8020	10.804	0.429	-0.36736
5/29/2008 15:01:20	54080.0	2639.5	10.8140	10.816	0.417	-0.37972
5/29/2008 15:02:53	54173.5	2733.0	10.8260	10.828	0.405	-0.39246
5/29/2008 15:04:39	54279.0	2838.5	10.8370	10.839	0.394	-0.40448
5/29/2008 15:06:31	54391.0	2950.5	10.8470	10.849	0.384	-0.41571
5/29/2008 15:07:39	54459.0	3018.5	10.8510	10.853	0.380	-0.42030

Slug Test P-76

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	40.90	ft
Stick up height:	3.07	ft
Depth to sand pack (BGS):	24.56	ft
Depth to screened interval (BGS):	25.90	ft
Well diameter:	2.00	in
Diameter of annular space:	6.50	in
Initial depth to water table from top of pipe:	29.80	ft
Initial Head Change:	5.51	ft
Total well length:	43.97	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1639	ft
r_c:	0.1639	ft
Radius of gravel pack (r_w):	0.2708	ft
Screened interval:	15.00	ft
Length of open section (L_e):	14.17	ft
L_e / r_w:	52.3200	
A (dimensionless):	3.251	
B (dimensionless):	0.543	
Drawdown at time = 0 (y_0):	3.16	ft
Drawdown at time = t (y_t):	1.26	ft
Elapsed Time between y_0 and y_t (t):	654	sec
Initial water column in well (L_w):	14.17	ft
$\ln(R_e/r_w)$ =	2.48	
K =	3.32E-06	ft/sec
	1.01E-04	**cm/sec**
	104.56	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-77

Initial offset in logger reading (feet):	0.010	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000002		
Initial depth to water table (feet):	30.63		
Depth of probe below water table (feet):	8.452		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 10:22:00	37320.5	0.0	2.695	2.687	5.765	0.76083
5/29/2008 10:22:02	37322.5	2.0	2.865	2.857	5.595	0.74783
5/29/2008 10:22:04	37324.0	3.5	3.015	3.007	5.445	0.73603
5/29/2008 10:22:05	37325.0	4.5	3.173	3.165	5.287	0.72324
5/29/2008 10:22:08	37328.0	7.5	3.296	3.288	5.164	0.71302
5/29/2008 10:22:13	37333.5	13.0	3.428	3.420	5.032	0.70177
5/29/2008 10:22:17	37337.5	17.0	3.550	3.542	4.910	0.69111
5/29/2008 10:22:21	37341.5	21.0	3.671	3.663	4.789	0.68027
5/29/2008 10:22:28	37348.0	27.5	3.789	3.781	4.671	0.66944
5/29/2008 10:22:34	37354.0	33.5	3.911	3.903	4.549	0.65794
5/29/2008 10:22:37	37357.5	37.0	4.022	4.014	4.438	0.64722
5/29/2008 10:22:40	37360.0	39.5	4.144	4.136	4.316	0.63511
5/29/2008 10:22:43	37363.0	42.5	4.255	4.247	4.205	0.62380
5/29/2008 10:22:46	37366.0	45.5	4.359	4.351	4.101	0.61292
5/29/2008 10:22:51	37371.5	51.0	4.455	4.447	4.005	0.60263
5/29/2008 10:22:58	37378.0	57.5	4.550	4.542	3.910	0.59221
5/29/2008 10:23:04	37384.0	63.5	4.639	4.631	3.821	0.58221
5/29/2008 10:23:09	37389.5	69.0	4.726	4.718	3.734	0.57220
5/29/2008 10:23:14	37394.5	74.0	4.811	4.803	3.649	0.56220
5/29/2008 10:23:20	37400.0	79.5	4.901	4.893	3.559	0.55135
5/29/2008 10:23:24	37404.5	84.0	4.988	4.980	3.472	0.54061
5/29/2008 10:23:27	37407.5	87.0	5.073	5.065	3.387	0.52984
5/29/2008 10:23:31	37411.0	90.5	5.158	5.150	3.302	0.51880
5/29/2008 10:23:34	37414.0	93.5	5.245	5.237	3.215	0.50721
5/29/2008 10:23:39	37419.5	99.0	5.323	5.315	3.137	0.49654
5/29/2008 10:23:43	37423.0	102.5	5.400	5.392	3.060	0.48575
5/29/2008 10:23:52	37432.0	111.5	5.471	5.463	2.989	0.47555
5/29/2008 10:23:59	37439.0	118.5	5.544	5.536	2.916	0.46481
5/29/2008 10:24:04	37444.5	124.0	5.615	5.607	2.845	0.45410
5/29/2008 10:24:10	37450.5	130.0	5.685	5.677	2.775	0.44328
5/29/2008 10:24:15	37455.5	135.0	5.749	5.741	2.711	0.43315
5/29/2008 10:24:21	37461.0	140.5	5.815	5.807	2.645	0.42244
5/29/2008 10:24:26	37466.5	146.0	5.881	5.873	2.579	0.41147
5/29/2008 10:24:31	37471.5	151.0	5.942	5.934	2.518	0.40107
5/29/2008 10:24:36	37476.5	156.0	6.004	5.996	2.456	0.39024
5/29/2008 10:24:42	37482.5	162.0	6.060	6.052	2.400	0.38022
5/29/2008 10:24:50	37490.5	170.0	6.116	6.108	2.344	0.36997
5/29/2008 10:24:57	37497.5	177.0	6.171	6.163	2.289	0.35965
5/29/2008 10:25:04	37504.5	184.0	6.225	6.217	2.235	0.34928
5/29/2008 10:25:11	37511.5	191.0	6.284	6.276	2.176	0.33766
5/29/2008 10:25:18	37518.5	198.0	6.338	6.331	2.122	0.32674
5/29/2008 10:25:24	37524.5	204.0	6.387	6.380	2.073	0.31659
5/29/2008 10:25:31	37531.5	211.0	6.437	6.430	2.023	0.30599
5/29/2008 10:25:37	37537.0	216.5	6.489	6.482	1.971	0.29468

Slug Test P-77

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 10:25:43	37543.0	222.5	6.540	6.533	1.920	0.28329
5/29/2008 10:25:48	37548.5	228.0	6.588	6.581	1.872	0.27229
5/29/2008 10:25:53	37553.5	233.0	6.632	6.625	1.828	0.26196
5/29/2008 10:25:58	37558.5	238.0	6.675	6.668	1.785	0.25162
5/29/2008 10:26:03	37563.5	243.0	6.719	6.712	1.741	0.24077
5/29/2008 10:26:08	37568.5	248.0	6.759	6.752	1.701	0.23068
5/29/2008 10:26:13	37573.0	252.5	6.800	6.793	1.660	0.22008
5/29/2008 10:26:18	37578.5	258.0	6.840	6.833	1.620	0.20948
5/29/2008 10:26:23	37583.5	263.0	6.880	6.873	1.580	0.19862
5/29/2008 10:26:29	37589.0	268.5	6.922	6.915	1.538	0.18692
5/29/2008 10:26:33	37593.0	272.5	6.957	6.950	1.503	0.17691
5/29/2008 10:26:38	37598.0	277.5	6.995	6.988	1.465	0.16579
5/29/2008 10:26:41	37601.5	281.0	7.030	7.023	1.430	0.15528
5/29/2008 10:26:44	37604.5	284.0	7.066	7.059	1.394	0.14421
5/29/2008 10:26:48	37608.0	287.5	7.099	7.092	1.361	0.13380
5/29/2008 10:26:51	37611.0	290.5	7.132	7.125	1.328	0.12314
5/29/2008 10:26:55	37615.5	295.0	7.165	7.158	1.295	0.11220
5/29/2008 10:27:02	37622.0	301.5	7.195	7.188	1.265	0.10202
5/29/2008 10:27:08	37628.5	308.0	7.226	7.219	1.234	0.09124
5/29/2008 10:27:15	37635.5	315.0	7.257	7.250	1.203	0.08018
5/29/2008 10:27:22	37642.0	321.5	7.287	7.280	1.173	0.06921
5/29/2008 10:27:28	37648.0	327.5	7.320	7.313	1.140	0.05681
5/29/2008 10:27:34	37654.5	334.0	7.346	7.339	1.114	0.04678
5/29/2008 10:27:40	37660.5	340.0	7.372	7.365	1.088	0.03652
5/29/2008 10:27:47	37667.0	346.5	7.400	7.393	1.060	0.02518
5/29/2008 10:27:53	37673.5	353.0	7.426	7.419	1.034	0.01439
5/29/2008 10:27:58	37678.5	358.0	7.450	7.443	1.010	0.00418
5/29/2008 10:28:04	37684.5	364.0	7.473	7.466	0.987	-0.00583
5/29/2008 10:28:09	37689.5	369.0	7.497	7.490	0.963	-0.01653
5/29/2008 10:28:17	37697.0	376.5	7.520	7.513	0.940	-0.02704
5/29/2008 10:28:21	37701.5	381.0	7.542	7.535	0.918	-0.03733
5/29/2008 10:28:27	37707.5	387.0	7.563	7.556	0.897	-0.04739
5/29/2008 10:28:33	37713.0	392.5	7.584	7.577	0.876	-0.05769
5/29/2008 10:28:39	37719.0	398.5	7.605	7.598	0.855	-0.06823
5/29/2008 10:28:45	37725.0	404.5	7.626	7.619	0.834	-0.07905
5/29/2008 10:28:50	37730.5	410.0	7.645	7.638	0.815	-0.08907
5/29/2008 10:28:56	37736.5	416.0	7.664	7.657	0.796	-0.09932
5/29/2008 10:29:02	37742.5	422.0	7.683	7.676	0.777	-0.10983
5/29/2008 10:29:09	37749.0	428.5	7.702	7.695	0.758	-0.12059
5/29/2008 10:29:15	37755.0	434.5	7.721	7.714	0.739	-0.13163
5/29/2008 10:29:23	37763.5	443.0	7.742	7.735	0.718	-0.14417
5/29/2008 10:29:31	37771.0	450.5	7.763	7.756	0.697	-0.15708
5/29/2008 10:29:37	37777.5	457.0	7.780	7.773	0.679	-0.16782
5/29/2008 10:29:44	37784.0	463.5	7.796	7.789	0.663	-0.17817
5/29/2008 10:29:51	37791.5	471.0	7.813	7.806	0.646	-0.18945
5/29/2008 10:29:59	37799.5	479.0	7.829	7.822	0.630	-0.20035
5/29/2008 10:30:07	37807.5	487.0	7.846	7.839	0.613	-0.21223
5/29/2008 10:30:14	37814.5	494.0	7.860	7.853	0.599	-0.22227
5/29/2008 10:30:20	37820.5	500.0	7.874	7.867	0.585	-0.23254

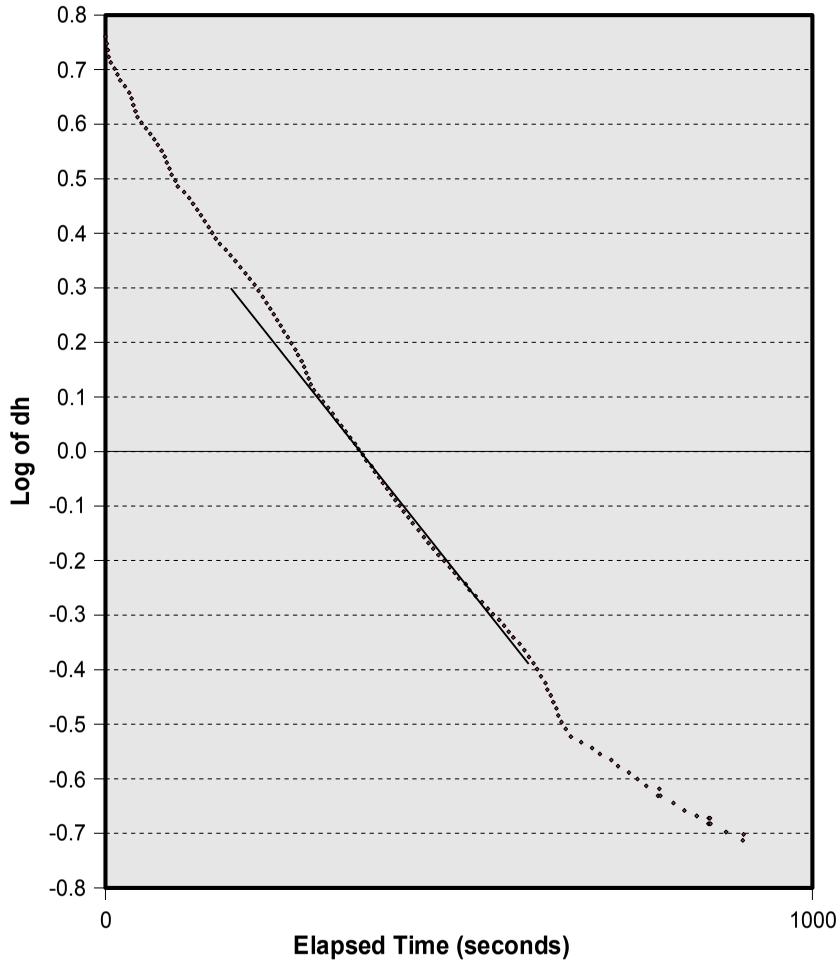
Slug Test P-77

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 10:30:30	37830.0	509.5	7.888	7.881	0.571	-0.24307
5/29/2008 10:30:35	37835.5	515.0	7.902	7.895	0.557	-0.25385
5/29/2008 10:30:44	37844.0	523.5	7.916	7.909	0.543	-0.26491
5/29/2008 10:30:53	37853.0	532.5	7.930	7.923	0.529	-0.27626
5/29/2008 10:31:01	37861.5	541.0	7.944	7.937	0.515	-0.28791
5/29/2008 10:31:08	37868.5	548.0	7.956	7.949	0.503	-0.29816
5/29/2008 10:31:17	37877.5	557.0	7.968	7.961	0.491	-0.30865
5/29/2008 10:31:24	37884.5	564.0	7.980	7.973	0.479	-0.31940
5/29/2008 10:31:31	37891.0	570.5	7.992	7.985	0.467	-0.33043
5/29/2008 10:31:37	37897.5	577.0	8.003	7.996	0.456	-0.34079
5/29/2008 10:31:46	37906.5	586.0	8.015	8.008	0.444	-0.35238
5/29/2008 10:31:53	37913.0	592.5	8.027	8.020	0.432	-0.36428
5/29/2008 10:31:59	37919.5	599.0	8.039	8.032	0.420	-0.37652
5/29/2008 10:32:06	37926.0	605.5	8.050	8.043	0.409	-0.38806
5/29/2008 10:32:11	37931.0	610.5	8.060	8.053	0.399	-0.39881
5/29/2008 10:32:16	37936.5	616.0	8.072	8.065	0.387	-0.41208
5/29/2008 10:32:23	37943.0	622.5	8.083	8.076	0.376	-0.42461
5/29/2008 10:32:25	37945.5	625.0	8.093	8.086	0.366	-0.43632
5/29/2008 10:32:30	37950.5	630.0	8.102	8.095	0.357	-0.44714
5/29/2008 10:32:34	37954.0	633.5	8.112	8.105	0.347	-0.45948
5/29/2008 10:32:38	37958.5	638.0	8.121	8.114	0.338	-0.47090
5/29/2008 10:32:41	37961.0	640.5	8.131	8.124	0.328	-0.48394
5/29/2008 10:32:45	37965.5	645.0	8.140	8.133	0.319	-0.49603
5/29/2008 10:32:51	37971.5	651.0	8.149	8.142	0.310	-0.50847
5/29/2008 10:32:59	37979.0	658.5	8.159	8.152	0.300	-0.52273
5/29/2008 10:33:13	37993.5	673.0	8.166	8.159	0.293	-0.53302
5/29/2008 10:33:29	38009.0	688.5	8.173	8.166	0.286	-0.54356
5/29/2008 10:33:40	38020.0	699.5	8.180	8.173	0.279	-0.55435
5/29/2008 10:33:56	38036.0	715.5	8.187	8.180	0.272	-0.56544
5/29/2008 10:34:05	38045.5	725.0	8.194	8.188	0.265	-0.57679
5/29/2008 10:34:21	38061.0	740.5	8.201	8.195	0.258	-0.58847
5/29/2008 10:34:33	38073.0	752.5	8.208	8.202	0.251	-0.60046
5/29/2008 10:34:45	38085.5	765.0	8.215	8.209	0.244	-0.61279
5/29/2008 10:35:02	38102.0	781.5	8.225	8.219	0.234	-0.63103
5/29/2008 10:35:04	38104.0	783.5	8.218	8.212	0.241	-0.61822
5/29/2008 10:35:05	38105.5	785.0	8.225	8.219	0.234	-0.63104
5/29/2008 10:35:24	38124.0	803.5	8.232	8.226	0.227	-0.64430
5/29/2008 10:35:39	38139.5	819.0	8.239	8.233	0.220	-0.65798
5/29/2008 10:35:57	38157.0	836.5	8.244	8.238	0.215	-0.66804
5/29/2008 10:36:13	38173.5	853.0	8.251	8.245	0.208	-0.68249
5/29/2008 10:36:14	38174.0	853.5	8.246	8.240	0.213	-0.67217
5/29/2008 10:36:15	38175.0	854.5	8.251	8.245	0.208	-0.68250
5/29/2008 10:36:15	38175.5	855.0	8.246	8.240	0.213	-0.67217
5/29/2008 10:36:16	38176.5	856.0	8.251	8.245	0.208	-0.68251
5/29/2008 10:36:38	38198.5	878.0	8.258	8.252	0.201	-0.69749
5/29/2008 10:37:02	38222.0	901.5	8.265	8.259	0.194	-0.71301
5/29/2008 10:37:03	38223.0	902.5	8.260	8.254	0.199	-0.70194

Slug Test P-77

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	40.50	ft
Stick up height:	2.98	ft
Depth to sand pack (BGS):	24.10	ft
Depth to screened interval (BGS):	25.50	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	30.63	ft
Initial Head Change:	5.77	ft
Total well length:	43.48	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	12.85	ft
L_e / r_w:	39.7935	
A (dimensionless):	2.871	
B (dimensionless):	0.479	
Drawdown at time = 0 (y_0):	1.33	ft
Drawdown at time = t (y_t):	0.50	ft
Elapsed Time between y_0 and y_t (t):	258	sec
Initial water column in well (L_w):	12.85	ft
$\ln(R_e/r_w)$ =	2.26	
K =	1.19E-05	ft/sec
	3.64E-04	**cm/sec**
	376.39	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-78S

Initial offset in logger reading (feet):	-0.055	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	0.000017		
Initial depth to water table (feet):	38.18		
Depth of probe below water table (feet):	9.558		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:19:32	44372.0	0.0	4.41	4.448	5.110	0.70845
5/29/2008 12:19:35	44375.0	3.0	4.48	4.518	5.040	0.70246
5/29/2008 12:19:35	44375.5	3.5	4.61	4.639	4.919	0.69191
5/29/2008 12:19:37	44377.5	5.5	4.68	4.712	4.846	0.68542
5/29/2008 12:19:39	44379.0	7.0	4.76	4.794	4.764	0.67801
5/29/2008 12:19:40	44380.5	8.5	4.83	4.860	4.698	0.67195
5/29/2008 12:19:42	44382.0	10.0	4.89	4.919	4.639	0.66647
5/29/2008 12:19:44	44384.0	12.0	4.95	4.983	4.575	0.66044
5/29/2008 12:19:46	44386.5	14.5	5.01	5.046	4.513	0.65442
5/29/2008 12:19:49	44389.0	17.0	5.07	5.100	4.459	0.64920
5/29/2008 12:19:52	44392.0	20.0	5.12	5.154	4.404	0.64381
5/29/2008 12:19:55	44395.0	23.0	5.18	5.208	4.350	0.63846
5/29/2008 12:19:58	44398.5	26.5	5.23	5.264	4.294	0.63284
5/29/2008 12:20:02	44402.5	30.5	5.29	5.323	4.235	0.62683
5/29/2008 12:20:04	44404.5	32.5	5.34	5.375	4.183	0.62147
5/29/2008 12:20:08	44408.0	36.0	5.39	5.427	4.131	0.61604
5/29/2008 12:20:12	44412.0	40.0	5.45	5.479	4.079	0.61055
5/29/2008 12:20:14	44414.0	42.0	5.49	5.526	4.032	0.60552
5/29/2008 12:20:16	44416.0	44.0	5.55	5.582	3.976	0.59945
5/29/2008 12:20:19	44419.5	47.5	5.6	5.630	3.928	0.59418
5/29/2008 12:20:23	44423.5	51.5	5.64	5.677	3.881	0.58896
5/29/2008 12:20:26	44426.0	54.0	5.7	5.729	3.829	0.58311
5/29/2008 12:20:27	44427.5	55.5	5.75	5.778	3.780	0.57752
5/29/2008 12:20:29	44429.5	57.5	5.79	5.825	3.733	0.57209
5/29/2008 12:20:31	44431.5	59.5	5.84	5.875	3.683	0.56624
5/29/2008 12:20:33	44433.5	61.5	5.89	5.924	3.634	0.56042
5/29/2008 12:20:37	44437.0	65.0	5.94	5.969	3.589	0.55502
5/29/2008 12:20:40	44440.0	68.0	5.99	6.018	3.540	0.54906
5/29/2008 12:20:42	44442.5	70.5	6.03	6.061	3.497	0.54375
5/29/2008 12:20:45	44445.0	73.0	6.07	6.103	3.456	0.53851
5/29/2008 12:20:47	44447.5	75.5	6.11	6.143	3.416	0.53346
5/29/2008 12:20:50	44450.5	78.5	6.16	6.192	3.367	0.52719
5/29/2008 12:20:53	44453.0	81.0	6.21	6.241	3.317	0.52070
5/29/2008 12:20:55	44455.0	83.0	6.25	6.279	3.279	0.51570
5/29/2008 12:20:58	44458.5	86.5	6.29	6.321	3.237	0.51011
5/29/2008 12:21:01	44461.5	89.5	6.33	6.361	3.197	0.50471
5/29/2008 12:21:05	44465.5	93.5	6.37	6.403	3.155	0.49898
5/29/2008 12:21:08	44468.0	96.0	6.42	6.448	3.110	0.49275
5/29/2008 12:21:10	44470.0	98.0	6.45	6.486	3.072	0.48741
5/29/2008 12:21:12	44472.5	100.5	6.5	6.533	3.025	0.48072
5/29/2008 12:21:14	44474.5	102.5	6.55	6.577	2.981	0.47436
5/29/2008 12:21:16	44476.5	104.5	6.58	6.615	2.943	0.46880
5/29/2008 12:21:18	44478.5	106.5	6.63	6.657	2.901	0.46256
5/29/2008 12:21:20	44480.0	108.0	6.66	6.693	2.865	0.45714

Slug Test P-78S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:21:22	44482.0	110.0	6.7	6.735	2.823	0.45073
5/29/2008 12:21:23	44483.5	111.5	6.74	6.768	2.790	0.44563
5/29/2008 12:21:25	44485.0	113.0	6.77	6.803	2.755	0.44015
5/29/2008 12:21:26	44486.0	114.0	6.81	6.846	2.712	0.43332
5/29/2008 12:21:27	44487.0	115.0	6.87	6.900	2.658	0.42459
5/29/2008 12:21:28	44488.0	116.0	6.93	6.959	2.599	0.41485
5/29/2008 12:21:29	44489.0	117.0	6.97	7.001	2.557	0.40777
5/29/2008 12:21:31	44491.0	119.0	7	7.036	2.522	0.40179
5/29/2008 12:21:32	44492.5	120.5	7.03	7.065	2.493	0.39678
5/29/2008 12:21:34	44494.0	122.0	7.07	7.098	2.460	0.39099
5/29/2008 12:21:35	44495.5	123.5	7.1	7.131	2.427	0.38513
5/29/2008 12:21:37	44497.0	125.0	7.13	7.161	2.397	0.37974
5/29/2008 12:21:39	44499.0	127.0	7.17	7.197	2.361	0.37317
5/29/2008 12:21:41	44501.0	129.0	7.19	7.225	2.333	0.36800
5/29/2008 12:21:44	44504.0	132.0	7.22	7.253	2.306	0.36277
5/29/2008 12:21:50	44510.0	138.0	7.25	7.281	2.278	0.35748
5/29/2008 12:21:58	44518.5	146.5	7.28	7.309	2.249	0.35194
5/29/2008 12:22:04	44524.5	152.5	7.31	7.337	2.221	0.34652
5/29/2008 12:22:10	44530.5	158.5	7.33	7.363	2.195	0.34142
5/29/2008 12:22:16	44536.0	164.0	7.36	7.389	2.169	0.33627
5/29/2008 12:22:22	44542.0	170.0	7.38	7.414	2.144	0.33125
5/29/2008 12:22:28	44548.5	176.5	7.41	7.440	2.118	0.32598
5/29/2008 12:22:35	44555.0	183.0	7.44	7.466	2.092	0.32064
5/29/2008 12:22:40	44560.5	188.5	7.46	7.492	2.066	0.31523
5/29/2008 12:22:45	44565.5	193.5	7.49	7.516	2.043	0.31017
5/29/2008 12:22:52	44572.0	200.0	7.51	7.541	2.017	0.30463
5/29/2008 12:22:58	44578.0	206.0	7.54	7.567	1.991	0.29902
5/29/2008 12:23:03	44583.5	211.5	7.56	7.590	1.968	0.29399
5/29/2008 12:23:10	44590.0	218.0	7.58	7.614	1.944	0.28868
5/29/2008 12:23:16	44596.0	224.0	7.61	7.637	1.921	0.28354
5/29/2008 12:23:22	44602.0	230.0	7.63	7.661	1.897	0.27810
5/29/2008 12:23:27	44607.0	235.0	7.65	7.684	1.874	0.27282
5/29/2008 12:23:32	44612.0	240.0	7.68	7.706	1.852	0.26771
5/29/2008 12:23:36	44616.5	244.5	7.7	7.729	1.829	0.26231
5/29/2008 12:23:42	44622.0	250.0	7.72	7.752	1.806	0.25683
5/29/2008 12:23:47	44627.0	255.0	7.74	7.774	1.785	0.25153
5/29/2008 12:23:52	44632.5	260.5	7.77	7.794	1.764	0.24641
5/29/2008 12:23:59	44639.0	267.0	7.79	7.815	1.743	0.24124
5/29/2008 12:24:04	44644.5	272.5	7.81	7.836	1.722	0.23600
5/29/2008 12:24:11	44651.0	279.0	7.83	7.857	1.701	0.23070
5/29/2008 12:24:16	44656.0	284.0	7.85	7.879	1.679	0.22506
5/29/2008 12:24:22	44662.5	290.5	7.87	7.900	1.658	0.21963
5/29/2008 12:24:28	44668.0	296.0	7.89	7.921	1.637	0.21412
5/29/2008 12:24:34	44674.0	302.0	7.91	7.942	1.616	0.20854
5/29/2008 12:24:39	44679.5	307.5	7.93	7.961	1.597	0.20343
5/29/2008 12:24:45	44685.5	313.5	7.95	7.980	1.579	0.19826
5/29/2008 12:24:50	44690.5	318.5	7.97	7.998	1.560	0.19302
5/29/2008 12:24:56	44696.5	324.5	7.99	8.019	1.539	0.18716
5/29/2008 12:25:03	44703.0	331.0	8.01	8.038	1.520	0.18180

Slug Test P-78S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:25:08	44708.5	336.5	8.03	8.057	1.501	0.17636
5/29/2008 12:25:15	44715.0	343.0	8.05	8.076	1.482	0.17086
5/29/2008 12:25:22	44722.5	350.5	8.07	8.094	1.464	0.16559
5/29/2008 12:25:27	44727.5	355.5	8.08	8.111	1.447	0.16054
5/29/2008 12:25:34	44734.0	362.0	8.1	8.130	1.428	0.15484
5/29/2008 12:25:40	44740.5	368.5	8.12	8.149	1.409	0.14905
5/29/2008 12:25:47	44747.0	375.0	8.14	8.167	1.392	0.14351
5/29/2008 12:25:52	44752.5	380.5	8.16	8.183	1.375	0.13820
5/29/2008 12:25:59	44759.0	387.0	8.17	8.199	1.359	0.13315
5/29/2008 12:26:05	44765.0	393.0	8.19	8.216	1.342	0.12771
5/29/2008 12:26:11	44771.5	399.5	8.21	8.232	1.326	0.12254
5/29/2008 12:26:18	44778.0	406.0	8.22	8.249	1.309	0.11697
5/29/2008 12:26:23	44783.5	411.5	8.24	8.265	1.293	0.11166
5/29/2008 12:26:29	44789.5	417.5	8.26	8.282	1.276	0.10595
5/29/2008 12:26:35	44795.5	423.5	8.27	8.298	1.260	0.10050
5/29/2008 12:26:42	44802.0	430.0	8.29	8.315	1.243	0.09464
5/29/2008 12:26:48	44808.0	436.0	8.3	8.331	1.228	0.08905
5/29/2008 12:26:55	44815.0	443.0	8.32	8.347	1.211	0.08304
5/29/2008 12:27:00	44820.5	448.5	8.34	8.361	1.197	0.07802
5/29/2008 12:27:07	44827.0	455.0	8.35	8.375	1.183	0.07295
5/29/2008 12:27:12	44832.5	460.5	8.36	8.389	1.169	0.06782
5/29/2008 12:27:19	44839.0	467.0	8.38	8.403	1.155	0.06262
5/29/2008 12:27:24	44844.5	472.5	8.39	8.417	1.141	0.05736
5/29/2008 12:27:30	44850.0	478.0	8.41	8.432	1.126	0.05165
5/29/2008 12:27:36	44856.0	484.0	8.42	8.446	1.112	0.04626
5/29/2008 12:27:41	44861.5	489.5	8.43	8.460	1.098	0.04080
5/29/2008 12:27:48	44868.0	496.0	8.45	8.474	1.085	0.03527
5/29/2008 12:27:54	44874.5	502.5	8.46	8.487	1.071	0.02967
5/29/2008 12:28:01	44881.0	509.0	8.48	8.501	1.057	0.02400
5/29/2008 12:28:07	44887.5	515.5	8.49	8.515	1.043	0.01825
5/29/2008 12:28:15	44895.0	523.0	8.5	8.529	1.029	0.01244
5/29/2008 12:28:20	44900.5	528.5	8.52	8.541	1.017	0.00738
5/29/2008 12:28:26	44906.5	534.5	8.53	8.553	1.005	0.00227
5/29/2008 12:28:32	44912.5	540.5	8.54	8.565	0.993	-0.00290
5/29/2008 12:28:38	44918.5	546.5	8.55	8.577	0.981	-0.00813
5/29/2008 12:28:44	44924.5	552.5	8.57	8.591	0.968	-0.01433
5/29/2008 12:28:51	44931.5	559.5	8.58	8.602	0.956	-0.01970
5/29/2008 12:28:59	44939.0	567.0	8.59	8.616	0.942	-0.02605
5/29/2008 12:29:06	44946.0	574.0	8.6	8.627	0.931	-0.03110
5/29/2008 12:29:12	44952.0	580.0	8.62	8.639	0.919	-0.03668
5/29/2008 12:29:19	44959.0	587.0	8.63	8.651	0.907	-0.04233
5/29/2008 12:29:26	44966.0	594.0	8.64	8.663	0.895	-0.04806
5/29/2008 12:29:35	44975.0	603.0	8.65	8.674	0.884	-0.05336
5/29/2008 12:29:40	44980.0	608.0	8.66	8.686	0.872	-0.05925
5/29/2008 12:29:47	44987.5	615.5	8.67	8.698	0.861	-0.06520
5/29/2008 12:29:53	44993.0	621.0	8.69	8.709	0.849	-0.07125
5/29/2008 12:30:00	45000.0	628.0	8.7	8.720	0.838	-0.07686
5/29/2008 12:30:05	45005.0	633.0	8.71	8.730	0.828	-0.08203
5/29/2008 12:30:11	45011.0	639.0	8.72	8.740	0.818	-0.08725

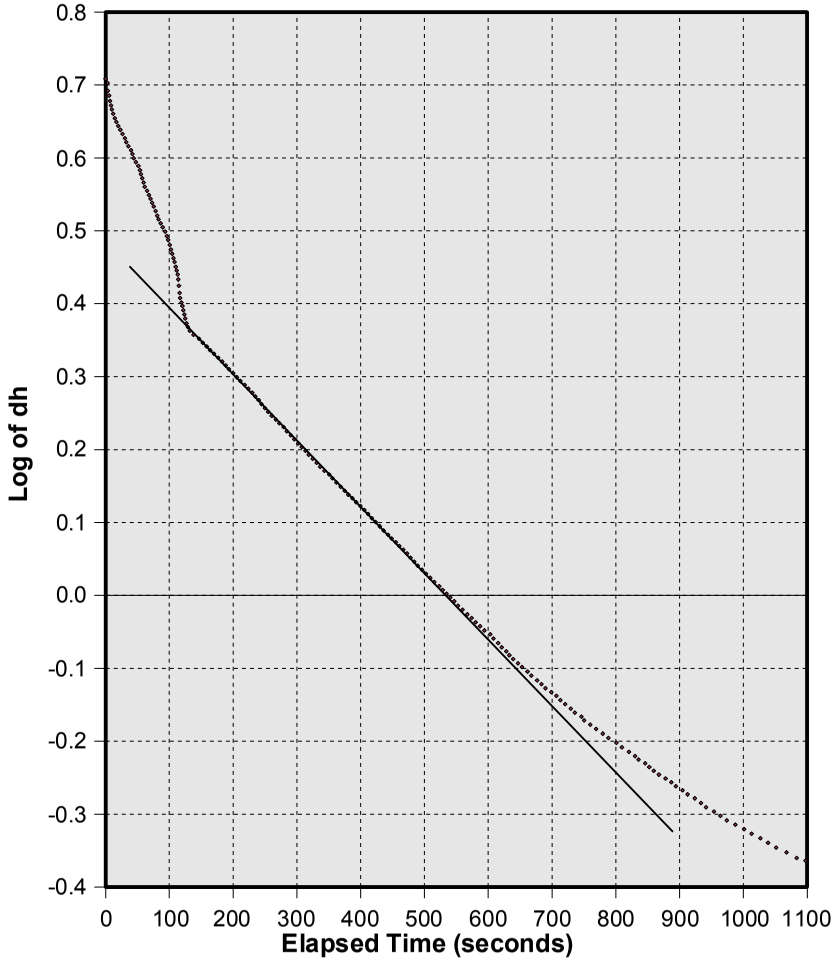
Slug Test P-78S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:30:18	45018.5	646.5	8.73	8.751	0.807	-0.09306
5/29/2008 12:30:25	45025.0	653.0	8.74	8.761	0.797	-0.09842
5/29/2008 12:30:33	45033.5	661.5	8.75	8.772	0.786	-0.10437
5/29/2008 12:30:39	45039.5	667.5	8.76	8.782	0.776	-0.10988
5/29/2008 12:30:48	45048.5	676.5	8.77	8.793	0.765	-0.11655
5/29/2008 12:30:55	45055.5	683.5	8.78	8.802	0.756	-0.12163
5/29/2008 12:31:01	45061.5	689.5	8.79	8.812	0.746	-0.12736
5/29/2008 12:31:11	45071.0	699.0	8.8	8.821	0.737	-0.13253
5/29/2008 12:31:19	45079.0	707.0	8.81	8.830	0.728	-0.13779
5/29/2008 12:31:25	45085.0	713.0	8.82	8.840	0.718	-0.14374
5/29/2008 12:31:32	45092.5	720.5	8.83	8.849	0.709	-0.14914
5/29/2008 12:31:41	45101.5	729.5	8.84	8.859	0.700	-0.15521
5/29/2008 12:31:47	45107.5	735.5	8.85	8.868	0.691	-0.16077
5/29/2008 12:31:58	45118.0	746.0	8.86	8.876	0.682	-0.16635
5/29/2008 12:32:02	45122.5	750.5	8.86	8.884	0.674	-0.17143
5/29/2008 12:32:12	45132.0	760.0	8.87	8.893	0.665	-0.17717
5/29/2008 12:32:21	45141.0	769.0	8.88	8.902	0.656	-0.18298
5/29/2008 12:32:31	45151.5	779.5	8.89	8.912	0.646	-0.18954
5/29/2008 12:32:40	45160.5	788.5	8.9	8.921	0.637	-0.19552
5/29/2008 12:32:53	45173.0	801.0	8.91	8.930	0.628	-0.20225
5/29/2008 12:33:01	45181.5	809.5	8.92	8.939	0.619	-0.20842
5/29/2008 12:33:12	45192.5	820.5	8.93	8.948	0.610	-0.21465
5/29/2008 12:33:22	45202.0	830.0	8.94	8.956	0.602	-0.22027
5/29/2008 12:33:27	45207.5	835.5	8.94	8.963	0.595	-0.22528
5/29/2008 12:33:38	45218.0	846.0	8.95	8.970	0.588	-0.23029
5/29/2008 12:33:44	45224.5	852.5	8.96	8.977	0.582	-0.23540
5/29/2008 12:33:51	45231.5	859.5	8.96	8.983	0.575	-0.24057
5/29/2008 12:33:59	45239.5	867.5	8.97	8.990	0.568	-0.24579
5/29/2008 12:34:10	45250.0	878.0	8.98	8.997	0.561	-0.25104
5/29/2008 12:34:19	45259.0	887.0	8.99	9.004	0.554	-0.25638
5/29/2008 12:34:26	45266.0	894.0	8.99	9.011	0.547	-0.26181
5/29/2008 12:34:36	45276.5	904.5	9	9.018	0.540	-0.26726
5/29/2008 12:34:44	45284.5	912.5	9.01	9.025	0.534	-0.27281
5/29/2008 12:34:56	45296.0	924.0	9.01	9.031	0.527	-0.27838
5/29/2008 12:35:05	45305.5	933.5	9.02	9.039	0.519	-0.28490
5/29/2008 12:35:13	45313.5	941.5	9.03	9.046	0.512	-0.29068
5/29/2008 12:35:26	45326.0	954.0	9.04	9.053	0.505	-0.29648
5/29/2008 12:35:36	45336.0	964.0	9.04	9.060	0.498	-0.30239
5/29/2008 12:35:46	45346.0	974.0	9.05	9.067	0.492	-0.30839
5/29/2008 12:35:59	45359.5	987.5	9.06	9.073	0.485	-0.31441
5/29/2008 12:36:13	45373.0	1001.0	9.06	9.080	0.478	-0.32052
5/29/2008 12:36:25	45385.0	1013.0	9.07	9.087	0.471	-0.32675
5/29/2008 12:36:38	45398.5	1026.5	9.08	9.094	0.464	-0.33303
5/29/2008 12:36:50	45410.5	1038.5	9.08	9.100	0.458	-0.33944
5/29/2008 12:37:03	45423.5	1051.5	9.09	9.107	0.451	-0.34592
5/29/2008 12:37:19	45439.5	1067.5	9.1	9.114	0.444	-0.35246
5/29/2008 12:37:35	45455.5	1083.5	9.11	9.122	0.436	-0.36008
5/29/2008 12:37:49	45469.5	1097.5	9.11	9.125	0.433	-0.36385

Slug Test P-78S

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	48.22	ft
Stick up height:	2.71	ft
Depth to sand pack (BGS):	31.85	ft
Depth to screened interval (BGS):	33.22	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	38.18	ft
Initial Head Change:	5.11	ft
Total well length:	50.93	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	12.75	ft
L_e / r_w:	39.4839	
A (dimensionless):	2.861	
B (dimensionless):	0.478	
Drawdown at time = 0 (y_0):	2.37	ft
Drawdown at time = t (y_t):	0.80	ft
Elapsed Time between y_0 and y_t (t):	527	sec
Initial water column in well (L_w):	12.75	ft
$\ln(R_e/r_w)$ =	2.25	
K =	6.60E-06	ft/sec
	2.01E-04	**cm/sec**
	208.09	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-78D

Initial offset in logger reading (feet):	-0.013	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000005		
Initial depth to water table (feet):	39.6		
Depth of probe below water table (feet):	5.494		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:41:28	45688.0	0.0	16.26	16.278	10.783	1.03275
5/29/2008 12:41:34	45694.0	6.0	15.99	16.006	10.511	1.02166
5/29/2008 12:41:38	45698.0	10.0	15.72	15.738	10.243	1.01044
5/29/2008 12:41:42	45702.0	14.0	15.47	15.479	9.984	0.99932
5/29/2008 12:41:46	45706.0	18.0	15.22	15.230	9.735	0.98835
5/29/2008 12:41:50	45710.0	22.0	14.98	14.990	9.495	0.97751
5/29/2008 12:41:54	45714.0	26.0	14.73	14.747	9.252	0.96626
5/29/2008 12:41:58	45718.0	30.0	14.5	14.510	9.015	0.95499
5/29/2008 12:42:02	45722.0	34.0	14.26	14.274	8.779	0.94347
5/29/2008 12:42:06	45726.0	38.0	14.04	14.058	8.563	0.93265
5/29/2008 12:42:10	45730.0	42.0	13.83	13.844	8.350	0.92166
5/29/2008 12:42:14	45734.0	46.0	13.62	13.637	8.143	0.91076
5/29/2008 12:42:18	45738.0	50.0	13.42	13.437	7.943	0.89996
5/29/2008 12:42:22	45742.0	54.0	13.23	13.239	7.745	0.88900
5/29/2008 12:42:26	45746.0	58.0	13.04	13.051	7.557	0.87833
5/29/2008 12:42:30	45750.0	62.0	12.85	12.865	7.371	0.86750
5/29/2008 12:42:34	45754.0	66.0	12.67	12.679	7.185	0.85640
5/29/2008 12:42:37	45757.5	69.5	12.5	12.512	7.018	0.84619
5/29/2008 12:42:41	45761.0	73.0	12.33	12.342	6.848	0.83554
5/29/2008 12:42:44	45764.5	76.5	12.16	12.177	6.683	0.82495
5/29/2008 12:42:48	45768.0	80.0	12	12.012	6.518	0.81409
5/29/2008 12:42:51	45771.5	83.5	11.84	11.857	6.363	0.80364
5/29/2008 12:42:55	45775.0	87.0	11.69	11.699	6.205	0.79272
5/29/2008 12:42:58	45778.5	90.5	11.54	11.553	6.059	0.78238
5/29/2008 12:43:02	45782.0	94.0	11.39	11.407	5.913	0.77179
5/29/2008 12:43:05	45785.5	97.5	11.25	11.263	5.769	0.76108
5/29/2008 12:43:09	45789.0	101.0	11.11	11.121	5.627	0.75026
5/29/2008 12:43:12	45792.5	104.5	10.97	10.984	5.490	0.73956
5/29/2008 12:43:16	45796.0	108.0	10.84	10.852	5.358	0.72899
5/29/2008 12:43:19	45799.5	111.5	10.71	10.720	5.226	0.71815
5/29/2008 12:43:23	45803.0	115.0	10.58	10.594	5.100	0.70756
5/29/2008 12:43:26	45806.5	118.5	10.46	10.471	4.977	0.69695
5/29/2008 12:43:30	45810.0	122.0	10.33	10.348	4.854	0.68609
5/29/2008 12:43:33	45813.5	125.5	10.22	10.233	4.739	0.67568
5/29/2008 12:43:37	45817.0	129.0	10.1	10.114	4.620	0.66463
5/29/2008 12:43:40	45820.5	132.5	9.99	10.006	4.512	0.65436
5/29/2008 12:43:44	45824.0	136.0	9.88	9.897	4.403	0.64374
5/29/2008 12:43:47	45827.5	139.5	9.77	9.788	4.294	0.63286
5/29/2008 12:43:51	45831.0	143.0	9.67	9.686	4.192	0.62242
5/29/2008 12:43:54	45834.5	146.5	9.57	9.587	4.093	0.61204
5/29/2008 12:43:58	45838.0	150.0	9.47	9.487	3.993	0.60130
5/29/2008 12:44:01	45841.5	153.5	9.38	9.392	3.898	0.59084
5/29/2008 12:44:05	45845.0	157.0	9.29	9.300	3.806	0.58047
5/29/2008 12:44:08	45848.5	160.5	9.19	9.208	3.714	0.56985

Slug Test P-78D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:44:12	45852.0	164.0	9.11	9.120	3.626	0.55943
5/29/2008 12:44:15	45855.5	167.5	9.02	9.030	3.536	0.54852
5/29/2008 12:44:19	45859.0	171.0	8.93	8.947	3.453	0.53821
5/29/2008 12:44:22	45862.5	174.5	8.85	8.867	3.373	0.52803
5/29/2008 12:44:26	45866.0	178.0	8.77	8.786	3.292	0.51748
5/29/2008 12:44:29	45869.5	181.5	8.69	8.708	3.214	0.50706
5/29/2008 12:44:33	45873.0	185.0	8.62	8.630	3.136	0.49640
5/29/2008 12:44:36	45876.5	188.5	8.54	8.557	3.063	0.48617
5/29/2008 12:44:40	45880.0	192.0	8.47	8.487	2.992	0.47599
5/29/2008 12:44:43	45883.5	195.5	8.4	8.416	2.921	0.46556
5/29/2008 12:44:47	45887.0	199.0	8.33	8.345	2.850	0.45488
5/29/2008 12:44:51	45891.0	203.0	8.26	8.271	2.776	0.44346
5/29/2008 12:44:54	45894.5	206.5	8.19	8.207	2.712	0.43333
5/29/2008 12:44:58	45898.0	210.0	8.13	8.143	2.648	0.42296
5/29/2008 12:45:01	45901.5	213.5	8.07	8.080	2.585	0.41251
5/29/2008 12:45:05	45905.0	217.0	8.01	8.020	2.525	0.40231
5/29/2008 12:45:09	45909.0	221.0	7.94	7.952	2.457	0.39046
5/29/2008 12:45:12	45912.5	224.5	7.88	7.895	2.400	0.38027
5/29/2008 12:45:16	45916.5	228.5	7.82	7.831	2.336	0.36854
5/29/2008 12:45:20	45920.5	232.5	7.76	7.772	2.277	0.35743
5/29/2008 12:45:24	45924.0	236.0	7.7	7.715	2.220	0.34643
5/29/2008 12:45:28	45928.0	240.0	7.65	7.661	2.166	0.33574
5/29/2008 12:45:31	45931.5	243.5	7.6	7.611	2.116	0.32560
5/29/2008 12:45:35	45935.0	247.0	7.55	7.561	2.066	0.31522
5/29/2008 12:45:39	45939.0	251.0	7.49	7.507	2.012	0.30373
5/29/2008 12:45:42	45942.5	254.5	7.45	7.460	1.965	0.29347
5/29/2008 12:45:46	45946.0	258.0	7.4	7.415	1.920	0.28341
5/29/2008 12:45:50	45950.0	262.0	7.35	7.367	1.872	0.27242
5/29/2008 12:45:54	45954.0	266.0	7.31	7.320	1.826	0.26139
5/29/2008 12:45:57	45957.5	269.5	7.26	7.278	1.784	0.25128
5/29/2008 12:46:01	45961.0	273.0	7.22	7.237	1.743	0.24119
5/29/2008 12:46:04	45964.5	276.5	7.18	7.197	1.703	0.23110
5/29/2008 12:46:08	45968.0	280.0	7.14	7.157	1.663	0.22078
5/29/2008 12:46:11	45971.5	283.5	7.1	7.117	1.623	0.21021
5/29/2008 12:46:15	45975.5	287.5	7.06	7.077	1.583	0.19938
5/29/2008 12:46:19	45979.5	291.5	7.02	7.039	1.545	0.18883
5/29/2008 12:46:23	45983.0	295.0	6.99	7.001	1.507	0.17801
5/29/2008 12:46:27	45987.0	299.0	6.95	6.961	1.467	0.16633
5/29/2008 12:46:31	45991.5	303.5	6.91	6.923	1.429	0.15494
5/29/2008 12:46:35	45995.0	307.0	6.88	6.890	1.396	0.14479
5/29/2008 12:46:39	45999.0	311.0	6.84	6.854	1.360	0.13345
5/29/2008 12:46:43	46003.0	315.0	6.81	6.821	1.327	0.12279
5/29/2008 12:46:47	46007.0	319.0	6.77	6.788	1.294	0.11185
5/29/2008 12:46:51	46011.0	323.0	6.74	6.755	1.261	0.10064
5/29/2008 12:46:55	46015.0	327.0	6.71	6.722	1.228	0.08913
5/29/2008 12:46:58	46018.5	330.5	6.68	6.694	1.200	0.07911
5/29/2008 12:47:02	46022.5	334.5	6.65	6.665	1.171	0.06849
5/29/2008 12:47:06	46026.5	338.5	6.62	6.635	1.141	0.05723
5/29/2008 12:47:10	46030.0	342.0	6.59	6.608	1.114	0.04683

Slug Test P-78D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:47:14	46034.5	346.5	6.57	6.580	1.086	0.03578
5/29/2008 12:47:18	46038.5	350.5	6.54	6.552	1.058	0.02444
5/29/2008 12:47:22	46042.0	354.0	6.51	6.526	1.032	0.01364
5/29/2008 12:47:26	46046.0	358.0	6.49	6.502	1.008	0.00343
5/29/2008 12:47:29	46049.5	361.5	6.46	6.478	0.984	-0.00703
5/29/2008 12:47:33	46053.5	365.5	6.44	6.455	0.961	-0.01729
5/29/2008 12:47:37	46057.5	369.5	6.41	6.429	0.935	-0.02919
5/29/2008 12:47:41	46061.0	373.0	6.39	6.407	0.913	-0.03953
5/29/2008 12:47:45	46065.0	377.0	6.37	6.386	0.892	-0.04963
5/29/2008 12:47:49	46069.0	381.0	6.35	6.365	0.871	-0.05996
5/29/2008 12:47:53	46073.0	385.0	6.33	6.344	0.850	-0.07055
5/29/2008 12:47:57	46077.0	389.0	6.31	6.322	0.828	-0.08193
5/29/2008 12:48:00	46080.5	392.5	6.29	6.303	0.809	-0.09200
5/29/2008 12:48:05	46085.0	397.0	6.27	6.280	0.786	-0.10452
5/29/2008 12:48:08	46088.5	400.5	6.25	6.261	0.767	-0.11513
5/29/2008 12:48:13	46093.0	405.0	6.23	6.242	0.748	-0.12601
5/29/2008 12:48:17	46097.0	409.0	6.21	6.223	0.729	-0.13717
5/29/2008 12:48:20	46100.5	412.5	6.19	6.207	0.712	-0.14741
5/29/2008 12:48:25	46105.0	417.0	6.17	6.188	0.693	-0.15914
5/29/2008 12:48:29	46109.0	421.0	6.16	6.172	0.677	-0.16927
5/29/2008 12:48:32	46112.5	424.5	6.14	6.155	0.660	-0.18030
5/29/2008 12:48:37	46117.0	429.0	6.12	6.139	0.644	-0.19094
5/29/2008 12:48:41	46121.5	433.5	6.11	6.122	0.627	-0.20254
5/29/2008 12:48:45	46125.5	437.5	6.09	6.106	0.611	-0.21375
5/29/2008 12:48:48	46128.5	440.5	6.08	6.092	0.597	-0.22380
5/29/2008 12:48:52	46132.0	444.0	6.06	6.077	0.582	-0.23484
5/29/2008 12:48:56	46136.5	448.5	6.05	6.063	0.568	-0.24539
5/29/2008 12:49:01	46141.0	453.0	6.03	6.049	0.554	-0.25620
5/29/2008 12:49:04	46144.5	456.5	6.02	6.035	0.540	-0.26730
5/29/2008 12:49:09	46149.0	461.0	6.01	6.021	0.526	-0.27868
5/29/2008 12:49:12	46152.5	464.5	5.99	6.009	0.514	-0.28868
5/29/2008 12:49:17	46157.0	469.0	5.98	5.997	0.502	-0.29892
5/29/2008 12:49:20	46160.5	472.5	5.97	5.983	0.488	-0.31118
5/29/2008 12:49:25	46165.0	477.0	5.96	5.971	0.476	-0.32196
5/29/2008 12:49:29	46169.5	481.5	5.94	5.959	0.464	-0.33302
5/29/2008 12:49:33	46173.5	485.5	5.93	5.948	0.454	-0.34341
5/29/2008 12:49:37	46177.0	489.0	5.92	5.936	0.442	-0.35504
5/29/2008 12:49:42	46182.5	494.5	5.91	5.924	0.430	-0.36698
5/29/2008 12:49:47	46187.0	499.0	5.9	5.912	0.418	-0.37927
5/29/2008 12:49:50	46190.5	502.5	5.89	5.901	0.407	-0.39084
5/29/2008 12:49:55	46195.0	507.0	5.88	5.891	0.397	-0.40164
5/29/2008 12:50:01	46201.0	513.0	5.86	5.879	0.385	-0.41495
5/29/2008 12:50:05	46205.0	517.0	5.85	5.870	0.376	-0.42521
5/29/2008 12:50:09	46209.0	521.0	5.85	5.861	0.367	-0.43572
5/29/2008 12:50:12	46212.5	524.5	5.84	5.851	0.357	-0.44771
5/29/2008 12:50:18	46218.0	530.0	5.83	5.842	0.348	-0.45878
5/29/2008 12:50:22	46222.5	534.5	5.82	5.832	0.338	-0.47143
5/29/2008 12:50:27	46227.0	539.0	5.81	5.823	0.329	-0.48313
5/29/2008 12:50:32	46232.0	544.0	5.8	5.814	0.320	-0.49515

Slug Test P-78D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:50:35	46235.0	547.0	5.79	5.806	0.312	-0.50614
5/29/2008 12:50:38	46238.5	550.5	5.78	5.797	0.303	-0.51883
5/29/2008 12:50:43	46243.5	555.5	5.77	5.790	0.296	-0.52896
5/29/2008 12:50:47	46247.5	559.5	5.77	5.783	0.289	-0.53933
5/29/2008 12:50:51	46251.0	563.0	5.76	5.776	0.282	-0.54996
5/29/2008 12:50:55	46255.0	567.0	5.75	5.769	0.275	-0.56085
5/29/2008 12:50:59	46259.5	571.5	5.75	5.762	0.268	-0.57202
5/29/2008 12:51:02	46262.5	574.5	5.74	5.755	0.261	-0.58350
5/29/2008 12:51:09	46269.0	581.0	5.73	5.748	0.254	-0.59526
5/29/2008 12:51:12	46272.0	584.0	5.73	5.741	0.247	-0.60738
5/29/2008 12:51:17	46277.5	589.5	5.72	5.734	0.240	-0.61982
5/29/2008 12:51:22	46282.0	594.0	5.71	5.727	0.233	-0.63264
5/29/2008 12:51:26	46286.0	598.0	5.7	5.720	0.226	-0.64585
5/29/2008 12:51:31	46291.0	603.0	5.7	5.713	0.219	-0.65947
5/29/2008 12:51:36	46296.5	608.5	5.69	5.706	0.212	-0.67352
5/29/2008 12:51:39	46299.5	611.5	5.69	5.701	0.207	-0.68386
5/29/2008 12:51:46	46306.0	618.0	5.68	5.696	0.202	-0.69441
5/29/2008 12:51:52	46312.0	624.0	5.67	5.689	0.195	-0.70965
5/29/2008 12:51:57	46317.5	629.5	5.67	5.682	0.188	-0.72546
5/29/2008 12:51:58	46318.5	630.5	5.67	5.687	0.193	-0.71406
5/29/2008 12:52:03	46323.5	635.5	5.66	5.681	0.186	-0.73004
5/29/2008 12:52:10	46330.0	642.0	5.66	5.676	0.181	-0.74179
5/29/2008 12:52:15	46335.0	647.0	5.65	5.669	0.174	-0.75884
5/29/2008 12:52:19	46339.0	651.0	5.65	5.665	0.170	-0.76888
5/29/2008 12:52:19	46339.5	651.5	5.65	5.669	0.174	-0.75879
5/29/2008 12:52:22	46342.0	654.0	5.65	5.664	0.169	-0.77141
5/29/2008 12:52:26	46346.5	658.5	5.64	5.660	0.165	-0.78174
5/29/2008 12:52:31	46351.0	663.0	5.64	5.655	0.160	-0.79502
5/29/2008 12:52:35	46355.5	667.5	5.63	5.651	0.156	-0.80594
5/29/2008 12:52:41	46361.0	673.0	5.63	5.646	0.151	-0.81998
5/29/2008 12:52:46	46366.5	678.5	5.62	5.641	0.146	-0.83450
5/29/2008 12:52:50	46370.0	682.0	5.62	5.637	0.142	-0.84648
5/29/2008 12:52:56	46376.5	688.5	5.62	5.632	0.137	-0.86191
5/29/2008 12:53:02	46382.5	694.5	5.61	5.627	0.132	-0.87792
5/29/2008 12:53:09	46389.0	701.0	5.61	5.623	0.128	-0.89114
5/29/2008 12:53:13	46393.5	705.5	5.6	5.620	0.126	-0.90133
5/29/2008 12:53:20	46400.0	712.0	5.6	5.616	0.122	-0.91529
5/29/2008 12:53:20	46400.5	712.5	5.6	5.613	0.119	-0.92613
5/29/2008 12:53:22	46402.0	714.0	5.6	5.616	0.122	-0.91526
5/29/2008 12:53:23	46403.0	715.0	5.6	5.613	0.119	-0.92609
5/29/2008 12:53:28	46408.0	720.0	5.59	5.609	0.115	-0.94091
5/29/2008 12:53:32	46412.0	724.0	5.59	5.604	0.110	-0.96022
5/29/2008 12:53:36	46416.5	728.5	5.59	5.607	0.113	-0.94841
5/29/2008 12:53:37	46417.0	729.0	5.59	5.604	0.110	-0.96013
5/29/2008 12:53:41	46421.5	733.5	5.58	5.599	0.105	-0.98032
5/29/2008 12:53:42	46422.0	734.0	5.59	5.602	0.108	-0.96804
5/29/2008 12:53:44	46424.5	736.5	5.58	5.599	0.105	-0.98026
5/29/2008 12:53:45	46425.0	737.0	5.59	5.602	0.108	-0.96798
5/29/2008 12:53:46	46426.0	738.0	5.58	5.599	0.105	-0.98024

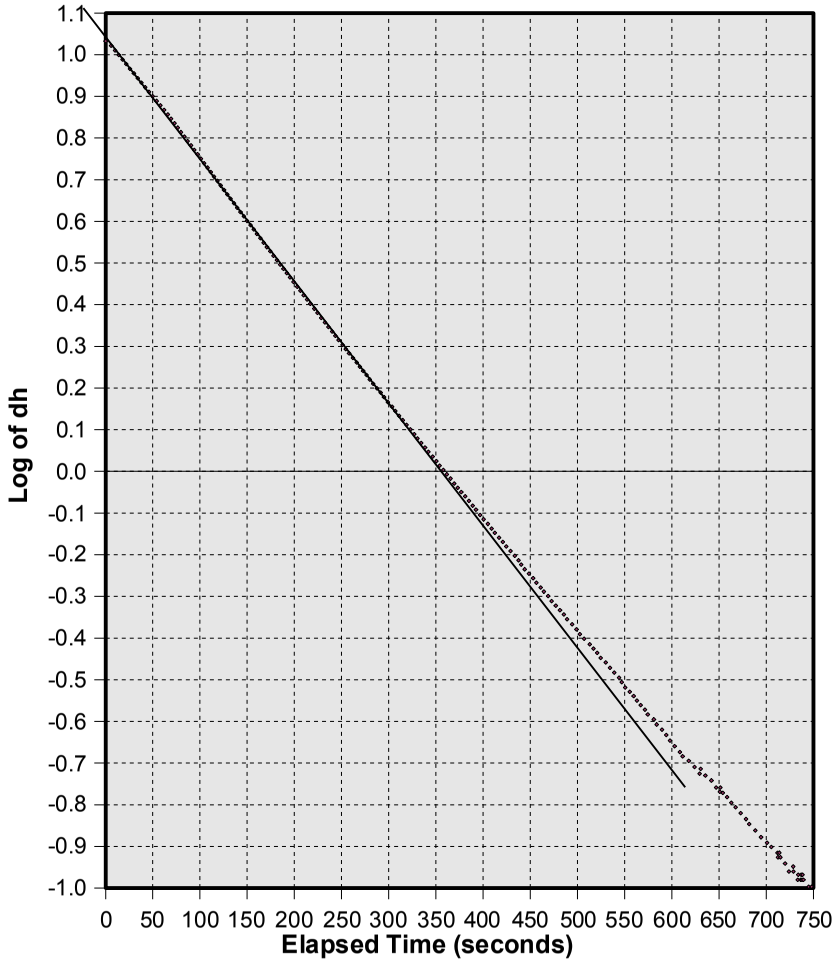
Slug Test P-78D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 12:53:46	46426.5	738.5	5.59	5.602	0.108	-0.96795
5/29/2008 12:53:47	46427.5	739.5	5.58	5.599	0.105	-0.98021
5/29/2008 12:53:53	46433.0	745.0	5.58	5.595	0.101	-0.99702
5/29/2008 12:53:56	46436.0	748.0	5.58	5.595	0.101	-0.99697

Slug Test P-78D

Slug Test by Bouwer and Rice

Displacement Method:	Injection	
Well depth:	75.81	ft
Stick up height:	2.93	ft
Depth to sand pack (BGS):	69.53	ft
Depth to screened interval (BGS):	70.81	ft
Well diameter:	2.00	in
Diameter of annular space:	6.00	in
Initial depth to water table from top of pipe:	39.60	ft
Initial Head Change:	10.78	ft
Total well length:	78.74	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:	5.00	ft
Length of open section (L_e):	5.00	ft
L_e / r_w:	20.0000	
A (dimensionless):	2.237	
B (dimensionless):	0.367	
Drawdown at time = 0 (y_0):	10.78	ft
Drawdown at time = t (y_t):	0.80	ft
Elapsed Time between y_0 and y_t (t):	394.5	sec
Initial water column in well (L_w):	39.14	ft
$\ln(R_e/r_w)$ =	2.28	
K =	1.04E-05	ft/sec
	3.18E-04	**cm/sec**
	328.54	ft/yr



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

Slug Test P-80

Initial offset in logger reading (feet):	0.002	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000002		
Initial depth to water table (feet):	30.98		
Depth of probe below water table (feet):	5.474		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:01:59	39719.5	0.0	0.48	0.483	4.992	0.69824
5/29/2008 11:02:01	39721.5	2.0	0.8	0.799	4.676	0.66983
5/29/2008 11:02:04	39724.5	5.0	1.09	1.086	4.389	0.64232
5/29/2008 11:02:08	39728.5	9.0	1.34	1.334	4.141	0.61706
5/29/2008 11:02:12	39732.0	12.5	1.58	1.577	3.898	0.59079
5/29/2008 11:02:15	39735.5	16.0	1.81	1.813	3.662	0.56366
5/29/2008 11:02:19	39739.0	19.5	2.05	2.046	3.429	0.53511
5/29/2008 11:02:22	39742.0	22.5	2.24	2.240	3.235	0.50981
5/29/2008 11:02:25	39745.0	25.5	2.43	2.424	3.051	0.48437
5/29/2008 11:02:29	39749.0	29.5	2.61	2.605	2.870	0.45781
5/29/2008 11:02:38	39758.5	39.0	2.77	2.770	2.705	0.43209
5/29/2008 11:02:48	39768.5	49.0	2.93	2.928	2.546	0.40594
5/29/2008 11:02:59	39779.5	60.0	3.08	3.078	2.396	0.37957
5/29/2008 11:03:12	39792.5	73.0	3.21	3.213	2.261	0.35439
5/29/2008 11:03:30	39810.0	90.5	3.34	3.342	2.132	0.32887
5/29/2008 11:03:47	39827.5	108.0	3.47	3.464	2.010	0.30328
5/29/2008 11:04:05	39845.0	125.5	3.58	3.580	1.894	0.27746
5/29/2008 11:04:22	39862.0	142.5	3.69	3.688	1.786	0.25196
5/29/2008 11:04:39	39879.5	160.0	3.79	3.791	1.683	0.22616
5/29/2008 11:04:56	39896.5	177.0	3.89	3.886	1.588	0.20092
5/29/2008 11:05:11	39911.5	192.0	3.98	3.975	1.499	0.17587
5/29/2008 11:05:27	39927.0	207.5	4.06	4.060	1.414	0.15051
5/29/2008 11:05:42	39942.5	223.0	4.14	4.140	1.334	0.12522
5/29/2008 11:05:56	39956.5	237.0	4.22	4.216	1.258	0.09974
5/29/2008 11:06:10	39970.5	251.0	4.29	4.289	1.185	0.07377
5/29/2008 11:06:25	39985.0	265.5	4.36	4.359	1.115	0.04732
5/29/2008 11:06:40	40000.0	280.5	4.42	4.423	1.051	0.02164
5/29/2008 11:06:53	40013.5	294.0	4.48	4.482	0.992	-0.00346
5/29/2008 11:07:08	40028.0	308.5	4.54	4.538	0.936	-0.02871
5/29/2008 11:07:21	40041.5	322.0	4.59	4.592	0.882	-0.05452
5/29/2008 11:07:35	40055.5	336.0	4.64	4.642	0.832	-0.07988
5/29/2008 11:07:49	40069.0	349.5	4.69	4.689	0.785	-0.10515
5/29/2008 11:08:03	40083.0	363.5	4.73	4.733	0.741	-0.13021
5/29/2008 11:08:17	40097.0	377.5	4.78	4.776	0.698	-0.15619
5/29/2008 11:08:30	40110.5	391.0	4.82	4.816	0.658	-0.18184
5/29/2008 11:08:44	40124.5	405.0	4.85	4.853	0.621	-0.20700
5/29/2008 11:08:58	40138.0	418.5	4.89	4.889	0.585	-0.23295
5/29/2008 11:09:11	40151.5	432.0	4.92	4.923	0.552	-0.25820
5/29/2008 11:09:26	40166.5	447.0	4.96	4.956	0.519	-0.28500
5/29/2008 11:09:40	40180.5	461.0	4.99	4.986	0.489	-0.31089
5/29/2008 11:09:55	40195.5	476.0	5.02	5.015	0.460	-0.33748
5/29/2008 11:10:10	40210.0	490.5	5.04	5.041	0.434	-0.36278
5/29/2008 11:10:25	40225.5	506.0	5.07	5.066	0.409	-0.38859
5/29/2008 11:10:39	40239.0	519.5	5.09	5.090	0.385	-0.41490

Slug Test P-80

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:10:56	40256.0	536.5	5.11	5.114	0.361	-0.44291
5/29/2008 11:11:10	40270.0	550.5	5.14	5.135	0.340	-0.46900
5/29/2008 11:11:22	40282.5	563.0	5.15	5.154	0.321	-0.49403
5/29/2008 11:11:37	40297.0	577.5	5.17	5.173	0.302	-0.52060
5/29/2008 11:11:52	40312.5	593.0	5.19	5.192	0.283	-0.54890
5/29/2008 11:12:05	40325.5	606.0	5.21	5.208	0.267	-0.57425
5/29/2008 11:12:20	40340.0	620.5	5.23	5.225	0.250	-0.60292
5/29/2008 11:12:33	40353.0	633.5	5.24	5.239	0.235	-0.62804
5/29/2008 11:12:47	40367.5	648.0	5.25	5.253	0.221	-0.65471
5/29/2008 11:13:00	40380.0	660.5	5.27	5.267	0.207	-0.68311
5/29/2008 11:13:12	40392.5	673.0	5.28	5.279	0.195	-0.70904
5/29/2008 11:13:23	40403.0	683.5	5.29	5.291	0.183	-0.73661
5/29/2008 11:13:35	40415.5	696.0	5.3	5.302	0.172	-0.76352
5/29/2008 11:13:46	40426.5	707.0	5.31	5.312	0.162	-0.78953
5/29/2008 11:14:01	40441.0	721.5	5.32	5.324	0.150	-0.82295
5/29/2008 11:14:15	40455.0	735.5	5.33	5.333	0.141	-0.84983
5/29/2008 11:14:24	40464.0	744.5	5.34	5.343	0.131	-0.88176
5/29/2008 11:14:37	40477.0	757.5	5.35	5.352	0.122	-0.91268
5/29/2008 11:14:46	40486.0	766.5	5.36	5.359	0.115	-0.93834
5/29/2008 11:14:56	40496.5	777.0	5.37	5.366	0.108	-0.96562
5/29/2008 11:15:09	40509.0	789.5	5.37	5.373	0.101	-0.99475
5/29/2008 11:15:20	40520.0	800.5	5.38	5.380	0.094	-1.02596
5/29/2008 11:15:30	40530.5	811.0	5.39	5.388	0.086	-1.06459
5/29/2008 11:15:42	40542.5	823.0	5.4	5.395	0.079	-1.10150
5/29/2008 11:15:55	40555.0	835.5	5.4	5.402	0.072	-1.14184
5/29/2008 11:15:58	40558.0	838.5	5.4	5.397	0.077	-1.11276
5/29/2008 11:15:58	40558.5	839.0	5.4	5.402	0.072	-1.14187
5/29/2008 11:16:04	40564.5	845.0	5.41	5.407	0.067	-1.17314
5/29/2008 11:16:15	40575.0	855.5	5.41	5.411	0.063	-1.19994
5/29/2008 11:16:20	40580.5	861.0	5.42	5.416	0.058	-1.23587
5/29/2008 11:16:29	40589.5	870.0	5.42	5.421	0.053	-1.27508
5/29/2008 11:16:37	40597.5	878.0	5.43	5.426	0.048	-1.31817
5/29/2008 11:16:38	40598.0	878.5	5.42	5.423	0.051	-1.29188
5/29/2008 11:16:39	40599.0	879.5	5.43	5.426	0.048	-1.31819
5/29/2008 11:16:39	40599.5	880.0	5.42	5.423	0.051	-1.29190
5/29/2008 11:16:40	40600.0	880.5	5.43	5.426	0.048	-1.31821
5/29/2008 11:16:47	40607.5	888.0	5.43	5.430	0.044	-1.35607
5/29/2008 11:16:49	40609.5	890.0	5.43	5.433	0.041	-1.38674
5/29/2008 11:16:50	40610.5	891.0	5.43	5.430	0.044	-1.35612
5/29/2008 11:16:52	40612.0	892.5	5.44	5.435	0.039	-1.40849
5/29/2008 11:17:05	40625.5	906.0	5.44	5.440	0.034	-1.46830
5/29/2008 11:17:06	40626.0	906.5	5.44	5.437	0.037	-1.43160
5/29/2008 11:17:09	40629.0	909.5	5.44	5.440	0.034	-1.46838
5/29/2008 11:17:12	40632.0	912.5	5.44	5.442	0.032	-1.49477
5/29/2008 11:17:13	40633.5	914.0	5.44	5.440	0.034	-1.46847
5/29/2008 11:17:14	40634.0	914.5	5.44	5.442	0.032	-1.49481
5/29/2008 11:17:18	40638.0	918.5	5.44	5.440	0.034	-1.46857
5/29/2008 11:17:19	40639.5	920.0	5.44	5.442	0.032	-1.49494
5/29/2008 11:17:20	40640.5	921.0	5.44	5.444	0.030	-1.52300

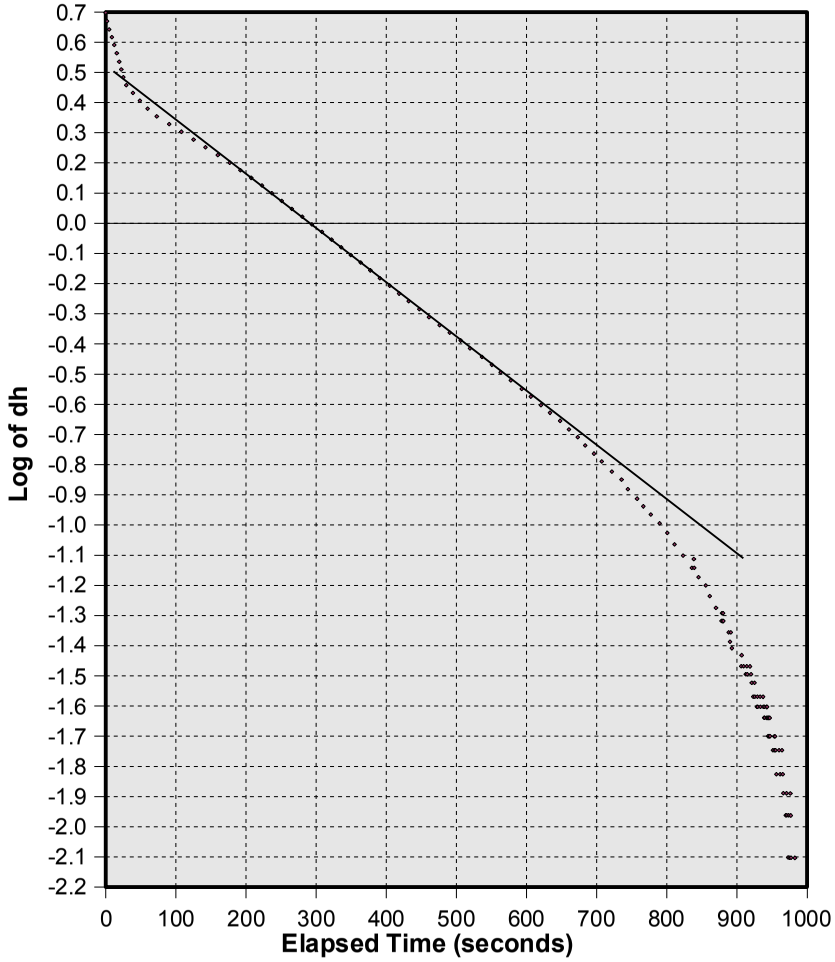
Slug Test P-80

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:17:22	40642.5	923.0	5.45	5.447	0.027	-1.56883
5/29/2008 11:17:24	40644.5	925.0	5.44	5.444	0.030	-1.52310
5/29/2008 11:17:25	40645.0	925.5	5.45	5.447	0.027	-1.56889
5/29/2008 11:17:28	40648.0	928.5	5.45	5.449	0.025	-1.60243
5/29/2008 11:17:28	40648.5	929.0	5.45	5.447	0.027	-1.56899
5/29/2008 11:17:29	40649.0	929.5	5.45	5.449	0.025	-1.60246
5/29/2008 11:17:32	40652.5	933.0	5.45	5.447	0.027	-1.56910
5/29/2008 11:17:33	40653.0	933.5	5.45	5.449	0.025	-1.60258
5/29/2008 11:17:36	40656.5	937.0	5.45	5.447	0.027	-1.56921
5/29/2008 11:17:37	40657.0	937.5	5.45	5.449	0.025	-1.60270
5/29/2008 11:17:38	40658.0	938.5	5.45	5.451	0.023	-1.63900
5/29/2008 11:17:38	40658.5	939.0	5.45	5.449	0.025	-1.60274
5/29/2008 11:17:39	40659.0	939.5	5.45	5.451	0.023	-1.63903
5/29/2008 11:17:41	40661.5	942.0	5.45	5.449	0.025	-1.60283
5/29/2008 11:17:42	40662.0	942.5	5.45	5.451	0.023	-1.63912
5/29/2008 11:17:42	40662.5	943.0	5.45	5.449	0.025	-1.60286
5/29/2008 11:17:43	40663.5	944.0	5.45	5.451	0.023	-1.63917
5/29/2008 11:17:44	40664.0	944.5	5.45	5.454	0.020	-1.70003
5/29/2008 11:17:44	40664.5	945.0	5.45	5.451	0.023	-1.63921
5/29/2008 11:17:45	40665.5	946.0	5.45	5.454	0.020	-1.70008
5/29/2008 11:17:46	40666.0	946.5	5.45	5.451	0.023	-1.63925
5/29/2008 11:17:46	40666.5	947.0	5.45	5.454	0.020	-1.70012
5/29/2008 11:17:50	40670.5	951.0	5.46	5.456	0.018	-1.74617
5/29/2008 11:17:52	40672.5	953.0	5.45	5.454	0.020	-1.70034
5/29/2008 11:17:53	40673.0	953.5	5.46	5.456	0.018	-1.74627
5/29/2008 11:17:53	40673.5	954.0	5.45	5.454	0.020	-1.70038
5/29/2008 11:17:54	40674.5	955.0	5.46	5.456	0.018	-1.74633
5/29/2008 11:17:55	40675.5	956.0	5.46	5.459	0.015	-1.82589
5/29/2008 11:17:59	40679.5	960.0	5.46	5.456	0.018	-1.74654
5/29/2008 11:18:01	40681.0	961.5	5.46	5.459	0.015	-1.82616
5/29/2008 11:18:03	40683.5	964.0	5.46	5.456	0.018	-1.74671
5/29/2008 11:18:04	40684.5	965.0	5.46	5.459	0.015	-1.82634
5/29/2008 11:18:05	40685.5	966.0	5.46	5.461	0.013	-1.88892
5/29/2008 11:18:09	40689.0	969.5	5.46	5.463	0.011	-1.96223
5/29/2008 11:18:10	40690.0	970.5	5.46	5.461	0.013	-1.88917
5/29/2008 11:18:10	40690.5	971.0	5.46	5.463	0.011	-1.96233
5/29/2008 11:18:12	40692.5	973.0	5.47	5.466	0.008	-2.10222
5/29/2008 11:18:13	40693.0	973.5	5.46	5.463	0.011	-1.96250
5/29/2008 11:18:14	40694.5	975.0	5.47	5.466	0.008	-2.10241
5/29/2008 11:18:15	40695.5	976.0	5.46	5.461	0.013	-1.88949
5/29/2008 11:18:16	40696.0	976.5	5.46	5.463	0.011	-1.96270
5/29/2008 11:18:16	40696.5	977.0	5.47	5.466	0.008	-2.10260
5/29/2008 11:18:22	40702.0	982.5	5.47	5.466	0.008	-2.10312

Slug Test P-80

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	35.00	ft
Stick up height:	3.01	ft
Depth to sand pack (BGS):	18.55	ft
Depth to screened interval (BGS):	20.00	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	30.98	ft
Initial Head Change:	4.99	ft
Total well length:	38.01	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	7.03	ft
L_e / r_w:	21.7703	
A (dimensionless):	2.293	
B (dimensionless):	0.378	
Drawdown at time = 0 (y_0):	2.00	ft
Drawdown at time = t (y_t):	0.20	ft
Elapsed Time between y_0 and y_t (t):	561	sec
Initial water column in well (L_w):	7.03	ft
$\ln(R_e/r_w)$ =	1.77	
K =	1.87E-05	ft/sec
	5.69E-04	**cm/sec**
	589.16	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-81

Initial offset in logger reading (feet):	-0.013	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	0.000003		
Initial depth to water table (feet):	17.92		
Depth of probe below water table (feet):	7.245		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 15:29:57	55797.5	0.0	2.27	2.284	4.961	0.69556
5/29/2008 15:30:01	55801.0	3.5	2.38	2.392	4.853	0.68600
5/29/2008 15:30:07	55807.5	10.0	2.49	2.498	4.747	0.67641
5/29/2008 15:30:14	55814.5	17.0	2.59	2.597	4.648	0.66726
5/29/2008 15:30:22	55822.0	24.5	2.69	2.701	4.544	0.65743
5/29/2008 15:30:28	55828.5	31.0	2.79	2.800	4.445	0.64787
5/29/2008 15:30:34	55834.0	36.5	2.89	2.899	4.346	0.63809
5/29/2008 15:30:38	55838.0	40.5	2.98	2.995	4.250	0.62839
5/29/2008 15:30:41	55841.5	44.0	3.08	3.092	4.153	0.61836
5/29/2008 15:30:45	55845.0	47.5	3.18	3.191	4.054	0.60788
5/29/2008 15:30:48	55848.5	51.0	3.27	3.278	3.967	0.59846
5/29/2008 15:30:52	55852.0	54.5	3.35	3.361	3.884	0.58928
5/29/2008 15:30:56	55856.5	59.0	3.43	3.443	3.802	0.58002
5/29/2008 15:31:01	55861.0	63.5	3.51	3.521	3.724	0.57102
5/29/2008 15:31:05	55865.5	68.0	3.59	3.601	3.644	0.56159
5/29/2008 15:31:10	55870.5	73.0	3.67	3.679	3.566	0.55219
5/29/2008 15:31:15	55875.5	78.0	3.74	3.754	3.491	0.54296
5/29/2008 15:31:21	55881.0	83.5	3.82	3.827	3.418	0.53379
5/29/2008 15:31:27	55887.0	89.5	3.89	3.902	3.343	0.52416
5/29/2008 15:31:34	55894.0	96.5	3.96	3.973	3.272	0.51484
5/29/2008 15:31:41	55901.0	103.5	4.03	4.041	3.204	0.50572
5/29/2008 15:31:49	55909.0	111.5	4.1	4.107	3.138	0.49668
5/29/2008 15:31:58	55918.0	120.5	4.16	4.175	3.070	0.48718
5/29/2008 15:32:07	55927.5	130.0	4.23	4.239	3.006	0.47803
5/29/2008 15:32:16	55936.5	139.0	4.29	4.302	2.943	0.46884
5/29/2008 15:32:24	55944.5	147.0	4.35	4.362	2.882	0.45975
5/29/2008 15:32:32	55952.5	155.0	4.41	4.423	2.821	0.45046
5/29/2008 15:32:41	55961.0	163.5	4.47	4.482	2.762	0.44129
5/29/2008 15:32:49	55969.0	171.5	4.53	4.539	2.705	0.43224
5/29/2008 15:32:58	55978.0	180.5	4.59	4.595	2.649	0.42316
5/29/2008 15:33:06	55986.0	188.5	4.64	4.654	2.590	0.41338
5/29/2008 15:33:15	55995.0	197.5	4.7	4.710	2.535	0.40390
5/29/2008 15:33:23	56003.0	205.5	4.75	4.764	2.481	0.39455
5/29/2008 15:33:31	56011.5	214.0	4.81	4.818	2.427	0.38500
5/29/2008 15:33:38	56018.0	220.5	4.86	4.868	2.377	0.37596
5/29/2008 15:33:44	56024.0	226.5	4.91	4.917	2.328	0.36691
5/29/2008 15:33:50	56030.5	233.0	4.96	4.967	2.278	0.35749
5/29/2008 15:33:56	56036.0	238.5	5	5.014	2.231	0.34844
5/29/2008 15:34:03	56043.5	246.0	5.05	5.063	2.182	0.33879
5/29/2008 15:34:10	56050.5	253.0	5.1	5.108	2.137	0.32975
5/29/2008 15:34:18	56058.0	260.5	5.15	5.155	2.090	0.32009
5/29/2008 15:34:30	56070.5	273.0	5.19	5.199	2.046	0.31086
5/29/2008 15:34:38	56078.0	280.5	5.23	5.244	2.001	0.30121
5/29/2008 15:34:44	56084.5	287.0	5.28	5.286	1.959	0.29200

Slug Test P-81

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 15:34:52	56092.5	295.0	5.32	5.329	1.916	0.28237
5/29/2008 15:34:59	56099.5	302.0	5.36	5.369	1.876	0.27321
5/29/2008 15:35:06	56106.0	308.5	5.4	5.409	1.836	0.26385
5/29/2008 15:35:14	56114.5	317.0	5.44	5.449	1.796	0.25429
5/29/2008 15:35:22	56122.5	325.0	5.48	5.489	1.756	0.24452
5/29/2008 15:35:30	56130.0	332.5	5.52	5.526	1.719	0.23528
5/29/2008 15:35:38	56138.5	341.0	5.55	5.562	1.683	0.22609
5/29/2008 15:35:48	56148.0	350.5	5.59	5.597	1.648	0.21697
5/29/2008 15:35:55	56155.5	358.0	5.62	5.632	1.613	0.20766
5/29/2008 15:36:04	56164.5	367.0	5.66	5.670	1.575	0.19731
5/29/2008 15:36:14	56174.5	377.0	5.69	5.703	1.542	0.18813
5/29/2008 15:36:23	56183.5	386.0	5.73	5.736	1.509	0.17874
5/29/2008 15:36:32	56192.5	395.0	5.76	5.769	1.476	0.16915
5/29/2008 15:36:42	56202.5	405.0	5.79	5.802	1.443	0.15934
5/29/2008 15:36:51	56211.0	413.5	5.82	5.832	1.413	0.15023
5/29/2008 15:36:58	56218.5	421.0	5.85	5.863	1.382	0.14060
5/29/2008 15:37:06	56226.0	428.5	5.88	5.893	1.352	0.13108
5/29/2008 15:37:14	56234.0	436.5	5.91	5.921	1.323	0.12168
5/29/2008 15:37:24	56244.0	446.5	5.94	5.949	1.295	0.11240
5/29/2008 15:37:33	56253.0	455.5	5.97	5.977	1.267	0.10292
5/29/2008 15:37:44	56264.0	466.5	6	6.005	1.239	0.09323
5/29/2008 15:37:51	56271.0	473.5	6.02	6.031	1.213	0.08403
5/29/2008 15:38:01	56281.0	483.5	6.05	6.059	1.186	0.07391
5/29/2008 15:38:09	56289.0	491.5	6.08	6.085	1.160	0.06429
5/29/2008 15:38:18	56298.0	500.5	6.1	6.109	1.136	0.05522
5/29/2008 15:38:29	56309.5	512.0	6.13	6.135	1.110	0.04517
5/29/2008 15:38:38	56318.0	520.5	6.15	6.158	1.087	0.03609
5/29/2008 15:38:45	56325.5	528.0	6.17	6.182	1.063	0.02640
5/29/2008 15:38:55	56335.5	538.0	6.2	6.205	1.040	0.01691
5/29/2008 15:39:05	56345.5	548.0	6.22	6.229	1.016	0.00678
5/29/2008 15:39:15	56355.5	558.0	6.24	6.250	0.995	-0.00227
5/29/2008 15:39:24	56364.5	567.0	6.26	6.271	0.974	-0.01153
5/29/2008 15:39:29	56369.0	571.5	6.28	6.292	0.953	-0.02099
5/29/2008 15:39:35	56375.5	578.0	6.3	6.313	0.932	-0.03066
5/29/2008 15:39:47	56387.0	589.5	6.33	6.334	0.911	-0.04054
5/29/2008 15:39:58	56398.5	601.0	6.34	6.353	0.892	-0.04967
5/29/2008 15:40:10	56410.5	613.0	6.36	6.372	0.873	-0.05900
5/29/2008 15:40:24	56424.5	627.0	6.38	6.391	0.854	-0.06853
5/29/2008 15:40:34	56434.0	636.5	6.4	6.410	0.835	-0.07829
5/29/2008 15:40:47	56447.0	649.5	6.42	6.428	0.817	-0.08773
5/29/2008 15:40:57	56457.0	659.5	6.44	6.445	0.800	-0.09684
5/29/2008 15:41:03	56463.0	665.5	6.46	6.464	0.781	-0.10727
5/29/2008 15:41:05	56465.0	667.5	6.48	6.485	0.760	-0.11910
5/29/2008 15:41:09	56469.0	671.5	6.5	6.504	0.741	-0.13008
5/29/2008 15:41:23	56483.0	685.5	6.51	6.520	0.725	-0.13953
5/29/2008 15:41:38	56498.0	700.5	6.53	6.537	0.708	-0.14980
5/29/2008 15:41:54	56514.0	716.5	6.54	6.553	0.692	-0.15969
5/29/2008 15:42:10	56530.0	732.5	6.56	6.568	0.676	-0.16981
5/29/2008 15:42:22	56542.5	745.0	6.57	6.582	0.662	-0.17886

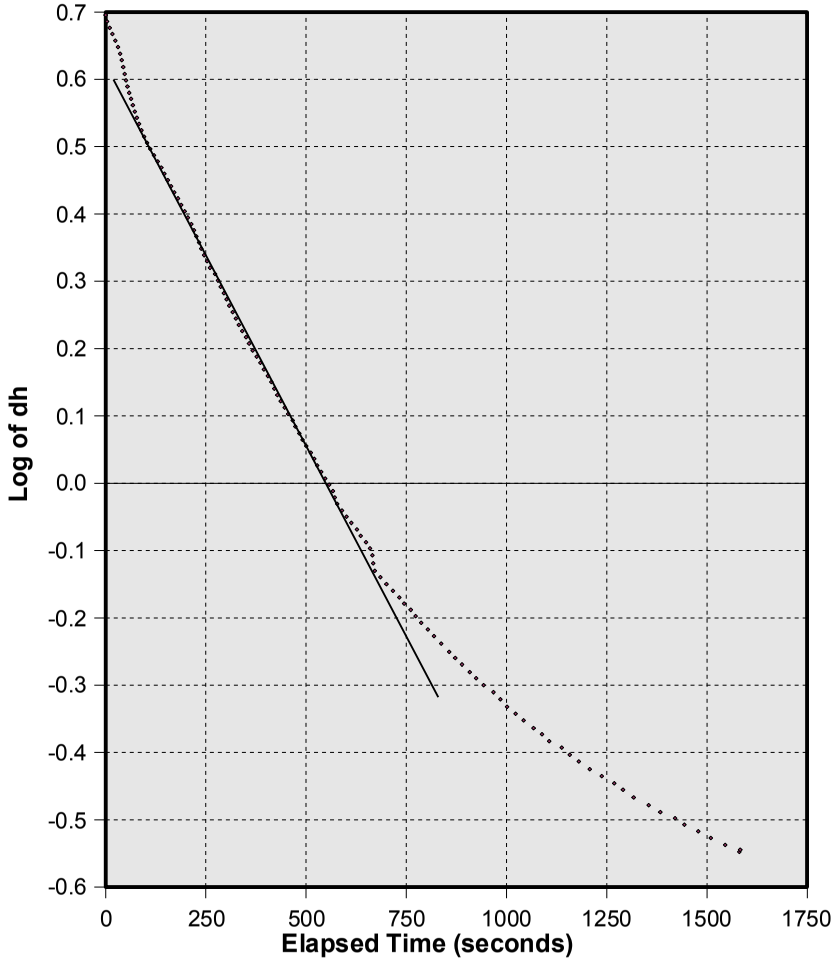
Slug Test P-81

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 15:42:38	56558.5	761.0	6.59	6.596	0.648	-0.18810
5/29/2008 15:42:51	56571.0	773.5	6.6	6.610	0.635	-0.19755
5/29/2008 15:43:04	56584.5	787.0	6.62	6.624	0.621	-0.20721
5/29/2008 15:43:21	56601.5	804.0	6.63	6.638	0.607	-0.21708
5/29/2008 15:43:36	56616.5	819.0	6.64	6.652	0.593	-0.22718
5/29/2008 15:43:54	56634.5	837.0	6.66	6.667	0.578	-0.23826
5/29/2008 15:44:14	56654.5	857.0	6.68	6.683	0.562	-0.25041
5/29/2008 15:44:29	56669.5	872.0	6.69	6.695	0.550	-0.25974
5/29/2008 15:44:46	56686.5	889.0	6.7	6.707	0.538	-0.26928
5/29/2008 15:45:06	56706.0	908.5	6.71	6.721	0.524	-0.28068
5/29/2008 15:45:22	56722.0	924.5	6.72	6.732	0.513	-0.28984
5/29/2008 15:45:40	56740.5	943.0	6.74	6.744	0.501	-0.30007
5/29/2008 15:46:05	56765.0	967.5	6.75	6.756	0.489	-0.31052
5/29/2008 15:46:22	56782.5	985.0	6.76	6.768	0.477	-0.32125
5/29/2008 15:46:39	56799.0	1001.5	6.77	6.780	0.465	-0.33225
5/29/2008 15:47:00	56820.0	1022.5	6.78	6.790	0.454	-0.34257
5/29/2008 15:47:20	56840.0	1042.5	6.79	6.800	0.444	-0.35217
5/29/2008 15:47:45	56865.0	1067.5	6.81	6.812	0.433	-0.36397
5/29/2008 15:48:06	56886.0	1088.5	6.81	6.821	0.424	-0.37303
5/29/2008 15:48:24	56904.0	1106.5	6.82	6.831	0.414	-0.38334
5/29/2008 15:48:55	56935.0	1137.5	6.83	6.840	0.405	-0.39277
5/29/2008 15:49:15	56955.0	1157.5	6.84	6.850	0.395	-0.40356
5/29/2008 15:49:38	56978.0	1180.5	6.85	6.859	0.386	-0.41349
5/29/2008 15:50:05	57005.0	1207.5	6.86	6.869	0.376	-0.42478
5/29/2008 15:50:35	57035.0	1237.5	6.87	6.878	0.367	-0.43518
5/29/2008 15:51:06	57066.0	1268.5	6.88	6.887	0.358	-0.44583
5/29/2008 15:51:28	57088.0	1290.5	6.89	6.895	0.350	-0.45554
5/29/2008 15:51:54	57114.5	1317.0	6.9	6.903	0.341	-0.46673
5/29/2008 15:52:32	57152.0	1354.5	6.91	6.912	0.333	-0.47816
5/29/2008 15:53:01	57181.0	1383.5	6.91	6.920	0.325	-0.48860
5/29/2008 15:53:38	57218.0	1420.5	6.92	6.927	0.318	-0.49789
5/29/2008 15:54:01	57241.0	1443.5	6.93	6.934	0.311	-0.50746
5/29/2008 15:54:35	57275.5	1478.0	6.94	6.941	0.304	-0.51718
5/29/2008 15:55:07	57307.0	1509.5	6.94	6.948	0.297	-0.52714
5/29/2008 15:55:43	57343.0	1545.5	6.95	6.955	0.290	-0.53730
5/29/2008 15:56:18	57378.5	1581.0	6.96	6.962	0.283	-0.54772
5/29/2008 15:56:20	57380.5	1583.0	6.95	6.960	0.285	-0.54465

Slug Test P-81

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	23.90	ft
Stick up height:	2.93	ft
Depth to sand pack (BGS):	7.50	ft
Depth to screened interval (BGS):	8.90	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	17.92	ft
Initial Head Change:	4.96	
Total well length:	26.83	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	8.91	ft
L_e / r_w:	27.5923	
A (dimensionless):	2.481	
B (dimensionless):	0.412	
Drawdown at time = 0 (y_0):	3.59	ft
Drawdown at time = t (y_t):	0.92	ft
Elapsed Time between y_0 and y_t (t):	512	sec
Initial water column in well (L_w):	8.91	ft
$\ln(R_e/r_w)$ =	1.96	
K =	1.05E-05	ft/sec
	3.21E-04	**cm/sec**
	332.26	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-82

Initial offset in logger reading (feet):	-0.011	Date:	05/30/2008
Offset increment in logger reading (feet/sec):	0.000003		
Initial depth to water table (feet):	37.2		
Depth of probe below water table (feet):	4.972		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 10:22:11	37331.0	0.0	0.36	0.371	4.601	0.66285
5/30/2008 10:22:13	37333.0	2.0	0.42	0.430	4.542	0.65724
5/30/2008 10:22:14	37334.0	3.0	0.49	0.496	4.476	0.65089
5/30/2008 10:22:18	37338.0	7.0	0.54	0.548	4.424	0.64581
5/30/2008 10:22:29	37349.0	18.0	0.59	0.600	4.372	0.64068
5/30/2008 10:22:37	37357.5	26.5	0.64	0.652	4.320	0.63548
5/30/2008 10:22:47	37367.0	36.0	0.7	0.704	4.268	0.63023
5/30/2008 10:23:00	37380.0	49.0	0.74	0.753	4.219	0.62522
5/30/2008 10:23:12	37392.5	61.5	0.79	0.802	4.170	0.62015
5/30/2008 10:23:25	37405.5	74.5	0.84	0.851	4.121	0.61502
5/30/2008 10:23:40	37420.5	89.5	0.89	0.900	4.072	0.60983
5/30/2008 10:23:55	37435.5	104.5	0.94	0.946	4.025	0.60479
5/30/2008 10:24:13	37453.0	122.0	0.99	0.993	3.978	0.59969
5/30/2008 10:24:30	37470.5	139.5	1.03	1.039	3.932	0.59465
5/30/2008 10:24:48	37488.5	157.5	1.08	1.088	3.883	0.58921
5/30/2008 10:25:07	37507.0	176.0	1.13	1.133	3.838	0.58415
5/30/2008 10:25:20	37520.0	189.0	1.17	1.182	3.789	0.57857
5/30/2008 10:25:22	37522.5	191.5	1.22	1.229	3.742	0.57315
5/30/2008 10:25:25	37525.5	194.5	1.26	1.272	3.699	0.56814
5/30/2008 10:25:52	37552.0	221.0	1.31	1.315	3.657	0.56307
5/30/2008 10:26:12	37572.5	241.5	1.35	1.357	3.615	0.55806
5/30/2008 10:26:32	37592.5	261.5	1.39	1.399	3.573	0.55299
5/30/2008 10:26:50	37610.0	279.0	1.43	1.442	3.530	0.54773
5/30/2008 10:27:07	37627.5	296.5	1.48	1.484	3.488	0.54254
5/30/2008 10:27:25	37645.0	314.0	1.52	1.525	3.447	0.53741
5/30/2008 10:27:47	37667.5	336.5	1.56	1.565	3.407	0.53235
5/30/2008 10:28:10	37690.5	359.5	1.6	1.606	3.366	0.52710
5/30/2008 10:28:32	37712.5	381.5	1.64	1.646	3.326	0.52191
5/30/2008 10:28:57	37737.0	406.0	1.68	1.686	3.286	0.51667
5/30/2008 10:29:18	37758.5	427.5	1.72	1.724	3.248	0.51162
5/30/2008 10:29:43	37783.0	452.0	1.75	1.762	3.210	0.50652
5/30/2008 10:30:04	37804.5	473.5	1.79	1.800	3.172	0.50136
5/30/2008 10:30:30	37830.0	499.0	1.83	1.837	3.134	0.49613
5/30/2008 10:30:57	37857.0	526.0	1.87	1.874	3.097	0.49098
5/30/2008 10:31:24	37884.5	553.5	1.9	1.910	3.061	0.48592
5/30/2008 10:31:46	37906.5	575.5	1.94	1.947	3.024	0.48064
5/30/2008 10:32:13	37933.0	602.0	1.98	1.983	2.989	0.47545
5/30/2008 10:32:39	37959.0	628.0	2.01	2.018	2.954	0.47035
5/30/2008 10:33:02	37982.5	651.5	2.05	2.053	2.919	0.46518
5/30/2008 10:33:28	38008.0	677.0	2.08	2.088	2.884	0.45995
5/30/2008 10:33:52	38032.0	701.0	2.12	2.124	2.848	0.45450
5/30/2008 10:34:17	38057.0	726.0	2.15	2.159	2.813	0.44914
5/30/2008 10:34:41	38081.5	750.5	2.19	2.192	2.780	0.44403
5/30/2008 10:35:06	38106.5	775.5	2.22	2.225	2.747	0.43885

Slug Test P-82

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 10:35:30	38130.0	799.0	2.25	2.258	2.714	0.43361
5/30/2008 10:35:55	38155.0	824.0	2.28	2.291	2.681	0.42831
5/30/2008 10:36:23	38183.0	852.0	2.32	2.322	2.650	0.42327
5/30/2008 10:36:48	38208.0	877.0	2.35	2.352	2.619	0.41817
5/30/2008 10:37:11	38231.5	900.5	2.38	2.383	2.588	0.41301
5/30/2008 10:37:37	38257.0	926.0	2.41	2.413	2.558	0.40796
5/30/2008 10:38:00	38280.0	949.0	2.44	2.444	2.527	0.40268
5/30/2008 10:38:25	38305.5	974.5	2.47	2.473	2.498	0.39768
5/30/2008 10:38:50	38330.5	999.5	2.5	2.503	2.469	0.39244
5/30/2008 10:39:17	38357.5	1026.5	2.53	2.534	2.438	0.38696
5/30/2008 10:39:39	38379.5	1048.5	2.56	2.562	2.410	0.38196
5/30/2008 10:40:02	38402.5	1071.5	2.59	2.591	2.381	0.37671
5/30/2008 10:40:19	38419.5	1088.5	2.61	2.619	2.353	0.37158
5/30/2008 10:40:40	38440.0	1109.0	2.64	2.648	2.324	0.36620
5/30/2008 10:41:06	38466.0	1135.0	2.67	2.676	2.296	0.36095
5/30/2008 10:41:31	38491.0	1160.0	2.7	2.704	2.268	0.35564
5/30/2008 10:42:01	38521.5	1190.5	2.73	2.731	2.241	0.35045
5/30/2008 10:42:22	38542.5	1211.5	2.75	2.757	2.215	0.34539
5/30/2008 10:42:46	38566.0	1235.0	2.78	2.783	2.189	0.34028
5/30/2008 10:43:10	38590.5	1259.5	2.8	2.808	2.163	0.33510
5/30/2008 10:43:35	38615.0	1284.0	2.83	2.834	2.137	0.32986
5/30/2008 10:44:00	38640.5	1309.5	2.86	2.860	2.111	0.32456
5/30/2008 10:44:28	38668.5	1337.5	2.88	2.886	2.085	0.31919
5/30/2008 10:44:52	38692.5	1361.5	2.91	2.912	2.059	0.31376
5/30/2008 10:45:16	38716.5	1385.5	2.93	2.936	2.036	0.30868
5/30/2008 10:45:42	38742.5	1411.5	2.96	2.962	2.010	0.30311
5/30/2008 10:46:10	38770.5	1439.5	2.98	2.988	1.984	0.29747
5/30/2008 10:46:31	38791.5	1460.5	3.01	3.011	1.961	0.29242
5/30/2008 10:46:54	38814.5	1483.5	3.03	3.035	1.937	0.28709
5/30/2008 10:47:21	38841.5	1510.5	3.05	3.058	1.914	0.28191
5/30/2008 10:47:45	38865.5	1534.5	3.08	3.080	1.892	0.27691
5/30/2008 10:48:13	38893.5	1562.5	3.1	3.103	1.869	0.27161
5/30/2008 10:48:36	38916.0	1585.0	3.12	3.125	1.847	0.26648
5/30/2008 10:49:02	38942.0	1611.0	3.14	3.148	1.824	0.26106
5/30/2008 10:49:28	38968.0	1637.0	3.17	3.169	1.802	0.25580
5/30/2008 10:49:50	38990.0	1659.0	3.19	3.190	1.781	0.25073
5/30/2008 10:50:07	39007.0	1676.0	3.21	3.211	1.760	0.24559
5/30/2008 10:50:40	39040.5	1709.5	3.23	3.232	1.739	0.24040
5/30/2008 10:51:04	39064.0	1733.0	3.25	3.254	1.717	0.23488
5/30/2008 10:51:30	39090.5	1759.5	3.27	3.275	1.697	0.22956
5/30/2008 10:51:55	39115.5	1784.5	3.29	3.296	1.676	0.22417
5/30/2008 10:52:21	39141.5	1810.5	3.31	3.318	1.654	0.21845
5/30/2008 10:52:45	39165.5	1834.5	3.33	3.337	1.635	0.21344
5/30/2008 10:53:13	39193.0	1862.0	3.35	3.356	1.616	0.20838
5/30/2008 10:53:39	39219.0	1888.0	3.37	3.377	1.595	0.20272
5/30/2008 10:54:02	39242.5	1911.5	3.39	3.396	1.576	0.19753
5/30/2008 10:54:34	39274.5	1943.5	3.41	3.417	1.555	0.19173
5/30/2008 10:55:10	39310.0	1979.0	3.43	3.436	1.536	0.18642
5/30/2008 10:55:33	39333.5	2002.5	3.45	3.455	1.517	0.18103

Slug Test P-82

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 10:56:01	39361.5	2030.5	3.47	3.473	1.498	0.17558
5/30/2008 10:56:29	39389.0	2058.0	3.49	3.492	1.479	0.17006
5/30/2008 10:56:53	39413.0	2082.0	3.51	3.510	1.461	0.16476
5/30/2008 10:57:12	39432.0	2101.0	3.52	3.527	1.444	0.15969
5/30/2008 10:57:31	39451.5	2120.5	3.54	3.544	1.427	0.15456
5/30/2008 10:57:56	39476.0	2145.0	3.56	3.563	1.409	0.14877
5/30/2008 10:58:21	39501.5	2170.5	3.58	3.581	1.391	0.14320
5/30/2008 10:58:48	39528.0	2197.0	3.6	3.598	1.374	0.13788
5/30/2008 10:59:14	39554.5	2223.5	3.61	3.614	1.358	0.13281
5/30/2008 10:59:45	39585.5	2254.5	3.63	3.631	1.341	0.12737
5/30/2008 11:00:08	39608.0	2277.0	3.65	3.648	1.324	0.12185
5/30/2008 11:00:35	39635.0	2304.0	3.66	3.664	1.308	0.11659
5/30/2008 11:01:01	39661.0	2330.0	3.68	3.681	1.291	0.11093
5/30/2008 11:01:33	39693.5	2362.5	3.69	3.697	1.275	0.10554
5/30/2008 11:01:57	39717.5	2386.5	3.71	3.714	1.258	0.09973
5/30/2008 11:02:23	39743.0	2412.0	3.73	3.729	1.242	0.09420
5/30/2008 11:02:45	39765.0	2434.0	3.74	3.746	1.225	0.08824
5/30/2008 11:03:07	39787.5	2456.5	3.76	3.762	1.209	0.08255
5/30/2008 11:03:24	39804.0	2473.0	3.78	3.777	1.194	0.07714
5/30/2008 11:03:50	39830.5	2499.5	3.79	3.791	1.180	0.07205
5/30/2008 11:04:17	39857.5	2526.5	3.8	3.805	1.167	0.06689
5/30/2008 11:04:49	39889.0	2558.0	3.82	3.819	1.153	0.06168
5/30/2008 11:05:20	39920.0	2589.0	3.83	3.833	1.139	0.05640
5/30/2008 11:05:48	39948.0	2617.0	3.85	3.847	1.125	0.05106
5/30/2008 11:06:21	39981.5	2650.5	3.86	3.861	1.111	0.04565
5/30/2008 11:06:48	40008.0	2677.0	3.87	3.876	1.096	0.03978
5/30/2008 11:07:18	40038.5	2707.5	3.89	3.890	1.082	0.03422
5/30/2008 11:07:53	40073.0	2742.0	3.9	3.904	1.068	0.02860
5/30/2008 11:08:21	40101.5	2770.5	3.92	3.918	1.054	0.02290
5/30/2008 11:08:49	40129.0	2798.0	3.93	3.931	1.040	0.01713
5/30/2008 11:09:14	40154.5	2823.5	3.94	3.943	1.028	0.01212
5/30/2008 11:09:36	40176.0	2845.0	3.95	3.955	1.016	0.00704
5/30/2008 11:10:01	40201.5	2870.5	3.97	3.967	1.004	0.00191
5/30/2008 11:10:25	40225.0	2894.0	3.98	3.979	0.992	-0.00328
5/30/2008 11:11:01	40261.5	2930.5	3.99	3.993	0.979	-0.00941
5/30/2008 11:11:29	40289.0	2958.0	4.01	4.007	0.965	-0.01563
5/30/2008 11:12:01	40321.5	2990.5	4.02	4.019	0.953	-0.02103
5/30/2008 11:12:32	40352.5	3021.5	4.03	4.030	0.942	-0.02604
5/30/2008 11:12:55	40375.5	3044.5	4.04	4.042	0.930	-0.03158
5/30/2008 11:13:25	40405.0	3074.0	4.05	4.054	0.918	-0.03718
5/30/2008 11:13:51	40431.5	3100.5	4.07	4.066	0.906	-0.04286
5/30/2008 11:14:16	40456.5	3125.5	4.08	4.078	0.894	-0.04862
5/30/2008 11:14:58	40498.5	3167.5	4.09	4.088	0.883	-0.05395
5/30/2008 11:15:26	40526.5	3195.5	4.1	4.100	0.871	-0.05985
5/30/2008 11:15:58	40558.5	3227.5	4.11	4.112	0.859	-0.06583
5/30/2008 11:16:20	40580.0	3249.0	4.12	4.122	0.849	-0.07089
5/30/2008 11:16:51	40611.5	3280.5	4.13	4.133	0.838	-0.07651
5/30/2008 11:17:14	40634.5	3303.5	4.14	4.143	0.829	-0.08168
5/30/2008 11:17:58	40678.0	3347.0	4.16	4.155	0.817	-0.08796

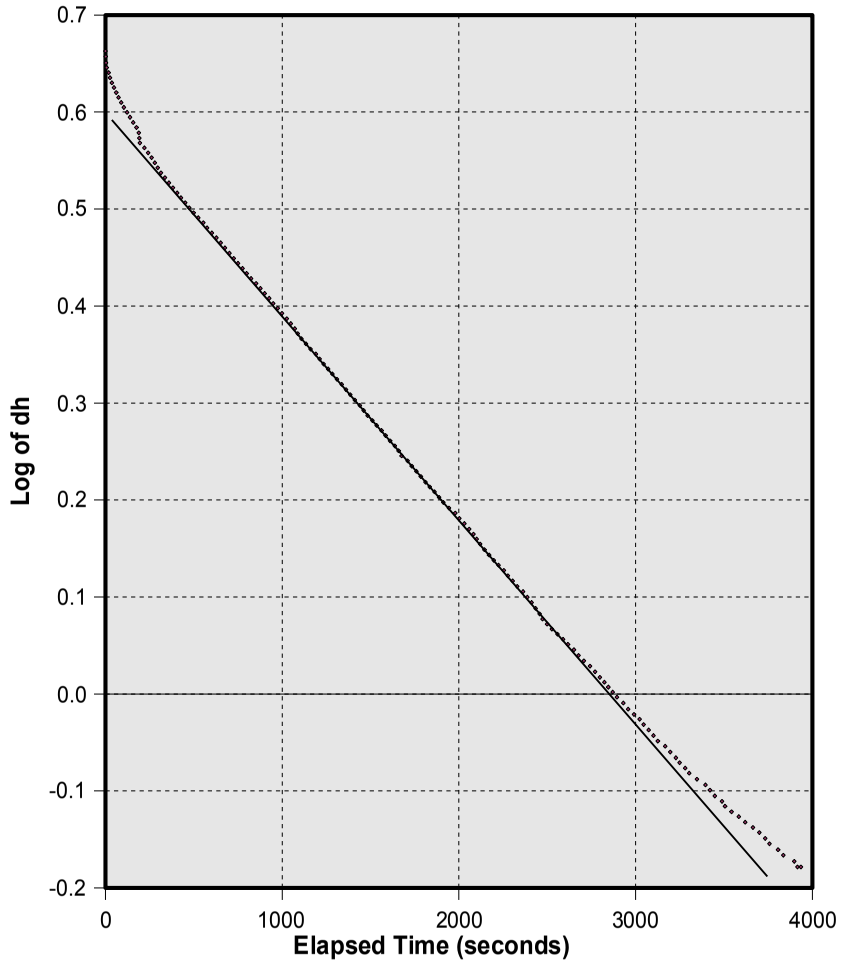
Slug Test P-82

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 11:18:46	40726.0	3395.0	4.17	4.166	0.806	-0.09378
5/30/2008 11:19:11	40751.0	3420.0	4.18	4.176	0.796	-0.09917
5/30/2008 11:19:38	40778.5	3447.5	4.19	4.187	0.785	-0.10518
5/30/2008 11:20:19	40819.5	3488.5	4.2	4.197	0.775	-0.11068
5/30/2008 11:20:37	40837.0	3506.0	4.21	4.206	0.766	-0.11573
5/30/2008 11:21:13	40873.0	3542.0	4.22	4.216	0.756	-0.12138
5/30/2008 11:21:54	40914.5	3583.5	4.23	4.224	0.747	-0.12652
5/30/2008 11:22:31	40951.0	3620.0	4.24	4.234	0.737	-0.13232
5/30/2008 11:23:14	40994.5	3663.5	4.24	4.243	0.728	-0.13758
5/30/2008 11:23:51	41031.0	3700.0	4.25	4.252	0.720	-0.14292
5/30/2008 11:24:23	41063.5	3732.5	4.26	4.262	0.710	-0.14895
5/30/2008 11:24:48	41088.5	3757.5	4.27	4.271	0.701	-0.15445
5/30/2008 11:25:37	41137.0	3806.0	4.28	4.281	0.691	-0.16061
5/30/2008 11:26:07	41167.0	3836.0	4.29	4.290	0.682	-0.16626
5/30/2008 11:27:08	41228.5	3897.5	4.3	4.300	0.672	-0.17257
5/30/2008 11:27:26	41246.0	3915.0	4.31	4.309	0.663	-0.17840
5/30/2008 11:27:45	41265.5	3934.5	4.31	4.308	0.663	-0.17836

Slug Test P-82

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	40.20	ft
Stick up height:	3.02	ft
Depth to sand pack (BGS):	23.80	ft
Depth to screened interval (BGS):	25.20	ft
Well diameter:	2.00	in
Diameter of annular space:	8.25	in
Initial depth to water table from top of pipe:	37.20	ft
Initial Head Change:	4.60	ft
Total well length:	43.22	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.2008	ft
r_c:	0.2008	ft
Radius of gravel pack (r_w):	0.3438	ft
Screened interval:	15.00	ft
Length of open section (L_e):	6.02	ft
L_e / r_w:	17.5127	
A (dimensionless):	2.158	
B (dimensionless):	0.351	
Drawdown at time = 0 (y_0):	3.59	ft
Drawdown at time = t (y_t):	1.08	ft
Elapsed Time between y_0 and y_t (t):	2469	sec
Initial water column in well (L_w):	6.02	ft
$\ln(R_e/r_w)$ =	1.59	
K =	2.60E-06	ft/sec
	7.94E-05	**cm/sec**
	82.11	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-83

Initial offset in logger reading (feet):	-0.020	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000018		
Initial depth to water table (feet):	42.73		
Depth of probe below water table (feet):	9.171		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 16:10:47	58247.0	0.0	3.67	3.697	5.475	0.73835
5/29/2008 16:10:48	58248.5	1.5	3.85	3.876	5.295	0.72391
5/29/2008 16:10:50	58250.0	3.0	4.04	4.065	5.106	0.70812
5/29/2008 16:10:51	58251.0	4.0	4.2	4.225	4.946	0.69429
5/29/2008 16:10:52	58252.0	5.0	4.34	4.362	4.809	0.68209
5/29/2008 16:10:53	58253.0	6.0	4.45	4.475	4.696	0.67177
5/29/2008 16:10:54	58254.5	7.5	4.59	4.614	4.557	0.65872
5/29/2008 16:10:56	58256.5	9.5	4.72	4.744	4.427	0.64614
5/29/2008 16:10:59	58259.0	12.0	4.83	4.852	4.319	0.63541
5/29/2008 16:11:01	58261.5	14.5	4.94	4.968	4.203	0.62359
5/29/2008 16:11:04	58264.0	17.0	5.06	5.081	4.090	0.61175
5/29/2008 16:11:06	58266.5	19.5	5.16	5.187	3.984	0.60034
5/29/2008 16:11:09	58269.0	22.0	5.26	5.288	3.883	0.58918
5/29/2008 16:11:11	58271.5	24.5	5.37	5.397	3.774	0.57681
5/29/2008 16:11:14	58274.0	27.0	5.47	5.493	3.678	0.56562
5/29/2008 16:11:16	58276.5	29.5	5.57	5.597	3.574	0.55315
5/29/2008 16:11:19	58279.0	32.0	5.67	5.696	3.475	0.54095
5/29/2008 16:11:21	58281.5	34.5	5.77	5.795	3.376	0.52839
5/29/2008 16:11:24	58284.0	37.0	5.86	5.888	3.284	0.51638
5/29/2008 16:11:26	58286.0	39.0	5.95	5.973	3.199	0.50499
5/29/2008 16:11:27	58287.5	40.5	6.02	6.048	3.124	0.49468
5/29/2008 16:11:29	58289.0	42.0	6.11	6.140	3.032	0.48169
5/29/2008 16:11:30	58290.5	43.5	6.2	6.227	2.945	0.46905
5/29/2008 16:11:32	58292.0	45.0	6.28	6.303	2.869	0.45769
5/29/2008 16:11:33	58293.5	46.5	6.35	6.373	2.799	0.44695
5/29/2008 16:11:35	58295.5	48.5	6.42	6.442	2.730	0.43611
5/29/2008 16:11:38	58298.5	51.5	6.48	6.505	2.667	0.42596
5/29/2008 16:11:41	58301.0	54.0	6.54	6.567	2.605	0.41573
5/29/2008 16:11:44	58304.0	57.0	6.61	6.633	2.538	0.40457
5/29/2008 16:11:48	58308.0	61.0	6.67	6.691	2.480	0.39452
5/29/2008 16:11:52	58312.5	65.5	6.73	6.753	2.418	0.38352
5/29/2008 16:11:58	58318.5	71.5	6.79	6.812	2.359	0.37277
5/29/2008 16:12:04	58324.0	77.0	6.84	6.866	2.305	0.36269
5/29/2008 16:12:09	58329.5	82.5	6.89	6.920	2.251	0.35238
5/29/2008 16:12:16	58336.0	89.0	6.95	6.972	2.199	0.34221
5/29/2008 16:12:22	58342.0	95.0	7	7.025	2.147	0.33179
5/29/2008 16:12:27	58347.5	100.5	7.05	7.074	2.098	0.32174
5/29/2008 16:12:34	58354.0	107.0	7.1	7.124	2.048	0.31124
5/29/2008 16:12:39	58359.5	112.5	7.15	7.173	1.998	0.30070
5/29/2008 16:12:46	58366.5	119.5	7.19	7.220	1.951	0.29034
5/29/2008 16:12:52	58372.5	125.5	7.24	7.265	1.906	0.28018
5/29/2008 16:12:58	58378.0	131.0	7.28	7.310	1.861	0.26978
5/29/2008 16:13:04	58384.5	137.5	7.33	7.357	1.814	0.25864
5/29/2008 16:13:10	58390.5	143.5	7.37	7.399	1.772	0.24844

Slug Test P-83

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 16:13:16	58396.5	149.5	7.42	7.443	1.729	0.23775
5/29/2008 16:13:22	58402.5	155.5	7.46	7.485	1.687	0.22704
5/29/2008 16:13:28	58408.5	161.5	7.5	7.525	1.647	0.21658
5/29/2008 16:13:34	58414.0	167.0	7.54	7.563	1.608	0.20642
5/29/2008 16:13:35	58415.5	168.5	7.58	7.603	1.568	0.19547
5/29/2008 16:13:36	58416.5	169.5	7.62	7.652	1.519	0.18168
5/29/2008 16:13:38	58418.0	171.0	7.66	7.690	1.481	0.17068
5/29/2008 16:13:41	58421.0	174.0	7.7	7.725	1.446	0.16028
5/29/2008 16:13:51	58431.5	184.5	7.73	7.758	1.413	0.15019
5/29/2008 16:13:58	58438.5	191.5	7.76	7.791	1.380	0.13989
5/29/2008 16:14:05	58445.5	198.5	7.8	7.824	1.347	0.12934
5/29/2008 16:14:12	58452.5	205.5	7.83	7.858	1.314	0.11853
5/29/2008 16:14:19	58459.5	212.5	7.86	7.888	1.284	0.10845
5/29/2008 16:14:26	58466.0	219.0	7.89	7.919	1.253	0.09779
5/29/2008 16:14:32	58472.5	225.5	7.92	7.952	1.219	0.08616
5/29/2008 16:14:39	58479.0	232.0	7.95	7.983	1.188	0.07493
5/29/2008 16:14:46	58486.0	239.0	7.98	8.011	1.160	0.06453
5/29/2008 16:14:54	58494.0	247.0	8.01	8.041	1.130	0.05309
5/29/2008 16:15:00	58500.5	253.5	8.04	8.067	1.104	0.04294
5/29/2008 16:15:08	58508.0	261.0	8.06	8.094	1.078	0.03253
5/29/2008 16:15:15	58515.0	268.0	8.09	8.120	1.052	0.02187
5/29/2008 16:15:23	58523.0	276.0	8.11	8.144	1.028	0.01178
5/29/2008 16:15:30	58530.0	283.0	8.14	8.170	1.001	0.00060
5/29/2008 16:15:38	58538.0	291.0	8.16	8.193	0.978	-0.00956
5/29/2008 16:15:45	58545.5	298.5	8.19	8.217	0.954	-0.02041
5/29/2008 16:15:54	58554.0	307.0	8.21	8.241	0.930	-0.03154
5/29/2008 16:16:03	58563.5	316.5	8.23	8.263	0.909	-0.04155
5/29/2008 16:16:11	58571.0	324.0	8.25	8.284	0.888	-0.05177
5/29/2008 16:16:20	58580.5	333.5	8.27	8.305	0.866	-0.06225
5/29/2008 16:16:29	58589.0	342.0	8.3	8.327	0.844	-0.07350
5/29/2008 16:16:38	58598.5	351.5	8.32	8.348	0.823	-0.08453
5/29/2008 16:16:48	58608.0	361.0	8.34	8.367	0.804	-0.09476
5/29/2008 16:16:57	58617.5	370.5	8.36	8.387	0.785	-0.10525
5/29/2008 16:17:06	58626.0	379.0	8.37	8.405	0.767	-0.11541
5/29/2008 16:17:15	58635.5	388.5	8.39	8.424	0.747	-0.12641
5/29/2008 16:17:24	58644.0	397.0	8.41	8.441	0.730	-0.13649
5/29/2008 16:17:35	58655.0	408.0	8.43	8.460	0.711	-0.14806
5/29/2008 16:17:45	58665.0	418.0	8.45	8.478	0.693	-0.15931
5/29/2008 16:17:55	58675.0	428.0	8.46	8.496	0.676	-0.17022
5/29/2008 16:18:04	58684.0	437.0	8.48	8.512	0.660	-0.18073
5/29/2008 16:18:12	58692.5	445.5	8.49	8.527	0.644	-0.19083
5/29/2008 16:18:24	58704.0	457.0	8.51	8.543	0.628	-0.20189
5/29/2008 16:18:36	58716.5	469.5	8.53	8.560	0.611	-0.21396
5/29/2008 16:18:45	58725.5	478.5	8.54	8.575	0.597	-0.22415
5/29/2008 16:18:57	58737.0	490.0	8.56	8.589	0.583	-0.23461
5/29/2008 16:19:05	58745.0	498.0	8.57	8.603	0.568	-0.24529
5/29/2008 16:19:16	58756.0	509.0	8.58	8.617	0.554	-0.25627
5/29/2008 16:19:27	58767.5	520.5	8.6	8.631	0.540	-0.26755
5/29/2008 16:19:38	58778.5	531.5	8.61	8.647	0.525	-0.27995

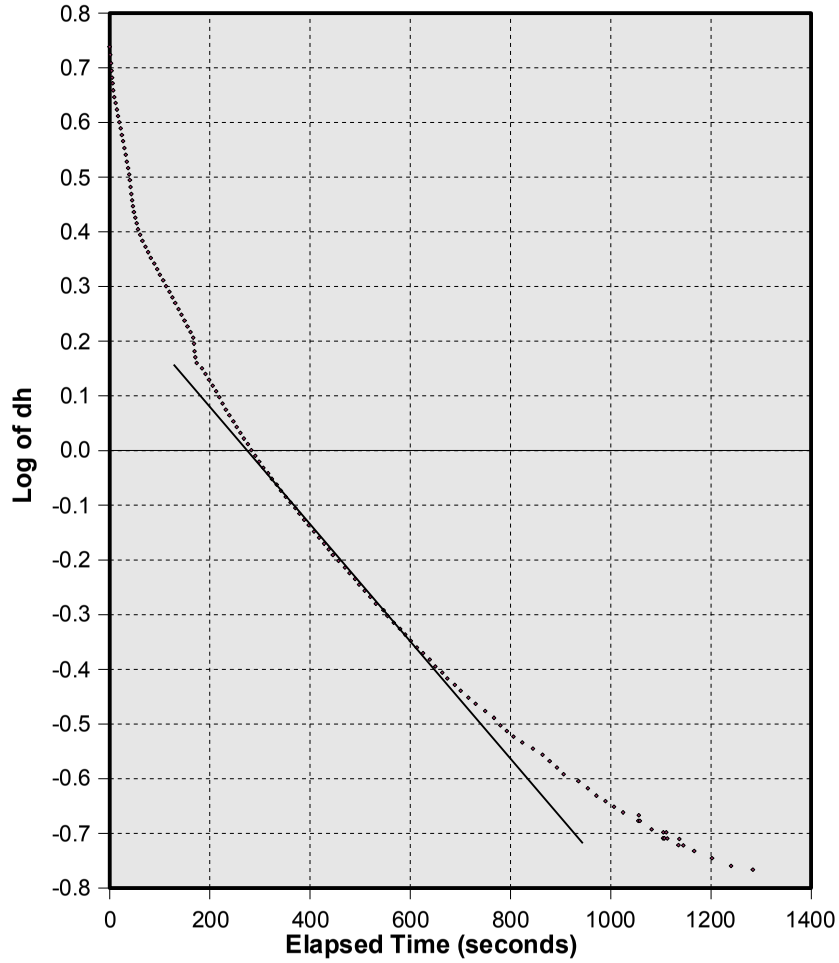
Slug Test P-83

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 16:19:53	58793.5	546.5	8.63	8.661	0.511	-0.29192
5/29/2008 16:20:01	58801.5	554.5	8.64	8.673	0.498	-0.30238
5/29/2008 16:20:14	58814.0	567.0	8.65	8.687	0.484	-0.31496
5/29/2008 16:20:26	58826.5	579.5	8.66	8.699	0.472	-0.32606
5/29/2008 16:20:37	58837.0	590.0	8.68	8.711	0.461	-0.33648
5/29/2008 16:20:48	58848.0	601.0	8.69	8.723	0.449	-0.34814
5/29/2008 16:21:00	58860.0	613.0	8.7	8.735	0.436	-0.36013
5/29/2008 16:21:12	58872.5	625.5	8.71	8.745	0.426	-0.37043
5/29/2008 16:21:26	58886.0	639.0	8.72	8.756	0.415	-0.38204
5/29/2008 16:21:37	58897.0	650.0	8.73	8.769	0.403	-0.39500
5/29/2008 16:21:51	58911.0	664.0	8.74	8.779	0.392	-0.40621
5/29/2008 16:22:01	58921.0	674.0	8.75	8.788	0.383	-0.41649
5/29/2008 16:22:16	58936.0	689.0	8.76	8.798	0.373	-0.42829
5/29/2008 16:22:27	58947.5	700.5	8.77	8.808	0.364	-0.43914
5/29/2008 16:22:43	58963.0	716.0	8.78	8.818	0.354	-0.45159
5/29/2008 16:22:57	58977.5	730.5	8.79	8.827	0.344	-0.46312
5/29/2008 16:23:16	58996.5	749.5	8.8	8.837	0.334	-0.47638
5/29/2008 16:23:34	59014.0	767.0	8.81	8.847	0.325	-0.48867
5/29/2008 16:23:47	59027.0	780.0	8.82	8.857	0.314	-0.50258
5/29/2008 16:23:59	59039.5	792.5	8.83	8.864	0.307	-0.51268
5/29/2008 16:24:13	59053.0	806.0	8.83	8.872	0.300	-0.52305
5/29/2008 16:24:30	59070.5	823.5	8.84	8.879	0.293	-0.53378
5/29/2008 16:24:51	59091.5	844.5	8.85	8.886	0.285	-0.54488
5/29/2008 16:25:11	59111.0	864.0	8.85	8.894	0.278	-0.55623
5/29/2008 16:25:25	59125.0	878.0	8.86	8.901	0.271	-0.56772
5/29/2008 16:25:39	59139.5	892.5	8.87	8.908	0.263	-0.57954
5/29/2008 16:25:53	59153.0	906.0	8.87	8.915	0.256	-0.59165
5/29/2008 16:26:22	59182.5	935.5	8.88	8.923	0.249	-0.60463
5/29/2008 16:26:41	59201.5	954.5	8.89	8.930	0.241	-0.61765
5/29/2008 16:26:58	59218.5	971.5	8.9	8.938	0.234	-0.63102
5/29/2008 16:27:16	59236.5	989.5	8.9	8.943	0.229	-0.64103
5/29/2008 16:27:33	59253.5	1006.5	8.91	8.948	0.223	-0.65123
5/29/2008 16:27:51	59271.5	1024.5	8.91	8.953	0.218	-0.66172
5/29/2008 16:28:22	59302.0	1055.0	8.92	8.961	0.210	-0.67704
5/29/2008 16:28:23	59303.0	1056.0	8.91	8.956	0.215	-0.66688
5/29/2008 16:28:25	59305.0	1058.0	8.92	8.961	0.210	-0.67716
5/29/2008 16:28:48	59328.5	1081.5	8.92	8.969	0.203	-0.69277
5/29/2008 16:29:11	59351.5	1104.5	8.93	8.976	0.195	-0.70895
5/29/2008 16:29:12	59352.0	1105.0	8.93	8.971	0.200	-0.69800
5/29/2008 16:29:14	59354.0	1107.0	8.93	8.976	0.195	-0.70905
5/29/2008 16:29:18	59358.0	1111.0	8.93	8.971	0.200	-0.69823
5/29/2008 16:29:20	59360.0	1113.0	8.93	8.976	0.195	-0.70929
5/29/2008 16:29:42	59382.0	1135.0	8.94	8.981	0.190	-0.72147
5/29/2008 16:29:44	59384.0	1137.0	8.93	8.977	0.195	-0.71026
5/29/2008 16:29:52	59392.0	1145.0	8.94	8.982	0.190	-0.72188
5/29/2008 16:30:13	59413.5	1166.5	8.94	8.986	0.185	-0.73205
5/29/2008 16:30:49	59449.0	1202.0	8.95	8.992	0.180	-0.74548
5/29/2008 16:31:27	59487.0	1240.0	8.95	8.997	0.174	-0.75946
5/29/2008 16:32:10	59530.5	1283.5	8.95	9.000	0.171	-0.76648

Slug Test P-83

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	50.25	ft
Stick up height:	2.94	ft
Depth to sand pack (BGS):	33.88	ft
Depth to screened interval (BGS):	35.25	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	42.73	ft
Initial Head Change:	5.47	ft
Total well length:	53.19	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	10.46	ft
L_e / r_w:	32.3923	
A (dimensionless):	2.636	
B (dimensionless):	0.439	
Drawdown at time = 0 (y_0):	1.00	ft
Drawdown at time = t (y_t):	0.40	ft
Elapsed Time between y_0 and y_t (t):	377	sec
Initial water column in well (L_w):	10.46	ft
$\ln(R_e/r_w)$ =	2.09	
K =	8.84E-06	ft/sec
	2.69E-04	**cm/sec**
	278.71	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-84S

Initial offset in logger reading (feet):	-0.005	Date:	05/30/2008
Offset increment in logger reading (feet/sec):	-0.000005		
Initial depth to water table (feet):	45.5		
Depth of probe below water table (feet):	9.763		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 11:55:26	42926.0	0.0	4.04	4.053	5.711	0.75669
5/30/2008 11:55:28	42928.5	2.5	4.11	4.122	5.642	0.75141
5/30/2008 11:55:29	42929.5	3.5	4.23	4.237	5.527	0.74246
5/30/2008 11:55:30	42930.0	4.0	4.29	4.303	5.461	0.73725
5/30/2008 11:55:30	42930.5	4.5	4.19	4.200	5.564	0.74536
5/30/2008 11:55:31	42931.5	5.5	4.29	4.298	5.466	0.73764
5/30/2008 11:55:33	42933.0	7.0	4.38	4.388	5.376	0.73043
5/30/2008 11:55:34	42934.0	8.0	4.47	4.475	5.289	0.72335
5/30/2008 11:55:35	42935.0	9.0	4.58	4.586	5.178	0.71413
5/30/2008 11:55:36	42936.0	10.0	4.67	4.680	5.084	0.70618
5/30/2008 11:55:37	42937.0	11.0	4.75	4.756	5.008	0.69963
5/30/2008 11:55:38	42938.5	12.5	4.83	4.840	4.924	0.69229
5/30/2008 11:55:40	42940.0	14.0	4.89	4.897	4.867	0.68723
5/30/2008 11:55:42	42942.5	16.5	4.95	4.961	4.803	0.68148
5/30/2008 11:55:46	42946.0	20.0	5.01	5.017	4.747	0.67638
5/30/2008 11:55:49	42949.0	23.0	5.07	5.078	4.686	0.67076
5/30/2008 11:55:53	42953.0	27.0	5.12	5.132	4.632	0.66573
5/30/2008 11:55:57	42957.5	31.5	5.18	5.189	4.575	0.66035
5/30/2008 11:55:58	42958.5	32.5	5.27	5.276	4.488	0.65201
5/30/2008 11:55:59	42959.0	33.0	5.35	5.360	4.404	0.64380
5/30/2008 11:56:00	42960.0	34.0	5.43	5.436	4.328	0.63624
5/30/2008 11:56:01	42961.0	35.0	5.49	5.499	4.265	0.62987
5/30/2008 11:56:02	42962.5	36.5	5.56	5.572	4.192	0.62237
5/30/2008 11:56:04	42964.5	38.5	5.61	5.624	4.140	0.61695
5/30/2008 11:56:21	42981.0	55.0	5.66	5.672	4.091	0.61187
5/30/2008 11:56:28	42988.5	62.5	5.71	5.719	4.044	0.60685
5/30/2008 11:56:36	42996.0	70.0	5.76	5.766	3.997	0.60177
5/30/2008 11:56:44	43004.5	78.5	5.8	5.812	3.951	0.59674
5/30/2008 11:56:53	43013.0	87.0	5.85	5.859	3.904	0.59154
5/30/2008 11:57:00	43020.5	94.5	5.9	5.906	3.857	0.58628
5/30/2008 11:57:08	43028.0	102.0	5.94	5.951	3.812	0.58118
5/30/2008 11:57:16	43036.5	110.5	5.99	5.995	3.768	0.57613
5/30/2008 11:57:24	43044.0	118.0	6.03	6.040	3.723	0.57091
5/30/2008 11:57:32	43052.5	126.5	6.08	6.085	3.678	0.56562
5/30/2008 11:57:41	43061.5	135.5	6.12	6.130	3.633	0.56027
5/30/2008 11:57:49	43069.5	143.5	6.16	6.172	3.591	0.55522
5/30/2008 11:57:57	43077.0	151.0	6.2	6.214	3.549	0.55010
5/30/2008 11:58:04	43084.5	158.5	6.25	6.259	3.504	0.54456
5/30/2008 11:58:12	43092.5	166.5	6.29	6.304	3.459	0.53894
5/30/2008 11:58:20	43100.0	174.0	6.33	6.344	3.419	0.53388
5/30/2008 11:58:27	43107.5	181.5	6.37	6.384	3.379	0.52876
5/30/2008 11:58:35	43115.5	189.5	6.41	6.424	3.339	0.52359
5/30/2008 11:58:44	43124.0	198.0	6.45	6.465	3.299	0.51835
5/30/2008 11:58:52	43132.0	206.0	6.49	6.503	3.261	0.51331

Slug Test P-84S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 11:59:00	43140.5	214.5	6.53	6.541	3.223	0.50821
5/30/2008 11:59:08	43148.0	222.0	6.57	6.578	3.186	0.50319
5/30/2008 11:59:17	43157.0	231.0	6.61	6.616	3.148	0.49798
5/30/2008 11:59:26	43166.0	240.0	6.64	6.654	3.110	0.49270
5/30/2008 11:59:35	43175.5	249.5	6.68	6.691	3.072	0.48749
5/30/2008 11:59:44	43184.5	258.5	6.72	6.729	3.034	0.48208
5/30/2008 11:59:54	43194.0	268.0	6.76	6.767	2.996	0.47660
5/30/2008 12:00:03	43203.5	277.5	6.79	6.802	2.961	0.47149
5/30/2008 12:00:12	43212.5	286.5	6.83	6.837	2.926	0.46632
5/30/2008 12:00:22	43222.5	296.5	6.86	6.873	2.890	0.46094
5/30/2008 12:00:32	43232.5	306.5	6.9	6.908	2.855	0.45564
5/30/2008 12:00:42	43242.0	316.0	6.93	6.941	2.822	0.45058
5/30/2008 12:00:52	43252.0	326.0	6.97	6.976	2.787	0.44516
5/30/2008 12:01:02	43262.0	336.0	7	7.009	2.754	0.43998
5/30/2008 12:01:12	43272.0	346.0	7.03	7.042	2.721	0.43473
5/30/2008 12:01:22	43282.5	356.5	7.07	7.077	2.686	0.42910
5/30/2008 12:01:32	43292.0	366.0	7.1	7.108	2.655	0.42405
5/30/2008 12:01:41	43301.5	375.5	7.13	7.139	2.624	0.41894
5/30/2008 12:01:51	43311.5	385.5	7.16	7.169	2.594	0.41394
5/30/2008 12:02:02	43322.0	396.0	7.19	7.200	2.563	0.40871
5/30/2008 12:02:11	43331.0	405.0	7.22	7.232	2.532	0.40342
5/30/2008 12:02:21	43341.5	415.5	7.25	7.265	2.499	0.39771
5/30/2008 12:02:34	43354.0	428.0	7.28	7.295	2.469	0.39246
5/30/2008 12:02:45	43365.0	439.0	7.31	7.324	2.440	0.38731
5/30/2008 12:02:55	43375.5	449.5	7.34	7.352	2.412	0.38229
5/30/2008 12:03:06	43386.0	460.0	7.37	7.382	2.381	0.37685
5/30/2008 12:03:17	43397.5	471.5	7.4	7.411	2.352	0.37151
5/30/2008 12:03:28	43408.5	482.5	7.43	7.439	2.324	0.36630
5/30/2008 12:03:38	43418.5	492.5	7.46	7.467	2.296	0.36103
5/30/2008 12:03:49	43429.5	503.5	7.48	7.496	2.267	0.35550
5/30/2008 12:03:59	43439.5	513.5	7.51	7.522	2.241	0.35048
5/30/2008 12:04:12	43452.5	526.5	7.54	7.550	2.213	0.34501
5/30/2008 12:04:22	43462.5	536.5	7.56	7.576	2.187	0.33987
5/30/2008 12:04:33	43473.5	547.5	7.59	7.602	2.161	0.33467
5/30/2008 12:04:43	43483.5	557.5	7.62	7.628	2.135	0.32940
5/30/2008 12:04:53	43493.5	567.5	7.64	7.653	2.110	0.32427
5/30/2008 12:05:02	43502.5	576.5	7.67	7.680	2.083	0.31867
5/30/2008 12:05:11	43511.0	585.0	7.69	7.705	2.058	0.31342
5/30/2008 12:05:19	43519.0	593.0	7.72	7.729	2.034	0.30832
5/30/2008 12:05:28	43528.0	602.0	7.74	7.753	2.010	0.30315
5/30/2008 12:05:38	43538.0	612.0	7.77	7.780	1.984	0.29748
5/30/2008 12:05:49	43549.0	623.0	7.79	7.803	1.961	0.29241
5/30/2008 12:06:01	43561.0	635.0	7.81	7.827	1.937	0.28705
5/30/2008 12:06:09	43569.5	643.5	7.84	7.850	1.914	0.28185
5/30/2008 12:06:20	43580.5	654.5	7.86	7.874	1.890	0.27636
5/30/2008 12:06:30	43590.5	664.5	7.88	7.897	1.866	0.27103
5/30/2008 12:06:40	43600.5	674.5	7.91	7.919	1.844	0.26586
5/30/2008 12:06:51	43611.0	685.0	7.93	7.942	1.821	0.26040
5/30/2008 12:07:01	43621.0	695.0	7.95	7.963	1.800	0.25535

Slug Test P-84S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:07:11	43631.5	705.5	7.97	7.985	1.778	0.25000
5/30/2008 12:07:22	43642.0	716.0	7.99	8.006	1.757	0.24483
5/30/2008 12:07:33	43653.0	727.0	8.01	8.027	1.736	0.23960
5/30/2008 12:07:45	43665.5	739.5	8.04	8.048	1.715	0.23430
5/30/2008 12:07:56	43676.5	750.5	8.06	8.070	1.693	0.22868
5/30/2008 12:08:06	43686.5	760.5	8.08	8.091	1.672	0.22324
5/30/2008 12:08:19	43699.0	773.0	8.1	8.112	1.651	0.21774
5/30/2008 12:08:30	43710.0	784.0	8.12	8.131	1.632	0.21270
5/30/2008 12:08:40	43720.5	794.5	8.14	8.150	1.613	0.20760
5/30/2008 12:08:51	43731.0	805.0	8.16	8.169	1.594	0.20244
5/30/2008 12:09:01	43741.5	815.5	8.18	8.189	1.575	0.19721
5/30/2008 12:09:12	43752.5	826.5	8.19	8.208	1.556	0.19193
5/30/2008 12:09:24	43764.5	838.5	8.21	8.226	1.538	0.18686
5/30/2008 12:09:34	43774.5	848.5	8.23	8.245	1.519	0.18144
5/30/2008 12:09:47	43787.0	861.0	8.25	8.264	1.500	0.17596
5/30/2008 12:09:57	43797.0	871.0	8.27	8.283	1.480	0.17041
5/30/2008 12:10:06	43806.5	880.5	8.29	8.300	1.463	0.16538
5/30/2008 12:10:18	43818.0	892.0	8.31	8.319	1.444	0.15968
5/30/2008 12:10:29	43829.0	903.0	8.32	8.337	1.426	0.15422
5/30/2008 12:10:40	43840.0	914.0	8.34	8.354	1.409	0.14900
5/30/2008 12:10:49	43849.0	923.0	8.36	8.371	1.392	0.14371
5/30/2008 12:11:00	43860.5	934.5	8.38	8.389	1.374	0.13804
5/30/2008 12:11:12	43872.0	946.0	8.39	8.406	1.357	0.13262
5/30/2008 12:11:21	43881.0	955.0	8.41	8.422	1.341	0.12746
5/30/2008 12:11:35	43895.0	969.0	8.43	8.439	1.324	0.12189
5/30/2008 12:11:44	43904.5	978.5	8.44	8.458	1.305	0.11560
5/30/2008 12:11:58	43918.5	992.5	8.46	8.474	1.289	0.11022
5/30/2008 12:12:09	43929.5	1003.5	8.48	8.491	1.272	0.10444
5/30/2008 12:12:20	43940.0	1014.0	8.49	8.507	1.256	0.09892
5/30/2008 12:12:36	43956.5	1030.5	8.51	8.527	1.237	0.09227
5/30/2008 12:12:50	43970.5	1044.5	8.53	8.544	1.220	0.08624
5/30/2008 12:13:03	43983.0	1057.0	8.54	8.558	1.206	0.08120
5/30/2008 12:13:14	43994.0	1068.0	8.56	8.572	1.192	0.07611
5/30/2008 12:13:26	44006.5	1080.5	8.57	8.586	1.177	0.07095
5/30/2008 12:13:39	44019.5	1093.5	8.59	8.603	1.160	0.06461
5/30/2008 12:13:52	44032.5	1106.5	8.6	8.617	1.146	0.05932
5/30/2008 12:14:06	44046.5	1120.5	8.62	8.631	1.132	0.05396
5/30/2008 12:14:19	44059.5	1133.5	8.63	8.645	1.118	0.04853
5/30/2008 12:14:32	44072.5	1146.5	8.64	8.659	1.104	0.04303
5/30/2008 12:14:46	44086.0	1160.0	8.66	8.674	1.089	0.03707
5/30/2008 12:14:59	44099.5	1173.5	8.67	8.688	1.075	0.03142
5/30/2008 12:15:12	44112.0	1186.0	8.69	8.702	1.061	0.02570
5/30/2008 12:15:26	44126.0	1200.0	8.7	8.716	1.047	0.01991
5/30/2008 12:15:36	44136.5	1210.5	8.71	8.728	1.035	0.01488
5/30/2008 12:15:51	44151.0	1225.0	8.73	8.740	1.023	0.00978
5/30/2008 12:16:01	44161.5	1235.5	8.74	8.753	1.011	0.00464
5/30/2008 12:16:16	44176.5	1250.5	8.75	8.767	0.997	-0.00145
5/30/2008 12:16:29	44189.0	1263.0	8.76	8.779	0.985	-0.00674
5/30/2008 12:16:42	44202.5	1276.5	8.78	8.793	0.971	-0.01299

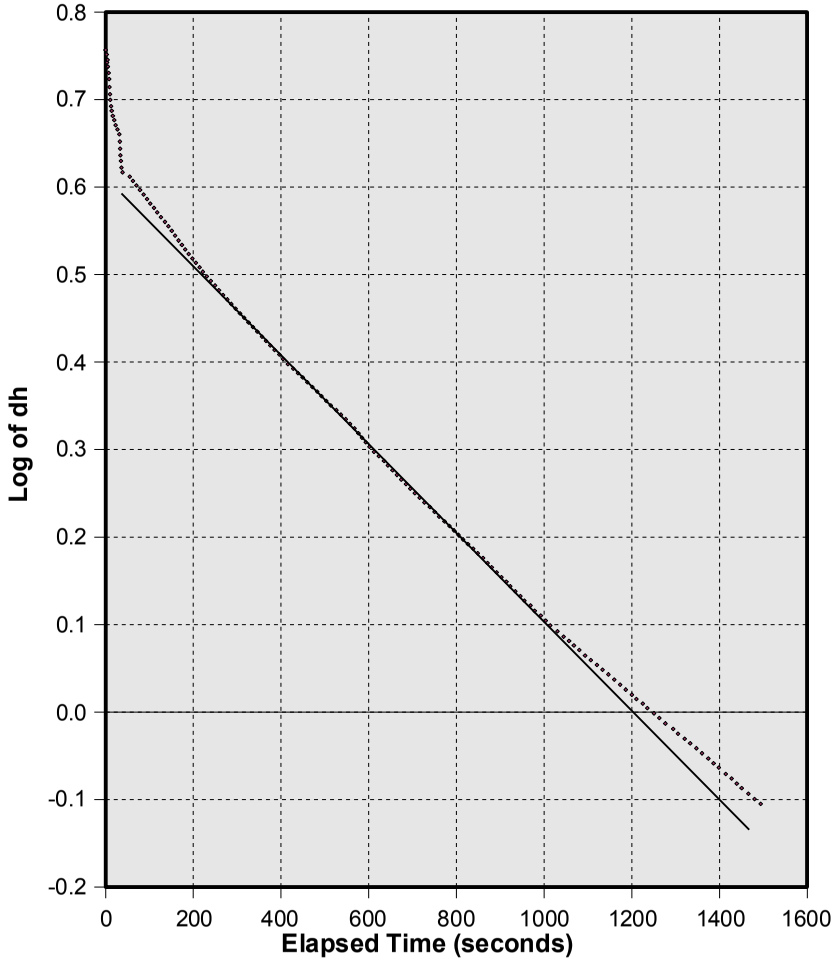
Slug Test P-84S

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:17:00	44220.5	1294.5	8.79	8.807	0.956	-0.01934
5/30/2008 12:17:11	44231.5	1305.5	8.8	8.819	0.944	-0.02485
5/30/2008 12:17:26	44246.5	1320.5	8.82	8.831	0.932	-0.03043
5/30/2008 12:17:39	44259.0	1333.0	8.83	8.842	0.921	-0.03562
5/30/2008 12:17:53	44273.5	1347.5	8.84	8.854	0.909	-0.04134
5/30/2008 12:18:06	44286.0	1360.0	8.85	8.866	0.897	-0.04714
5/30/2008 12:18:20	44300.5	1374.5	8.86	8.878	0.885	-0.05303
5/30/2008 12:18:32	44312.5	1386.5	8.87	8.889	0.874	-0.05849
5/30/2008 12:18:44	44324.5	1398.5	8.88	8.899	0.864	-0.06351
5/30/2008 12:19:00	44340.5	1414.5	8.9	8.913	0.850	-0.07065
5/30/2008 12:19:13	44353.5	1427.5	8.91	8.923	0.840	-0.07582
5/30/2008 12:19:25	44365.5	1439.5	8.92	8.935	0.829	-0.08158
5/30/2008 12:19:36	44376.5	1450.5	8.93	8.945	0.819	-0.08688
5/30/2008 12:19:52	44392.0	1466.0	8.94	8.957	0.807	-0.09333
5/30/2008 12:20:06	44406.0	1480.0	8.95	8.968	0.796	-0.09933
5/30/2008 12:20:20	44420.0	1494.0	8.96	8.978	0.785	-0.10486

Slug Test P-84S

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	53.47	ft
Stick up height:	2.63	ft
Depth to sand pack (BGS):	37.10	ft
Depth to screened interval (BGS):	38.47	ft
Well diameter:	2.00	in
Diameter of annular space:	8.25	in
Initial depth to water table from top of pipe:	45.50	ft
Initial Head Change:	5.71	ft
Total well length:	56.10	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.2008	ft
r_c:	0.2008	ft
Radius of gravel pack (r_w):	0.3438	ft
Screened interval:	15.00	ft
Length of open section (L_e):	10.60	ft
L_e / r_w:	30.8364	
A (dimensionless):	2.586	
B (dimensionless):	0.431	
Drawdown at time = 0 (y_0):	3.28	ft
Drawdown at time = t (y_t):	1.20	ft
Elapsed Time between y_0 and y_t (t):	863	sec
Initial water column in well (L_w):	10.60	ft
$\ln(R_e/r_w)$ =	2.05	
K =	4.55E-06	ft/sec
	1.39E-04	**cm/sec**
	143.41	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-84D

Initial offset in logger reading (feet):	0.001	Date:	05/30/2008
Offset increment in logger reading (feet/sec):	0.000663		
Initial depth to water table (feet):	43.68		
Depth of probe below water table (feet):	4.463		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:24:04	44644.0	0.0	11.21	11.135	6.672	0.82423
5/30/2008 12:24:17	44657.0	13.0	11.06	10.982	6.519	0.81418
5/30/2008 12:24:27	44667.5	23.5	10.92	10.833	6.370	0.80414
5/30/2008 12:24:38	44678.5	34.5	10.77	10.679	6.216	0.79349
5/30/2008 12:24:49	44689.0	45.0	10.64	10.537	6.074	0.78346
5/30/2008 12:25:00	44700.0	56.0	10.5	10.392	5.928	0.77294
5/30/2008 12:25:10	44710.5	66.5	10.37	10.252	5.789	0.76257
5/30/2008 12:25:21	44721.0	77.0	10.24	10.116	5.653	0.75225
5/30/2008 12:25:31	44731.0	87.0	10.11	9.983	5.520	0.74193
5/30/2008 12:25:41	44741.5	97.5	9.99	9.854	5.391	0.73167
5/30/2008 12:25:52	44752.0	108.0	9.87	9.728	5.265	0.72140
5/30/2008 12:26:02	44762.5	118.5	9.76	9.604	5.141	0.71105
5/30/2008 12:26:12	44772.5	128.5	9.64	9.487	5.023	0.70100
5/30/2008 12:26:23	44783.0	139.0	9.53	9.368	4.904	0.69059
5/30/2008 12:26:33	44793.0	149.0	9.43	9.255	4.792	0.68050
5/30/2008 12:26:43	44803.5	159.5	9.32	9.140	4.677	0.66996
5/30/2008 12:26:53	44813.5	169.5	9.22	9.032	4.569	0.65984
5/30/2008 12:27:03	44823.5	179.5	9.12	8.927	4.464	0.64969
5/30/2008 12:27:13	44833.5	189.5	9.02	8.821	4.358	0.63929
5/30/2008 12:27:23	44843.5	199.5	8.93	8.721	4.257	0.62914
5/30/2008 12:27:33	44853.5	209.5	8.83	8.622	4.159	0.61896
5/30/2008 12:27:43	44863.5	219.5	8.74	8.523	4.060	0.60854
5/30/2008 12:27:53	44873.5	229.5	8.65	8.430	3.966	0.59840
5/30/2008 12:28:03	44883.5	239.5	8.57	8.336	3.873	0.58803
5/30/2008 12:28:13	44893.0	249.0	8.48	8.247	3.784	0.57790
5/30/2008 12:28:22	44902.5	258.5	8.4	8.160	3.697	0.56788
5/30/2008 12:28:32	44912.0	268.0	8.32	8.074	3.611	0.55762
5/30/2008 12:28:42	44922.0	278.0	8.25	7.989	3.526	0.54732
5/30/2008 12:28:51	44931.0	287.0	8.17	7.908	3.445	0.53723
5/30/2008 12:29:01	44941.0	297.0	8.1	7.827	3.364	0.52682
5/30/2008 12:29:10	44950.5	306.5	8.03	7.750	3.286	0.51673
5/30/2008 12:29:20	44960.0	316.0	7.95	7.672	3.209	0.50639
5/30/2008 12:29:29	44969.5	325.5	7.89	7.598	3.135	0.49622
5/30/2008 12:29:39	44979.0	335.0	7.82	7.521	3.058	0.48537
5/30/2008 12:29:48	44988.5	344.5	7.75	7.448	2.985	0.47498
5/30/2008 12:29:57	44997.5	353.5	7.69	7.378	2.915	0.46468
5/30/2008 12:30:07	45007.0	363.0	7.62	7.311	2.848	0.45454
5/30/2008 12:30:16	45016.0	372.0	7.56	7.243	2.780	0.44405
5/30/2008 12:30:25	45025.0	381.0	7.5	7.176	2.713	0.43346
5/30/2008 12:30:34	45034.0	390.0	7.44	7.113	2.650	0.42326
5/30/2008 12:30:43	45043.5	399.5	7.39	7.050	2.587	0.41276
5/30/2008 12:30:52	45052.5	408.5	7.33	6.988	2.525	0.40223
5/30/2008 12:31:00	45060.5	416.5	7.28	6.930	2.467	0.39208
5/30/2008 12:31:10	45070.0	426.0	7.23	6.871	2.408	0.38170

Slug Test P-84D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:31:18	45078.5	434.5	7.17	6.814	2.351	0.37118
5/30/2008 12:31:27	45087.5	443.5	7.12	6.758	2.295	0.36071
5/30/2008 12:31:36	45096.5	452.5	7.07	6.702	2.239	0.34999
5/30/2008 12:31:45	45105.5	461.5	7.02	6.644	2.181	0.33859
5/30/2008 12:31:54	45114.5	470.5	6.97	6.588	2.125	0.32730
5/30/2008 12:32:03	45123.0	479.0	6.93	6.539	2.076	0.31725
5/30/2008 12:32:11	45131.5	487.5	6.89	6.491	2.027	0.30695
5/30/2008 12:32:18	45138.5	494.5	6.84	6.443	1.980	0.29662
5/30/2008 12:32:27	45147.5	503.5	6.8	6.394	1.931	0.28575
5/30/2008 12:32:36	45156.0	512.0	6.76	6.348	1.885	0.27536
5/30/2008 12:32:43	45163.5	519.5	6.72	6.305	1.842	0.26535
5/30/2008 12:32:51	45171.0	527.0	6.68	6.261	1.798	0.25486
5/30/2008 12:32:59	45179.5	535.5	6.65	6.218	1.755	0.24419
5/30/2008 12:33:07	45187.0	543.0	6.61	6.177	1.714	0.23393
5/30/2008 12:33:15	45195.0	551.0	6.57	6.137	1.673	0.22359
5/30/2008 12:33:22	45202.0	558.0	6.54	6.098	1.635	0.21344
5/30/2008 12:33:29	45209.5	565.5	6.51	6.060	1.597	0.20324
5/30/2008 12:33:36	45216.5	572.5	6.47	6.022	1.559	0.19288
5/30/2008 12:33:44	45224.0	580.0	6.44	5.986	1.523	0.18274
5/30/2008 12:33:51	45231.5	587.5	6.41	5.950	1.487	0.17236
5/30/2008 12:33:59	45239.0	595.0	6.38	5.914	1.451	0.16173
5/30/2008 12:34:06	45246.0	602.0	6.35	5.881	1.418	0.15154
5/30/2008 12:34:12	45252.5	608.5	6.32	5.847	1.384	0.14121
5/30/2008 12:34:20	45260.0	616.0	6.3	5.814	1.351	0.13074
5/30/2008 12:34:26	45266.5	622.5	6.27	5.781	1.318	0.11991
5/30/2008 12:34:33	45273.5	629.5	6.24	5.750	1.287	0.10969
5/30/2008 12:34:40	45280.5	636.5	6.21	5.720	1.257	0.09923
5/30/2008 12:34:47	45287.0	643.0	6.19	5.690	1.226	0.08863
5/30/2008 12:34:53	45293.5	649.5	6.16	5.661	1.198	0.07848
5/30/2008 12:35:00	45300.0	656.0	6.14	5.633	1.170	0.06810
5/30/2008 12:35:06	45306.0	662.0	6.12	5.606	1.143	0.05796
5/30/2008 12:35:12	45312.5	668.5	6.1	5.580	1.116	0.04785
5/30/2008 12:35:18	45318.5	674.5	6.07	5.552	1.089	0.03683
5/30/2008 12:35:25	45325.0	681.0	6.05	5.526	1.063	0.02661
5/30/2008 12:35:30	45330.0	686.0	6.03	5.502	1.039	0.01656
5/30/2008 12:35:37	45337.0	693.0	6.01	5.473	1.010	0.00442
5/30/2008 12:35:43	45343.5	699.5	5.99	5.450	0.987	-0.00571
5/30/2008 12:35:49	45349.0	705.0	5.97	5.427	0.964	-0.01580
5/30/2008 12:35:55	45355.0	711.0	5.95	5.404	0.941	-0.02627
5/30/2008 12:36:01	45361.0	717.0	5.93	5.381	0.918	-0.03700
5/30/2008 12:36:06	45366.5	722.5	5.91	5.359	0.896	-0.04785
5/30/2008 12:36:12	45372.0	728.0	5.89	5.336	0.873	-0.05897
5/30/2008 12:36:18	45378.0	734.0	5.87	5.315	0.852	-0.06953
5/30/2008 12:36:23	45383.5	739.5	5.86	5.294	0.830	-0.08071
5/30/2008 12:36:29	45389.0	745.0	5.84	5.273	0.810	-0.09164
5/30/2008 12:36:34	45394.5	750.5	5.82	5.252	0.789	-0.10286
5/30/2008 12:36:39	45399.5	755.5	5.81	5.233	0.770	-0.11362
5/30/2008 12:36:45	45405.0	761.0	5.79	5.215	0.752	-0.12369
5/30/2008 12:36:49	45409.5	765.5	5.78	5.197	0.734	-0.13420

Slug Test P-84D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:36:54	45414.5	770.5	5.76	5.180	0.717	-0.14456
5/30/2008 12:36:59	45419.0	775.0	5.75	5.163	0.700	-0.15497
5/30/2008 12:37:04	45424.0	780.0	5.74	5.146	0.683	-0.16585
5/30/2008 12:37:08	45428.5	784.5	5.72	5.129	0.666	-0.17680
5/30/2008 12:37:13	45433.5	789.5	5.71	5.113	0.650	-0.18691
5/30/2008 12:37:18	45438.0	794.0	5.7	5.098	0.635	-0.19703
5/30/2008 12:37:22	45442.0	798.0	5.69	5.084	0.621	-0.20716
5/30/2008 12:37:26	45446.0	802.0	5.67	5.069	0.606	-0.21754
5/30/2008 12:37:30	45450.0	806.0	5.66	5.054	0.591	-0.22817
5/30/2008 12:37:34	45454.5	810.5	5.65	5.040	0.577	-0.23856
5/30/2008 12:37:39	45459.5	815.5	5.64	5.027	0.564	-0.24869
5/30/2008 12:37:42	45462.5	818.5	5.63	5.013	0.550	-0.25960
5/30/2008 12:37:45	45465.5	821.5	5.62	5.000	0.537	-0.26998
5/30/2008 12:37:50	45470.5	826.5	5.61	4.987	0.524	-0.28088
5/30/2008 12:37:55	45475.0	831.0	5.6	4.975	0.512	-0.29093
5/30/2008 12:37:58	45478.0	834.0	5.59	4.963	0.500	-0.30123
5/30/2008 12:38:02	45482.0	838.0	5.58	4.951	0.488	-0.31147
5/30/2008 12:38:05	45485.5	841.5	5.57	4.939	0.476	-0.32257
5/30/2008 12:38:09	45489.0	845.0	5.56	4.925	0.461	-0.33585
5/30/2008 12:38:13	45493.0	849.0	5.55	4.913	0.450	-0.34695
5/30/2008 12:38:17	45497.5	853.5	5.54	4.901	0.438	-0.35868
5/30/2008 12:38:20	45500.5	856.5	5.53	4.889	0.426	-0.37073
5/30/2008 12:38:25	45505.0	861.0	5.52	4.879	0.416	-0.38104
5/30/2008 12:38:29	45509.0	865.0	5.51	4.867	0.404	-0.39338
5/30/2008 12:38:32	45512.0	868.0	5.5	4.855	0.392	-0.40645
5/30/2008 12:38:35	45515.5	871.5	5.5	4.846	0.383	-0.41690
5/30/2008 12:38:38	45518.5	874.5	5.49	4.837	0.374	-0.42721
5/30/2008 12:38:42	45522.0	878.0	5.48	4.828	0.365	-0.43817
5/30/2008 12:38:44	45524.5	880.5	5.48	4.819	0.356	-0.44861
5/30/2008 12:38:47	45527.5	883.5	5.47	4.810	0.347	-0.45972
5/30/2008 12:38:50	45530.5	886.5	5.46	4.801	0.338	-0.47112
5/30/2008 12:38:54	45534.0	890.0	5.45	4.792	0.329	-0.48326
5/30/2008 12:38:57	45537.0	893.0	5.45	4.783	0.320	-0.49531
5/30/2008 12:38:59	45539.5	895.5	5.44	4.774	0.311	-0.50723
5/30/2008 12:39:02	45542.5	898.5	5.43	4.764	0.301	-0.52141
5/30/2008 12:39:06	45546.0	902.0	5.43	4.755	0.292	-0.53507
5/30/2008 12:39:09	45549.0	905.0	5.42	4.746	0.283	-0.54866
5/30/2008 12:39:12	45552.5	908.5	5.41	4.737	0.273	-0.56322
5/30/2008 12:39:15	45555.0	911.0	5.41	4.730	0.267	-0.57392
5/30/2008 12:39:18	45558.0	914.0	5.4	4.722	0.259	-0.58713
5/30/2008 12:39:20	45560.0	916.0	5.4	4.716	0.252	-0.59788
5/30/2008 12:39:22	45562.0	918.0	5.39	4.709	0.246	-0.60890
5/30/2008 12:39:23	45563.5	919.5	5.39	4.703	0.240	-0.61961
5/30/2008 12:39:26	45566.0	922.0	5.38	4.698	0.234	-0.62997
5/30/2008 12:39:27	45567.0	923.0	5.38	4.692	0.229	-0.64058
5/30/2008 12:39:30	45570.0	926.0	5.37	4.683	0.220	-0.65799
5/30/2008 12:39:35	45575.0	931.0	5.36	4.675	0.211	-0.67474
5/30/2008 12:39:37	45577.0	933.0	5.36	4.668	0.205	-0.68793
5/30/2008 12:39:39	45579.0	935.0	5.36	4.663	0.200	-0.69935

Slug Test P-84D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:39:41	45581.0	937.0	5.35	4.657	0.193	-0.71332
5/30/2008 12:39:44	45584.0	940.0	5.35	4.650	0.187	-0.72930
5/30/2008 12:39:45	45585.5	941.5	5.34	4.645	0.182	-0.74109
5/30/2008 12:39:48	45588.0	944.0	5.34	4.638	0.175	-0.75731
5/30/2008 12:39:50	45590.5	946.5	5.33	4.631	0.168	-0.77417
5/30/2008 12:39:53	45593.0	949.0	5.33	4.625	0.162	-0.79171
5/30/2008 12:39:54	45594.5	950.5	5.32	4.620	0.157	-0.80535
5/30/2008 12:39:56	45596.0	952.0	5.32	4.616	0.153	-0.81657
5/30/2008 12:39:58	45598.5	954.5	5.32	4.610	0.147	-0.83298
5/30/2008 12:39:59	45599.5	955.5	5.31	4.606	0.143	-0.84395
5/30/2008 12:40:01	45601.0	957.0	5.31	4.601	0.138	-0.85936
5/30/2008 12:40:02	45602.5	958.5	5.31	4.597	0.134	-0.87210
5/30/2008 12:40:04	45604.5	960.5	5.3	4.594	0.131	-0.88299
5/30/2008 12:40:06	45606.0	962.0	5.3	4.591	0.128	-0.89304
5/30/2008 12:40:07	45607.0	963.0	5.3	4.587	0.124	-0.90566
5/30/2008 12:40:08	45608.5	964.5	5.3	4.584	0.121	-0.91625
5/30/2008 12:40:10	45610.0	966.0	5.29	4.578	0.115	-0.93826
5/30/2008 12:40:11	45611.0	967.0	5.29	4.576	0.113	-0.94841
5/30/2008 12:40:11	45611.5	967.5	5.29	4.572	0.109	-0.96146
5/30/2008 12:40:12	45612.5	968.5	5.28	4.570	0.107	-0.97217
5/30/2008 12:40:15	45615.5	971.5	5.28	4.566	0.103	-0.98873
5/30/2008 12:40:16	45616.5	972.5	5.28	4.562	0.099	-1.00451
5/30/2008 12:40:17	45617.5	973.5	5.28	4.559	0.096	-1.01636
5/30/2008 12:40:18	45618.5	974.5	5.28	4.557	0.094	-1.02853
5/30/2008 12:40:19	45619.0	975.0	5.27	4.553	0.090	-1.04427
5/30/2008 12:40:19	45619.5	975.5	5.27	4.551	0.088	-1.05563
5/30/2008 12:40:21	45621.0	977.0	5.27	4.548	0.085	-1.07066
5/30/2008 12:40:23	45623.0	979.0	5.26	4.542	0.079	-1.10426
5/30/2008 12:40:25	45625.0	981.0	5.26	4.538	0.075	-1.12302
5/30/2008 12:40:27	45627.5	983.5	5.26	4.534	0.071	-1.15073
5/30/2008 12:40:29	45629.0	985.0	5.26	4.531	0.068	-1.16953
5/30/2008 12:40:29	45629.5	985.5	5.25	4.527	0.064	-1.19146
5/30/2008 12:40:31	45631.0	987.0	5.26	4.529	0.066	-1.17813
5/30/2008 12:40:31	45631.5	987.5	5.25	4.522	0.059	-1.22897
5/30/2008 12:40:34	45634.0	990.0	5.25	4.518	0.054	-1.26467
5/30/2008 12:40:34	45634.5	990.5	5.24	4.515	0.052	-1.28370
5/30/2008 12:40:36	45636.0	992.0	5.24	4.512	0.049	-1.30944
5/30/2008 12:40:37	45637.5	993.5	5.24	4.508	0.045	-1.34634
5/30/2008 12:40:38	45638.0	994.0	5.24	4.511	0.048	-1.32134
5/30/2008 12:40:38	45638.5	994.5	5.24	4.506	0.042	-1.37280
5/30/2008 12:40:40	45640.0	996.0	5.24	4.503	0.039	-1.40462
5/30/2008 12:40:41	45641.0	997.0	5.23	4.499	0.036	-1.44701
5/30/2008 12:40:42	45642.5	998.5	5.23	4.496	0.033	-1.48503
5/30/2008 12:40:44	45644.0	1000.0	5.23	4.493	0.030	-1.52669
5/30/2008 12:40:45	45645.0	1001.0	5.23	4.494	0.031	-1.50759
5/30/2008 12:40:45	45645.5	1001.5	5.23	4.492	0.029	-1.54146
5/30/2008 12:40:46	45646.0	1002.0	5.23	4.489	0.025	-1.59496
5/30/2008 12:40:46	45646.5	1002.5	5.22	4.486	0.023	-1.63675
5/30/2008 12:40:47	45647.0	1003.0	5.23	4.488	0.025	-1.60644

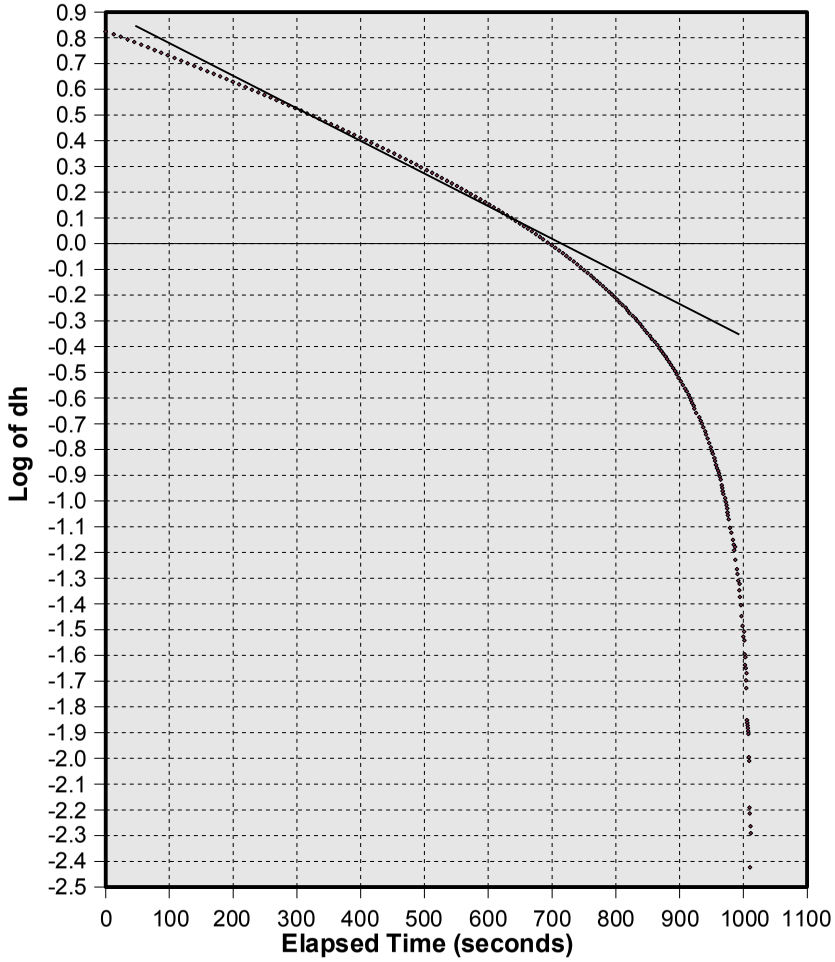
Slug Test P-84D

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 12:40:47	45647.5	1003.5	5.22	4.486	0.022	-1.64941
5/30/2008 12:40:48	45648.0	1004.0	5.22	4.483	0.020	-1.69710
5/30/2008 12:40:48	45648.5	1004.5	5.22	4.482	0.019	-1.72688
5/30/2008 12:40:49	45649.0	1005.0	5.22	4.485	0.021	-1.66911
5/30/2008 12:40:49	45649.5	1005.5	5.22	4.477	0.014	-1.85102
5/30/2008 12:40:50	45650.0	1006.0	5.22	4.477	0.014	-1.86136
5/30/2008 12:40:50	45650.5	1006.5	5.22	4.477	0.013	-1.87195
5/30/2008 12:40:51	45651.0	1007.0	5.22	4.476	0.013	-1.88280
5/30/2008 12:40:51	45651.5	1007.5	5.22	4.476	0.013	-1.89393
5/30/2008 12:40:52	45652.0	1008.0	5.22	4.476	0.012	-1.90536
5/30/2008 12:40:52	45652.5	1008.5	5.21	4.473	0.010	-1.99553
5/30/2008 12:40:53	45653.0	1009.0	5.21	4.473	0.010	-2.01001
5/30/2008 12:40:53	45653.5	1009.5	5.21	4.470	0.006	-2.19107
5/30/2008 12:40:54	45654.0	1010.0	5.21	4.469	0.006	-2.21402
5/30/2008 12:40:54	45654.5	1010.5	5.21	4.467	0.004	-2.42276
5/30/2008 12:40:55	45655.0	1011.0	5.21	4.469	0.005	-2.26390
5/30/2008 12:40:55	45655.5	1011.5	5.21	4.468	0.005	-2.29116

Slug Test P-84D

Slug Test by Bouwer and Rice

Displacement Method:	Injection	
Well depth:	101.52	ft
Stick up height:	2.62	ft
Depth to sand pack (BGS):	95.25	ft
Depth to screened interval (BGS):	96.52	ft
Well diameter:	2.00	in
Diameter of annular space:	6.00	in
Initial depth to water table from top of pipe:	43.68	ft
Initial Head Change:	6.67	ft
Total well length:	104.14	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:	5.00	ft
Length of open section (L_e):	5.00	ft
L_e / r_w:	20.0000	
A (dimensionless):	2.237	
B (dimensionless):	0.367	
Drawdown at time = 0 (y_0):	3.89	ft
Drawdown at time = t (y_t):	1.07	ft
Elapsed Time between y_0 and y_t (t):	442	sec
Initial water column in well (L_w):	60.46	ft
$\ln(R_e/r_w)$ =	2.37	
K =	4.80E-06	ft/sec
	1.46E-04	**cm/sec**
	151.40	ft/yr



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

Slug Test P-85

Initial offset in logger reading (feet):	-0.001	Date:	05/29/2008
Offset increment in logger reading (feet/sec):	-0.000018		
Initial depth to water table (feet):	35.18		
Depth of probe below water table (feet):	5.413		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:31:52	41512.5	0.0	0.73	0.730	4.683	0.67051
5/29/2008 11:31:54	41514.5	2.0	0.84	0.848	4.565	0.65943
5/29/2008 11:31:55	41515.5	3.0	0.94	0.945	4.468	0.65010
5/29/2008 11:31:56	41516.5	4.0	1.09	1.096	4.317	0.63516
5/29/2008 11:31:57	41517.5	5.0	1.21	1.216	4.197	0.62292
5/29/2008 11:31:58	41518.5	6.0	1.31	1.313	4.100	0.61276
5/29/2008 11:31:59	41519.5	7.0	1.39	1.391	4.022	0.60442
5/29/2008 11:32:01	41521.0	8.5	1.48	1.480	3.933	0.59470
5/29/2008 11:32:02	41522.5	10.0	1.56	1.563	3.850	0.58543
5/29/2008 11:32:04	41524.0	11.5	1.65	1.657	3.756	0.57469
5/29/2008 11:32:05	41525.5	13.0	1.74	1.749	3.664	0.56392
5/29/2008 11:32:07	41527.0	14.5	1.84	1.844	3.569	0.55250
5/29/2008 11:32:08	41528.0	15.5	1.91	1.910	3.503	0.54439
5/29/2008 11:32:09	41529.0	16.5	1.97	1.976	3.437	0.53613
5/29/2008 11:32:10	41530.0	17.5	2.03	2.039	3.374	0.52809
5/29/2008 11:32:11	41531.5	19.0	2.12	2.129	3.284	0.51635
5/29/2008 11:32:13	41533.0	20.5	2.21	2.216	3.197	0.50468
5/29/2008 11:32:14	41534.0	21.5	2.27	2.278	3.135	0.49617
5/29/2008 11:32:15	41535.0	22.5	2.33	2.338	3.076	0.48792
5/29/2008 11:32:16	41536.0	23.5	2.39	2.399	3.014	0.47921
5/29/2008 11:32:17	41537.5	25.0	2.47	2.479	2.934	0.46753
5/29/2008 11:32:18	41538.5	26.0	2.53	2.536	2.877	0.45901
5/29/2008 11:32:19	41539.5	27.0	2.59	2.597	2.816	0.44970
5/29/2008 11:32:20	41540.5	28.0	2.64	2.649	2.764	0.44160
5/29/2008 11:32:21	41541.5	29.0	2.7	2.705	2.708	0.43271
5/29/2008 11:32:22	41542.5	30.0	2.76	2.762	2.651	0.42347
5/29/2008 11:32:23	41543.5	31.0	2.82	2.821	2.592	0.41369
5/29/2008 11:32:24	41544.5	32.0	2.87	2.880	2.533	0.40369
5/29/2008 11:32:25	41545.5	33.0	2.92	2.929	2.484	0.39521
5/29/2008 11:32:26	41546.5	34.0	2.97	2.979	2.434	0.38638
5/29/2008 11:32:27	41547.5	35.0	3.03	3.035	2.378	0.37626
5/29/2008 11:32:28	41548.5	36.0	3.08	3.083	2.330	0.36741
5/29/2008 11:32:29	41549.5	37.0	3.12	3.130	2.283	0.35855
5/29/2008 11:32:30	41550.5	38.0	3.18	3.182	2.231	0.34855
5/29/2008 11:32:31	41551.5	39.0	3.23	3.231	2.182	0.33890
5/29/2008 11:32:32	41552.5	40.0	3.28	3.281	2.132	0.32883
5/29/2008 11:32:33	41553.5	41.0	3.33	3.335	2.078	0.31768
5/29/2008 11:32:34	41554.5	42.0	3.38	3.384	2.029	0.30732
5/29/2008 11:32:35	41555.5	43.0	3.43	3.431	1.982	0.29714
5/29/2008 11:32:36	41556.5	44.0	3.48	3.481	1.932	0.28604
5/29/2008 11:32:37	41557.5	45.0	3.51	3.519	1.894	0.27741
5/29/2008 11:32:38	41558.5	46.0	3.55	3.556	1.857	0.26883
5/29/2008 11:32:39	41559.5	47.0	3.59	3.594	1.819	0.25985
5/29/2008 11:32:40	41560.5	48.0	3.62	3.629	1.784	0.25141

Slug Test P-85

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:32:41	41561.5	49.0	3.66	3.667	1.746	0.24205
5/29/2008 11:32:42	41562.5	50.0	3.7	3.709	1.704	0.23148
5/29/2008 11:32:43	41563.5	51.0	3.74	3.742	1.671	0.22298
5/29/2008 11:32:44	41564.5	52.0	3.77	3.773	1.640	0.21484
5/29/2008 11:32:46	41566.0	53.5	3.8	3.808	1.605	0.20547
5/29/2008 11:32:48	41568.5	56.0	3.84	3.844	1.569	0.19560
5/29/2008 11:32:51	41571.0	58.5	3.87	3.879	1.534	0.18579
5/29/2008 11:32:53	41573.0	60.5	3.9	3.907	1.506	0.17778
5/29/2008 11:32:57	41577.5	65.0	3.93	3.935	1.478	0.16960
5/29/2008 11:33:01	41581.0	68.5	3.96	3.964	1.449	0.16098
5/29/2008 11:33:05	41585.0	72.5	3.99	3.994	1.419	0.15187
5/29/2008 11:33:08	41588.5	76.0	4.01	4.020	1.393	0.14382
5/29/2008 11:33:12	41592.0	79.5	4.04	4.047	1.367	0.13561
5/29/2008 11:33:15	41595.0	82.5	4.07	4.073	1.340	0.12725
5/29/2008 11:33:17	41597.5	85.0	4.09	4.099	1.314	0.11873
5/29/2008 11:33:19	41599.0	86.5	4.13	4.134	1.279	0.10700
5/29/2008 11:33:20	41600.0	87.5	4.16	4.162	1.251	0.09739
5/29/2008 11:33:21	41601.0	88.5	4.19	4.193	1.220	0.08648
5/29/2008 11:33:22	41602.0	89.5	4.22	4.226	1.187	0.07457
5/29/2008 11:33:23	41603.0	90.5	4.25	4.252	1.161	0.06495
5/29/2008 11:33:25	41605.0	92.5	4.27	4.276	1.137	0.05587
5/29/2008 11:33:30	41610.5	98.0	4.29	4.297	1.116	0.04774
5/29/2008 11:33:35	41615.5	103.0	4.31	4.318	1.095	0.03945
5/29/2008 11:33:40	41620.0	107.5	4.33	4.339	1.074	0.03101
5/29/2008 11:33:44	41624.5	112.0	4.35	4.360	1.053	0.02240
5/29/2008 11:33:49	41629.0	116.5	4.37	4.381	1.032	0.01362
5/29/2008 11:33:54	41634.0	121.5	4.39	4.400	1.013	0.00551
5/29/2008 11:33:57	41637.5	125.0	4.41	4.419	0.994	-0.00274
5/29/2008 11:34:02	41642.0	129.5	4.43	4.440	0.973	-0.01205
5/29/2008 11:34:07	41647.5	135.0	4.45	4.459	0.954	-0.02066
5/29/2008 11:34:11	41651.5	139.0	4.47	4.479	0.934	-0.02944
5/29/2008 11:34:16	41656.5	144.0	4.49	4.498	0.915	-0.03840
5/29/2008 11:34:21	41661.0	148.5	4.51	4.516	0.897	-0.04706
5/29/2008 11:34:25	41665.5	153.0	4.53	4.533	0.880	-0.05541
5/29/2008 11:34:29	41669.5	157.0	4.54	4.549	0.864	-0.06341
5/29/2008 11:34:34	41674.0	161.5	4.56	4.566	0.847	-0.07208
5/29/2008 11:34:39	41679.0	166.5	4.57	4.582	0.831	-0.08041
5/29/2008 11:34:43	41683.5	171.0	4.59	4.599	0.814	-0.08943
5/29/2008 11:34:49	41689.0	176.5	4.61	4.615	0.798	-0.09810
5/29/2008 11:34:53	41693.5	181.0	4.62	4.631	0.782	-0.10694
5/29/2008 11:34:58	41698.0	185.5	4.64	4.646	0.767	-0.11540
5/29/2008 11:35:02	41702.0	189.5	4.65	4.660	0.753	-0.12345
5/29/2008 11:35:06	41706.5	194.0	4.67	4.675	0.739	-0.13165
5/29/2008 11:35:12	41712.0	199.5	4.68	4.689	0.724	-0.14002
5/29/2008 11:35:17	41717.0	204.5	4.69	4.703	0.710	-0.14855
5/29/2008 11:35:21	41721.5	209.0	4.71	4.717	0.696	-0.15724
5/29/2008 11:35:27	41727.0	214.5	4.72	4.731	0.682	-0.16612
5/29/2008 11:35:32	41732.5	220.0	4.74	4.746	0.667	-0.17584
5/29/2008 11:35:38	41738.0	225.5	4.75	4.762	0.651	-0.18645

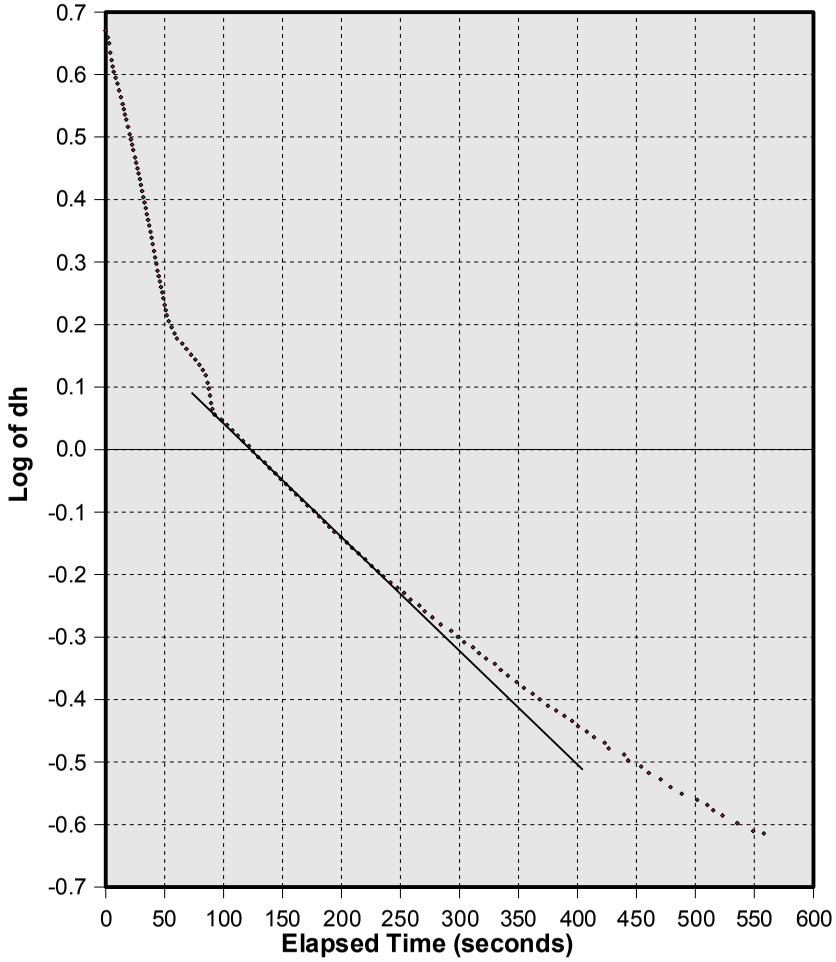
Slug Test P-85

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/29/2008 11:35:43	41743.5	231.0	4.77	4.774	0.639	-0.19460
5/29/2008 11:35:48	41748.0	235.5	4.78	4.786	0.627	-0.20289
5/29/2008 11:35:54	41754.0	241.5	4.79	4.800	0.613	-0.21277
5/29/2008 11:36:00	41760.0	247.5	4.8	4.812	0.601	-0.22144
5/29/2008 11:36:05	41765.5	253.0	4.81	4.824	0.589	-0.22954
5/29/2008 11:36:11	41771.0	258.5	4.83	4.838	0.575	-0.24005
5/29/2008 11:36:18	41778.5	266.0	4.84	4.850	0.563	-0.24930
5/29/2008 11:36:23	41783.0	270.5	4.85	4.862	0.551	-0.25872
5/29/2008 11:36:29	41789.5	277.0	4.86	4.874	0.539	-0.26837
5/29/2008 11:36:36	41796.5	284.0	4.88	4.888	0.525	-0.27990
5/29/2008 11:36:45	41805.5	293.0	4.89	4.900	0.513	-0.29008
5/29/2008 11:36:51	41811.0	298.5	4.9	4.911	0.502	-0.29958
5/29/2008 11:36:56	41816.5	304.0	4.91	4.921	0.492	-0.30841
5/29/2008 11:37:04	41824.0	311.5	4.92	4.931	0.482	-0.31655
5/29/2008 11:37:09	41829.0	316.5	4.93	4.941	0.472	-0.32573
5/29/2008 11:37:15	41835.0	322.5	4.94	4.950	0.463	-0.33418
5/29/2008 11:37:22	41842.5	330.0	4.95	4.959	0.454	-0.34283
5/29/2008 11:37:27	41847.5	335.0	4.96	4.969	0.444	-0.35258
5/29/2008 11:37:33	41853.5	341.0	4.97	4.978	0.435	-0.36158
5/29/2008 11:37:41	41861.0	348.5	4.98	4.988	0.425	-0.37182
5/29/2008 11:37:47	41867.0	354.5	4.99	4.997	0.416	-0.38123
5/29/2008 11:37:54	41874.5	362.0	5	5.006	0.407	-0.39087
5/29/2008 11:38:00	41880.5	368.0	5	5.015	0.398	-0.39962
5/29/2008 11:38:07	41887.5	375.0	5.01	5.024	0.389	-0.40968
5/29/2008 11:38:14	41894.5	382.0	5.02	5.031	0.382	-0.41770
5/29/2008 11:38:21	41901.5	389.0	5.03	5.038	0.375	-0.42586
5/29/2008 11:38:28	41908.0	395.5	5.03	5.045	0.368	-0.43418
5/29/2008 11:38:33	41913.0	400.5	5.04	5.052	0.361	-0.44263
5/29/2008 11:38:40	41920.5	408.0	5.05	5.059	0.354	-0.45129
5/29/2008 11:38:46	41926.5	414.0	5.05	5.066	0.347	-0.46011
5/29/2008 11:38:55	41935.5	423.0	5.06	5.074	0.339	-0.46917
5/29/2008 11:38:59	41939.0	426.5	5.07	5.081	0.332	-0.47830
5/29/2008 11:39:12	41952.0	439.5	5.08	5.088	0.325	-0.48784
5/29/2008 11:39:15	41955.5	443.0	5.08	5.095	0.318	-0.49738
5/29/2008 11:39:26	41966.5	454.0	5.09	5.102	0.311	-0.50731
5/29/2008 11:39:33	41973.0	460.5	5.1	5.109	0.304	-0.51736
5/29/2008 11:39:43	41983.0	470.5	5.1	5.116	0.297	-0.52774
5/29/2008 11:39:51	41991.5	479.0	5.11	5.125	0.289	-0.53983
5/29/2008 11:40:01	42001.0	488.5	5.12	5.132	0.281	-0.55076
5/29/2008 11:40:14	42014.0	501.5	5.12	5.138	0.275	-0.56048
5/29/2008 11:40:22	42022.5	510.0	5.13	5.143	0.270	-0.56868
5/29/2008 11:40:27	42027.5	515.0	5.13	5.148	0.265	-0.57694
5/29/2008 11:40:35	42035.5	523.0	5.14	5.153	0.260	-0.58545
5/29/2008 11:40:48	42048.0	535.5	5.15	5.160	0.253	-0.59770
5/29/2008 11:41:01	42061.5	549.0	5.15	5.168	0.245	-0.61032
5/29/2008 11:41:10	42070.5	558.0	5.16	5.170	0.243	-0.61416

Slug Test P-85

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	38.86	ft
Stick up height:	3.15	ft
Depth to sand pack (BGS):	22.12	ft
Depth to screened interval (BGS):	23.86	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	35.18	ft
Initial Head Change:	4.68	ft
Total well length:	42.01	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	6.83	ft
L_e / r_w:	21.1510	
A (dimensionless):	2.274	
B (dimensionless):	0.374	
Drawdown at time = 0 (y_0):	1.16	ft
Drawdown at time = t (y_t):	0.55	ft
Elapsed Time between y_0 and y_t (t):	179.5	sec
Initial water column in well (L_w):	6.83	ft
$\ln(R_e/r_w)$ =	1.74	
K =	1.90E-05	ft/sec
	5.81E-04	**cm/sec**
	600.63	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

Slug Test P-86

Initial offset in logger reading (feet):	-0.055	Date:	05/30/2008
Offset increment in logger reading (feet/sec):	0.000026		
Initial depth to water table (feet):	53.2		
Depth of probe below water table (feet):	8.040		

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 9:35:41	34541.5	0.0	2.49	2.518	5.522	0.74209
5/30/2008 9:35:43	34543.0	1.5	2.6	2.626	5.414	0.73351
5/30/2008 9:35:44	34544.0	2.5	2.75	2.773	5.267	0.72156
5/30/2008 9:35:44	34544.5	3.0	2.87	2.893	5.147	0.71155
5/30/2008 9:35:45	34545.0	3.5	2.97	2.994	5.046	0.70295
5/30/2008 9:35:45	34545.5	4.0	3.06	3.091	4.949	0.69452
5/30/2008 9:35:46	34546.5	5.0	3.24	3.270	4.770	0.67852
5/30/2008 9:35:47	34547.5	6.0	3.4	3.423	4.617	0.66437
5/30/2008 9:35:48	34548.5	7.0	3.53	3.555	4.485	0.65177
5/30/2008 9:35:49	34549.5	8.0	3.64	3.666	4.374	0.64089
5/30/2008 9:35:50	34550.5	9.0	3.73	3.753	4.287	0.63217
5/30/2008 9:35:52	34552.0	10.5	3.83	3.854	4.186	0.62182
5/30/2008 9:35:54	34554.0	12.5	3.92	3.944	4.096	0.61238
5/30/2008 9:35:56	34556.0	14.5	3.99	4.022	4.018	0.60404
5/30/2008 9:35:58	34558.0	16.5	4.07	4.099	3.941	0.59564
5/30/2008 9:36:00	34560.0	18.5	4.15	4.180	3.860	0.58663
5/30/2008 9:36:02	34562.0	20.5	4.23	4.260	3.780	0.57754
5/30/2008 9:36:04	34564.0	22.5	4.32	4.345	3.695	0.56767
5/30/2008 9:36:05	34565.5	24.0	4.39	4.413	3.628	0.55961
5/30/2008 9:36:07	34567.5	26.0	4.47	4.498	3.543	0.54932
5/30/2008 9:36:09	34569.5	28.0	4.54	4.571	3.470	0.54028
5/30/2008 9:36:12	34572.0	30.5	4.61	4.637	3.404	0.53195
5/30/2008 9:36:15	34575.0	33.5	4.68	4.705	3.336	0.52320
5/30/2008 9:36:19	34579.0	37.5	4.74	4.768	3.272	0.51480
5/30/2008 9:36:22	34582.0	40.5	4.8	4.829	3.211	0.50664
5/30/2008 9:36:27	34587.0	45.5	4.87	4.892	3.148	0.49805
5/30/2008 9:36:31	34591.5	50.0	4.93	4.954	3.086	0.48943
5/30/2008 9:36:35	34595.0	53.5	4.99	5.012	3.028	0.48120
5/30/2008 9:36:39	34599.5	58.0	5.04	5.071	2.969	0.47267
5/30/2008 9:36:42	34602.5	61.0	5.11	5.132	2.909	0.46367
5/30/2008 9:36:45	34605.5	64.0	5.17	5.194	2.847	0.45432
5/30/2008 9:36:54	34614.5	73.0	5.22	5.250	2.791	0.44573
5/30/2008 9:36:56	34616.0	74.5	5.28	5.301	2.739	0.43757
5/30/2008 9:36:57	34617.5	76.0	5.33	5.357	2.683	0.42860
5/30/2008 9:37:06	34626.0	84.5	5.39	5.411	2.629	0.41981
5/30/2008 9:37:11	34631.5	90.0	5.43	5.460	2.580	0.41166
5/30/2008 9:37:17	34637.5	96.0	5.48	5.510	2.530	0.40319
5/30/2008 9:37:22	34642.5	101.0	5.53	5.557	2.484	0.39507
5/30/2008 9:37:28	34648.0	106.5	5.58	5.604	2.437	0.38680
5/30/2008 9:37:33	34653.5	112.0	5.63	5.650	2.390	0.37837
5/30/2008 9:37:39	34659.5	118.0	5.67	5.694	2.346	0.37033
5/30/2008 9:37:45	34665.5	124.0	5.71	5.739	2.301	0.36195
5/30/2008 9:37:52	34672.0	130.5	5.76	5.786	2.254	0.35302
5/30/2008 9:37:58	34678.5	137.0	5.81	5.831	2.209	0.34429

Slug Test P-86

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 9:38:04	34684.0	142.5	5.85	5.873	2.168	0.33599
5/30/2008 9:38:09	34689.0	147.5	5.89	5.915	2.126	0.32752
5/30/2008 9:38:14	34694.0	152.5	5.93	5.954	2.086	0.31929
5/30/2008 9:38:18	34698.5	157.0	5.97	5.994	2.046	0.31091
5/30/2008 9:38:22	34702.5	161.0	6.01	6.032	2.008	0.30279
5/30/2008 9:38:27	34707.0	165.5	6.05	6.070	1.970	0.29452
5/30/2008 9:38:31	34711.0	169.5	6.08	6.107	1.933	0.28631
5/30/2008 9:38:35	34715.0	173.5	6.12	6.145	1.895	0.27771
5/30/2008 9:38:38	34718.5	177.0	6.16	6.183	1.858	0.26894
5/30/2008 9:38:42	34722.5	181.0	6.2	6.220	1.821	0.26023
5/30/2008 9:38:47	34727.5	186.0	6.23	6.256	1.785	0.25159
5/30/2008 9:38:52	34732.0	190.5	6.27	6.288	1.752	0.24351
5/30/2008 9:38:58	34738.0	196.5	6.3	6.321	1.719	0.23529
5/30/2008 9:39:04	34744.5	203.0	6.33	6.354	1.686	0.22692
5/30/2008 9:39:11	34751.0	209.5	6.36	6.387	1.653	0.21838
5/30/2008 9:39:17	34757.5	216.0	6.4	6.422	1.619	0.20913
5/30/2008 9:39:22	34762.0	220.5	6.43	6.453	1.588	0.20077
5/30/2008 9:39:26	34766.0	224.5	6.46	6.483	1.558	0.19251
5/30/2008 9:39:30	34770.0	228.5	6.49	6.511	1.529	0.18438
5/30/2008 9:39:36	34776.0	234.5	6.52	6.541	1.499	0.17582
5/30/2008 9:39:42	34782.0	240.5	6.55	6.569	1.471	0.16768
5/30/2008 9:39:47	34787.0	245.5	6.58	6.598	1.442	0.15907
5/30/2008 9:39:51	34791.0	249.5	6.6	6.626	1.414	0.15059
5/30/2008 9:39:54	34794.0	252.5	6.64	6.657	1.384	0.14099
5/30/2008 9:39:56	34796.5	255.0	6.67	6.687	1.354	0.13149
5/30/2008 9:40:00	34800.0	258.5	6.69	6.713	1.328	0.12310
5/30/2008 9:40:05	34805.0	263.5	6.72	6.741	1.300	0.11388
5/30/2008 9:40:10	34810.0	268.5	6.74	6.764	1.276	0.10583
5/30/2008 9:40:14	34814.5	273.0	6.77	6.790	1.250	0.09693
5/30/2008 9:40:18	34818.5	277.0	6.8	6.821	1.219	0.08607
5/30/2008 9:40:21	34821.0	279.5	6.82	6.844	1.196	0.07782
5/30/2008 9:40:23	34823.0	281.5	6.85	6.868	1.172	0.06904
5/30/2008 9:40:25	34825.5	284.0	6.87	6.891	1.149	0.06046
5/30/2008 9:40:28	34828.0	286.5	6.9	6.920	1.120	0.04938
5/30/2008 9:40:30	34830.5	289.0	6.92	6.941	1.099	0.04119
5/30/2008 9:40:34	34834.0	292.5	6.94	6.962	1.079	0.03285
5/30/2008 9:40:38	34838.0	296.5	6.96	6.983	1.058	0.02436
5/30/2008 9:40:42	34842.5	301.0	6.98	7.004	1.037	0.01570
5/30/2008 9:40:46	34846.5	305.0	7.01	7.027	1.013	0.00557
5/30/2008 9:40:49	34849.0	307.5	7.03	7.048	0.992	-0.00350
5/30/2008 9:40:51	34851.5	310.0	7.05	7.069	0.971	-0.01276
5/30/2008 9:40:54	34854.0	312.5	7.07	7.088	0.952	-0.02131
5/30/2008 9:40:56	34856.5	315.0	7.09	7.109	0.931	-0.03097
5/30/2008 9:40:59	34859.5	318.0	7.11	7.128	0.912	-0.03989
5/30/2008 9:41:02	34862.5	321.0	7.13	7.145	0.895	-0.04802
5/30/2008 9:41:06	34866.0	324.5	7.14	7.164	0.876	-0.05729
5/30/2008 9:41:10	34870.0	328.5	7.16	7.183	0.858	-0.06675
5/30/2008 9:41:13	34873.0	331.5	7.18	7.199	0.842	-0.07489
5/30/2008 9:41:16	34876.5	335.0	7.2	7.218	0.823	-0.08476

Slug Test P-86

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 9:41:20	34880.5	339.0	7.21	7.234	0.807	-0.09323
5/30/2008 9:41:25	34885.0	343.5	7.23	7.248	0.792	-0.10132
5/30/2008 9:41:29	34889.0	347.5	7.25	7.264	0.776	-0.11012
5/30/2008 9:41:34	34894.0	352.5	7.26	7.280	0.760	-0.11910
5/30/2008 9:41:37	34897.5	356.0	7.28	7.295	0.745	-0.12770
5/30/2008 9:41:40	34900.0	358.5	7.29	7.309	0.731	-0.13590
5/30/2008 9:41:44	34904.0	362.5	7.3	7.323	0.717	-0.14423
5/30/2008 9:41:48	34908.0	366.5	7.32	7.339	0.702	-0.15396
5/30/2008 9:41:54	34914.0	372.5	7.34	7.354	0.687	-0.16324
5/30/2008 9:42:00	34920.0	378.5	7.35	7.367	0.673	-0.17209
5/30/2008 9:42:06	34926.0	384.5	7.36	7.381	0.659	-0.18112
5/30/2008 9:42:12	34932.5	391.0	7.38	7.395	0.645	-0.19033
5/30/2008 9:42:17	34937.5	396.0	7.39	7.407	0.633	-0.19839
5/30/2008 9:42:23	34943.0	401.5	7.4	7.421	0.619	-0.20800
5/30/2008 9:42:29	34949.5	408.0	7.42	7.433	0.608	-0.21637
5/30/2008 9:42:35	34955.0	413.5	7.43	7.447	0.594	-0.22639
5/30/2008 9:42:39	34959.5	418.0	7.44	7.458	0.582	-0.23517
5/30/2008 9:42:43	34963.5	422.0	7.45	7.469	0.571	-0.24338
5/30/2008 9:42:46	34966.5	425.0	7.46	7.481	0.559	-0.25254
5/30/2008 9:42:50	34970.5	429.0	7.48	7.495	0.545	-0.26347
5/30/2008 9:42:54	34974.0	432.5	7.49	7.507	0.533	-0.27306
5/30/2008 9:42:57	34977.0	435.5	7.5	7.519	0.521	-0.28288
5/30/2008 9:43:00	34980.5	439.0	7.51	7.531	0.509	-0.29292
5/30/2008 9:43:04	34984.0	442.5	7.53	7.543	0.498	-0.30319
5/30/2008 9:43:07	34987.5	446.0	7.54	7.554	0.487	-0.31282
5/30/2008 9:43:11	34991.0	449.5	7.55	7.564	0.477	-0.32175
5/30/2008 9:43:14	34994.5	453.0	7.56	7.573	0.468	-0.32994
5/30/2008 9:43:19	34999.0	457.5	7.57	7.582	0.458	-0.33922
5/30/2008 9:43:24	35004.0	462.5	7.58	7.591	0.449	-0.34771
5/30/2008 9:43:30	35010.0	468.5	7.58	7.600	0.440	-0.35635
5/30/2008 9:43:33	35013.5	472.0	7.59	7.610	0.430	-0.36623
5/30/2008 9:43:39	35019.0	477.5	7.6	7.619	0.421	-0.37526
5/30/2008 9:43:41	35021.5	480.0	7.61	7.629	0.412	-0.38562
5/30/2008 9:43:45	35025.0	483.5	7.62	7.638	0.403	-0.39513
5/30/2008 9:43:48	35028.5	487.0	7.63	7.648	0.393	-0.40595
5/30/2008 9:43:52	35032.0	490.5	7.64	7.657	0.384	-0.41592
5/30/2008 9:43:56	35036.5	495.0	7.65	7.668	0.372	-0.42957
5/30/2008 9:43:59	35039.5	498.0	7.66	7.675	0.365	-0.43773
5/30/2008 9:44:01	35041.0	499.5	7.67	7.682	0.358	-0.44610
5/30/2008 9:44:04	35044.5	503.0	7.67	7.689	0.351	-0.45456
5/30/2008 9:44:07	35047.5	506.0	7.68	7.696	0.344	-0.46320
5/30/2008 9:44:12	35052.5	511.0	7.69	7.703	0.337	-0.47196
5/30/2008 9:44:15	35055.5	514.0	7.7	7.710	0.330	-0.48096
5/30/2008 9:44:20	35060.5	519.0	7.7	7.717	0.324	-0.49009
5/30/2008 9:44:26	35066.5	525.0	7.71	7.724	0.317	-0.49937
5/30/2008 9:44:32	35072.0	530.5	7.72	7.731	0.310	-0.50887
5/30/2008 9:44:38	35078.0	536.5	7.72	7.737	0.303	-0.51857
5/30/2008 9:44:45	35085.5	544.0	7.73	7.744	0.296	-0.52843
5/30/2008 9:44:55	35095.0	553.5	7.74	7.754	0.286	-0.54297

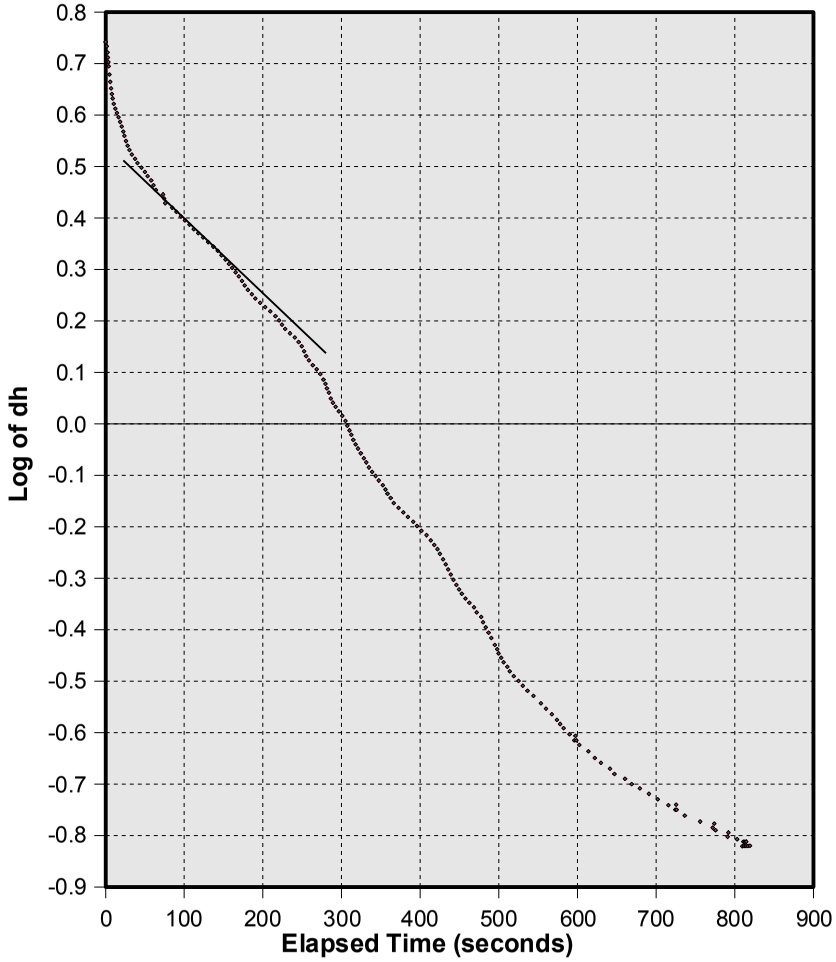
Slug Test P-86

Time	Time (sec)	Elapsed Time (sec)	Logger Reading (ft)	Adjusted Reading (ft)	dh (ft)	Log of dh
5/30/2008 9:45:01	35101.5	560.0	7.75	7.761	0.280	-0.55345
5/30/2008 9:45:09	35109.0	567.5	7.75	7.768	0.273	-0.56415
5/30/2008 9:45:15	35115.5	574.0	7.76	7.774	0.266	-0.57516
5/30/2008 9:45:19	35119.5	578.0	7.77	7.779	0.261	-0.58323
5/30/2008 9:45:24	35124.0	582.5	7.77	7.784	0.256	-0.59142
5/30/2008 9:45:31	35131.5	590.0	7.78	7.791	0.249	-0.60311
5/30/2008 9:45:37	35137.5	596.0	7.79	7.798	0.243	-0.61519
5/30/2008 9:45:39	35139.0	597.5	7.78	7.793	0.248	-0.60626
5/30/2008 9:45:40	35140.0	598.5	7.79	7.798	0.243	-0.61508
5/30/2008 9:45:44	35144.0	602.5	7.79	7.803	0.238	-0.62393
5/30/2008 9:45:55	35155.5	614.0	7.8	7.809	0.231	-0.63634
5/30/2008 9:46:03	35163.5	622.0	7.8	7.816	0.224	-0.64930
5/30/2008 9:46:11	35171.5	630.0	7.81	7.821	0.219	-0.65867
5/30/2008 9:46:23	35183.0	641.5	7.82	7.827	0.214	-0.67010
5/30/2008 9:46:28	35188.5	647.0	7.82	7.831	0.209	-0.68008
5/30/2008 9:46:42	35202.0	660.5	7.83	7.836	0.204	-0.68985
5/30/2008 9:46:50	35210.5	669.0	7.83	7.841	0.199	-0.70012
5/30/2008 9:47:01	35221.0	679.5	7.83	7.845	0.196	-0.70831
5/30/2008 9:47:12	35232.5	691.0	7.84	7.849	0.191	-0.71886
5/30/2008 9:47:23	35243.5	702.0	7.84	7.854	0.186	-0.72970
5/30/2008 9:47:37	35257.0	715.5	7.85	7.859	0.182	-0.74067
5/30/2008 9:47:46	35266.0	724.5	7.85	7.862	0.178	-0.74976
5/30/2008 9:47:47	35267.0	725.5	7.85	7.858	0.182	-0.74004
5/30/2008 9:47:47	35267.5	726.0	7.85	7.862	0.178	-0.74966
5/30/2008 9:47:58	35278.0	736.5	7.86	7.867	0.173	-0.76135
5/30/2008 9:48:17	35297.5	756.0	7.86	7.872	0.169	-0.77274
5/30/2008 9:48:33	35313.5	772.0	7.87	7.876	0.164	-0.78469
5/30/2008 9:48:35	35315.5	774.0	7.87	7.873	0.167	-0.77669
5/30/2008 9:48:37	35317.0	775.5	7.87	7.878	0.162	-0.78977
5/30/2008 9:48:52	35332.5	791.0	7.88	7.883	0.158	-0.80224
5/30/2008 9:48:53	35333.5	792.0	7.87	7.880	0.161	-0.79398
5/30/2008 9:49:04	35344.5	803.0	7.88	7.884	0.156	-0.80691
5/30/2008 9:49:11	35351.0	809.5	7.88	7.889	0.151	-0.82056
5/30/2008 9:49:12	35352.5	811.0	7.88	7.886	0.154	-0.81192
5/30/2008 9:49:13	35353.5	812.0	7.88	7.889	0.151	-0.82038
5/30/2008 9:49:14	35354.0	812.5	7.88	7.886	0.154	-0.81181
5/30/2008 9:49:15	35355.5	814.0	7.88	7.889	0.151	-0.82022
5/30/2008 9:49:16	35356.0	814.5	7.88	7.886	0.154	-0.81166
5/30/2008 9:49:18	35358.0	816.5	7.88	7.889	0.151	-0.82004
5/30/2008 9:49:21	35361.0	819.5	7.88	7.889	0.151	-0.81981

Slug Test P-86

Slug Test by Bouwer and Rice

Displacement Method:	Pump	
Well depth:	61.26	ft
Stick up height:	3.08	ft
Depth to sand pack (BGS):	45.18	ft
Depth to screened interval (BGS):	46.26	ft
Well diameter:	2.00	in
Diameter of annular space:	7.75	in
Initial depth to water table from top of pipe:	53.20	ft
Initial Head Change:	5.52	ft
Total well length:	64.34	ft
Radius of well casing:	0.0833	ft
Assumed porosity of sand/gravel pack:	30%	
Adjusted radius of well casing:	0.1901	ft
r_c:	0.1901	ft
Radius of gravel pack (r_w):	0.3229	ft
Screened interval:	15.00	ft
Length of open section (L_e):	11.14	ft
L_e / r_w:	34.4981	
A (dimensionless):	2.704	
B (dimensionless):	0.451	
Drawdown at time = 0 (y_0):	2.92	ft
Drawdown at time = t (y_t):	2.00	ft
Elapsed Time between y_0 and y_t (t):	102.5	sec
Initial water column in well (L_w):	11.14	ft
$\ln(R_e/r_w)$ =	2.14	
K =	1.28E-05	ft/sec
	3.92E-04	**cm/sec**
	405.17	ft/yr



Water above sand pack:	No
%Duration below sand pack:	100.00%
Water above screen:	No
%Duration below screen:	100.00%

APPENDIX D

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1960	1	31	0	2.69	0.21	0.5	0.04	**6.22**
1960	2	29	0	2.16	0.24	0.53	0.05	**7.22**
1960	3	31	0	1.63	0.19	0.43	0.03	**5.65**
1960	4	30	0	1.3	0.13	0.29	0.02	**4.01**
1960	5	31	0	1.64	0.09	0.3	0.02	**2.68**
1960	6	30	0	2.42	0.19	0.48	0.04	**5.83**
1960	7	31	0	0.62	0.07	0.15	0	**2.19**
1960	8	31	0	1.22	0.08	0.23	0.01	**2.46**
1960	9	30	0	0.78	0.14	0.26	0.01	**4.08**
1960	10	31	0	0.9	0.17	0.27	0.01	**5.21**
1960	11	30	0	0.38	0.03	0.08	0	**1.03**
1960	12	31	0	1.11	0.06	0.21	0.01	**1.85**
1961	1	31	0	0.95	0.1	0.24	0.01	**2.92**
1961	2	28	0	1.38	0.22	0.4	0.03	**6.61**
1961	3	31	0	1.58	0.17	0.38	0.03	**5.22**
1961	4	30	0	1.13	0.15	0.29	0.01	**4.35**
1961	5	31	0	2.48	0.14	0.45	0.04	**4.11**
1961	6	30	0	2.25	0.19	0.43	0.03	**5.61**
1961	7	31	0	1.24	0.15	0.28	0.01	**4.35**
1961	8	31	0	0.96	0.18	0.29	0.01	**5.51**
1961	9	30	0	0.12	0.01	0.03	0	**0.28**
1961	10	31	0	0.33	0.02	0.07	0	**0.75**
1961	11	30	0	1.1	0.09	0.23	0.01	**2.64**
1961	12	31	0	2.05	0.25	0.51	0.05	**7.40**
1962	1	31	0	1.57	0.2	0.44	0.03	**6.02**
1962	2	28	0	1.02	0.15	0.27	0.01	**4.48**
1962	3	31	0	0.82	0.11	0.23	0.01	**3.45**
1962	4	30	0	1.15	0.11	0.24	0.01	**3.16**
1962	5	31	0	0.8	0.06	0.17	0.01	**1.76**
1962	6	30	0	1.45	0.23	0.38	0.03	**6.88**
1962	7	31	0	0.35	0.04	0.09	0	**1.22**
1962	8	31	0	1.36	0.06	0.25	0.01	**1.93**
1962	9	30	0	2.1	0.18	0.47	0.04	**5.51**
1962	10	31	0	0.41	0.04	0.11	0	**1.30**
1962	11	30	0	3.82	0.21	0.71	0.09	**6.31**
1962	12	31	0	1.21	0.11	0.3	0.02	**3.33**
1963	1	31	0	1.03	0.1	0.23	0.01	**2.94**
1963	2	28	0	0.84	0.11	0.23	0.01	**3.18**
1963	3	31	0	1.98	0.24	0.46	0.04	**7.13**
1963	4	30	0	1.74	0.14	0.37	0.03	**4.20**
1963	5	31	0	1.22	0.13	0.28	0.01	**4.00**
1963	6	30	0	0.64	0.1	0.19	0.01	**2.95**
1963	7	31	0	0.59	0.07	0.15	0	**2.23**
1963	8	31	0	0.62	0.08	0.16	0	**2.48**
1963	9	30	0	1.7	0.16	0.42	0.03	**4.82**
1963	10	31	0	0.03	0	0.01	0	**0.03**
1963	11	30	0	1.68	0.12	0.33	0.02	**3.58**
1963	12	31	0	1.3	0.09	0.25	0.01	**2.59**
1964	1	31	0	1.6	0.16	0.34	0.02	**4.85**
1964	2	29	0	1.33	0.13	0.28	0.01	**3.84**
1964	3	31	0	0.7	0.11	0.2	0.01	**3.38**
1964	4	30	0	1.88	0.17	0.39	0.03	**5.24**
1964	5	31	0	0.39	0.04	0.1	0	**1.25**
1964	6	30	0	1.67	0.22	0.43	0.03	**6.58**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1964	7	31	0	1.62	0.17	0.33	0.02	**5.14**
1964	8	31	0	1.74	0.19	0.43	0.03	**5.72**
1964	9	30	0	0.85	0.07	0.18	0.01	**1.99**
1964	10	31	0	5.1	0.32	1.09	0.22	**9.47**
1964	11	30	0	2.78	0.11	0.5	0.05	**3.17**
1964	12	31	0	2.04	0.14	0.38	0.03	**4.23**
1965	1	31	0	0.66	0.07	0.16	0	**2.09**
1965	2	28	0	1.18	0.13	0.3	0.02	**3.95**
1965	3	31	0	2.39	0.2	0.47	0.04	**5.90**
1965	4	30	0	0.84	0.11	0.22	0.01	**3.26**
1965	5	31	0	0.6	0.04	0.12	0	**1.29**
1965	6	30	0	1.54	0.18	0.41	0.03	**5.54**
1965	7	31	0	1.75	0.16	0.4	0.03	**4.93**
1965	8	31	0	1.51	0.15	0.33	0.02	**4.44**
1965	9	30	0	0.47	0.04	0.11	0	**1.23**
1965	10	31	0	2.36	0.14	0.46	0.04	**4.11**
1965	11	30	0	0.47	0.05	0.11	0	**1.61**
1965	12	31	0	0.28	0.01	0.05	0	**0.34**
1966	1	30	0	0.83	0.08	0.17	0.01	**2.42**
1966	2	28	0	2.28	0.25	0.54	0.06	**7.59**
1966	3	31	0	1.47	0.06	0.26	0.01	**1.84**
1966	4	30	0	0.54	0.05	0.11	0	**1.40**
1966	5	31	0	1.51	0.1	0.28	0.01	**3.11**
1966	6	30	0	1.27	0.1	0.31	0.02	**2.89**
1966	7	31	0	1.7	0.1	0.33	0.02	**3.08**
1966	8	31	0	2.16	0.14	0.47	0.04	**4.28**
1966	9	30	0	2.65	0.16	0.52	0.05	**4.77**
1966	10	31	0	1.26	0.09	0.27	0.01	**2.83**
1966	11	30	0	0.62	0.05	0.14	0	**1.52**
1966	12	31	0	0.54	0.08	0.16	0	**2.39**
1967	1	31	0	0.98	0.07	0.2	0.01	**2.09**
1967	2	28	0	1.21	0.13	0.3	0.02	**3.88**
1967	3	31	0	0.79	0.1	0.21	0.01	**2.97**
1967	4	30	0	0.91	0.05	0.18	0.01	**1.54**
1967	5	31	0	1.26	0.19	0.31	0.02	**5.68**
1967	6	30	0	1.1	0.08	0.22	0.01	**2.47**
1967	7	31	0	0.82	0.09	0.19	0.01	**2.66**
1967	8	31	0	1.33	0.2	0.37	0.02	**5.98**
1967	9	30	0	1.06	0.09	0.27	0.01	**2.80**
1967	10	31	0	0.88	0.06	0.18	0.01	**1.83**
1967	11	30	0	0.77	0.07	0.18	0.01	**2.18**
1967	12	31	0	1.66	0.24	0.47	0.04	**7.17**
1968	1	31	0	1.47	0.13	0.32	0.02	**4.01**
1968	2	29	0	0.41	0.02	0.08	0	**0.66**
1968	3	31	0	2.65	0.15	0.48	0.04	**4.40**
1968	4	30	0	0.66	0.11	0.2	0.01	**3.39**
1968	5	31	0	2.13	0.19	0.5	0.04	**5.83**
1968	6	30	0	1	0.09	0.22	0.01	**2.70**
1968	7	31	0	1.14	0.17	0.36	0.02	**4.98**
1968	8	31	0	0.97	0.09	0.21	0.01	**2.76**
1968	9	30	0	0.39	0.02	0.08	0	**0.68**
1968	10	31	0	1.68	0.13	0.34	0.02	**4.00**
1968	11	30	0	2.3	0.2	0.53	0.05	**5.88**
1968	12	31	0	0.6	0.09	0.17	0.01	**2.83**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1969	1	31	0	0.93	0.08	0.23	0.01	**2.40**
1969	2	28	0	1.19	0.16	0.31	0.02	**4.66**
1969	3	31	0	1.31	0.17	0.35	0.02	**4.96**
1969	4	30	0	0.93	0.12	0.24	0.01	**3.63**
1969	5	31	0	1.47	0.07	0.26	0.01	**2.19**
1969	6	30	0	1.34	0.15	0.29	0.02	**4.46**
1969	7	31	0	1	0.13	0.26	0.01	**4.00**
1969	8	31	0	0.62	0.1	0.16	0	**2.93**
1969	9	30	0	1.61	0.26	0.45	0.04	**7.91**
1969	10	31	0	1.35	0.08	0.29	0.01	**2.48**
1969	11	30	0	0.76	0.05	0.17	0.01	**1.64**
1969	12	31	0	1.87	0.14	0.41	0.03	**4.16**
1970	1	31	0	0.73	0.07	0.15	0	**2.00**
1970	2	28	0	1.16	0.13	0.3	0.02	**3.96**
1970	3	30	0	0.65	0.09	0.17	0	**2.77**
1970	4	30	0	1.17	0.14	0.32	0.02	**4.06**
1970	5	31	0	1.45	0.09	0.29	0.01	**2.75**
1970	6	30	0	0.85	0.11	0.21	0.01	**3.18**
1970	7	31	0	0.51	0.07	0.13	0	**2.06**
1970	8	31	0	6.39	0.35	1.15	0.24	**10.41**
1970	9	30	0	0.19	0.02	0.04	0	**0.47**
1970	10	31	0	2.35	0.16	0.44	0.03	**4.69**
1970	11	28	0	0.52	0.05	0.12	0	**1.41**
1970	12	31	0	0.73	0.06	0.17	0	**1.87**
1971	1	31	0	1.26	0.08	0.23	0.01	**2.31**
1971	2	28	0	1.19	0.17	0.34	0.02	**4.98**
1971	3	31	0	0.44	0.06	0.13	0	**1.76**
1971	4	30	0	1.31	0.09	0.26	0.01	**2.70**
1971	5	31	0	1.22	0.13	0.29	0.02	**4.00**
1971	6	29	0	1.8	0.12	0.34	0.02	**3.57**
1971	7	31	0	1.16	0.19	0.33	0.02	**5.72**
1971	8	31	0	0.73	0.07	0.16	0	**2.25**
1971	9	30	0	2.03	0.27	0.57	0.06	**8.19**
1971	10	31	0	1.51	0.2	0.39	0.03	**6.00**
1971	11	30	0	1.22	0.08	0.25	0.01	**2.36**
1971	12	31	0	1.22	0.09	0.26	0.01	**2.55**
1972	1	31	0	0.78	0.1	0.21	0.01	**3.02**
1972	2	28	0	0.45	0.09	0.15	0	**2.63**
1972	3	31	0	0.75	0.13	0.22	0.01	**3.88**
1972	4	30	0	0.67	0.07	0.15	0	**2.07**
1972	5	31	0	2.13	0.26	0.47	0.04	**7.88**
1972	6	30	0	7.68	0.34	1.41	0.36	**10.22**
1972	7	31	0	0.82	0.06	0.16	0	**1.73**
1972	9	30	0	1.46	0.06	0.27	0.01	**1.88**
1972	10	31	0	1.08	0.06	0.2	0.01	**1.90**
1972	11	30	0	1.41	0.16	0.37	0.02	**4.82**
1972	12	31	0	2.46	0.2	0.48	0.04	**6.01**
1973	1	31	0	1.11	0.12	0.23	0.01	**3.49**
1973	2	28	0	2.39	0.15	0.47	0.04	**4.53**
1973	3	31	0	1.89	0.25	0.39	0.03	**7.58**
1973	4	30	0	2.3	0.17	0.46	0.04	**5.08**
1973	5	31	0	2.6	0.18	0.53	0.05	**5.53**
1973	6	30	0	2.93	0.24	0.68	0.08	**7.29**
1973	7	31	0	1.96	0.1	0.36	0.02	**2.99**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1973	8	31	0	0.89	0.13	0.24	0.01	**4.02**
1973	9	30	0	1.28	0.06	0.24	0.01	**1.75**
1973	10	31	0	0.65	0.05	0.15	0	**1.64**
1973	11	30	0	0.81	0.05	0.16	0	**1.55**
1973	12	31	0	1.33	0.23	0.37	0.02	**7.02**
1974	1	31	0	2.16	0.17	0.4	0.03	**5.12**
1974	2	28	0	0.74	0.12	0.22	0.01	**3.57**
1974	3	31	0	1.96	0.15	0.38	0.03	**4.58**
1974	4	30	0	1.15	0.09	0.23	0.01	**2.66**
1974	5	31	0	1.4	0.2	0.39	0.03	**5.87**
1974	6	30	0	0.65	0.11	0.19	0.01	**3.17**
1974	7	31	0	0.74	0.05	0.14	0	**1.38**
1974	8	31	0	2.39	0.23	0.5	0.05	**6.92**
1974	9	30	0	2.04	0.14	0.4	0.03	**4.10**
1974	10	31	0	0.6	0.03	0.11	0	**0.85**
1974	11	30	0	1.04	0.11	0.26	0.01	**3.40**
1974	12	31	0	1.46	0.14	0.3	0.02	**4.16**
1975	1	31	0	1.02	0.15	0.3	0.02	**4.39**
1975	2	28	0	1.33	0.15	0.28	0.01	**4.61**
1975	3	31	0	2	0.28	0.53	0.05	**8.28**
1975	4	30	0	0.46	0.06	0.13	0	**1.66**
1975	5	31	0	1.6	0.21	0.35	0.02	**6.37**
1975	6	30	0	0.88	0.13	0.25	0.01	**3.89**
1975	7	31	0	1.71	0.23	0.44	0.03	**7.03**
1975	8	31	0	0.66	0.05	0.15	0	**1.57**
1975	9	30	0	0.85	0.14	0.26	0.01	**4.18**
1975	10	31	0	1.62	0.12	0.38	0.03	**3.60**
1975	11	30	0	0.82	0.08	0.19	0.01	**2.47**
1975	12	31	0	0.97	0.13	0.26	0.01	**3.81**
1976	1	31	0	1.07	0.06	0.2	0.01	**1.95**
1976	2	29	0	0.73	0.06	0.18	0.01	**1.89**
1976	3	31	0	0.9	0.1	0.23	0.01	**3.07**
1976	4	30	0	0.16	0.01	0.04	0	**0.35**
1976	5	31	0	2.11	0.23	0.53	0.05	**6.77**
1976	6	30	0	0.95	0.14	0.25	0.01	**4.20**
1976	7	31	0	0.3	0.02	0.06	0	**0.75**
1976	8	31	0	1.61	0.2	0.47	0.04	**5.99**
1976	9	30	0	2.69	0.14	0.5	0.05	**4.34**
1976	10	31	0	2.79	0.23	0.54	0.05	**6.84**
1976	11	30	0	1.03	0.07	0.2	0.01	**2.14**
1976	12	31	0	1.52	0.17	0.34	0.02	**5.00**
1977	1	31	0	0.82	0.07	0.17	0.01	**2.14**
1977	2	28	0	0.42	0.03	0.1	0	**1.03**
1977	3	31	0	1.3	0.13	0.27	0.01	**3.87**
1977	4	30	0	1.52	0.1	0.29	0.02	**3.05**
1977	5	31	0	0.4	0.06	0.12	0	**1.94**
1977	6	30	0	0.87	0.12	0.24	0.01	**3.53**
1977	7	31	0	0.65	0.03	0.12	0	**0.83**
1977	8	31	0	1.01	0.12	0.23	0.01	**3.71**
1977	9	30	0	4.76	0.24	0.88	0.14	**7.34**
1977	10	31	0	3.33	0.17	0.6	0.06	**5.10**
1977	11	30	0	2.26	0.21	0.5	0.05	**6.35**
1977	12	31	0	0.83	0.1	0.19	0.01	**2.95**
1978	1	31	0	3.72	0.3	0.72	0.09	**9.01**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1978	2	28	0	1.16	0.05	0.22	0.01	**1.49**
1978	3	31	0	1.7	0.17	0.42	0.03	**5.11**
1978	4	30	0	1.51	0.11	0.33	0.02	**3.36**
1978	5	31	0	1.79	0.11	0.34	0.02	**3.19**
1978	6	30	0	2.33	0.14	0.43	0.03	**4.31**
1978	7	31	0	2.04	0.18	0.45	0.04	**5.44**
1978	8	31	0	1.04	0.1	0.21	0.01	**3.08**
1978	9	30	0	2.2	0.16	0.49	0.04	**4.74**
1978	10	31	0	0.85	0.05	0.18	0.01	**1.63**
1978	11	30	0	0.6	0.1	0.19	0.01	**3.09**
1978	12	31	0	2	0.2	0.47	0.04	**6.02**
1979	1	31	0	1.71	0.2	0.4	0.03	**5.99**
1979	2	28	0	1.52	0.19	0.42	0.03	**5.55**
1979	3	31	0	2.11	0.15	0.39	0.03	**4.43**
1979	4	30	0	1.43	0.13	0.32	0.02	**4.00**
1979	5	31	0	2.17	0.19	0.45	0.04	**5.69**
1979	6	30	0	2.04	0.23	0.45	0.04	**6.87**
1979	7	31	0	1.77	0.18	0.34	0.02	**5.45**
1979	8	31	0	1.26	0.15	0.32	0.02	**4.40**
1979	9	30	0	3.01	0.37	0.72	0.1	**10.95**
1979	10	31	0	0.65	0.07	0.17	0	**2.14**
1979	11	30	0	1.3	0.13	0.34	0.02	**3.94**
1979	12	31	0	0.41	0.04	0.09	0	**1.22**
1980	1	31	0	1.56	0.15	0.35	0.02	**4.47**
1980	2	29	0	0.44	0.06	0.12	0	**1.70**
1980	3	31	0	1.19	0.23	0.35	0.02	**6.75**
1980	4	30	0	1.19	0.11	0.27	0.01	**3.42**
1980	5	31	0	1.53	0.12	0.36	0.02	**3.72**
1980	6	30	0	2.86	0.15	0.53	0.05	**4.57**
1980	7	31	0	1.87	0.14	0.37	0.02	**4.16**
1980	8	31	0	1.5	0.14	0.36	0.02	**4.18**
1980	9	30	0	1.89	0.18	0.38	0.03	**5.38**
1980	10	31	0	0.74	0.1	0.22	0.01	**3.15**
1980	11	30	0	0.8	0.11	0.23	0.01	**3.16**
1980	12	31	0	0.57	0.03	0.11	0	**0.89**
1981	1	31	0	0.5	0.03	0.1	0	**0.90**
1981	2	28	0	1.09	0.11	0.25	0.01	**3.39**
1981	3	31	0	1.42	0.1	0.3	0.02	**2.90**
1981	4	30	0	0.27	0.04	0.08	0	**1.11**
1981	5	31	0	1.6	0.12	0.32	0.02	**3.71**
1981	6	30	0	6.02	0.33	1.09	0.22	**9.87**
1981	7	31	0	2.62	0.14	0.48	0.04	**4.11**
1981	8	31	0	0.51	0.06	0.13	0	**1.88**
1981	9	30	0	1.74	0.15	0.37	0.03	**4.64**
1981	10	31	0	1.52	0.13	0.35	0.02	**3.93**
1981	11	30	0	0.55	0.04	0.11	0	**1.11**
1981	12	31	0	1.26	0.18	0.4	0.03	**5.55**
1982	1	31	0	1.44	0.12	0.29	0.01	**3.72**
1982	2	28	0	1.65	0.18	0.38	0.03	**5.48**
1982	3	31	0	0.86	0.06	0.16	0	**1.86**
1982	4	30	0	0.8	0.11	0.19	0.01	**3.43**
1982	5	31	0	0.73	0.14	0.23	0.01	**4.07**
1982	6	30	0	1.5	0.21	0.4	0.03	**6.39**
1982	7	31	0	1.53	0.14	0.33	0.02	**4.27**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1982	8	31	0	0.33	0.02	0.06	0	**0.56**
1982	9	30	0	0.72	0.08	0.17	0.01	**2.32**
1982	10	31	0	2.1	0.13	0.44	0.03	**3.94**
1982	11	30	0	1.68	0.14	0.35	0.02	**4.14**
1982	12	31	0	1.6	0.14	0.35	0.02	**4.23**
1983	1	31	0	0.3	0.04	0.08	0	**1.11**
1983	2	28	0	0.92	0.11	0.26	0.01	**3.28**
1983	3	31	0	1.42	0.19	0.39	0.03	**5.79**
1983	4	30	0	1.27	0.18	0.32	0.02	**5.28**
1983	5	31	0	0.61	0.11	0.16	0	**3.24**
1983	6	30	0	1.29	0.1	0.26	0.01	**2.86**
1983	7	31	0	0.5	0.03	0.1	0	**0.86**
1983	8	31	0	2.38	0.15	0.49	0.04	**4.65**
1983	9	30	0	0.72	0.07	0.16	0	**1.97**
1983	10	31	0	1.54	0.13	0.32	0.02	**3.89**
1983	11	30	0	1.52	0.15	0.37	0.02	**4.40**
1983	12	31	0	1.9	0.21	0.45	0.04	**6.28**
1984	1	31	0	1.26	0.12	0.28	0.01	**3.45**
1984	2	29	0	2.14	0.21	0.5	0.05	**6.29**
1984	3	31	0	1.42	0.16	0.33	0.02	**4.75**
1984	4	30	0	1.99	0.18	0.41	0.03	**5.41**
1984	5	31	0	1.58	0.25	0.48	0.04	**7.58**
1984	6	30	0	0.43	0.05	0.12	0	**1.56**
1984	7	31	0	1.85	0.18	0.45	0.04	**5.50**
1984	8	31	0	0.5	0.05	0.11	0	**1.41**
1984	9	30	0	0.93	0.03	0.17	0.01	**0.93**
1984	10	31	0	1.08	0.07	0.22	0.01	**2.08**
1984	11	30	0	1.12	0.08	0.23	0.01	**2.41**
1984	12	31	0	0.82	0.06	0.17	0.01	**1.79**
1985	1	31	0	1	0.09	0.22	0.01	**2.70**
1985	2	28	0	1.6	0.19	0.41	0.03	**5.55**
1985	3	31	0	0.88	0.04	0.16	0	**1.20**
1985	4	30	0	0.68	0.05	0.14	0	**1.49**
1985	5	31	0	3.24	0.25	0.77	0.11	**7.54**
1985	6	30	0	1.58	0.13	0.33	0.02	**3.97**
1985	7	31	0	1.69	0.25	0.43	0.03	**7.51**
1985	8	31	0	2.1	0.15	0.39	0.03	**4.40**
1985	9	30	0	0.05	0	0.01	0	**0.05**
1985	10	31	0	1.78	0.1	0.32	0.02	**2.92**
1985	11	30	0	1.3	0.19	0.36	0.02	**5.69**
1985	12	31	0	0.56	0.05	0.13	0	**1.48**
1986	1	31	0	0.43	0.02	0.08	0	**0.75**
1986	2	28	0	0.34	0.05	0.09	0	**1.44**
1986	3	31	0	0.87	0.08	0.2	0.01	**2.32**
1986	4	30	0	0.14	0.01	0.04	0	**0.43**
1986	5	31	0	0.34	0.03	0.07	0	**0.84**
1986	6	30	0	0.72	0.03	0.13	0	**0.80**
1986	7	31	0	0.33	0.05	0.11	0	**1.62**
1986	8	31	0	1.55	0.18	0.35	0.02	**5.30**
1986	9	30	0	0.62	0.05	0.14	0	**1.46**
1986	10	31	0	1.04	0.11	0.28	0.01	**3.22**
1986	11	30	0	0.98	0.15	0.28	0.01	**4.46**
1986	12	31	0	2.3	0.14	0.43	0.03	**4.14**
1987	1	31	0	1.16	0.13	0.3	0.02	**3.79**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1987	2	28	0	1.3	0.15	0.33	0.02	**4.56**
1987	3	31	0	1.63	0.18	0.36	0.02	**5.29**
1987	4	30	0	0.91	0.13	0.25	0.01	**3.83**
1987	5	31	0	0.71	0.05	0.14	0	**1.63**
1987	6	30	0	3.88	0.25	0.76	0.11	**7.44**
1987	7	31	0	1.2	0.08	0.25	0.01	**2.30**
1987	8	31	0	1.51	0.09	0.3	0.02	**2.63**
1987	9	30	0	1.97	0.24	0.51	0.05	**7.19**
1987	10	31	0	0.98	0.04	0.17	0.01	**1.05**
1987	11	30	0	2.19	0.15	0.44	0.04	**4.51**
1987	12	31	0	1.23	0.13	0.29	0.02	**3.84**
1988	1	31	0	0.41	0.07	0.11	0	**2.01**
1988	2	29	0	0.67	0.05	0.14	0	**1.48**
1988	3	31	0	1.02	0.09	0.21	0.01	**2.67**
1988	4	30	0	0.82	0.08	0.21	0.01	**2.36**
1988	5	31	0	0.8	0.07	0.18	0.01	**2.15**
1988	6	30	0	2.14	0.08	0.38	0.03	**2.42**
1988	7	31	0	1.6	0.12	0.31	0.02	**3.75**
1988	8	31	0	1	0.12	0.25	0.01	**3.65**
1988	9	30	0	2.17	0.22	0.51	0.05	**6.59**
1988	10	31	0	1.01	0.1	0.26	0.01	**2.92**
1988	11	30	0	1	0.13	0.27	0.01	**3.84**
1988	12	31	0	0.53	0.05	0.13	0	**1.60**
1989	1	31	0	0.7	0.06	0.14	0	**1.88**
1989	2	28	0	1.1	0.2	0.34	0.02	**6.12**
1989	3	31	0	1.02	0.15	0.23	0.01	**4.35**
1989	4	30	0	0.72	0.11	0.21	0.01	**3.36**
1989	5	31	0	1.27	0.16	0.34	0.02	**4.77**
1989	6	30	0	1.58	0.17	0.33	0.02	**5.06**
1989	7	31	0	2.6	0.25	0.63	0.07	**7.35**
1989	8	31	0	1.13	0.08	0.22	0.01	**2.38**
1989	9	30	0	2.88	0.23	0.59	0.06	**6.99**
1989	10	31	0	2.61	0.19	0.55	0.06	**5.56**
1989	11	30	0	0.7	0.1	0.2	0.01	**3.04**
1989	12	31	0	1.57	0.13	0.35	0.02	**3.85**
1990	1	31	0	1.17	0.16	0.28	0.01	**4.74**
1990	2	28	0	1.56	0.21	0.47	0.04	**6.38**
1990	3	31	0	2.46	0.16	0.46	0.04	**4.69**
1990	4	30	0	1.05	0.08	0.21	0.01	**2.48**
1990	5	31	0	1.83	0.27	0.49	0.04	**8.11**
1990	6	30	0	0.75	0.07	0.18	0.01	**1.98**
1990	7	31	0	1.55	0.08	0.28	0.01	**2.52**
1990	8	31	0	2.77	0.13	0.5	0.04	**3.91**
1990	9	30	0	0.16	0.01	0.03	0	**0.19**
1990	10	31	0	2.8	0.41	0.78	0.11	**12.23**
1990	11	30	0	1.26	0.08	0.25	0.01	**2.43**
1990	12	31	0	0.71	0.09	0.17	0.01	**2.84**
1991	1	31	0	1.54	0.15	0.34	0.02	**4.52**
1991	2	28	0	0.86	0.08	0.18	0.01	**2.43**
1991	3	31	0	3.65	0.24	0.69	0.08	**7.24**
1991	4	30	0	1.54	0.19	0.34	0.02	**5.58**
1991	5	31	0	2.87	0.15	0.51	0.05	**4.36**
1991	6	30	0	1.16	0.13	0.28	0.01	**3.77**
1991	7	31	0	1.34	0.16	0.35	0.02	**4.95**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1991	8	31	0	1.29	0.16	0.33	0.02	**4.93**
1991	9	30	0	1.07	0.07	0.21	0.01	**2.22**
1991	10	31	0	0.57	0.02	0.1	0	**0.58**
1991	11	30	0	1.4	0.06	0.25	0.01	**1.79**
1991	12	31	0	1	0.12	0.25	0.01	**3.64**
1992	1	31	0	0.99	0.08	0.22	0.01	**2.26**
1992	2	29	0	1.14	0.12	0.27	0.01	**3.47**
1992	3	31	0	1	0.09	0.22	0.01	**2.68**
1992	4	30	0	3.73	0.14	0.67	0.08	**4.27**
1992	5	31	0	0.7	0.11	0.21	0.01	**3.25**
1992	6	30	0	1.78	0.19	0.44	0.04	**5.73**
1992	7	31	0	1.62	0.14	0.33	0.02	**4.22**
1992	8	31	0	3.2	0.13	0.57	0.06	**3.90**
1992	9	30	0	1.65	0.17	0.39	0.03	**5.09**
1992	10	31	0	2	0.14	0.4	0.03	**4.19**
1992	11	30	0	1.42	0.21	0.39	0.03	**6.18**
1992	12	31	0	0.83	0.11	0.24	0.01	**3.23**
1993	1	31	0	1.8	0.23	0.46	0.04	**6.82**
1993	2	28	0	1.97	0.14	0.39	0.03	**4.06**
1993	3	31	0	2.2	0.26	0.58	0.06	**7.68**
1993	4	30	0	0.91	0.11	0.24	0.01	**3.40**
1993	5	31	0	1.4	0.06	0.25	0.01	**1.85**
1993	6	30	0	1.77	0.08	0.33	0.02	**2.46**
1993	7	31	0	0.66	0.1	0.18	0.01	**2.93**
1993	8	31	0	0.6	0.05	0.12	0	**1.55**
1993	9	30	0	0.41	0.05	0.1	0	**1.35**
1993	10	31	0	1.13	0.04	0.2	0.01	**1.31**
1993	11	30	0	2.02	0.09	0.36	0.02	**2.77**
1993	12	31	0	1.55	0.13	0.3	0.02	**3.88**
1994	1	31	0	0.92	0.15	0.28	0.01	**4.35**
1994	2	28	0	0.97	0.1	0.24	0.01	**2.97**
1994	3	31	0	2.34	0.22	0.53	0.05	**6.69**
1994	4	30	0	0.58	0.06	0.14	0	**1.94**
1994	5	31	0	0.88	0.08	0.21	0.01	**2.55**
1994	6	30	0	1.22	0.16	0.32	0.02	**4.74**
1994	7	31	0	2.46	0.19	0.45	0.04	**5.60**
1994	8	31	0	3.35	0.19	0.6	0.07	**5.70**
1994	9	30	0	1.03	0.08	0.2	0.01	**2.44**
1994	10	31	0	1.57	0.08	0.29	0.01	**2.53**
1994	11	30	0	1.03	0.1	0.26	0.01	**3.06**
1994	12	31	0	0.61	0.05	0.14	0	**1.64**
1995	1	31	0	1.45	0.16	0.36	0.02	**4.78**
1995	2	28	0	1.24	0.15	0.31	0.02	**4.45**
1995	3	31	0	1.22	0.08	0.23	0.01	**2.50**
1995	4	30	0	0.2	0.01	0.05	0	**0.44**
1995	5	31	0	0.94	0.12	0.24	0.01	**3.48**
1995	6	30	0	1.51	0.31	0.44	0.04	**9.22**
1995	7	31	0	1.35	0.1	0.26	0.01	**3.00**
1995	8	31	0	4.53	0.18	0.8	0.11	**5.41**
1995	9	30	0	2.13	0.12	0.4	0.03	**3.63**
1995	10	31	0	2.59	0.23	0.57	0.06	**6.89**
1995	11	30	0	1.29	0.12	0.3	0.02	**3.52**
1995	12	31	0	0.66	0.06	0.14	0	**1.74**
1996	1	31	0	1.3	0.13	0.28	0.01	**3.95**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1996	2	29	0	1.87	0.11	0.35	0.02	**3.21**
1996	3	31	0	0.9	0.14	0.26	0.01	**4.11**
1996	4	30	0	1.07	0.12	0.23	0.01	**3.46**
1996	5	31	0	0.57	0.05	0.12	0	**1.42**
1996	6	30	0	1.5	0.14	0.34	0.02	**4.17**
1996	7	31	0	0.48	0.08	0.16	0	**2.30**
1996	8	31	0	2.06	0.23	0.46	0.04	**6.98**
1996	9	30	0	1.25	0.2	0.34	0.02	**6.01**
1996	10	31	0	1.25	0.07	0.24	0.01	**1.95**
1996	11	30	0	1.16	0.14	0.3	0.02	**4.12**
1996	12	31	0	1.92	0.17	0.38	0.03	**5.04**
1997	1	31	0	1	0.12	0.24	0.01	**3.47**
1997	2	28	0	1.24	0.16	0.3	0.02	**4.82**
1997	3	31	0	1.18	0.11	0.27	0.01	**3.38**
1997	4	30	0	2.76	0.29	0.63	0.07	**8.55**
1997	5	31	0	0.72	0.04	0.13	0	**1.28**
1997	6	30	0	1.3	0.1	0.25	0.01	**2.89**
1997	7	31	0	2.7	0.21	0.51	0.05	**6.23**
1997	8	31	0	1.33	0.08	0.28	0.01	**2.51**
1997	9	30	0	1.66	0.13	0.35	0.02	**3.81**
1997	10	31	0	1.48	0.11	0.33	0.02	**3.31**
1997	11	30	0	0.52	0.08	0.15	0	**2.43**
1997	12	31	0	0.84	0.12	0.23	0.01	**3.65**
1998	1	31	0	1.75	0.21	0.42	0.03	**6.33**
1998	2	28	0	0.9	0.16	0.26	0.01	**4.82**
1998	3	31	0	1.65	0.1	0.33	0.02	**2.95**
1998	4	30	0	1.45	0.22	0.39	0.03	**6.63**
1998	5	31	0	0.79	0.13	0.23	0.01	**3.94**
1998	6	30	0	0.94	0.11	0.24	0.01	**3.41**
1998	7	31	0	1.15	0.08	0.21	0.01	**2.33**
1998	8	31	0	0.57	0.05	0.13	0	**1.35**
1998	9	30	0	0.96	0.09	0.25	0.01	**2.76**
1998	10	31	0	1.29	0.06	0.24	0.01	**1.77**
1998	11	30	0	0.47	0.06	0.12	0	**1.72**
1998	12	31	0	1.46	0.13	0.35	0.02	**3.89**
1999	1	31	0	1.22	0.12	0.28	0.01	**3.75**
1999	2	28	0	0.67	0.1	0.18	0.01	**2.87**
1999	3	31	0	0.8	0.07	0.18	0.01	**2.16**
1999	4	30	0	1.38	0.17	0.39	0.03	**5.22**
1999	5	31	0	1.1	0.05	0.2	0.01	**1.60**
1999	6	30	0	0.74	0.08	0.17	0.01	**2.30**
1999	7	31	0	1.68	0.13	0.38	0.03	**4.05**
1999	8	31	0	0.75	0.11	0.21	0.01	**3.38**
1999	9	30	0	1.32	0.15	0.33	0.02	**4.54**
1999	10	31	0	0.97	0.1	0.25	0.01	**3.06**
1999	11	30	0	0.8	0.05	0.18	0.01	**1.64**
1999	12	31	0	0.65	0.08	0.18	0.01	**2.30**
2000	1	31	0	0.95	0.14	0.26	0.01	**4.05**
2000	2	29	0	0.92	0.08	0.21	0.01	**2.26**
2000	3	31	0	1.68	0.11	0.32	0.02	**3.23**
2000	4	30	0	0.95	0.19	0.32	0.02	**5.62**
2000	5	31	0	0.72	0.07	0.16	0	**2.21**
2000	6	30	0	0.9	0.07	0.2	0.01	**2.15**
2000	7	31	0	1.9	0.12	0.36	0.02	**3.71**

Table D-1: Monthly precipitation, Statesville COOP 318292

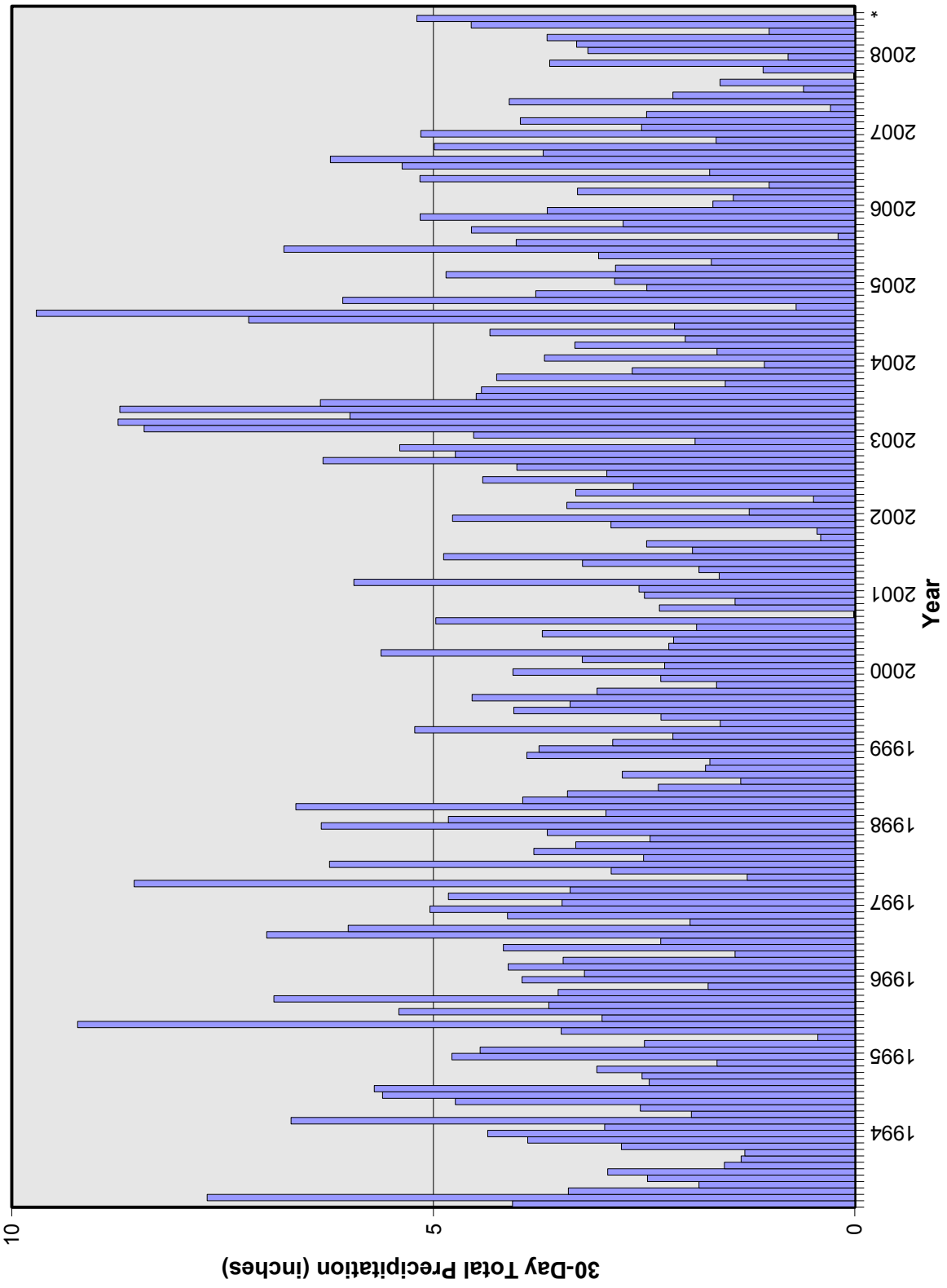
Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
2000	8	31	0	0.59	0.06	0.14	0	**1.88**
2000	9	30	0	1.79	0.17	0.37	0.03	**4.97**
2000	10	31	0	0	0	0	0	**0.00**
2000	11	30	0	1.01	0.08	0.2	0.01	**2.32**
2000	12	31	0	0.62	0.05	0.14	0	**1.42**
2001	1	31	0	0.98	0.08	0.2	0.01	**2.50**
2001	2	28	0	0.89	0.09	0.2	0.01	**2.56**
2001	3	31	0	1.74	0.2	0.38	0.03	**5.94**
2001	4	30	0	0.65	0.05	0.15	0	**1.61**
2001	5	31	0	0.75	0.06	0.14	0	**1.85**
2001	6	30	0	1.8	0.11	0.34	0.02	**3.23**
2001	7	31	0	1.75	0.16	0.33	0.02	**4.88**
2001	8	31	0	0.73	0.06	0.17	0.01	**1.93**
2001	9	30	0	1.1	0.08	0.24	0.01	**2.47**
2001	10	31	0	0.25	0.01	0.05	0	**0.41**
2001	11	30	0	0.43	0.02	0.08	0	**0.45**
2001	12	31	0	0.9	0.1	0.25	0.01	**2.89**
2002	1	31	0	1.86	0.16	0.39	0.03	**4.77**
2002	2	28	0	0.93	0.04	0.17	0.01	**1.25**
2002	3	31	0	0.79	0.11	0.2	0.01	**3.42**
2002	4	30	0	0.15	0.02	0.04	0	**0.49**
2002	5	30	0	1.92	0.11	0.36	0.02	**3.31**
2002	6	29	0	1.69	0.09	0.32	0.02	**2.63**
2002	7	31	0	1.34	0.15	0.35	0.02	**4.41**
2002	8	31	0	1.05	0.1	0.25	0.01	**2.94**
2002	9	30	0	1.04	0.13	0.29	0.01	**4.01**
2002	10	31	0	1.48	0.21	0.4	0.03	**6.31**
2002	11	30	0	1.41	0.16	0.37	0.03	**4.74**
2002	12	31	0	1.4	0.18	0.38	0.03	**5.40**
2003	1	31	0	0.63	0.06	0.14	0	**1.90**
2003	2	28	0	1.42	0.15	0.29	0.02	**4.52**
2003	3	31	0	4.2	0.28	0.79	0.11	**8.43**
2003	4	30	0	2.05	0.29	0.55	0.06	**8.74**
2003	5	31	0	1.56	0.2	0.38	0.03	**5.99**
2003	6	30	0	1.8	0.29	0.5	0.05	**8.72**
2003	7	31	0	1.85	0.21	0.42	0.03	**6.34**
2003	8	31	0	1.07	0.15	0.29	0.01	**4.49**
2003	9	30	0	2.01	0.15	0.48	0.04	**4.43**
2003	10	31	0	0.6	0.05	0.13	0	**1.54**
2003	11	30	0	2.12	0.14	0.41	0.03	**4.25**
2003	12	31	0	1.03	0.09	0.23	0.01	**2.64**
2004	1	31	0	0.45	0.04	0.1	0	**1.07**
2004	2	29	0	0.96	0.12	0.27	0.01	**3.68**
2004	3	31	0	0.6	0.05	0.13	0	**1.64**
2004	4	30	0	0.94	0.11	0.25	0.01	**3.32**
2004	5	31	0	1.03	0.07	0.19	0.01	**2.01**
2004	6	30	0	0.92	0.14	0.23	0.01	**4.33**
2004	7	30	0	0.62	0.07	0.16	0	**2.14**
2004	8	31	0	4.15	0.24	0.77	0.11	**7.19**
2004	9	30	0	4.2	0.32	0.97	0.17	**9.71**
2004	10	31	0	0.16	0.02	0.04	0	**0.70**
2004	11	28	0	1.59	0.2	0.43	0.04	**6.08**
2004	12	31	0	2.19	0.13	0.4	0.03	**3.78**
2005	1	31	0	1.65	0.08	0.31	0.02	**2.47**

Table D-1: Monthly precipitation, Statesville COOP 318292

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
2005	2	28	0	0.71	0.1	0.16	0	**2.85**
2005	3	31	0	1.86	0.16	0.37	0.02	**4.85**
2005	4	30	0	0.79	0.09	0.19	0.01	**2.84**
2005	5	31	0	0.55	0.06	0.12	0	**1.70**
2005	6	30	0	0.96	0.1	0.22	0.01	**3.04**
2005	7	31	0	3.24	0.23	0.59	0.06	**6.77**
2005	8	31	0	1.02	0.13	0.28	0.01	**4.02**
2005	9	30	0	0.13	0.01	0.02	0	**0.20**
2005	10	31	0	2.47	0.15	0.51	0.05	**4.55**
2005	11	30	0	1.1	0.09	0.24	0.01	**2.75**
2005	12	31	0	1.4	0.17	0.37	0.02	**5.16**
2006	1	31	0	1.64	0.12	0.33	0.02	**3.65**
2006	2	26	0	0.47	0.06	0.12	0	**1.68**
2006	3	31	0	0.95	0.05	0.17	0.01	**1.44**
2006	4	30	0	0.73	0.11	0.2	0.01	**3.29**
2006	5	31	0	0.5	0.03	0.09	0	**1.02**
2006	6	30	0	1.63	0.17	0.34	0.02	**5.16**
2006	7	31	0	0.5	0.06	0.12	0	**1.72**
2006	8	31	0	1.6	0.18	0.34	0.02	**5.37**
2006	9	30	0	3.3	0.21	0.61	0.07	**6.22**
2006	10	31	0	1.58	0.12	0.36	0.02	**3.70**
2006	11	30	0	1.75	0.17	0.39	0.03	**4.99**
2006	12	31	0	1.14	0.05	0.22	0.01	**1.65**
2007	1	31	0	2.29	0.17	0.46	0.04	**5.15**
2007	2	28	0	0.95	0.08	0.23	0.01	**2.53**
2007	3	31	0	1.9	0.13	0.39	0.03	**3.97**
2007	4	30	0	1.22	0.08	0.28	0.01	**2.47**
2007	5	31	0	0.13	0.01	0.03	0	**0.29**
2007	6	30	0	1.2	0.14	0.27	0.01	**4.10**
2007	7	31	0	0.65	0.07	0.14	0	**2.16**
2007	8	31	0	0.27	0.02	0.06	0	**0.61**
2007	9	30	0	1.6	0.05	0.29	0.02	**1.60**
2007	10	31	0	0	0	0	0	**0.00**
2007	11	30	0	0.68	0.04	0.13	0	**1.09**
2007	12	31	0	1.15	0.12	0.27	0.01	**3.62**
2008	1	31	0	0.27	0.03	0.07	0	**0.79**
2008	2	29	0	0.69	0.11	0.19	0.01	**3.17**
2008	3	30	0	0.9	0.11	0.25	0.01	**3.30**
2008	4	30	0	1.28	0.12	0.26	0.01	**3.65**
2008	5	31	0	0.31	0.03	0.07	0	**1.02**
2008	6	30	0	1.65	0.15	0.38	0.03	**4.55**
2008	7	31	0	1.28	0.17	0.35	0.02	**5.20**
2008	8	12	0	0.4	0.08	0.14	0.01	**2.35**

NOTE: In order to compensate for the variable number of days in a month as well as the presence of missing data in some months, a monthly total precipitation was standardized to the so-called “30-day average total”, which was calculated by multiplying the average daily water precipitation for a given month by 30 in order to remove a likely bias caused by the above conditions.

Graph D-1: Monthly precipitation, Statesville COOP 318292



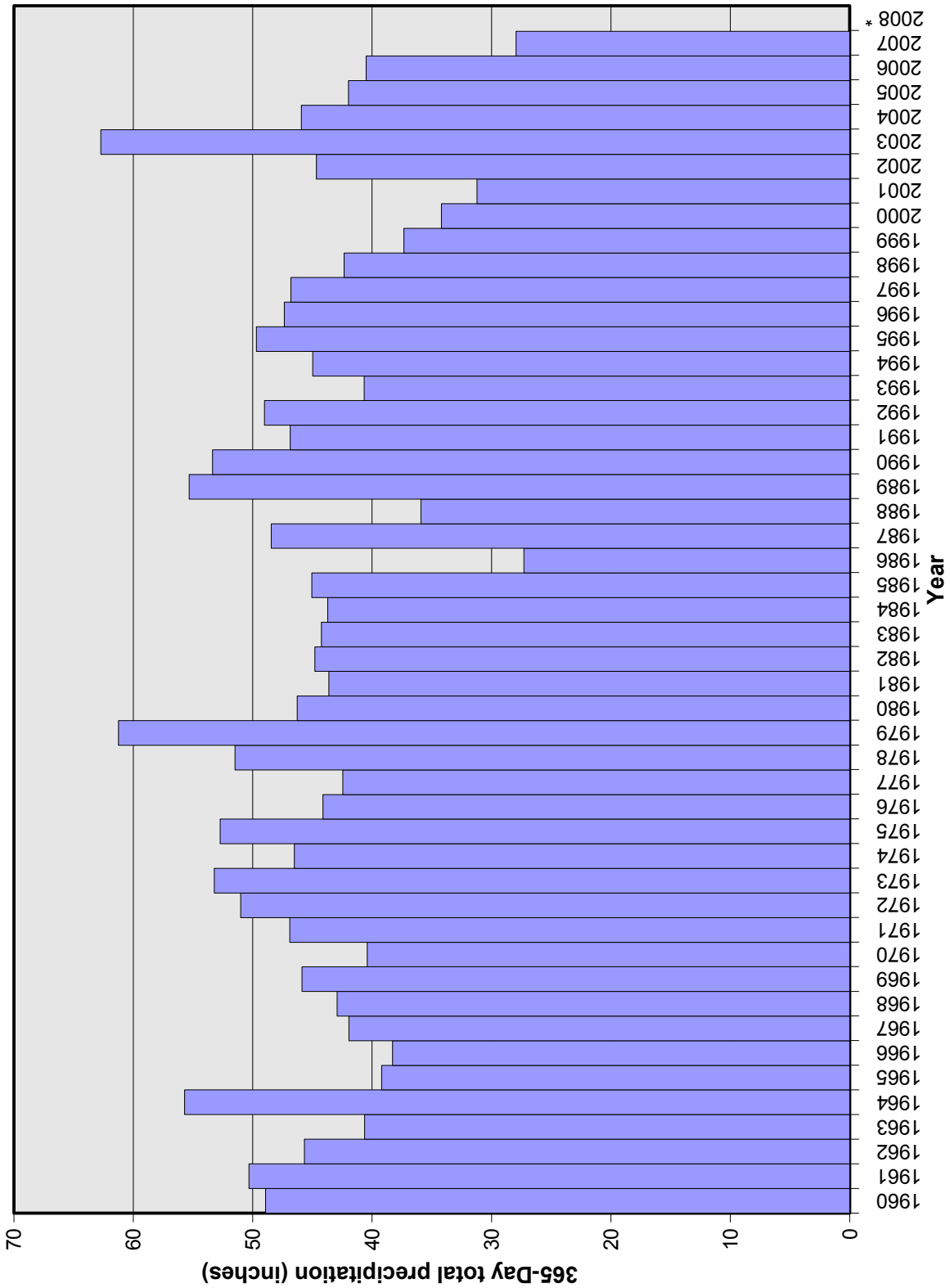
NOTE: Months with available data of less than 25 were marked insufficient,further denoted with *, and are not presented in this graph

Table D-2: Annual precipitation, Statesville COOP 318292

Year	Months	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	365-Day Average Total
1960	12	366	0	2.69	0.13	0.35	0.01	**48.93**
1961	12	365	0	2.48	0.14	0.34	0.01	**50.32**
1962	12	365	0	3.82	0.13	0.35	0.01	**45.67**
1963	12	365	0	1.98	0.11	0.29	0	**40.63**
1964	12	366	0	5.1	0.15	0.46	0.01	**55.71**
1965	12	365	0	2.39	0.11	0.31	0	**39.20**
1966	12	364	0	2.65	0.1	0.33	0.01	**38.28**
1967	12	365	0	1.66	0.11	0.28	0	**41.94**
1968	12	366	0	2.65	0.12	0.33	0.01	**42.93**
1969	12	365	0	1.87	0.13	0.3	0	**45.88**
1970	12	362	0	6.39	0.11	0.41	0.01	**40.41**
1971	12	364	0	2.03	0.13	0.32	0.01	**46.89**
1972	11	334	0	7.68	0.14	0.52	0.01	**51.00**
1973	12	365	0	2.93	0.15	0.39	0.01	**53.23**
1974	12	365	0	2.39	0.13	0.32	0.01	**46.51**
1975	12	365	0	2	0.14	0.32	0.01	**52.72**
1976	12	366	0	2.79	0.12	0.35	0.01	**44.12**
1977	12	365	0	4.76	0.12	0.39	0.01	**42.45**
1978	12	365	0	3.72	0.14	0.41	0.01	**51.48**
1979	12	365	0	3.01	0.17	0.4	0.01	**61.24**
1980	12	366	0	2.86	0.13	0.33	0.01	**46.27**
1981	12	365	0	6.02	0.12	0.43	0.01	**43.63**
1982	12	365	0	2.1	0.12	0.3	0	**44.79**
1983	12	365	0	2.38	0.12	0.31	0.01	**44.25**
1984	12	366	0	2.14	0.12	0.33	0.01	**43.72**
1985	12	365	0	3.24	0.12	0.37	0.01	**45.06**
1986	12	365	0	2.3	0.07	0.23	0	**27.29**
1987	12	365	0	3.88	0.13	0.38	0.01	**48.46**
1988	12	366	0	2.17	0.1	0.27	0	**35.91**
1989	12	365	0	2.88	0.15	0.38	0.01	**55.32**
1990	12	365	0	2.8	0.15	0.41	0.01	**53.37**
1991	12	365	0	3.65	0.13	0.36	0.01	**46.85**
1992	12	366	0	3.73	0.13	0.39	0.01	**49.02**
1993	12	365	0	2.2	0.11	0.33	0.01	**40.66**
1994	12	365	0	3.35	0.12	0.34	0.01	**44.97**
1995	12	365	0	4.53	0.14	0.4	0.01	**49.69**
1996	12	366	0	2.06	0.13	0.31	0	**47.35**
1997	12	365	0	2.76	0.13	0.34	0.01	**46.80**
1998	12	365	0	1.75	0.12	0.28	0	**42.34**
1999	12	365	0	1.68	0.1	0.26	0	**37.34**
2000	12	366	0	1.9	0.09	0.25	0	**34.20**
2001	12	365	0	1.8	0.09	0.24	0	**31.22**
2002	12	363	0	1.92	0.12	0.32	0.01	**44.66**
2003	12	365	0	4.2	0.17	0.43	0.01	**62.73**
2004	12	363	0	4.2	0.13	0.43	0.01	**45.92**
2005	12	365	0	3.24	0.12	0.33	0.01	**41.99**
2006	12	363	0	3.3	0.11	0.31	0.01	**40.50**
2007	12	365	0	2.29	0.08	0.26	0	**27.94**
2008	8	224	0	1.65	0.1	0.25	0	**37.05**

NOTE: In order to compensate for the variable number of days in a year as well as the presence of missing data in some years, an annual total precipitation was standardized to a so-called “365-day average total”, which was calculated by multiplying the average daily precipitation for a given year by 365 in order to remove a likely bias caused by the above conditions.

Graph D-2: Annual precipitation, Statesville COOP 318292

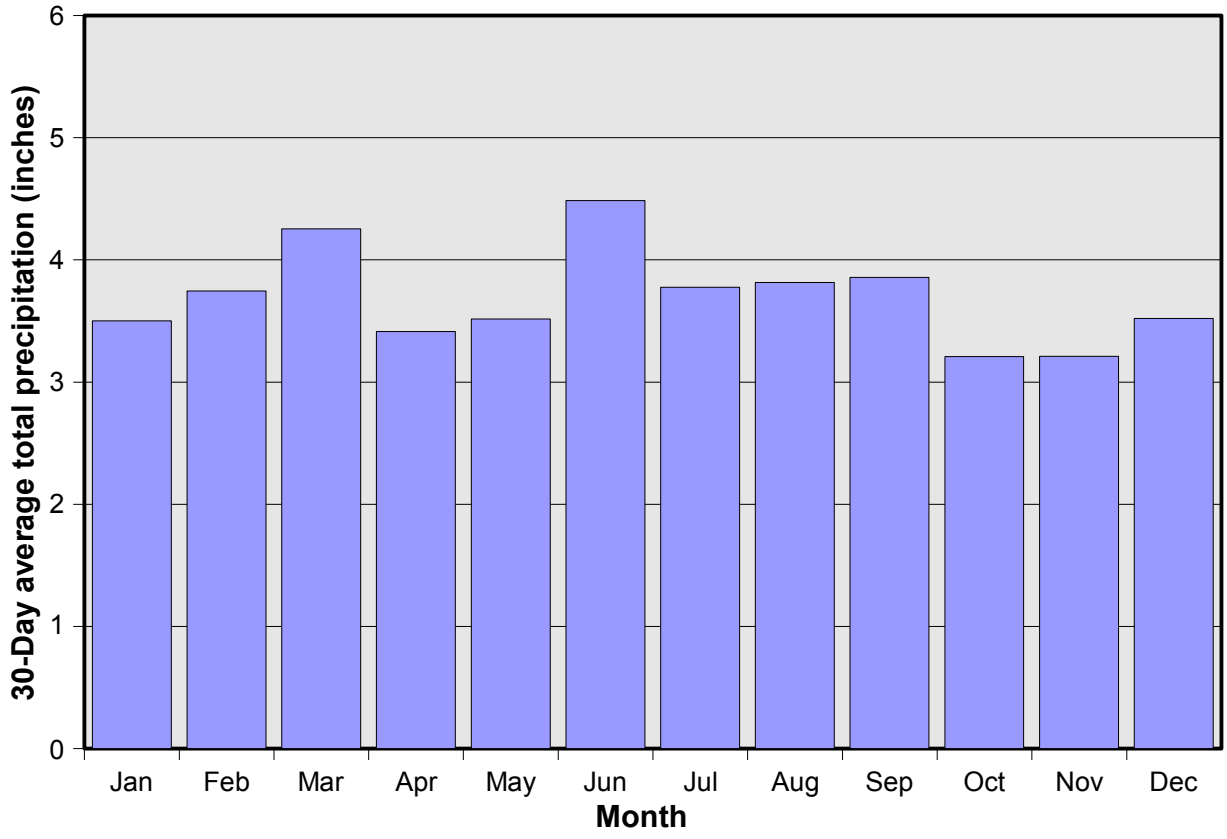


NOTE: Years with available data of less than 300 were marked insufficient,further denoted with *, and are not presented in this graph

Table D-3: Precipitation by month, Statesville COOP 318292

Month	Total	Day Count	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
Jan	177.14	1518	0.12	0.3	0.01	**3.50**
Feb	172.5	1382	0.12	0.3	0.01	**3.74**
Mar	215.17	1517	0.14	0.36	0.01	**4.26**
Apr	167.29	1470	0.11	0.3	0.01	**3.41**
May	177.98	1518	0.12	0.33	0.01	**3.52**
Jun	219.45	1468	0.15	0.43	0.01	**4.48**
Jul	191.13	1518	0.13	0.33	0.01	**3.78**
Aug	186.83	1469	0.13	0.39	0.01	**3.82**
Sep	185.18	1440	0.13	0.4	0.01	**3.86**
Oct	159.2	1488	0.11	0.37	0.01	**3.21**
Nov	153.68	1436	0.11	0.31	0.01	**3.21**
Dec	174.6	1488	0.12	0.31	0.01	**3.52**

Graph D-3: Precipitation by month, Statesville COOP 318292



NOTE: The 30-day aveage total precipitaion for a month was calculated by multiplying its dail average precipitation by 30 in order to elmiinate the slight bias die to the inconsistent number of days in different months.

Table D-4: Precipitation by weekday, Statesville COOP 318292

Day	Total	Day Count	Daily Average	Std. Dev.	Std. Error	52-Week Average Total
Mon	292.24	2532	0.1154	0.3314	0.0022	**6.002**
Tue	288.00	2531	0.1138	0.3360	0.0022	**5.917**
Wed	324.98	2529	0.1285	0.3825	0.0029	**6.682**
Thu	319.18	2528	0.1263	0.3477	0.0024	**6.565**
Fri	334.27	2529	0.1322	0.3746	0.0028	**6.873**
Sat	300.76	2530	0.1189	0.3166	0.0020	**6.182**
Sun	320.72	2533	0.1266	0.3402	0.0023	**6.584**

Graph D-4: Precipitation by weekday, Statesville COOP 318292

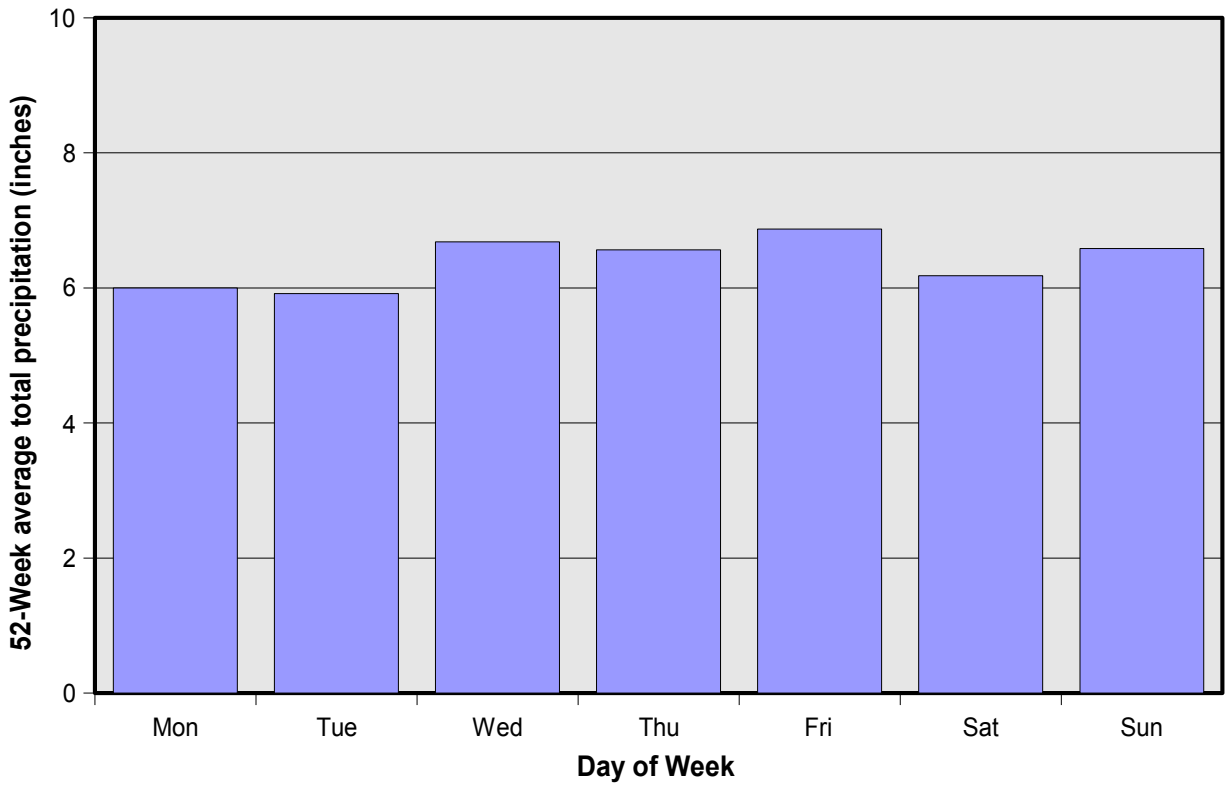


Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1960	1	31	0	1.45	0.16	0.34	0.02	**4.84**
1960	2	29	0	1.69	0.27	0.5	0.05	**8.06**
1960	3	31	0	2.1	0.19	0.46	0.04	**5.65**
1960	4	30	0	0.66	0.04	0.16	0	**1.26**
1960	5	31	0	1.62	0.13	0.36	0.02	**3.83**
1960	6	30	0	1	0.13	0.25	0.01	**3.85**
1960	7	31	0	1.6	0.13	0.34	0.02	**3.80**
1960	8	31	0	1.03	0.14	0.28	0.01	**4.12**
1960	9	30	0	2.07	0.28	0.6	0.06	**8.42**
1960	10	31	0	0.57	0.07	0.16	0	**2.22**
1960	11	30	0	0.62	0.04	0.14	0	**1.12**
1960	12	31	0	1.16	0.07	0.22	0.01	**1.96**
1961	1	31	0	0.87	0.09	0.24	0.01	**2.59**
1961	2	28	0	1.6	0.21	0.43	0.03	**6.39**
1961	3	31	0	1.62	0.17	0.4	0.03	**4.96**
1961	4	30	0	1.66	0.16	0.38	0.03	**4.81**
1961	5	31	0	0.72	0.09	0.18	0.01	**2.65**
1961	6	30	0	1.68	0.17	0.41	0.03	**5.14**
1961	7	31	0	2.79	0.22	0.55	0.05	**6.48**
1961	8	31	0	1.02	0.16	0.3	0.02	**4.76**
1961	9	30	0	0.31	0.02	0.06	0	**0.47**
1961	10	31	0	0.42	0.04	0.1	0	**1.07**
1961	11	30	0	1.18	0.11	0.27	0.01	**3.24**
1961	12	31	0	3.22	0.25	0.64	0.07	**7.39**
1962	1	31	0	1.3	0.19	0.37	0.02	**5.69**
1962	2	28	0	0.98	0.16	0.31	0.02	**4.86**
1962	3	31	0	0.8	0.1	0.2	0.01	**2.85**
1962	4	30	0	1.46	0.14	0.35	0.02	**4.07**
1962	5	31	0	1.1	0.13	0.24	0.01	**3.81**
1962	6	30	0	1.58	0.24	0.44	0.04	**7.24**
1962	7	31	0	0.88	0.09	0.21	0.01	**2.75**
1962	8	31	0	1.38	0.14	0.32	0.02	**4.35**
1962	9	30	0	1.76	0.16	0.4	0.03	**4.68**
1962	10	31	0	0.58	0.05	0.12	0	**1.37**
1962	11	30	0	3	0.21	0.57	0.06	**6.20**
1962	12	31	0	0.88	0.1	0.24	0.01	**3.05**
1963	1	31	0	1.03	0.1	0.25	0.01	**3.10**
1963	2	28	0	0.8	0.11	0.23	0.01	**3.27**
1963	3	31	0	2.08	0.22	0.51	0.05	**6.69**
1963	4	30	0	1.67	0.11	0.39	0.03	**3.26**
1963	5	31	0	0.72	0.15	0.21	0.01	**4.62**
1963	6	30	0	1.03	0.12	0.23	0.01	**3.48**
1963	7	31	0	0.95	0.09	0.19	0.01	**2.59**
1963	8	31	0	1.9	0.13	0.35	0.02	**3.76**
1963	9	30	0	3.1	0.14	0.56	0.06	**4.22**
1963	10	31	0	0	0	0	0	**0.00**
1963	11	30	0	1.42	0.12	0.33	0.02	**3.72**
1963	12	31	0	0.95	0.07	0.21	0.01	**2.12**
1964	1	31	0	1.98	0.17	0.42	0.03	**5.17**
1964	2	29	0	1.25	0.16	0.3	0.02	**4.90**
1964	3	31	0	1.16	0.1	0.25	0.01	**3.00**
1964	4	30	0	1.89	0.16	0.38	0.03	**4.76**
1964	5	31	0	0.2	0.01	0.04	0	**0.44**
1964	6	30	0	2.36	0.18	0.46	0.04	**5.27**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1964	7	31	0	0.75	0.1	0.19	0.01	**2.94**
1964	8	31	0	1.37	0.14	0.33	0.02	**4.14**
1964	9	30	0	0.42	0.03	0.1	0	**0.97**
1964	10	31	0	3.48	0.32	0.84	0.13	**9.64**
1964	11	30	0	2	0.11	0.39	0.03	**3.15**
1964	12	31	0	1.55	0.13	0.3	0.02	**3.90**
1965	1	31	0	0.78	0.07	0.19	0.01	**2.19**
1965	2	28	0	1.46	0.14	0.32	0.02	**4.15**
1965	3	31	0	2.36	0.2	0.49	0.04	**6.04**
1965	4	30	0	0.78	0.11	0.21	0.01	**3.17**
1965	5	31	0	1.25	0.07	0.24	0.01	**2.24**
1965	6	30	0	1.67	0.15	0.38	0.03	**4.47**
1965	7	31	0	0.95	0.11	0.23	0.01	**3.34**
1965	8	31	0	1.04	0.1	0.21	0.01	**2.94**
1965	9	30	0	1.11	0.05	0.2	0.01	**1.43**
1965	10	31	0	1.7	0.12	0.34	0.02	**3.46**
1965	11	30	0	0.7	0.05	0.16	0	**1.45**
1965	12	31	0	0.38	0.01	0.07	0	**0.37**
1966	1	31	0	1.14	0.12	0.28	0.01	**3.63**
1966	2	28	0	2.18	0.2	0.46	0.04	**5.96**
1966	3	31	0	1.34	0.09	0.31	0.02	**2.81**
1966	4	30	0	0.36	0.06	0.11	0	**1.67**
1966	5	31	0	1.82	0.11	0.33	0.02	**3.24**
1966	6	30	0	1.79	0.12	0.37	0.03	**3.69**
1966	7	31	0	1.5	0.11	0.3	0.02	**3.25**
1966	8	31	0	1.19	0.15	0.33	0.02	**4.64**
1966	9	30	0	2.57	0.15	0.49	0.04	**4.61**
1966	10	31	0	1.7	0.1	0.33	0.02	**2.86**
1966	11	30	0	0.7	0.05	0.14	0	**1.46**
1966	12	31	0	0.74	0.08	0.2	0.01	**2.35**
1967	1	31	0	0.67	0.07	0.18	0.01	**2.15**
1967	2	28	0	0.9	0.1	0.24	0.01	**3.00**
1967	3	31	0	0.74	0.07	0.18	0.01	**2.05**
1967	4	30	0	0.57	0.05	0.14	0	**1.52**
1967	5	31	0	0.83	0.16	0.25	0.01	**4.93**
1967	6	30	0	0.27	0.05	0.09	0	**1.62**
1967	7	31	0	1.37	0.09	0.28	0.01	**2.71**
1967	8	31	0	2.9	0.26	0.59	0.06	**7.83**
1967	9	30	0	1.58	0.11	0.32	0.02	**3.35**
1967	10	31	0	0.76	0.07	0.18	0.01	**2.03**
1967	11	30	0	0.81	0.06	0.18	0.01	**1.89**
1967	12	31	0	1.65	0.25	0.48	0.04	**7.35**
1968	1	31	0	1.26	0.13	0.27	0.01	**3.83**
1968	2	29	0	0.23	0.01	0.04	0	**0.24**
1968	3	31	0	1.57	0.15	0.37	0.02	**4.60**
1968	4	30	0	0.91	0.11	0.21	0.01	**3.41**
1968	5	31	0	1.77	0.21	0.42	0.03	**6.34**
1968	6	30	0	1.35	0.15	0.35	0.02	**4.61**
1968	7	31	0	0.8	0.07	0.16	0	**1.95**
1968	8	31	0	0.97	0.08	0.22	0.01	**2.29**
1968	9	30	0	0.43	0.03	0.1	0	**0.80**
1968	10	31	0	2.77	0.17	0.54	0.05	**5.00**
1968	11	30	0	1.45	0.14	0.36	0.02	**4.27**
1968	12	31	0	0.51	0.08	0.17	0.01	**2.46**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1969	1	31	0	0.92	0.06	0.19	0.01	**1.72**
1969	2	28	0	1.25	0.17	0.32	0.02	**5.03**
1969	3	31	0	1.4	0.15	0.33	0.02	**4.41**
1969	4	30	0	0.98	0.12	0.24	0.01	**3.52**
1969	5	31	0	1.44	0.1	0.3	0.02	**2.92**
1969	6	30	0	1.9	0.1	0.35	0.02	**2.92**
1969	7	31	0	1.15	0.09	0.24	0.01	**2.73**
1969	8	31	0	0.92	0.11	0.23	0.01	**3.34**
1969	9	30	0	1.09	0.16	0.32	0.02	**4.85**
1969	10	31	0	1.33	0.1	0.3	0.02	**3.02**
1969	11	30	0	0.65	0.05	0.15	0	**1.59**
1969	12	31	0	1.71	0.18	0.41	0.03	**5.29**
1970	1	30	0	0.79	0.08	0.19	0.01	**2.26**
1970	2	28	0	1.72	0.13	0.35	0.02	**3.89**
1970	3	31	0	0.62	0.1	0.17	0.01	**2.86**
1970	4	30	0	0.98	0.1	0.23	0.01	**3.09**
1970	5	31	0	1.32	0.13	0.33	0.02	**3.77**
1970	6	30	0	2.22	0.22	0.5	0.05	**6.52**
1970	7	31	0	1.47	0.13	0.31	0.02	**3.80**
1970	8	31	0	5.68	0.37	1.05	0.2	**11.12**
1970	9	30	0	1	0.06	0.19	0.01	**1.76**
1970	10	31	0	1.62	0.16	0.4	0.03	**4.95**
1970	11	30	0	0.36	0.05	0.09	0	**1.41**
1970	12	31	0	0.67	0.05	0.13	0	**1.49**
1971	1	31	0	1.8	0.11	0.34	0.02	**3.32**
1971	2	28	0	1.44	0.22	0.39	0.03	**6.72**
1971	3	31	0	1.02	0.12	0.22	0.01	**3.63**
1971	4	30	0	1.34	0.09	0.26	0.01	**2.72**
1971	5	31	0	2.55	0.21	0.55	0.05	**6.36**
1971	6	30	0	0.6	0.08	0.16	0	**2.50**
1971	7	31	0	1.25	0.2	0.33	0.02	**5.86**
1971	8	31	0	1.3	0.14	0.28	0.01	**4.09**
1971	9	30	0	1.67	0.22	0.45	0.04	**6.45**
1971	10	31	0	3.7	0.29	0.72	0.09	**8.60**
1971	11	30	0	0.8	0.09	0.18	0.01	**2.74**
1971	12	31	0	0.78	0.09	0.2	0.01	**2.67**
1972	1	31	0	0.7	0.1	0.17	0.01	**2.94**
1972	2	29	0	1.06	0.12	0.25	0.01	**3.67**
1972	3	31	0	1.07	0.12	0.24	0.01	**3.72**
1972	4	30	0	0.65	0.1	0.18	0.01	**2.96**
1972	5	31	0	2.25	0.3	0.6	0.06	**9.05**
1972	6	30	0	5.6	0.24	1.01	0.19	**7.10**
1972	7	31	0	0.91	0.12	0.23	0.01	**3.46**
1972	8	31	0	2.62	0.13	0.5	0.04	**3.92**
1972	9	30	0	1.84	0.14	0.37	0.03	**4.24**
1972	10	31	0	1.02	0.07	0.19	0.01	**2.11**
1972	11	30	0	1.49	0.15	0.37	0.03	**4.42**
1972	12	31	0	1.9	0.2	0.4	0.03	**6.10**
1973	1	31	0	1.18	0.13	0.29	0.01	**4.02**
1973	2	28	0	2.43	0.16	0.47	0.04	**4.83**
1973	3	31	0	1.55	0.24	0.35	0.02	**7.21**
1973	4	30	0	2.15	0.17	0.45	0.04	**5.10**
1973	5	31	0	2	0.16	0.41	0.03	**4.75**
1973	6	30	0	1.83	0.11	0.38	0.03	**3.26**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1973	7	31	0	1.6	0.17	0.4	0.03	**5.23**
1973	8	31	0	1.8	0.15	0.39	0.03	**4.39**
1973	9	30	0	0.7	0.05	0.14	0	**1.48**
1973	10	31	0	1.57	0.11	0.34	0.02	**3.21**
1973	11	30	0	0.48	0.06	0.12	0	**1.66**
1973	12	31	0	1.44	0.24	0.37	0.02	**7.13**
1974	1	31	0	2.1	0.2	0.4	0.03	**5.92**
1974	2	28	0	0.6	0.12	0.21	0.01	**3.58**
1974	3	31	0	2.23	0.17	0.42	0.03	**5.01**
1974	4	30	0	1.54	0.1	0.3	0.02	**3.03**
1974	5	31	0	1.09	0.23	0.36	0.02	**6.78**
1974	6	30	0	0.72	0.08	0.16	0	**2.43**
1974	7	31	0	1.43	0.07	0.26	0.01	**2.11**
1974	8	31	0	2.48	0.21	0.49	0.04	**6.31**
1974	9	30	0	1.91	0.18	0.41	0.03	**5.28**
1974	10	31	0	0.3	0.02	0.06	0	**0.52**
1974	11	30	0	0.61	0.08	0.15	0	**2.32**
1974	12	31	0	2.01	0.14	0.39	0.03	**4.19**
1975	1	31	0	1.22	0.17	0.34	0.02	**5.05**
1975	2	28	0	1.65	0.14	0.32	0.02	**4.21**
1975	3	31	0	2.7	0.31	0.64	0.07	**9.45**
1975	4	30	0	2	0.11	0.37	0.02	**3.18**
1975	5	31	0	1.38	0.19	0.34	0.02	**5.62**
1975	6	30	0	1.14	0.09	0.22	0.01	**2.57**
1975	7	31	0	1.16	0.17	0.31	0.02	**4.95**
1975	8	31	0	0.54	0.05	0.14	0	**1.61**
1975	9	30	0	1.3	0.19	0.34	0.02	**5.72**
1975	10	31	0	2.26	0.15	0.52	0.05	**4.55**
1975	11	30	0	1.28	0.08	0.24	0.01	**2.38**
1975	12	31	0	1.01	0.08	0.21	0.01	**2.35**
1976	1	31	0	0.74	0.09	0.19	0.01	**2.78**
1976	2	29	0	0.72	0.08	0.19	0.01	**2.26**
1976	3	31	0	0.73	0.09	0.19	0.01	**2.63**
1976	4	30	0	0.39	0.02	0.07	0	**0.53**
1976	5	31	0	2.44	0.18	0.45	0.04	**5.46**
1976	6	30	0	2.65	0.19	0.49	0.04	**5.59**
1976	7	31	0	0.65	0.06	0.15	0	**1.91**
1976	8	31	0	1.03	0.11	0.24	0.01	**3.20**
1976	9	30	0	1.88	0.14	0.4	0.03	**4.21**
1976	10	31	0	3.4	0.23	0.62	0.07	**6.99**
1976	11	30	0	1.06	0.05	0.19	0.01	**1.54**
1976	12	31	0	2	0.15	0.39	0.03	**4.43**
1977	1	31	0	0.96	0.07	0.19	0.01	**2.03**
1977	2	28	0	0.33	0.04	0.09	0	**1.16**
1977	3	31	0	1.28	0.14	0.27	0.01	**4.16**
1977	4	30	0	1.75	0.1	0.32	0.02	**3.10**
1977	5	31	0	0.71	0.1	0.18	0.01	**2.86**
1977	6	30	0	1.76	0.13	0.33	0.02	**3.97**
1977	7	31	0	0.78	0.06	0.18	0.01	**1.76**
1977	8	31	0	0.74	0.09	0.19	0.01	**2.68**
1977	9	30	0	5.1	0.28	0.96	0.17	**8.38**
1977	10	31	0	3.31	0.17	0.59	0.06	**5.10**
1977	11	30	0	1.75	0.14	0.35	0.02	**4.31**
1977	12	31	0	0.78	0.12	0.2	0.01	**3.50**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1978	1	31	0	1.31	0.24	0.42	0.03	**7.14**
1978	2	28	0	0.08	0.01	0.02	0	**0.33**
1978	3	31	0	1.81	0.19	0.41	0.03	**5.64**
1978	4	30	0	1.67	0.11	0.33	0.02	**3.29**
1978	5	31	0	1.85	0.14	0.37	0.02	**4.22**
1978	6	30	0	1.79	0.11	0.4	0.03	**3.35**
1978	7	31	0	1.9	0.17	0.4	0.03	**5.19**
1978	8	31	0	1.65	0.17	0.35	0.02	**5.13**
1978	9	30	0	2.9	0.14	0.54	0.05	**4.15**
1978	10	31	0	1.04	0.05	0.19	0.01	**1.50**
1978	11	30	0	0.7	0.1	0.2	0.01	**3.13**
1978	12	31	0	1.67	0.16	0.42	0.03	**4.80**
1979	1	31	0	2.18	0.2	0.51	0.05	**6.14**
1979	2	28	0	1.63	0.18	0.41	0.03	**5.27**
1979	3	31	0	2.58	0.17	0.5	0.05	**5.03**
1979	4	30	0	1.15	0.13	0.29	0.02	**3.90**
1979	5	31	0	1.91	0.19	0.4	0.03	**5.62**
1979	6	30	0	3.43	0.15	0.61	0.07	**4.36**
1979	7	31	0	2.66	0.23	0.62	0.07	**6.90**
1979	8	31	0	0.57	0.07	0.14	0	**2.04**
1979	9	30	0	3.89	0.4	0.84	0.13	**12.00**
1979	10	31	0	0.68	0.08	0.16	0	**2.54**
1979	11	30	0	1.71	0.16	0.41	0.03	**4.69**
1979	12	31	0	0.56	0.04	0.12	0	**1.23**
1980	1	31	0	1.33	0.15	0.29	0.02	**4.52**
1980	2	29	0	0.49	0.04	0.11	0	**1.31**
1980	3	31	0	2.18	0.21	0.44	0.03	**6.43**
1980	4	30	0	1.28	0.12	0.31	0.02	**3.64**
1980	5	31	0	2.31	0.18	0.5	0.05	**5.33**
1980	6	30	0	2.22	0.14	0.45	0.04	**4.27**
1980	7	31	0	0.93	0.11	0.24	0.01	**3.23**
1980	8	31	0	0.89	0.09	0.21	0.01	**2.68**
1980	9	30	0	1.04	0.17	0.31	0.02	**5.20**
1980	10	31	0	0.7	0.11	0.22	0.01	**3.33**
1980	11	30	0	0.68	0.1	0.21	0.01	**3.03**
1980	12	31	0	0.18	0.02	0.04	0	**0.47**
1981	1	31	0	0.35	0.03	0.08	0	**0.79**
1981	2	28	0	1.23	0.1	0.26	0.01	**2.88**
1981	3	31	0	1.47	0.12	0.33	0.02	**3.52**
1981	4	30	0	0.51	0.03	0.11	0	**0.97**
1981	5	31	0	0.88	0.12	0.26	0.01	**3.54**
1981	6	30	0	2.64	0.21	0.51	0.05	**6.23**
1981	7	31	0	2.55	0.14	0.47	0.04	**4.14**
1981	8	31	0	0.46	0.02	0.08	0	**0.51**
1981	9	29	0	2.98	0.24	0.6	0.07	**7.12**
1981	10	30	0	2.11	0.14	0.43	0.03	**4.19**
1981	11	30	0	0.25	0.02	0.06	0	**0.53**
1981	12	30	0	1.8	0.16	0.41	0.03	**4.80**
1982	1	31	0	1.98	0.14	0.37	0.02	**4.24**
1982	2	28	0	1.4	0.16	0.35	0.02	**4.91**
1982	3	31	0	0.91	0.07	0.17	0.01	**1.96**
1982	4	30	0	1.07	0.12	0.26	0.01	**3.69**
1982	5	31	0	1.37	0.16	0.32	0.02	**4.69**
1982	6	30	0	1.92	0.25	0.53	0.05	**7.63**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1982	7	31	0	2.01	0.18	0.44	0.03	**5.44**
1982	8	31	0	1.04	0.07	0.22	0.01	**2.19**
1982	9	30	0	0.45	0.04	0.1	0	**1.06**
1982	10	31	0	1.64	0.14	0.37	0.02	**4.30**
1982	11	30	0	1.28	0.14	0.33	0.02	**4.20**
1982	12	31	0	1.18	0.11	0.29	0.02	**3.45**
1983	1	31	0	1.55	0.08	0.3	0.02	**2.43**
1983	2	28	0	1.58	0.22	0.43	0.04	**6.47**
1983	3	31	0	1.2	0.17	0.34	0.02	**5.12**
1983	4	30	0	1.14	0.19	0.3	0.02	**5.57**
1983	5	31	0	0.6	0.1	0.18	0.01	**2.97**
1983	6	30	0	1.6	0.18	0.4	0.03	**5.44**
1983	7	31	0	0.4	0.03	0.08	0	**0.89**
1983	8	31	0	1.87	0.14	0.42	0.03	**4.11**
1983	9	30	0	0.4	0.04	0.1	0	**1.27**
1983	10	31	0	1.73	0.13	0.33	0.02	**3.90**
1983	11	30	0	2	0.15	0.4	0.03	**4.36**
1983	12	31	0	1.98	0.22	0.47	0.04	**6.51**
1984	1	31	0	1.62	0.12	0.32	0.02	**3.57**
1984	2	29	0	2.18	0.2	0.5	0.05	**5.89**
1984	3	31	0	1.07	0.16	0.32	0.02	**4.79**
1984	4	30	0	1.99	0.15	0.4	0.03	**4.41**
1984	5	31	0	4.25	0.29	0.79	0.11	**8.71**
1984	6	30	0	1.29	0.08	0.25	0.01	**2.45**
1984	7	30	0	1.85	0.22	0.46	0.04	**6.50**
1984	8	31	0	1.43	0.14	0.35	0.02	**4.28**
1984	9	30	0	0.02	0	0	0	**0.02**
1984	10	31	0	1.63	0.12	0.36	0.02	**3.48**
1984	11	30	0	0.82	0.07	0.2	0.01	**2.17**
1984	12	31	0	0.5	0.06	0.15	0	**1.81**
1985	1	31	0	0.9	0.1	0.23	0.01	**3.00**
1985	2	28	0	1.23	0.16	0.35	0.02	**4.84**
1985	3	31	0	0.46	0.03	0.11	0	**1.04**
1985	4	30	0	0.4	0.04	0.1	0	**1.24**
1985	5	31	0	2.9	0.16	0.54	0.05	**4.84**
1985	6	30	0	1.69	0.19	0.43	0.03	**5.73**
1985	7	31	0	0.85	0.15	0.25	0.01	**4.54**
1985	8	31	0	1.43	0.21	0.37	0.02	**6.35**
1985	9	30	0	0.02	0	0	0	**0.02**
1985	10	31	0	1.35	0.09	0.26	0.01	**2.61**
1985	11	30	0	1.82	0.22	0.44	0.04	**6.48**
1985	12	31	0	0.6	0.03	0.11	0	**0.93**
1986	1	31	0	0.3	0.02	0.06	0	**0.48**
1986	2	28	0	0.69	0.06	0.16	0	**1.90**
1986	3	31	0	0.59	0.05	0.14	0	**1.49**
1986	4	30	0	0.12	0.01	0.03	0	**0.33**
1986	5	31	0	0.48	0.06	0.13	0	**1.89**
1986	6	30	0	0.37	0.02	0.07	0	**0.49**
1986	7	31	0	2.5	0.11	0.45	0.04	**3.43**
1986	8	31	0	2.29	0.24	0.53	0.05	**7.17**
1986	9	30	0	0.86	0.07	0.2	0.01	**2.11**
1986	10	31	0	1.77	0.12	0.43	0.03	**3.53**
1986	11	30	0	0.7	0.12	0.2	0.01	**3.66**
1986	12	31	0	1.15	0.14	0.28	0.01	**4.25**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1987	1	31	0	1.76	0.16	0.44	0.04	**4.72**
1987	2	28	0	3.95	0.24	0.76	0.11	**7.29**
1987	3	31	0	1.06	0.14	0.27	0.01	**4.10**
1987	4	30	0	1.6	0.15	0.37	0.02	**4.53**
1987	5	31	0	0.99	0.06	0.2	0.01	**1.71**
1987	6	30	0	1.7	0.21	0.43	0.03	**6.31**
1987	7	31	0	1.25	0.09	0.28	0.01	**2.83**
1987	8	31	0	0.58	0.06	0.15	0	**1.77**
1987	9	30	0	2.35	0.2	0.52	0.05	**6.06**
1987	10	31	0	0.91	0.03	0.16	0	**0.95**
1987	11	30	0	1.93	0.18	0.46	0.04	**5.35**
1987	12	31	0	1.26	0.12	0.31	0.02	**3.59**
1988	1	31	0	0.7	0.09	0.18	0.01	**2.62**
1988	2	29	0	0.49	0.04	0.11	0	**1.28**
1988	3	31	0	0.48	0.05	0.14	0	**1.56**
1988	4	30	0	0.98	0.07	0.21	0.01	**2.07**
1988	5	31	0	0.58	0.08	0.16	0	**2.52**
1988	6	30	0	1.53	0.06	0.27	0.01	**1.79**
1988	7	31	0	2.15	0.18	0.44	0.03	**5.53**
1988	8	31	0	1.44	0.14	0.33	0.02	**4.31**
1988	9	30	0	2.2	0.2	0.54	0.05	**6.02**
1988	10	31	0	0.97	0.08	0.23	0.01	**2.34**
1988	11	30	0	1.8	0.14	0.38	0.03	**4.17**
1988	12	31	0	0.57	0.05	0.12	0	**1.36**
1989	1	31	0	0.62	0.06	0.14	0	**1.70**
1989	2	28	0	1.9	0.2	0.44	0.04	**6.12**
1989	3	31	0	1.65	0.14	0.31	0.02	**4.17**
1989	4	30	0	0.64	0.1	0.19	0.01	**2.98**
1989	5	31	0	1.49	0.17	0.4	0.03	**5.09**
1989	6	30	0	2.1	0.28	0.52	0.05	**8.53**
1989	7	31	0	2.3	0.29	0.58	0.06	**8.68**
1989	8	31	0	3.05	0.16	0.57	0.06	**4.90**
1989	9	30	0	2.73	0.2	0.54	0.05	**5.94**
1989	10	31	0	2.72	0.2	0.64	0.07	**5.96**
1989	11	30	0	1.05	0.09	0.26	0.01	**2.84**
1989	12	31	0	1	0.14	0.32	0.02	**4.18**
1990	1	31	0	1.11	0.14	0.29	0.02	**4.12**
1990	2	28	0	1.39	0.21	0.38	0.03	**6.33**
1990	3	31	0	1.57	0.17	0.4	0.03	**5.10**
1990	4	30	0	0.96	0.08	0.23	0.01	**2.54**
1990	5	31	0	1.74	0.24	0.47	0.04	**7.11**
1990	6	30	0	0.72	0.05	0.15	0	**1.54**
1990	7	31	0	1.5	0.1	0.32	0.02	**3.05**
1990	8	31	0	1.68	0.11	0.31	0.02	**3.41**
1990	9	30	0	1.1	0.07	0.25	0.01	**2.14**
1990	10	31	0	3.7	0.4	0.97	0.17	**11.91**
1990	11	30	0	1.75	0.09	0.33	0.02	**2.66**
1990	12	31	0	1.2	0.12	0.26	0.01	**3.57**
1991	1	31	0	0.91	0.15	0.29	0.02	**4.58**
1991	2	28	0	0.89	0.07	0.19	0.01	**2.15**
1991	3	31	0	2.12	0.26	0.61	0.07	**7.74**
1991	4	30	0	1.1	0.19	0.34	0.02	**5.60**
1991	5	31	0	1.35	0.13	0.31	0.02	**3.76**
1991	6	30	0	1.25	0.1	0.27	0.01	**3.09**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1991	7	31	0	1.52	0.15	0.37	0.02	**4.50**
1991	8	31	0	1.13	0.12	0.27	0.01	**3.51**
1991	9	30	0	0.6	0.05	0.14	0	**1.49**
1991	10	31	0	0.25	0.01	0.05	0	**0.32**
1991	11	30	0	1.22	0.06	0.22	0.01	**1.65**
1991	12	31	0	1.4	0.15	0.35	0.02	**4.55**
1992	1	31	0	1.04	0.06	0.2	0.01	**1.87**
1992	2	29	0	1.09	0.12	0.29	0.02	**3.50**
1992	3	31	0	1.34	0.11	0.28	0.01	**3.20**
1992	4	30	0	2.45	0.18	0.52	0.05	**5.37**
1992	5	31	0	1.3	0.15	0.3	0.02	**4.59**
1992	6	30	0	1.38	0.2	0.36	0.02	**5.94**
1992	7	31	0	1.28	0.18	0.34	0.02	**5.26**
1992	8	31	0	3.24	0.15	0.57	0.06	**4.36**
1992	9	30	0	2.25	0.16	0.46	0.04	**4.86**
1992	10	31	0	2.4	0.17	0.52	0.05	**5.18**
1992	11	30	0	1.86	0.21	0.45	0.04	**6.19**
1992	12	31	0	0.95	0.1	0.22	0.01	**2.87**
1993	1	31	0	1.76	0.23	0.48	0.04	**6.95**
1993	2	28	0	1.46	0.21	0.42	0.03	**6.43**
1993	3	31	0	2.55	0.3	0.65	0.08	**8.96**
1993	4	30	0	0.98	0.13	0.27	0.01	**3.75**
1993	5	31	0	1.32	0.1	0.27	0.01	**3.15**
1993	6	30	0	1.64	0.08	0.3	0.02	**2.54**
1993	7	31	0	1.14	0.13	0.3	0.02	**3.88**
1993	8	31	0	1.21	0.08	0.25	0.01	**2.28**
1993	9	30	0	0.42	0.04	0.1	0	**1.30**
1993	10	31	0	1.02	0.05	0.18	0.01	**1.58**
1993	11	30	0	1.22	0.11	0.28	0.01	**3.16**
1993	12	31	0	2.01	0.17	0.41	0.03	**5.08**
1994	1	31	0	1.17	0.16	0.34	0.02	**4.81**
1994	2	28	0	0.92	0.12	0.26	0.01	**3.57**
1994	3	31	0	3.7	0.27	0.74	0.1	**8.07**
1994	4	30	0	0.53	0.05	0.11	0	**1.44**
1994	5	31	0	1.41	0.08	0.28	0.01	**2.54**
1994	6	30	0	1.42	0.2	0.35	0.02	**5.87**
1994	7	31	0	2.64	0.17	0.49	0.04	**5.17**
1994	8	31	0	2	0.17	0.42	0.03	**5.12**
1994	9	30	0	1.73	0.12	0.38	0.03	**3.67**
1994	10	31	0	1.02	0.08	0.22	0.01	**2.30**
1994	11	30	0	1.49	0.17	0.4	0.03	**4.95**
1994	12	31	0	0.68	0.04	0.13	0	**1.13**
1995	1	31	0	1.29	0.13	0.32	0.02	**3.86**
1995	2	28	0	1.34	0.15	0.33	0.02	**4.41**
1995	3	31	0	1	0.07	0.21	0.01	**2.24**
1995	4	30	0	0.38	0.01	0.07	0	**0.38**
1995	5	31	0	1.25	0.12	0.31	0.02	**3.58**
1995	6	30	0	1.63	0.22	0.37	0.02	**6.64**
1995	7	31	0	5.9	0.27	1.05	0.2	**8.19**
1995	8	30	0	7.1	0.28	1.27	0.3	**8.32**
1995	9	30	0	1.42	0.14	0.32	0.02	**4.29**
1995	10	31	0	2.7	0.23	0.58	0.06	**6.88**
1995	11	30	0	1.1	0.12	0.25	0.01	**3.65**
1995	12	31	0	0.63	0.05	0.14	0	**1.48**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
1996	1	31	0	1.98	0.18	0.43	0.03	**5.36**
1996	2	29	0	1.76	0.1	0.33	0.02	**2.95**
1996	3	31	0	0.73	0.1	0.2	0.01	**3.14**
1996	4	30	0	0.73	0.09	0.18	0.01	**2.84**
1996	5	31	0	1.12	0.08	0.21	0.01	**2.32**
1996	6	30	0	1.42	0.08	0.27	0.01	**2.42**
1996	7	31	0	2.09	0.19	0.44	0.03	**5.56**
1996	8	31	0	1.54	0.14	0.36	0.02	**4.27**
1996	9	30	0	1.42	0.21	0.41	0.03	**6.26**
1996	10	31	0	0.97	0.07	0.2	0.01	**2.05**
1996	11	30	0	0.96	0.11	0.24	0.01	**3.18**
1996	12	31	0	2.83	0.18	0.53	0.05	**5.48**
1997	1	31	0	0.6	0.11	0.21	0.01	**3.23**
1997	2	27	0	1.8	0.15	0.36	0.03	**4.60**
1997	3	31	0	1.36	0.18	0.32	0.02	**5.34**
1997	4	30	0	2	0.3	0.61	0.07	**9.05**
1997	5	31	0	0.8	0.09	0.21	0.01	**2.68**
1997	6	30	0	1.45	0.17	0.35	0.02	**5.14**
1997	7	31	0	1.49	0.21	0.4	0.03	**6.33**
1997	8	31	0	1.4	0.06	0.25	0.01	**1.79**
1997	9	30	0	1.45	0.11	0.32	0.02	**3.43**
1997	10	30	0	1.4	0.12	0.34	0.02	**3.49**
1997	11	30	0	0.62	0.07	0.16	0	**2.22**
1997	12	31	0	1	0.14	0.26	0.01	**4.23**
1998	1	31	0	1.53	0.22	0.43	0.03	**6.57**
1998	2	28	0	1.43	0.18	0.37	0.03	**5.30**
1998	3	31	0	2.76	0.13	0.5	0.05	**3.78**
1998	4	30	0	2	0.21	0.47	0.04	**6.20**
1998	5	31	0	1.1	0.13	0.27	0.01	**3.90**
1998	6	30	0	0.98	0.09	0.21	0.01	**2.66**
1998	7	31	0	0.61	0.04	0.12	0	**1.08**
1998	8	31	0	1.05	0.08	0.25	0.01	**2.47**
1998	9	30	0	1.75	0.09	0.33	0.02	**2.75**
1998	10	31	0	1.4	0.05	0.25	0.01	**1.63**
1998	11	30	0	0.5	0.07	0.15	0	**2.15**
1998	12	31	0	1.95	0.13	0.41	0.03	**3.87**
1999	1	31	0	1.4	0.12	0.35	0.02	**3.59**
1999	2	28	0	0.65	0.06	0.17	0.01	**1.84**
1999	3	31	0	0.8	0.1	0.2	0.01	**2.92**
1999	4	30	0	2.15	0.17	0.43	0.03	**4.99**
1999	5	31	0	0.87	0.08	0.22	0.01	**2.32**
1999	6	30	0	0.84	0.08	0.18	0.01	**2.39**
1999	7	31	0	0.8	0.09	0.2	0.01	**2.55**
1999	8	31	0	1.1	0.12	0.27	0.01	**3.60**
1999	9	30	0	0.6	0.07	0.17	0.01	**2.15**
1999	10	31	0	1.3	0.07	0.24	0.01	**2.00**
1999	11	29	0	0.66	0.05	0.14	0	**1.50**
1999	12	31	0	0.74	0.06	0.17	0.01	**1.70**
2000	1	31	0	1.34	0.1	0.28	0.01	**2.98**
2000	2	29	0	1.7	0.08	0.32	0.02	**2.30**
2000	3	31	0	1.12	0.08	0.25	0.01	**2.54**
2000	4	30	0	1.26	0.17	0.38	0.03	**5.12**
2000	5	31	0	1.43	0.1	0.29	0.02	**2.97**
2000	6	30	0	1.8	0.1	0.33	0.02	**3.02**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

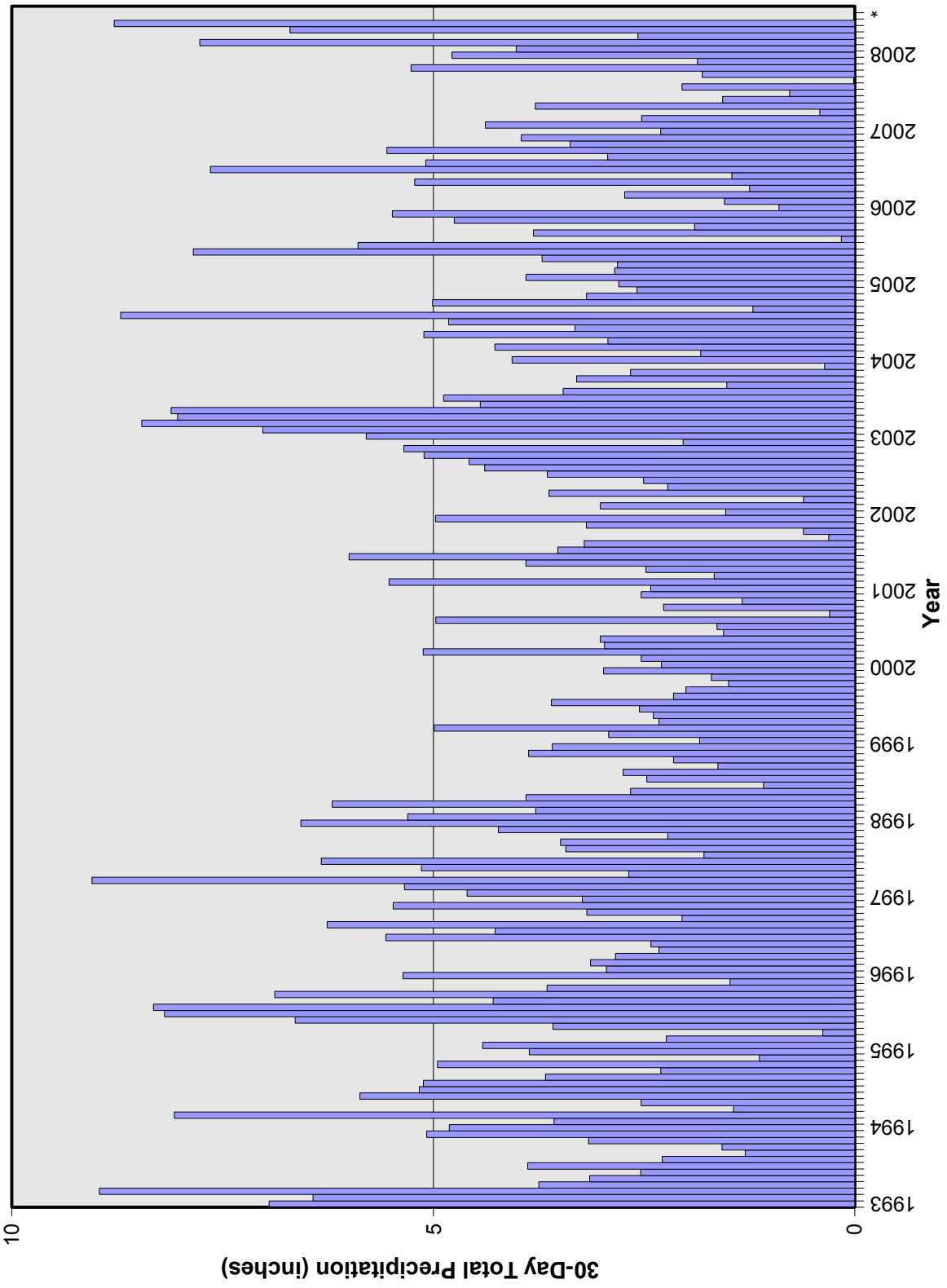
Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
2000	7	31	0	0.72	0.05	0.15	0	**1.56**
2000	8	31	0	0.6	0.05	0.15	0	**1.64**
2000	9	30	0	1.95	0.17	0.45	0.04	**4.97**
2000	10	31	0	0.21	0.01	0.04	0	**0.30**
2000	11	30	0	0.9	0.08	0.18	0.01	**2.27**
2000	12	31	0	0.5	0.04	0.12	0	**1.34**
2001	1	31	0	0.94	0.08	0.2	0.01	**2.54**
2001	2	28	0	0.76	0.08	0.17	0.01	**2.42**
2001	3	31	0	1.9	0.18	0.41	0.03	**5.53**
2001	4	30	0	0.82	0.06	0.17	0.01	**1.67**
2001	5	31	0	1	0.08	0.2	0.01	**2.48**
2001	6	30	0	1.23	0.13	0.29	0.02	**3.90**
2001	7	31	0	2.02	0.2	0.4	0.03	**6.00**
2001	8	31	0	1.92	0.12	0.37	0.02	**3.52**
2001	9	30	0	1.36	0.11	0.29	0.02	**3.21**
2001	10	31	0	0.26	0.01	0.05	0	**0.31**
2001	11	30	0	0.55	0.02	0.1	0	**0.61**
2001	12	31	0	1.86	0.11	0.36	0.02	**3.18**
2002	1	31	0	1.58	0.17	0.37	0.02	**4.97**
2002	2	28	0	0.83	0.05	0.17	0.01	**1.53**
2002	3	31	0	0.9	0.1	0.22	0.01	**3.02**
2002	4	30	0	0.38	0.02	0.07	0	**0.61**
2002	5	31	0	0.86	0.12	0.24	0.01	**3.63**
2002	6	30	0	0.56	0.07	0.16	0	**2.22**
2002	7	31	0	1.5	0.08	0.29	0.01	**2.51**
2002	8	31	0	1.56	0.12	0.35	0.02	**3.65**
2002	9	30	0	1.25	0.15	0.33	0.02	**4.39**
2002	10	31	0	1.64	0.15	0.35	0.02	**4.58**
2002	11	29	0	1.89	0.17	0.43	0.03	**5.11**
2002	12	30	0	1.33	0.18	0.37	0.03	**5.35**
2003	1	29	0	0.59	0.07	0.17	0.01	**2.04**
2003	2	28	0	1.38	0.19	0.36	0.02	**5.80**
2003	3	29	0	2.35	0.23	0.56	0.06	**7.02**
2003	4	30	0	1.66	0.28	0.53	0.05	**8.46**
2003	5	31	0	1.39	0.27	0.4	0.03	**8.03**
2003	6	29	0	1.98	0.27	0.54	0.05	**8.11**
2003	7	31	0	1.73	0.15	0.35	0.02	**4.44**
2003	8	31	0	1.45	0.16	0.35	0.02	**4.88**
2003	9	30	0	1.69	0.12	0.35	0.02	**3.46**
2003	10	30	0	0.7	0.05	0.14	0	**1.52**
2003	11	30	0	1.1	0.11	0.26	0.01	**3.30**
2003	12	31	0	0.95	0.09	0.24	0.01	**2.66**
2004	1	30	0	0.22	0.01	0.04	0	**0.36**
2004	2	29	0	1.17	0.14	0.28	0.01	**4.07**
2004	3	31	0	0.65	0.06	0.15	0	**1.83**
2004	4	26	0	1.08	0.14	0.31	0.02	**4.27**
2004	5	26	0	1.03	0.1	0.22	0.01	**2.93**
2004	6	26	0	1.39	0.17	0.29	0.02	**5.11**
2004	7	30	0	1.32	0.11	0.27	0.01	**3.32**
2004	8	31	0	2.47	0.16	0.45	0.04	**4.82**
2004	9	30	0	4	0.29	0.91	0.15	**8.71**
2004	10	31	0	0.3	0.04	0.08	0	**1.21**
2004	11	30	0	1.25	0.17	0.35	0.02	**5.01**
2004	12	31	0	1.74	0.11	0.33	0.02	**3.18**

Table D-5: Monthly precipitation, Turnersburg COOP 318778

Year	Month	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
2005	1	31	0	1.41	0.09	0.29	0.01	**2.58**
2005	2	27	0	0.94	0.09	0.21	0.01	**2.80**
2005	3	31	0	1.66	0.13	0.32	0.02	**3.90**
2005	4	30	0	0.62	0.1	0.18	0.01	**2.85**
2005	5	31	0	0.93	0.09	0.21	0.01	**2.82**
2005	6	30	0	1.1	0.12	0.28	0.01	**3.71**
2005	7	31	0	2.81	0.26	0.58	0.06	**7.85**
2005	8	31	0	2.25	0.2	0.52	0.05	**5.89**
2005	9	30	0	0.07	0.01	0.02	0	**0.16**
2005	10	31	0	2.1	0.13	0.42	0.03	**3.81**
2005	11	30	0	0.7	0.06	0.17	0.01	**1.90**
2005	12	31	0	1.7	0.16	0.41	0.03	**4.75**
2006	1	31	0	1.72	0.18	0.42	0.03	**5.49**
2006	2	28	0	0.3	0.03	0.08	0	**0.90**
2006	3	31	0	0.8	0.05	0.17	0.01	**1.55**
2006	4	30	0	0.68	0.09	0.18	0.01	**2.73**
2006	5	31	0	0.9	0.04	0.16	0	**1.25**
2006	6	30	0	0.9	0.17	0.29	0.02	**5.22**
2006	7	31	0	0.81	0.05	0.17	0	**1.46**
2006	8	31	0	2	0.25	0.56	0.06	**7.65**
2006	9	30	0	2.2	0.17	0.45	0.04	**5.09**
2006	10	31	0	1.18	0.1	0.29	0.01	**2.93**
2006	11	30	0	2.2	0.19	0.46	0.04	**5.55**
2006	12	31	0	1.3	0.11	0.32	0.02	**3.38**
2007	1	31	0	2.02	0.13	0.41	0.03	**3.96**
2007	2	28	0	0.81	0.08	0.2	0.01	**2.30**
2007	3	31	0	2	0.15	0.46	0.04	**4.38**
2007	4	30	0	1.65	0.08	0.33	0.02	**2.53**
2007	5	31	0	0.23	0.01	0.05	0	**0.42**
2007	6	30	0	1.65	0.13	0.37	0.02	**3.79**
2007	7	31	0	0.7	0.05	0.17	0.01	**1.57**
2007	8	31	0	0.72	0.03	0.13	0	**0.77**
2007	9	30	0	2.05	0.07	0.37	0.02	**2.05**
2007	10	31	0	0	0	0	0	**0.00**
2007	11	30	0	0.46	0.06	0.13	0	**1.81**
2007	12	31	0	0.77	0.18	0.25	0.01	**5.26**
2008	1	31	0	0.44	0.06	0.12	0	**1.87**
2008	2	29	0	1	0.16	0.25	0.01	**4.78**
2008	3	31	0	0.92	0.13	0.29	0.01	**4.02**
2008	4	30	0	1.56	0.26	0.41	0.03	**7.77**
2008	5	31	0	0.48	0.09	0.13	0	**2.57**
2008	6	30	0	1.3	0.22	0.36	0.02	**6.70**
2008	7	31	0	2.44	0.29	0.52	0.05	**8.79**
2008	8	12	0	0.53	0.17	0.18	0.01	**5.00**

NOTE: In order to compensate for the variable number of days in a month as well as the presence of missing data in some months, a monthly total precipitation was standardized to the so-called “30-day average total”, which was calculated by multiplying the average daily water precipitation for a given month by 30 in order to remove a likely bias caused by the above conditions.

Graph D-5: Monthly precipitation, Turnersburg COOP 318778



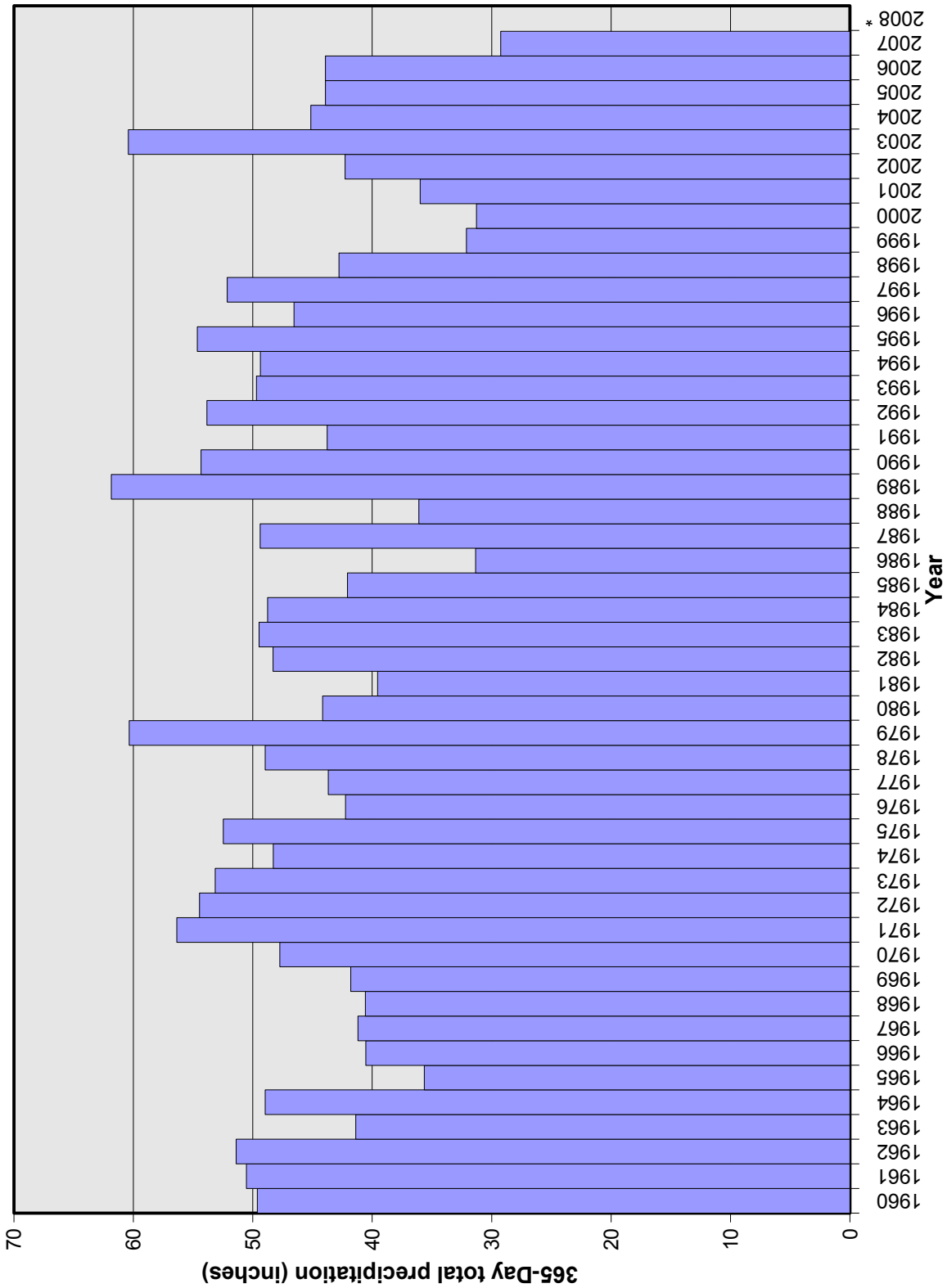
NOTE: Months with available data of less than 25 were marked insufficient,further denoted with *, and are not presented in this graph

Table D-6: Annual precipitation, Turnersburg COOP 318778

Year	Months	Days	Low	High	Daily Average	Std. Dev.	Std. Err.	365-Day Average Total
1960	12	366	0	2.1	0.14	0.35	0.01	**49.61**
1961	12	365	0	3.22	0.14	0.38	0.01	**50.54**
1962	12	365	0	3	0.14	0.34	0.01	**51.40**
1963	12	365	0	3.1	0.11	0.33	0.01	**41.37**
1964	12	366	0	3.48	0.13	0.39	0.01	**48.96**
1965	12	365	0	2.36	0.1	0.28	0	**35.65**
1966	12	365	0	2.57	0.11	0.33	0.01	**40.53**
1967	12	365	0	2.9	0.11	0.3	0	**41.20**
1968	12	366	0	2.77	0.11	0.31	0	**40.57**
1969	12	365	0	1.9	0.11	0.29	0	**41.79**
1970	12	364	0	5.68	0.13	0.42	0.01	**47.73**
1971	12	365	0	3.7	0.15	0.38	0.01	**56.37**
1972	12	366	0	5.6	0.15	0.45	0.01	**54.46**
1973	12	365	0	2.43	0.15	0.36	0.01	**53.15**
1974	12	365	0	2.48	0.13	0.33	0.01	**48.28**
1975	12	365	0	2.7	0.14	0.37	0.01	**52.48**
1976	12	366	0	3.4	0.12	0.34	0.01	**42.24**
1977	12	365	0	5.1	0.12	0.4	0.01	**43.68**
1978	12	365	0	2.9	0.13	0.37	0.01	**48.97**
1979	12	365	0	3.89	0.17	0.48	0.01	**60.35**
1980	12	366	0	2.31	0.12	0.31	0.01	**44.15**
1981	12	362	0	2.98	0.11	0.36	0.01	**39.55**
1982	12	365	0	2.01	0.13	0.34	0.01	**48.30**
1983	12	365	0	2	0.14	0.34	0.01	**49.48**
1984	12	365	0	4.25	0.13	0.4	0.01	**48.77**
1985	12	365	0	2.9	0.12	0.32	0.01	**42.07**
1986	12	365	0	2.5	0.09	0.28	0	**31.34**
1987	12	365	0	3.95	0.14	0.4	0.01	**49.38**
1988	12	366	0	2.2	0.1	0.3	0	**36.10**
1989	12	365	0	3.05	0.17	0.45	0.01	**61.84**
1990	12	365	0	3.7	0.15	0.43	0.01	**54.34**
1991	12	365	0	2.12	0.12	0.32	0.01	**43.77**
1992	12	366	0	3.24	0.15	0.4	0.01	**53.84**
1993	12	365	0	2.55	0.14	0.36	0.01	**49.69**
1994	12	365	0	3.7	0.14	0.39	0.01	**49.37**
1995	12	364	0	7.1	0.15	0.56	0.02	**54.65**
1996	12	366	0	2.83	0.13	0.34	0.01	**46.54**
1997	12	363	0	2	0.14	0.34	0.01	**52.15**
1998	12	365	0	2.76	0.12	0.34	0.01	**42.79**
1999	12	364	0	2.15	0.09	0.25	0	**32.11**
2000	12	366	0	1.95	0.09	0.27	0	**31.27**
2001	12	365	0	2.02	0.1	0.28	0	**35.99**
2002	12	363	0	1.89	0.12	0.3	0	**42.27**
2003	12	359	0	2.35	0.17	0.39	0.01	**60.42**
2004	12	351	0	4	0.12	0.38	0.01	**45.14**
2005	12	364	0	2.81	0.12	0.35	0.01	**43.92**
2006	12	365	0	2.2	0.12	0.34	0.01	**43.92**
2007	12	365	0	2.05	0.08	0.28	0	**29.24**
2008	8	225	0	2.44	0.17	0.33	0.01	**63.12**

NOTE: In order to compensate for the variable number of days in a year as well as the presence of missing data in some years, an annual total precipitation was standardized to a so-called “365-day average total”, which was calculated by multiplying the average daily precipitation for a given year by 365 in order to remove a likely bias caused by the above conditions.

Graph D-6: Annual precipitation, Turnersburg COOP 318778

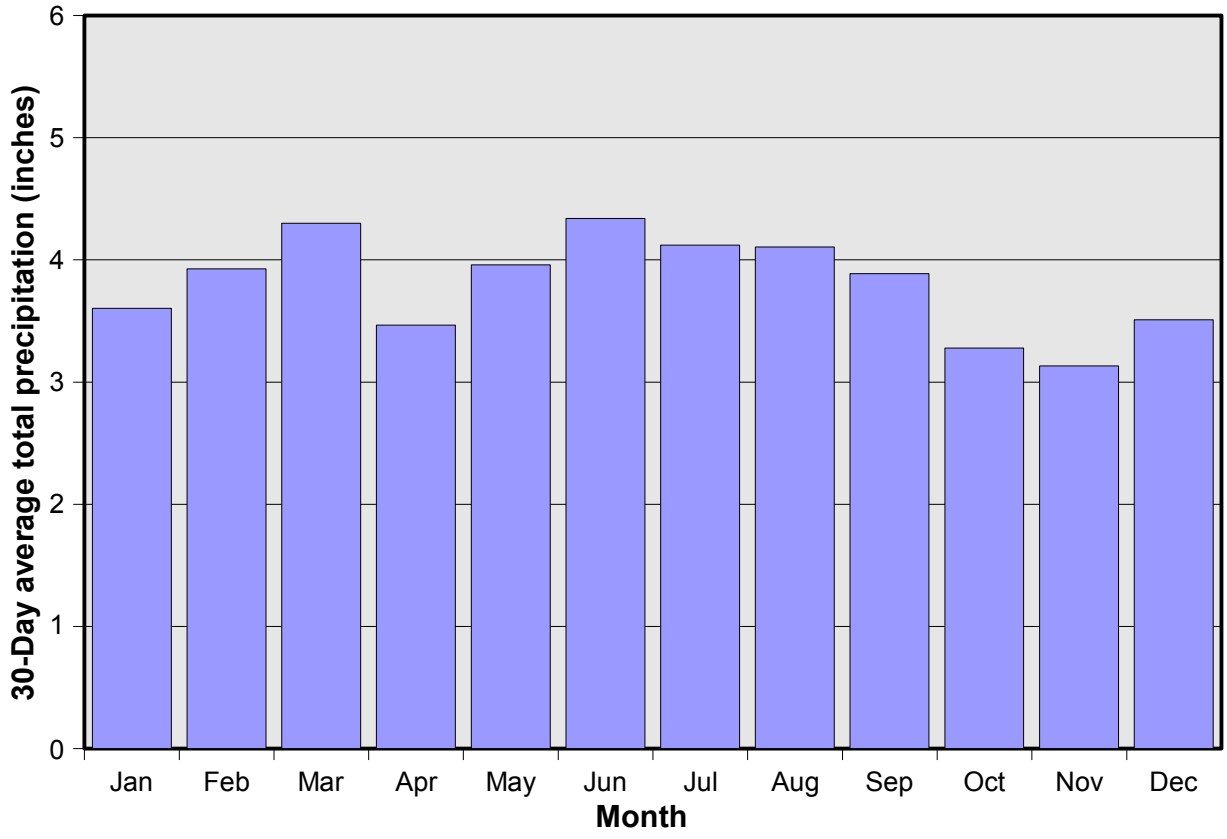


NOTE: Years with available data of less than 300 were marked insufficient,further denoted with *, and are not presented in this graph

Table D-7: Precipitation by month, Turnersburg COOP 318778

Month	Total	Day Count	Daily Average	Std. Dev.	Std. Err.	30-Day Average Total
Jan	181.97	1515	0.12	0.31	0.01	**3.60**
Feb	181.05	1383	0.13	0.33	0.01	**3.93**
Mar	217.43	1517	0.14	0.37	0.01	**4.30**
Apr	169.38	1466	0.12	0.31	0.01	**3.47**
May	199.83	1514	0.13	0.34	0.01	**3.96**
Jun	211.87	1465	0.14	0.39	0.01	**4.34**
Jul	208.41	1517	0.14	0.38	0.01	**4.12**
Aug	205.17	1499	0.14	0.42	0.01	**4.11**
Sep	186.43	1439	0.13	0.42	0.01	**3.89**
Oct	162.29	1485	0.11	0.39	0.01	**3.28**
Nov	150.13	1438	0.1	0.29	0.01	**3.13**
Dec	173.86	1486	0.12	0.32	0.01	**3.51**

Graph D-7: Precipitation by month, Turnersburg COOP 318778



NOTE: The 30-day aveage total precipitaion for a month was calculated by multiplying its dail average precipitation by 30 in order to elmiinate the slight bias die to the inconsistent number of days in different months.

Table D-8: Precipitation by weekday, Turnersburg COOP 318778

Day	Total	Day Count	Daily Average	Std. Dev.	Std. Error	52-Week Average Total
Mon	391.20	2533	0.1544	0.4113	0.0034	**8.031**
Tue	339.50	2536	0.1339	0.3614	0.0026	**6.961**
Wed	323.96	2536	0.1277	0.3647	0.0026	**6.643**
Thu	321.59	2533	0.1270	0.3444	0.0024	**6.602**
Fri	348.73	2535	0.1376	0.3625	0.0026	**7.153**
Sat	310.61	2537	0.1224	0.3528	0.0025	**6.366**
Sun	212.23	2514	0.0844	0.3004	0.0018	**4.390**

Graph D-8: Precipitation by weekday, Turnersville COOP 318778

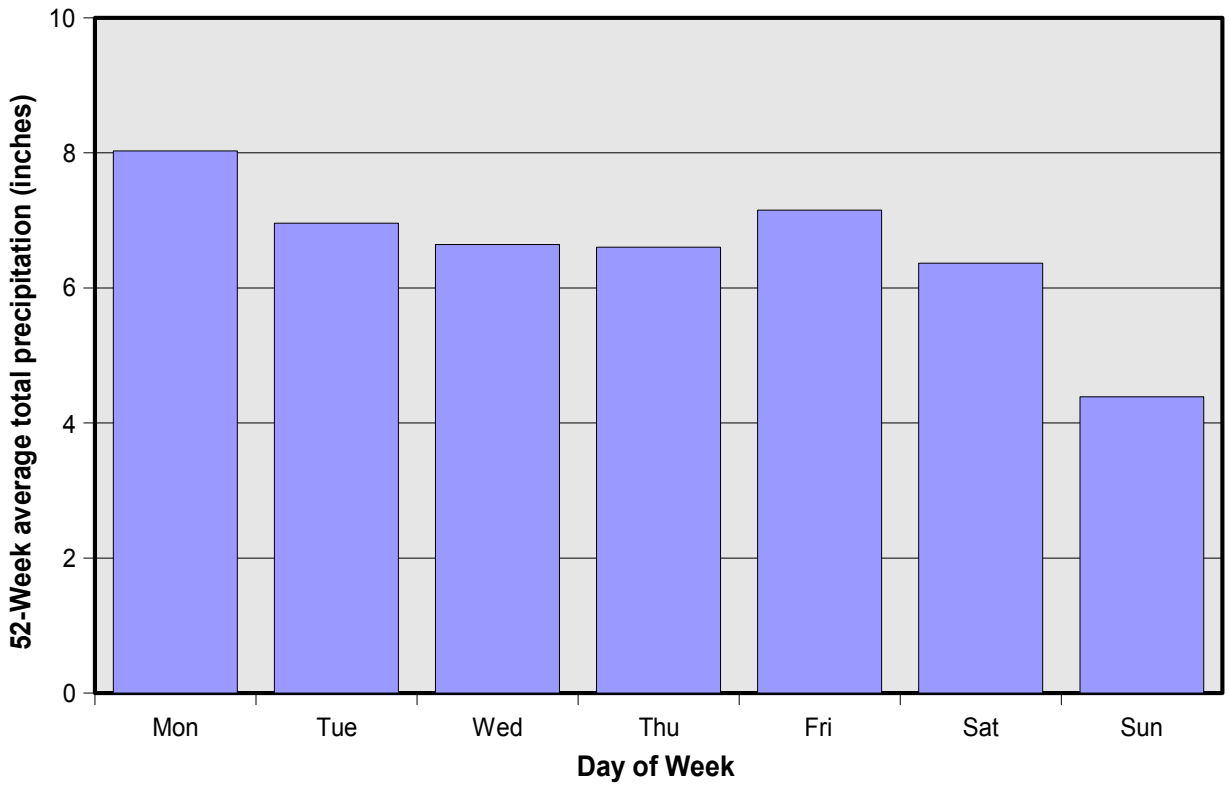


Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
1981	10	31	20.7	20.98	20.84	**815.16**	0.09	0
1981	11	30	20.69	20.92	20.8	**815.20**	0.07	0
1981	12	31	20	20.95	20.64	**815.36**	0.31	0.02
1982	1	31	19.19	19.87	19.39	**816.61**	0.17	0.01
1982	2	28	18.41	19.27	18.74	**817.26**	0.23	0.01
1982	3	31	18.03	18.46	18.2	**817.80**	0.13	0
1982	4	30	18.46	18.91	18.71	**817.29**	0.15	0
1982	5	31	18.91	19.25	19.1	**816.90**	0.11	0
1982	6	30	18.97	19.34	19.16	**816.84**	0.12	0
1982	7	31	19.27	19.7	19.53	**816.47**	0.13	0
1982	8	31	19.53	19.9	19.67	**816.33**	0.1	0
1982	9	30	19.92	20.6	20.28	**815.72**	0.2	0.01
1982	10	31	20.61	20.91	20.78	**815.22**	0.08	0
1982	11	30	20.04	20.78	20.43	**815.57**	0.17	0.01
1982	12	31	19.3	20.19	19.64	**816.36**	0.31	0.02
1983	1	31	19.37	19.67	19.49	**816.51**	0.09	0
1983	2	28	18.29	19.39	18.72	**817.28**	0.37	0.03
1983	3	31	17.65	18.41	18.07	**817.93**	0.23	0.01
1983	4	30	16.84	17.66	17.1	**818.90**	0.24	0.01
1983	5	31	17.04	17.9	17.5	**818.50**	0.27	0.01
1983	6	30	17.95	18.51	18.25	**817.75**	0.18	0.01
1983	7	31	18.53	19.31	18.92	**817.08**	0.23	0.01
1983	8	31	19.3	20.07	19.7	**816.30**	0.22	0.01
1983	9	30	20.1	20.69	20.44	**815.56**	0.17	0.01
1983	10	31	20.71	20.94	20.85	**815.15**	0.06	0
1983	11	30	20.29	20.89	20.74	**815.26**	0.19	0.01
1983	12	31	18.87	20.29	19.36	**816.64**	0.43	0.03
1984	1	28	18.03	18.94	18.57	**817.43**	0.28	0.01
1984	2	3	16.89	17	16.94	**819.06**	0.04	0
1984	3	31	16.61	17.08	16.85	**819.15**	0.13	0
1984	4	30	16.07	16.61	16.37	**819.63**	0.18	0.01
1984	5	31	16.19	16.91	16.55	**819.45**	0.19	0.01
1984	6	30	16.18	17.19	16.78	**819.22**	0.33	0.02
1984	7	30	16.43	17.44	17.01	**818.99**	0.33	0.02
1984	10	6	18.43	18.5	18.46	**817.54**	0.02	0
1984	11	16	18.5	18.8	18.63	**817.37**	0.11	0
1984	12	31	18.8	19.04	18.92	**817.08**	0.07	0
1985	1	31	18.63	19.05	18.78	**817.22**	0.11	0
1985	2	28	17.5	18.62	17.74	**818.26**	0.27	0.01
1985	3	31	17.52	18	17.78	**818.22**	0.15	0
1985	4	30	18.03	18.52	18.29	**817.71**	0.14	0
1985	5	31	18.32	18.66	18.5	**817.50**	0.12	0
1985	6	30	18.55	19.04	18.73	**817.27**	0.16	0
1985	7	31	19.05	19.37	19.24	**816.76**	0.1	0
1985	8	31	18.28	19.43	19.1	**816.90**	0.39	0.03
1985	9	30	18.23	19.08	18.59	**817.41**	0.26	0.01
1985	10	31	18.59	19.22	18.99	**817.01**	0.19	0.01
1985	11	30	18.14	19.29	19.01	**816.99**	0.35	0.02
1985	12	31	17.64	18.15	17.91	**818.09**	0.1	0
1986	1	31	18.16	18.69	18.46	**817.54**	0.16	0
1986	2	28	18.63	18.85	18.76	**817.24**	0.07	0
1986	3	31	18.34	18.89	18.64	**817.36**	0.2	0.01
1986	4	30	18.37	18.96	18.61	**817.40**	0.14	0
1986	5	31	18.96	19.54	19.28	**816.72**	0.17	0

Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
1986	6	30	19.56	20.22	19.9	**816.10**	0.19	0.01
1986	7	31	20.23	20.8	20.59	**815.41**	0.18	0.01
1986	8	31	19.87	20.85	20.3	**815.70**	0.42	0.03
1986	9	30	19.97	20.42	20.13	**815.87**	0.13	0
1986	10	31	20.43	20.73	20.61	**815.39**	0.08	0
1986	11	30	19.53	20.61	20.1	**815.90**	0.36	0.02
1986	12	31	18.7	19.52	19.05	**816.95**	0.25	0.01
1987	1	31	17.97	18.81	18.53	**817.47**	0.2	0.01
1987	2	28	17.12	17.82	17.57	**818.43**	0.14	0
1987	3	31	16.5	16.77	16.61	**819.39**	0.06	0
1987	4	30	15.1	16.75	16.07	**819.93**	0.52	0.05
1987	5	31	15.23	16.84	16.15	**819.85**	0.47	0.04
1987	6	30	16.88	17.79	17.34	**818.66**	0.27	0.01
1987	7	31	17.81	18.67	18.24	**817.76**	0.26	0.01
1987	8	31	18.65	19.19	18.83	**817.17**	0.18	0.01
1987	9	30	18.61	19.28	18.85	**817.15**	0.24	0.01
1987	10	31	18.88	19.44	19.2	**816.80**	0.18	0.01
1987	11	30	19.31	19.63	19.52	**816.48**	0.07	0
1987	12	31	18.42	19.32	18.94	**817.06**	0.28	0.01
1988	1	31	17.5	18.39	17.91	**818.09**	0.28	0.01
1988	2	29	17.29	17.63	17.45	**818.55**	0.1	0
1988	3	31	17.6	17.88	17.75	**818.25**	0.08	0
1988	4	30	17.55	17.85	17.67	**818.33**	0.07	0
1988	5	31	17.79	18.08	17.94	**818.06**	0.1	0
1988	6	30	18.09	18.84	18.47	**817.53**	0.21	0.01
1988	7	31	18.87	19.66	19.31	**816.69**	0.23	0.01
1988	8	29	19.45	19.89	19.72	**816.28**	0.11	0
1988	9	30	18.27	19.41	18.66	**817.34**	0.37	0.02
1988	10	31	17.7	18.33	17.99	**818.01**	0.21	0.01
1988	11	30	18.19	18.65	18.46	**817.54**	0.13	0
1988	12	31	18.15	18.65	18.39	**817.61**	0.17	0.01
1989	1	31	17.98	18.53	18.17	**817.83**	0.15	0
1989	2	28	16.98	18.51	18.11	**817.89**	0.42	0.03
1989	3	31	15.67	16.91	16.24	**819.76**	0.34	0.02
1989	4	30	15.8	16.24	15.97	**820.03**	0.12	0
1989	5	31	15.56	16.36	15.9	**820.10**	0.24	0.01
1989	6	30	15.91	16.52	16.27	**819.73**	0.2	0.01
1989	7	31	16.07	16.65	16.39	**819.61**	0.18	0.01
1989	8	31	16.5	17.12	16.78	**819.22**	0.2	0.01
1989	9	30	17.12	17.55	17.36	**818.64**	0.13	0
1989	10	31	15.91	16.79	16.21	**819.79**	0.2	0.01
1989	11	30	16.21	16.58	16.42	**819.58**	0.11	0
1989	12	31	15.63	16.56	16.02	**819.98**	0.32	0.02
1990	1	31	14.68	15.9	15.29	**820.71**	0.31	0.02
1990	2	28	13.51	14.83	14.15	**821.85**	0.39	0.03
1990	3	31	13.73	14.57	14.23	**821.77**	0.26	0.01
1990	4	30	14.45	14.76	14.6	**821.40**	0.09	0
1990	5	31	13.59	14.83	14.43	**821.57**	0.31	0.02
1990	6	30	13.65	15.14	14.44	**821.56**	0.45	0.04
1990	7	31	15.16	16.22	15.74	**820.26**	0.29	0.02
1990	8	31	16.28	17	16.62	**819.38**	0.2	0.01
1990	9	30	17.04	17.71	17.37	**818.63**	0.19	0.01
1990	10	31	15.61	17.89	16.82	**819.18**	0.83	0.13
1990	11	30	15.52	16	15.7	**820.30**	0.13	0

Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
1990	12	31	15.62	16.17	15.96	**820.04**	0.13	0
1991	1	31	13.98	15.56	14.58	**821.42**	0.58	0.06
1991	2	9	14.54	14.65	14.58	**821.42**	0.04	0
1991	3	31	13.71	14.89	14.21	**821.79**	0.23	0.01
1991	4	30	13.18	14.06	13.65	**822.35**	0.25	0.01
1991	5	31	12.56	13.53	13.11	**822.89**	0.27	0.01
1991	6	30	13.27	14.62	14.03	**821.97**	0.4	0.03
1991	7	31	14.66	15.65	15.23	**820.77**	0.31	0.02
1991	8	31	15.56	15.94	15.74	**820.26**	0.11	0
1991	9	30	15.82	16.37	16.13	**819.87**	0.15	0
1991	10	31	16.36	16.83	16.61	**819.39**	0.15	0
1991	11	30	16.83	16.98	16.91	**819.09**	0.04	0
1991	12	31	16.83	17.08	16.95	**819.05**	0.07	0
1992	1	31	16.56	16.88	16.67	**819.33**	0.08	0
1992	2	29	16.04	16.89	16.67	**819.33**	0.24	0.01
1992	3	31	15.48	16.06	15.69	**820.31**	0.18	0.01
1992	4	30	15.45	16.05	15.74	**820.26**	0.18	0.01
1992	5	31	15.66	16	15.81	**820.19**	0.09	0
1992	6	30	14.92	15.64	15.24	**820.76**	0.23	0.01
1992	7	31	15.49	16.46	16.02	**819.98**	0.31	0.02
1992	8	31	16.29	16.72	16.51	**819.49**	0.13	0
1992	9	30	16.47	16.8	16.68	**819.32**	0.08	0
1992	10	31	15.59	16.46	15.89	**820.11**	0.26	0.01
1992	11	30	14.51	15.89	15.16	**820.84**	0.37	0.02
1992	12	31	14.14	14.77	14.43	**821.57**	0.19	0.01
1993	1	31	12.66	14.33	13.34	**822.66**	0.53	0.05
1993	2	28	12.96	13.56	13.27	**822.73**	0.15	0
1993	3	31	10.66	13.04	11.97	**824.03**	0.74	0.1
1993	4	30	10.85	11.83	11.3	**824.70**	0.31	0.02
1993	5	31	11.84	12.57	12.17	**823.83**	0.22	0.01
1993	6	30	12.59	13.5	13.04	**822.96**	0.26	0.01
1993	7	31	13.54	14.64	14.11	**821.89**	0.32	0.02
1993	8	31	14.66	15.25	14.98	**821.02**	0.16	0
1993	9	30	15.3	15.58	15.43	**820.57**	0.06	0
1993	10	31	15.5	15.96	15.73	**820.27**	0.14	0
1993	11	30	15.85	16.07	15.96	**820.04**	0.05	0
1993	12	31	15.06	15.93	15.44	**820.56**	0.26	0.01
1994	1	31	13.81	15.07	14.38	**821.62**	0.4	0.03
1994	2	28	13.12	13.99	13.6	**822.40**	0.25	0.01
1994	3	31	11.46	13.11	12.58	**823.42**	0.4	0.03
1994	4	30	11.62	13.03	12.51	**823.49**	0.36	0.02
1994	5	31	13.02	13.93	13.45	**822.55**	0.27	0.01
1994	6	30	13.93	14.44	14.18	**821.82**	0.15	0
1994	7	31	14.46	15.07	14.8	**821.20**	0.19	0.01
1994	8	31	14.56	15.06	14.81	**821.19**	0.15	0
1994	9	30	14.84	15.39	15.1	**820.90**	0.17	0.01
1994	10	31	15.39	15.69	15.54	**820.46**	0.09	0
1994	11	30	15.64	15.95	15.83	**820.17**	0.07	0
1994	12	31	15.48	15.71	15.57	**820.43**	0.07	0
1995	1	31	14.75	15.82	15.2	**820.80**	0.36	0.02
1995	2	28	14.31	15.3	14.84	**821.16**	0.35	0.02
1995	3	31	13.75	14.49	14.09	**821.91**	0.23	0.01
1995	4	30	14.51	15.43	14.99	**821.01**	0.27	0.01
1995	5	31	15.46	16.17	15.81	**820.19**	0.23	0.01

Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
1995	6	30	14.56	16.22	15.75	**820.25**	0.44	0.04
1995	7	31	14.51	15.31	14.88	**821.12**	0.23	0.01
1995	8	31	15.04	15.93	15.45	**820.55**	0.27	0.01
1995	9	30	14.94	15.26	15.07	**820.93**	0.09	0
1995	10	31	14.35	15.04	14.67	**821.33**	0.17	0.01
1995	11	30	13.8	14.33	14.05	**821.96**	0.16	0
1995	12	31	14.12	14.36	14.25	**821.75**	0.06	0
1996	1	31	12.78	14.41	13.76	**822.24**	0.57	0.06
1996	2	29	12.42	13.15	12.76	**823.24**	0.2	0.01
1996	3	31	12.64	13.31	12.94	**823.06**	0.17	0.01
1996	4	30	12.62	13.11	12.85	**823.15**	0.14	0
1996	5	31	12.89	13.78	13.3	**822.70**	0.28	0.01
1996	6	30	13.82	14.43	14.05	**821.95**	0.18	0.01
1996	7	31	14.47	15.24	14.93	**821.07**	0.26	0.01
1996	8	31	15.23	15.7	15.46	**820.54**	0.13	0
1996	9	30	15.19	15.79	15.4	**820.61**	0.19	0.01
1996	10	31	15.17	15.4	15.24	**820.76**	0.06	0
1996	11	30	15.23	15.43	15.36	**820.64**	0.05	0
1996	12	30	14.28	14.99	14.47	**821.53**	0.17	0.01
1997	1	3	13.97	14.06	14.01	**821.99**	0.04	0
1997	2	28	13.48	14.08	13.81	**822.19**	0.23	0.01
1997	3	31	12.99	13.47	13.22	**822.78**	0.11	0
1997	4	30	12.52	13.57	13.33	**822.67**	0.26	0.01
1997	5	31	12.3	13.57	12.97	**823.03**	0.43	0.03
1997	6	30	13.54	14.24	13.83	**822.17**	0.21	0.01
1997	7	31	14.25	14.9	14.59	**821.41**	0.2	0.01
1997	8	31	14.57	15.41	14.96	**821.04**	0.25	0.01
1997	9	30	15.44	15.93	15.73	**820.28**	0.15	0
1997	10	31	15.96	16.32	16.19	**819.81**	0.11	0
1997	11	30	16.18	16.33	16.26	**819.74**	0.05	0
1997	12	30	15.58	16.19	16.01	**819.99**	0.16	0
1998	1	31	13.83	15.6	14.81	**821.19**	0.53	0.05
1998	2	28	13.44	13.9	13.62	**822.38**	0.14	0
1998	3	31	13.19	13.69	13.37	**822.63**	0.15	0
1998	4	30	12.54	13.53	13.12	**822.88**	0.32	0.02
1998	5	29	12.9	13.71	13.26	**822.74**	0.22	0.01
1998	6	28	13.76	14.62	14.15	**821.85**	0.24	0.01
1998	7	31	14.64	15.64	15.24	**820.76**	0.32	0.02
1998	8	31	15.64	16.34	15.96	**820.04**	0.19	0.01
1998	9	30	16.37	16.92	16.65	**819.35**	0.16	0
1998	10	31	16.94	17.53	17.25	**818.75**	0.18	0.01
1998	11	30	17.54	17.75	17.66	**818.34**	0.05	0
1998	12	31	17.43	17.84	17.69	**818.31**	0.12	0
1999	1	31	16.19	17.5	16.9	**819.10**	0.38	0.03
1999	2	28	16	16.3	16.17	**819.83**	0.08	0
1999	3	31	15.99	16.26	16.13	**819.87**	0.09	0
1999	4	30	16.02	16.49	16.24	**819.76**	0.16	0
1999	5	31	16.03	16.54	16.2	**819.80**	0.14	0
1999	6	30	16.57	17.46	17.09	**818.91**	0.27	0.01
1999	7	31	17.5	17.99	17.75	**818.25**	0.13	0
1999	8	31	18.02	18.63	18.37	**817.63**	0.19	0.01
1999	9	30	18.65	18.92	18.78	**817.22**	0.09	0
1999	10	31	18.7	18.85	18.79	**817.21**	0.03	0
1999	11	30	18.8	19	18.91	**817.09**	0.04	0

Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
1999	12	31	18.84	19.02	18.94	**817.06**	0.06	0
2000	1	31	18.29	18.88	18.61	**817.39**	0.19	0.01
2000	2	29	17.84	18.25	18.01	**817.99**	0.15	0
2000	3	31	17.5	18.13	17.85	**818.15**	0.21	0.01
2000	4	30	17.34	17.7	17.5	**818.50**	0.12	0
2000	5	31	17.33	18.1	17.7	**818.30**	0.26	0.01
2000	6	30	18.12	18.97	18.53	**817.48**	0.26	0.01
2000	7	31	19	19.6	19.33	**816.67**	0.19	0.01
2000	8	31	19.62	19.97	19.8	**816.20**	0.11	0
2000	9	30	19.98	20.14	20.06	**815.94**	0.05	0
2000	10	31	20.08	20.47	20.26	**815.74**	0.1	0
2000	11	30	20.48	20.58	20.53	**815.47**	0.03	0
2000	12	31	20.57	20.71	20.64	**815.36**	0.03	0
2001	1	31	20.5	20.74	20.65	**815.35**	0.1	0
2001	2	28	20.11	20.56	20.42	**815.58**	0.15	0
2001	3	31	19.11	20.09	19.69	**816.31**	0.25	0.01
2001	4	30	18.95	19.25	19.05	**816.95**	0.09	0
2001	5	31	19.25	19.9	19.59	**816.41**	0.19	0.01
2001	6	29	19.88	20.51	20.17	**815.83**	0.18	0.01
2001	7	31	20.52	20.91	20.74	**815.26**	0.12	0
2001	8	31	20.92	21.27	21.11	**814.89**	0.1	0
2001	9	30	21.28	21.63	21.46	**814.54**	0.11	0
2001	10	31	21.65	22.04	21.84	**814.16**	0.12	0
2001	11	30	22.02	22.27	22.17	**813.83**	0.07	0
2001	12	31	22.26	22.38	22.32	**813.68**	0.03	0
2002	1	30	21.39	22.44	22.13	**813.87**	0.35	0.02
2002	2	26	21.22	21.45	21.31	**814.69**	0.07	0
2002	3	28	20.94	21.42	21.14	**814.86**	0.13	0
2002	4	30	20.94	21.37	21.11	**814.89**	0.13	0
2002	5	31	21.37	22.02	21.68	**814.32**	0.2	0.01
2002	6	30	22.04	22.67	22.39	**813.61**	0.19	0.01
2002	7	31	22.68	23.06	22.89	**813.11**	0.11	0
2002	8	31	23.06	23.32	23.22	**812.78**	0.07	0
2002	9	30	22.98	23.21	23.09	**812.91**	0.07	0
2002	10	31	22.27	23.19	22.85	**813.15**	0.29	0.01
2002	11	30	20.85	22.21	21.42	**814.58**	0.53	0.05
2002	12	31	19.22	21.02	20.07	**815.93**	0.58	0.06
2003	1	31	19.14	19.65	19.37	**816.63**	0.16	0
2003	2	28	18.46	19.47	19.14	**816.86**	0.28	0.02
2003	3	31	16.98	18.36	17.62	**818.38**	0.47	0.04
2003	4	30	15.59	17.19	16.21	**819.79**	0.55	0.06
2003	5	31	15.27	16.01	15.74	**820.26**	0.25	0.01
2003	6	30	14.37	15.62	15	**821.00**	0.4	0.03
2003	7	31	15.42	15.66	15.56	**820.44**	0.06	0
2003	8	31	14.46	15.38	14.87	**821.13**	0.29	0.01
2003	9	30	15.27	16.15	15.75	**820.25**	0.25	0.01
2003	10	31	16.11	16.55	16.31	**819.69**	0.13	0
2003	11	30	16.52	16.83	16.66	**819.34**	0.1	0
2003	12	31	16.27	16.96	16.59	**819.41**	0.21	0.01
2004	1	31	16.49	16.92	16.73	**819.27**	0.13	0
2004	2	29	16.02	16.95	16.31	**819.69**	0.26	0.01
2004	3	31	15.5	16.02	15.76	**820.24**	0.12	0
2004	4	30	15.5	15.85	15.69	**820.31**	0.11	0
2004	5	31	15.52	16.22	15.81	**820.19**	0.22	0.01

Table D-9: Monthly average water level, NC-142

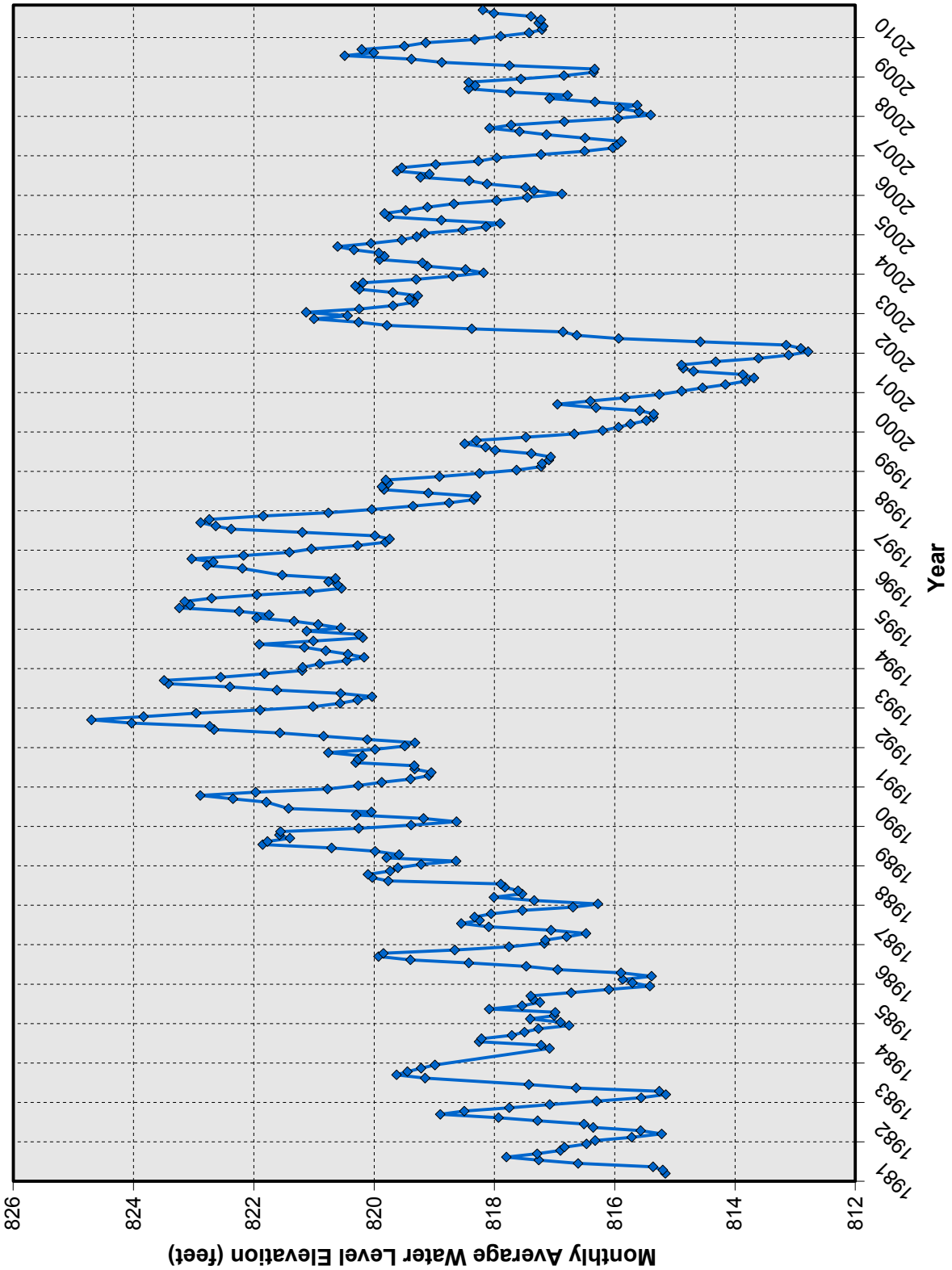
Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
2004	6	30	16.3	17	16.7	**819.30**	0.2	0.01
2004	7	31	17.01	17.59	17.31	**818.69**	0.19	0.01
2004	8	31	17.6	18.02	17.82	**818.18**	0.1	0
2004	9	30	16.75	18.12	17.52	**818.48**	0.37	0.03
2004	10	31	16.65	17.14	16.88	**819.12**	0.17	0.01
2004	11	30	16.38	17.18	16.8	**819.20**	0.28	0.01
2004	12	31	15.85	16.41	16.09	**819.91**	0.19	0.01
2005	1	31	15.98	16.36	16.17	**819.83**	0.1	0
2005	2	28	15.9	16.21	16.08	**819.92**	0.08	0
2005	3	31	15.2	15.86	15.67	**820.33**	0.17	0.01
2005	4	30	15.07	15.69	15.39	**820.61**	0.14	0
2005	5	31	15.68	16.29	15.95	**820.05**	0.17	0.01
2005	6	30	16.27	16.7	16.46	**819.54**	0.15	0
2005	7	31	16.56	16.93	16.71	**819.29**	0.12	0
2005	8	31	16.65	17.02	16.84	**819.16**	0.12	0
2005	9	30	17.08	17.92	17.47	**818.53**	0.24	0.01
2005	10	31	17.71	18.02	17.86	**818.14**	0.1	0
2005	11	30	17.89	18.28	18.1	**817.90**	0.1	0
2005	12	31	16.67	17.87	17.12	**818.88**	0.39	0.03
2006	1	31	15.97	16.71	16.25	**819.75**	0.21	0.01
2006	2	28	16.02	16.3	16.17	**819.83**	0.07	0
2006	3	31	16.26	16.7	16.53	**819.47**	0.12	0
2006	4	30	16.65	17.09	16.89	**819.11**	0.12	0
2006	5	31	17.07	17.7	17.33	**818.67**	0.19	0.01
2006	6	30	17.71	18.26	18.03	**817.97**	0.19	0.01
2006	7	31	18.29	18.86	18.55	**817.45**	0.18	0.01
2006	8	31	18.89	19.26	19.12	**816.88**	0.11	0
2006	9	30	18.32	19.11	18.66	**817.34**	0.31	0.02
2006	10	31	18.4	18.7	18.52	**817.48**	0.08	0
2006	11	30	17.26	18.53	17.88	**818.12**	0.44	0.03
2006	12	31	17.25	17.79	17.58	**818.42**	0.13	0
2007	1	31	16.56	17.16	16.77	**819.23**	0.14	0
2007	2	28	16.78	17.11	16.92	**819.08**	0.09	0
2007	3	31	16.17	16.75	16.38	**819.62**	0.15	0
2007	4	30	16.27	16.66	16.46	**819.54**	0.12	0
2007	5	31	16.62	17.48	17.02	**818.98**	0.26	0.01
2007	6	30	17.47	17.88	17.73	**818.27**	0.12	0
2007	7	31	17.8	18.31	18.04	**817.96**	0.16	0
2007	8	31	18.34	19.17	18.77	**817.23**	0.26	0.01
2007	9	30	19.21	19.75	19.5	**816.50**	0.14	0
2007	10	31	19.76	20.15	19.97	**816.03**	0.12	0
2007	11	30	19.92	20.13	20.05	**815.95**	0.05	0
2007	12	31	19.7	20.23	20.11	**815.89**	0.11	0
2008	1	30	19.32	19.67	19.51	**816.49**	0.1	0
2008	2	29	18.75	19.29	18.87	**817.13**	0.12	0
2008	3	31	18.22	18.84	18.42	**817.58**	0.19	0.01
2008	4	30	17.65	18.39	17.92	**818.08**	0.2	0.01
2008	5	31	17.92	18.62	18.28	**817.72**	0.23	0.01
2008	6	30	18.65	19.64	19.16	**816.84**	0.3	0.02
2008	7	31	19.68	20.38	20.05	**815.95**	0.21	0.01
2008	8	31	20.3	20.87	20.6	**815.40**	0.17	0.01
2008	9	30	20.12	20.5	20.4	**815.60**	0.09	0
2008	10	31	20	20.26	20.08	**815.92**	0.07	0
2008	11	30	20.25	20.47	20.38	**815.62**	0.06	0

Table D-9: Monthly average water level, NC-142

Year	Month	Days	Low	High	Daily Average		Std. Dev.	Std. Err.
					Depth	Elevation		
2008	12	31	19.16	20.27	19.67	**816.33**	0.4	0.03
2009	1	31	18.68	19.23	18.92	**817.08**	0.18	0.01
2009	2	28	19.03	19.34	19.22	**816.78**	0.09	0
2009	3	31	17.87	19.14	18.26	**817.74**	0.3	0.02
2009	4	30	17.35	17.84	17.57	**818.43**	0.15	0
2009	5	31	17.5	17.88	17.68	**818.32**	0.11	0
2009	6	30	17.32	17.91	17.57	**818.43**	0.2	0.01
2009	7	31	17.97	18.78	18.44	**817.56**	0.24	0.01
2009	8	31	18.81	19.52	19.16	**816.84**	0.22	0.01
2009	9	30	19.49	19.74	19.65	**816.35**	0.07	0
2009	10	31	19.42	19.77	19.67	**816.33**	0.09	0
2009	11	30	17.78	19.19	18.25	**817.75**	0.51	0.05
2009	12	31	16.47	17.91	17.12	**818.88**	0.4	0.03
2010	1	29	16.09	17.07	16.62	**819.38**	0.31	0.02
2010	2	28	15	16.22	15.51	**820.49**	0.33	0.02
2010	3	31	15.61	16.23	16	**820.00**	0.14	0
2010	4	30	15.56	16.2	15.79	**820.21**	0.2	0.01
2010	5	31	16.23	16.64	16.5	**819.50**	0.12	0
2010	6	30	16.54	17.24	16.86	**819.14**	0.21	0.01
2010	7	31	17.27	17.98	17.67	**818.33**	0.22	0.01
2010	8	31	18	18.24	18.1	**817.90**	0.07	0
2010	9	30	18.25	18.84	18.58	**817.42**	0.18	0.01
2010	10	31	18.69	18.92	18.79	**817.21**	0.07	0
2010	11	30	18.67	18.94	18.81	**817.19**	0.06	0
2010	12	31	18.62	18.8	18.73	**817.27**	0.05	0
2011	1	31	18.64	18.89	18.77	**817.23**	0.05	0
2011	2	28	18.49	18.79	18.61	**817.39**	0.08	0
2011	3	31	17.75	18.58	17.99	**818.01**	0.26	0.01
2011	4	30	17.72	17.99	17.81	**818.19**	0.06	0
2011	5	3	18.02	18.04	18.03	**817.97**	0.01	0

NOTE:

1. Water level data presented herein are in units of feet.
2. Number in the *Days* column indicated the number of days on which water level was recorded for that particular month.
3. Water level depths were converted to their respective elevation by using the datum elevation of 836 above MSL.



Graph D-9: Monthly average water level NC-142

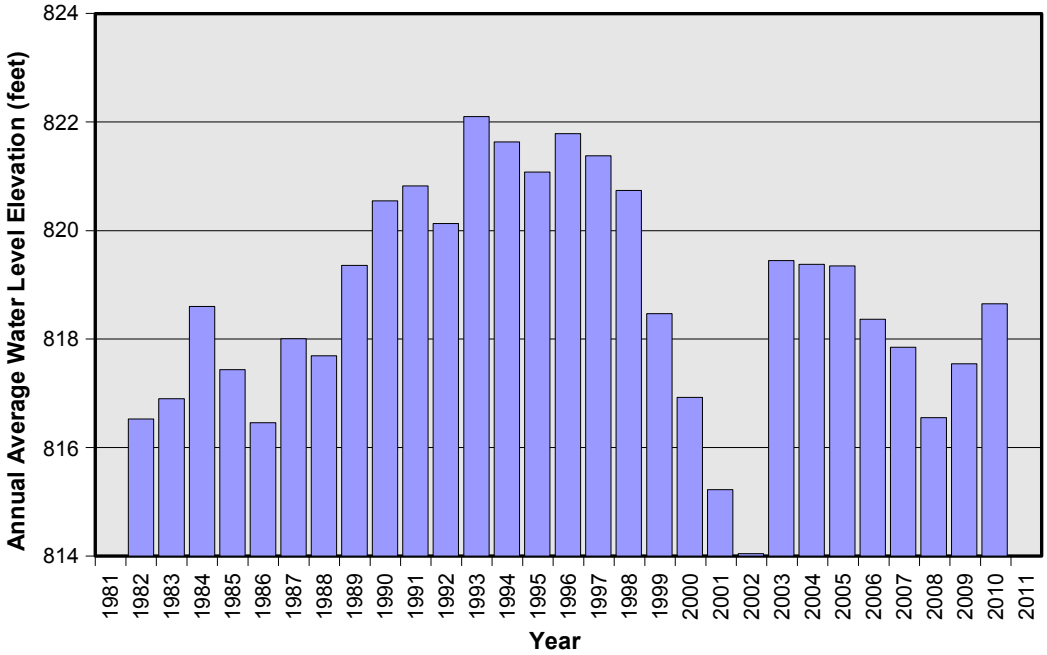
Table D-10: Annual average water level, NC-142

Year	Months	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
1981	3	92	20	20.98	20.76	**815.24**	0.21	0
1982	12	365	18.03	20.91	19.47	**816.53**	0.75	0.03
1983	12	365	16.84	20.94	19.1	**816.90**	1.2	0.08
1984	10	236	16.07	19.04	17.4	**818.60**	0.99	0.06
1985	12	365	17.5	19.43	18.56	**817.44**	0.54	0.02
1986	12	365	18.16	20.85	19.54	**816.46**	0.82	0.03
1987	12	365	15.1	19.63	17.99	**818.01**	1.19	0.07
1988	12	364	17.29	19.89	18.31	**817.69**	0.67	0.02
1989	12	365	15.56	18.53	16.64	**819.36**	0.79	0.03
1990	12	365	13.51	17.89	15.45	**820.55**	1.11	0.06
1991	12	346	12.56	17.08	15.18	**820.82**	1.32	0.09
1992	12	366	14.14	16.89	15.87	**820.13**	0.7	0.03
1993	12	365	10.66	16.07	13.9	**822.10**	1.58	0.13
1994	12	365	11.46	15.95	14.37	**821.63**	1.11	0.06
1995	12	365	13.75	16.22	14.92	**821.08**	0.62	0.02
1996	12	365	12.42	15.79	14.21	**821.79**	1.05	0.06
1997	12	336	12.3	16.33	14.62	**821.38**	1.23	0.08
1998	12	361	12.54	17.84	15.26	**820.74**	1.71	0.15
1999	12	365	15.99	19.02	17.53	**818.47**	1.15	0.07
2000	12	366	17.33	20.71	19.07	**816.93**	1.13	0.07
2001	12	364	18.95	22.38	20.77	**815.23**	1.02	0.05
2002	12	359	19.22	23.32	21.96	**814.04**	0.99	0.05
2003	12	365	14.37	19.65	16.56	**819.44**	1.42	0.11
2004	12	366	15.5	18.12	16.62	**819.38**	0.71	0.03
2005	12	365	15.07	18.28	16.65	**819.35**	0.84	0.04
2006	12	365	15.97	19.26	17.63	**818.37**	0.98	0.05
2007	12	365	16.17	20.23	18.15	**817.85**	1.42	0.11
2008	12	365	17.65	20.87	19.45	**816.55**	0.89	0.04
2009	12	365	16.47	19.77	18.45	**817.55**	0.86	0.04
2010	12	363	15	18.94	17.35	**818.65**	1.21	0.08
2011	5	123	17.72	18.89	18.28	**817.72**	0.43	0.02

NOTE:

1. Water level data presented in units of feet.

Graph D-10: Annual average water level, NC-142



NOTE: The average water levels for years 1981and 2011 were considered insufficient due to their limited number of recorded water levels for those particular years.

Table D-11: Average water levels by month, NC-142

Month	Total	Day Count	Daily Average		Std. Dev.	Std. Err.
			Depth	Elevation		
Jan	15557.74	895	17.38	**818.62**	2.14	0.07
Feb	13470.37	800	16.84	**819.16**	2.24	0.08
Mar	15122.45	927	16.31	**819.69**	2.19	0.07
Apr	14535.07	900	16.15	**819.85**	2.17	0.07
May	14743.31	900	16.38	**819.62**	2.24	0.07
Jun	14630.61	867	16.87	**819.13**	2.23	0.08
Jul	15724.86	898	17.51	**818.49**	2.18	0.07
Aug	15533.97	866	17.94	**818.06**	2.2	0.07
Sept	15263.47	840	18.17	**817.83**	2.08	0.07
Oct	16578.92	905	18.32	**817.68**	2.16	0.07
Nov	16147.79	886	18.23	**817.77**	2.11	0.07
Dec	16543.02	928	17.83	**818.17**	2.05	0.07

NOTE:
1. Water level data presented herein are in units of feet.

Graph D-11: Average water levels by month, NC-142

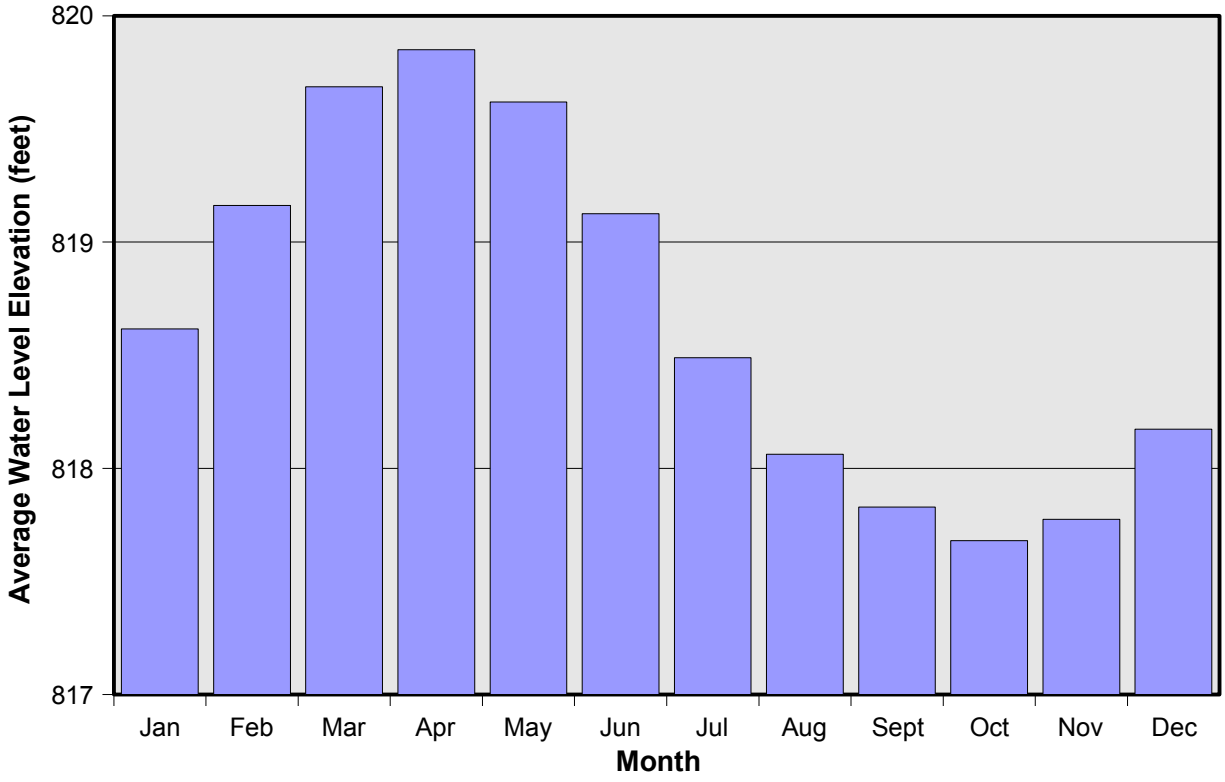


Table D-12: Monthly average water level, NC-193

Year	Month	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
1989	11	29	6.3	6.84	6.64	**674.66**	0.17	0.01
1989	12	31	5.72	6.71	6.37	**674.93**	0.26	0.01
1990	1	31	5.51	6.32	6.01	**675.29**	0.22	0.01
1990	2	28	5.33	6.01	5.66	**675.64**	0.19	0.01
1990	3	31	5.42	5.98	5.82	**675.48**	0.13	0
1990	4	30	5.42	6	5.83	**675.47**	0.14	0
1990	5	31	5.27	6.02	5.75	**675.55**	0.2	0.01
1990	6	30	5.85	6.43	6.16	**675.14**	0.16	0
1990	7	31	6.45	6.99	6.71	**674.59**	0.14	0
1990	8	31	7.02	7.52	7.25	**674.05**	0.14	0
1990	9	30	7.55	7.97	7.78	**673.52**	0.12	0
1990	10	30	5.95	8	7.02	**674.28**	0.74	0.1
1990	12	31	5.88	6.59	6.34	**674.96**	0.21	0.01
1991	1	31	5.26	6.09	5.78	**675.52**	0.21	0.01
1991	2	28	5.75	6.16	5.97	**675.33**	0.12	0
1991	3	31	5.19	5.93	5.64	**675.66**	0.18	0.01
1991	4	30	5.38	5.86	5.7	**675.60**	0.13	0
1991	5	31	5.47	6.16	5.95	**675.35**	0.16	0
1991	6	30	6.18	6.62	6.4	**674.90**	0.12	0
1991	7	31	6.57	6.96	6.77	**674.53**	0.11	0
1991	8	31	6.81	7.16	7	**674.30**	0.11	0
1991	9	29	7.18	7.45	7.33	**673.97**	0.08	0
1991	10	31	7.47	7.65	7.58	**673.72**	0.06	0
1991	11	30	7.44	7.65	7.53	**673.77**	0.07	0
1991	12	31	7.08	7.47	7.39	**673.91**	0.09	0
1992	1	31	7	7.32	7.19	**674.11**	0.09	0
1992	2	29	6.14	7.31	7.03	**674.27**	0.33	0.02
1992	3	28	6.17	6.86	6.56	**674.74**	0.19	0.01
1992	4	29	6.07	6.81	6.63	**674.67**	0.18	0.01
1992	5	31	6.47	6.89	6.72	**674.58**	0.11	0
1992	6	30	5.83	6.86	6.4	**674.90**	0.27	0.01
1992	7	31	6.41	7.26	6.83	**674.47**	0.26	0.01
1992	8	31	7.29	7.56	7.41	**673.89**	0.08	0
1992	9	29	7.44	7.75	7.64	**673.66**	0.08	0
1992	10	1	6.14	6.14	6.14	**675.16**	0	0
1992	11	30	5.31	6.09	5.67	**675.64**	0.21	0.01
1992	12	29	5.31	5.74	5.48	**675.82**	0.14	0
1993	3	2	5.02	5.02	5.02	**676.28**	0	0
1993	4	26	5.12	5.57	5.43	**675.87**	0.11	0
1993	6	29	6.15	6.62	6.41	**674.89**	0.16	0
1993	7	1	7.62	7.62	7.62	**673.68**	0	0
1993	8	31	7.65	7.99	7.8	**673.50**	0.1	0
1993	9	30	7.94	8.15	8.05	**673.25**	0.06	0
1993	10	31	8.16	8.3	8.25	**673.05**	0.04	0
1993	11	30	7.74	8.18	8.01	**673.29**	0.11	0
1993	12	31	7.16	7.8	7.46	**673.84**	0.21	0.01
1994	1	31	6.35	7.27	6.88	**674.42**	0.23	0.01
1994	2	28	5.91	6.82	6.54	**674.76**	0.23	0.01
1994	3	31	5.34	6.54	6.24	**675.06**	0.32	0.02
1994	4	30	5.97	6.5	6.31	**674.99**	0.13	0
1994	5	31	6.47	6.85	6.64	**674.66**	0.11	0
1994	6	30	6.33	7	6.77	**674.53**	0.19	0.01
1994	7	31	6.86	7.27	7.1	**674.20**	0.13	0
1994	8	31	6.9	7.5	7.24	**674.06**	0.16	0

Table D-12: Monthly average water level, NC-193

Year	Month	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
1994	9	30	6.95	7.5	7.29	**674.01**	0.17	0.01
1994	10	31	7.5	7.58	7.55	**673.75**	0.02	0
1994	11	30	7.21	7.58	7.51	**673.79**	0.1	0
1994	12	31	6.91	7.26	7.13	**674.17**	0.1	0
1995	1	31	6.32	7.28	6.84	**674.46**	0.25	0.01
1995	2	28	5.93	6.96	6.61	**674.69**	0.33	0.02
1995	3	31	5.93	6.56	6.34	**674.96**	0.18	0.01
1995	4	30	6.57	6.81	6.68	**674.62**	0.07	0
1995	5	31	6.78	7.1	6.92	**674.38**	0.09	0
1995	6	30	6.16	7.11	6.59	**674.71**	0.25	0.01
1995	7	31	6.27	7.06	6.72	**674.58**	0.24	0.01
1995	8	31	6.56	7.54	7.26	**674.04**	0.27	0.01
1995	9	30	6.33	7.17	6.83	**674.47**	0.22	0.01
1995	10	31	5.87	6.78	6.4	**674.90**	0.22	0.01
1995	11	30	5.7	6.33	6.11	**675.19**	0.17	0.01
1995	12	31	6.02	6.36	6.23	**675.07**	0.09	0
1996	1	31	5.45	6.32	5.98	**675.32**	0.3	0.02
1996	2	29	5.32	6.08	5.84	**675.46**	0.17	0.01
1996	3	31	5.45	6.14	5.81	**675.49**	0.18	0.01
1996	4	3	5.46	5.56	5.51	**675.79**	0.04	0
1996	10	21	6.79	7.17	7.01	**674.29**	0.11	0
1996	11	26	6.67	7.15	6.98	**674.32**	0.1	0
1996	12	31	6.22	6.62	6.48	**674.82**	0.12	0
1997	1	31	6.07	6.67	6.39	**674.91**	0.15	0
1997	2	28	5.58	6.4	6.17	**675.13**	0.2	0.01
1997	3	14	5.55	6.18	5.99	**675.31**	0.18	0.01
1997	4	28	5.19	6.23	6	**675.30**	0.29	0.02
1997	5	31	5.39	6.32	6.03	**675.27**	0.27	0.01
1997	6	28	5.58	6.5	6.21	**675.09**	0.22	0.01
1997	7	31	6.39	6.9	6.71	**674.59**	0.14	0
1997	8	31	6.94	7.63	7.3	**674.00**	0.22	0.01
1997	9	30	7.64	7.96	7.82	**673.48**	0.08	0
1997	10	31	7.46	8	7.83	**673.47**	0.16	0
1997	11	30	6.85	7.48	7.27	**674.03**	0.19	0.01
1997	12	31	6.3	7.11	6.81	**674.49**	0.26	0.01
1998	1	31	5.35	6.58	6.1	**675.20**	0.33	0.02
1998	2	28	5.34	6.15	5.8	**675.50**	0.21	0.01
1998	3	31	5.21	6.02	5.81	**675.49**	0.19	0.01
1998	4	29	5.23	6.04	5.82	**675.48**	0.21	0.01
1998	5	31	5.63	6.26	6.01	**675.29**	0.18	0.01
1998	6	30	6.28	6.97	6.57	**674.73**	0.21	0.01
1998	7	31	7.01	7.82	7.47	**673.83**	0.24	0.01
1998	8	31	7.86	8.3	8.06	**673.24**	0.11	0
1998	9	30	8.26	8.51	8.38	**672.92**	0.08	0
1998	10	30	8.51	8.65	8.59	**672.71**	0.04	0
1998	11	30	8.28	8.66	8.44	**672.86**	0.12	0
1998	12	31	7.73	8.28	8.06	**673.24**	0.18	0.01
1999	1	31	6.67	7.89	7.39	**673.91**	0.29	0.01
1999	2	28	6.89	7.4	7.16	**674.14**	0.16	0
1999	3	31	7.21	7.41	7.31	**673.99**	0.05	0
1999	4	30	7.03	7.62	7.48	**673.82**	0.12	0
1999	5	31	7	7.92	7.57	**673.73**	0.24	0.01
1999	6	30	7.95	8.37	8.23	**673.07**	0.12	0
1999	7	20	8.36	8.69	8.51	**672.79**	0.09	0

Table D-12: Monthly average water level, NC-193

Year	Month	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
1999	8	29	8.84	9.27	9.09	**672.21**	0.13	0
1999	9	30	8.16	9.15	8.53	**672.77**	0.3	0.02
1999	10	31	7.72	8.24	8.01	**673.29**	0.16	0
1999	11	30	7.8	8.07	7.94	**673.36**	0.09	0
1999	12	31	7.34	7.89	7.69	**673.61**	0.17	0.01
2000	1	31	6.99	7.67	7.4	**673.90**	0.2	0.01
2000	2	29	6.83	7.33	7.15	**674.15**	0.13	0
2000	3	31	6.55	7.36	7.11	**674.19**	0.23	0.01
2000	4	30	6.99	7.19	7.1	**674.20**	0.06	0
2000	5	31	7.04	7.63	7.38	**673.92**	0.17	0.01
2000	6	30	7.65	8.38	8	**673.30**	0.24	0.01
2000	7	31	8.4	8.82	8.64	**672.66**	0.11	0
2000	8	17	8.71	8.94	8.8	**672.50**	0.06	0
2000	10	1	9.24	9.24	9.24	**672.06**	0	0
2000	11	30	8.71	9.24	8.99	**672.31**	0.17	0.01
2000	12	31	8.46	8.72	8.6	**672.70**	0.1	0
2001	1	31	8.08	8.54	8.36	**672.94**	0.16	0
2001	2	28	7.67	8.31	8.06	**673.24**	0.23	0.01
2001	3	31	7	7.85	7.56	**673.74**	0.22	0.01
2001	4	30	7.09	7.78	7.53	**673.77**	0.2	0.01
2001	5	31	7.78	8.16	8.01	**673.29**	0.11	0
2001	6	30	8.07	8.59	8.33	**672.97**	0.14	0
2001	7	31	8.42	8.9	8.68	**672.62**	0.14	0
2001	8	31	8.79	9.56	9.22	**672.08**	0.24	0.01
2001	9	30	9.44	9.74	9.61	**671.69**	0.09	0
2001	10	31	9.75	9.83	9.8	**671.50**	0.02	0
2001	11	30	9.28	9.74	9.53	**671.77**	0.14	0
2001	12	31	8.88	9.27	9.04	**672.26**	0.14	0
2002	1	31	7.86	8.88	8.54	**672.76**	0.37	0.02
2002	2	28	7.99	8.29	8.16	**673.14**	0.09	0
2002	3	31	7.63	8.26	7.85	**673.45**	0.16	0
2002	4	30	7.65	8.2	7.92	**673.38**	0.15	0
2002	5	31	8.21	8.75	8.44	**672.86**	0.16	0
2002	6	30	8.78	9.76	9.28	**672.02**	0.32	0.02
2002	7	31	9.78	10.39	10.13	**671.17**	0.17	0.01
2002	8	31	10.42	11.07	10.82	**670.48**	0.2	0.01
2002	9	30	10.91	11.15	11.05	**670.25**	0.07	0
2002	10	31	9.37	11.11	10.26	**671.04**	0.61	0.07
2002	11	30	8.23	9.35	8.8	**672.50**	0.35	0.02
2002	12	31	7.42	8.78	8.01	**673.29**	0.34	0.02
2003	1	27	7.81	8.18	8	**673.30**	0.1	0
2003	2	28	7.02	7.92	7.59	**673.71**	0.26	0.01
2003	3	31	6.36	7.38	6.98	**674.32**	0.23	0.01
2003	4	30	5.64	7.11	6.46	**674.84**	0.35	0.02
2003	5	31	5.78	6.65	6.25	**675.05**	0.28	0.01
2003	6	30	5.28	6.54	6.15	**675.15**	0.3	0.02
2003	7	31	5.98	6.92	6.62	**674.68**	0.24	0.01
2003	8	31	6.42	7.13	6.8	**674.50**	0.18	0.01
2003	9	30	6.76	7.36	7.11	**674.19**	0.14	0
2003	10	31	7.13	7.4	7.26	**674.04**	0.06	0
2003	11	30	7.26	7.44	7.34	**673.96**	0.04	0
2003	12	31	6.9	7.48	7.24	**674.06**	0.17	0.01
2004	1	29	7.26	7.44	7.36	**673.94**	0.04	0
2004	2	28	6.69	7.37	6.98	**674.32**	0.15	0

Table D-12: Monthly average water level, NC-193

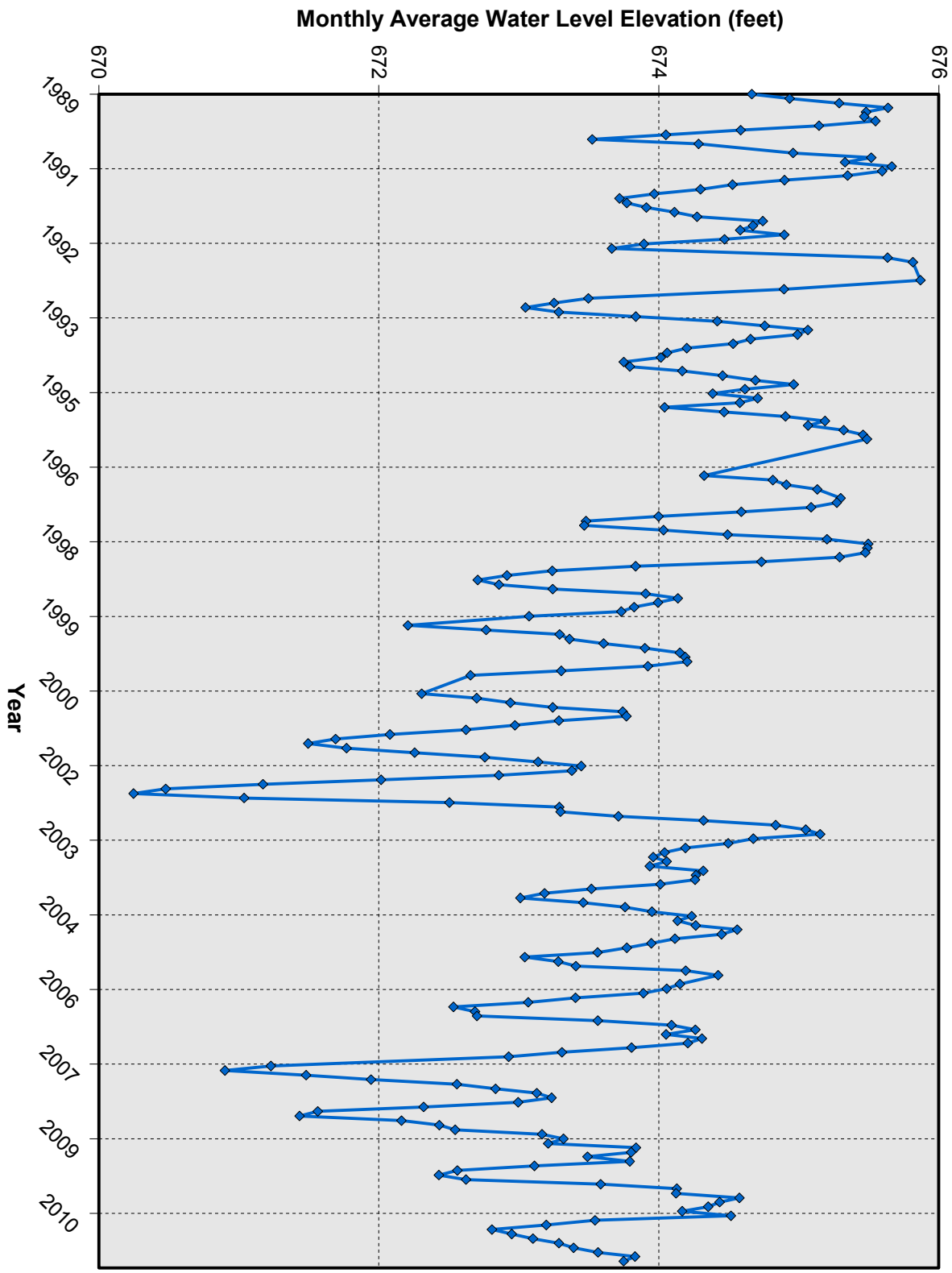
Year	Month	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
2004	3	31	6.73	7.17	7.03	**674.27**	0.13	0
2004	4	30	6.69	7.26	7.04	**674.26**	0.14	0
2004	5	31	6.88	7.56	7.29	**674.01**	0.16	0
2004	6	30	7.59	7.92	7.78	**673.52**	0.1	0
2004	7	31	7.91	8.37	8.12	**673.18**	0.13	0
2004	8	31	8.12	8.44	8.29	**673.01**	0.11	0
2004	9	30	6.83	8.48	7.84	**673.46**	0.43	0.03
2004	10	31	7.28	7.68	7.54	**673.76**	0.12	0
2004	11	30	6.86	7.67	7.35	**673.95**	0.23	0.01
2004	12	30	6.52	7.29	7.06	**674.24**	0.2	0.01
2005	1	27	6.81	7.32	7.17	**674.13**	0.13	0
2005	2	28	6.55	7.23	7.04	**674.26**	0.15	0
2005	3	31	6.37	6.99	6.74	**674.56**	0.17	0.01
2005	4	30	6.61	7.03	6.85	**674.45**	0.1	0
2005	5	31	7.04	7.39	7.18	**674.12**	0.1	0
2005	6	30	7.11	7.55	7.35	**673.95**	0.12	0
2005	7	31	7.22	7.82	7.53	**673.77**	0.15	0
2005	8	31	7.5	7.91	7.74	**673.56**	0.11	0
2005	9	30	7.95	8.52	8.26	**673.04**	0.17	0.01
2005	10	31	7.49	8.58	8.02	**673.28**	0.31	0.02
2005	11	30	7.21	8.06	7.89	**673.41**	0.22	0.01
2005	12	30	6.67	7.51	7.11	**674.19**	0.19	0.01
2006	1	31	6.32	7.17	6.88	**674.42**	0.19	0.01
2006	2	24	6.83	7.1	7.01	**674.29**	0.07	0
2006	3	31	7.03	7.21	7.15	**674.15**	0.05	0
2006	4	30	7.1	7.33	7.24	**674.06**	0.06	0
2006	5	28	7.22	7.63	7.41	**673.89**	0.1	0
2006	6	29	7.73	8.08	7.9	**673.40**	0.1	0
2006	7	31	7.94	8.55	8.23	**673.07**	0.17	0.01
2006	8	31	8.6	8.96	8.77	**672.53**	0.09	0
2006	9	30	8.21	8.88	8.61	**672.69**	0.22	0.01
2006	10	31	8.23	8.83	8.6	**672.70**	0.18	0.01
2006	11	30	6.97	8.41	7.74	**673.56**	0.47	0.04
2006	12	31	6.69	7.39	7.21	**674.09**	0.15	0
2007	1	31	6.42	7.34	7.04	**674.26**	0.2	0.01
2007	2	28	6.84	7.47	7.25	**674.05**	0.18	0.01
2007	3	31	6.49	7.25	6.99	**674.31**	0.17	0.01
2007	4	30	6.58	7.28	7.09	**674.21**	0.18	0.01
2007	5	31	7.22	7.86	7.49	**673.81**	0.2	0.01
2007	6	30	7.82	8.18	7.99	**673.31**	0.09	0
2007	7	31	7.93	8.78	8.37	**672.93**	0.23	0.01
2007	8	24	8.82	9.76	9.27	**672.03**	0.29	0.02
2007	9	30	9.79	10.3	10.07	**671.23**	0.13	0
2007	10	31	10.11	10.53	10.4	**670.90**	0.12	0
2007	11	30	9.59	10.08	9.82	**671.48**	0.14	0
2007	12	31	8.73	9.58	9.36	**671.94**	0.19	0.01
2008	1	31	8.59	8.86	8.74	**672.56**	0.1	0
2008	2	29	8.34	8.55	8.47	**672.83**	0.05	0
2008	3	31	7.86	8.46	8.17	**673.13**	0.14	0
2008	4	30	7.65	8.29	8.07	**673.23**	0.18	0.01
2008	5	31	7.98	8.55	8.3	**673.00**	0.16	0
2008	6	30	8.57	9.41	8.98	**672.32**	0.26	0.01
2008	7	31	9.45	9.97	9.74	**671.56**	0.16	0
2008	8	31	8.97	10.29	9.87	**671.43**	0.37	0.03

Table D-12: Monthly average water level, NC-193

Year	Month	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
2008	9	30	8.93	9.25	9.14	**672.16**	0.09	0
2008	10	31	8.73	8.97	8.87	**672.43**	0.06	0
2008	11	30	8.44	8.96	8.75	**672.55**	0.17	0.01
2008	12	31	7.69	8.52	8.13	**673.17**	0.23	0.01
2009	1	31	7.39	8.15	7.98	**673.32**	0.19	0.01
2009	2	28	7.98	8.17	8.09	**673.21**	0.05	0
2009	3	31	7.11	7.76	7.46	**673.84**	0.19	0.01
2009	4	30	7.18	7.66	7.5	**673.80**	0.13	0
2009	5	31	7.64	7.92	7.81	**673.49**	0.08	0
2009	6	30	6.89	7.98	7.51	**673.79**	0.31	0.02
2009	7	31	7.89	8.47	8.19	**673.11**	0.15	0
2009	8	31	8.49	8.89	8.74	**672.56**	0.13	0
2009	9	30	8.58	9.04	8.87	**672.43**	0.12	0
2009	10	31	8.38	8.84	8.68	**672.62**	0.12	0
2009	11	30	6.99	8.22	7.72	**673.58**	0.31	0.02
2009	12	31	6.67	7.71	7.17	**674.13**	0.22	0.01
2010	1	31	6.38	7.5	7.18	**674.12**	0.27	0.01
2010	2	28	6.03	7.15	6.72	**674.58**	0.25	0.01
2010	3	31	6.07	7.07	6.87	**674.43**	0.22	0.01
2010	4	30	6.65	7.17	6.95	**674.35**	0.13	0
2010	5	31	6.67	7.44	7.13	**674.17**	0.22	0.01
2010	6	30	5.92	7.35	6.79	**674.52**	0.37	0.02
2010	7	31	7.38	7.99	7.76	**673.54**	0.18	0.01
2010	8	31	7.96	8.26	8.1	**673.20**	0.09	0
2010	9	30	8.24	8.72	8.49	**672.81**	0.15	0
2010	10	31	8.21	8.45	8.35	**672.95**	0.07	0
2010	11	30	8.12	8.28	8.2	**673.10**	0.04	0
2010	12	31	7.86	8.08	8.01	**673.29**	0.06	0
2011	1	31	7.73	8.01	7.91	**673.39**	0.07	0
2011	2	28	7.38	7.89	7.73	**673.57**	0.14	0
2011	3	31	6.96	7.74	7.47	**673.83**	0.22	0.01
2011	4	30	7.19	7.75	7.55	**673.75**	0.12	0
2011	5	3	7.77	7.78	7.77	**673.53**	0	0

NOTE:

1. Water level data presented herein are in units of feet.
2. Number in the *Days* column indicated the number of days on which water level was recorded for that particular month.
3. Water level depths were converted to their respective elevation by using the datum elevation of 681.3 above MSL.



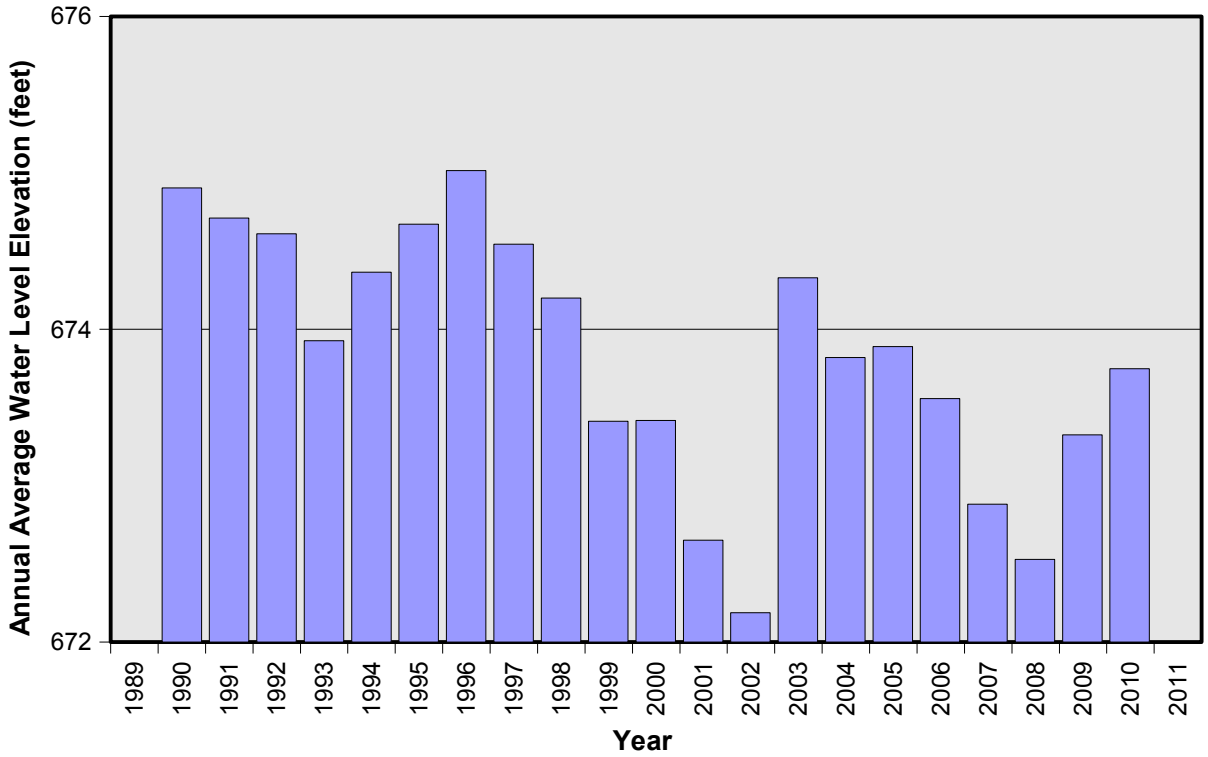
Graph D-12: Monthly average water level NC-193

Table D-13: Annual average water level, NC-193

Year	Months	Days	Low	High	Daily Average Depth	Daily Average Elevation	Std. Dev.	Std. Err.
1989	2	60	5.72	6.84	6.5	**674.80**	0.26	0.01
1990	11	334	5.27	8	6.4	**674.90**	0.72	0.03
1991	12	364	5.19	7.65	6.59	**674.71**	0.74	0.03
1992	12	329	5.31	7.75	6.69	**674.61**	0.66	0.02
1993	9	211	5.02	8.3	7.37	**673.93**	0.96	0.06
1994	12	365	5.34	7.58	6.94	**674.36**	0.46	0.01
1995	12	365	5.7	7.54	6.63	**674.67**	0.38	0.01
1996	7	172	5.32	7.17	6.29	**675.01**	0.53	0.02
1997	12	344	5.19	8	6.76	**674.54**	0.69	0.03
1998	12	363	5.21	8.66	7.1	**674.20**	1.13	0.07
1999	12	352	6.67	9.27	7.89	**673.41**	0.58	0.02
2000	11	292	6.55	9.24	7.88	**673.42**	0.75	0.03
2001	12	365	7	9.83	8.65	**672.65**	0.78	0.03
2002	12	365	7.42	11.15	9.11	**672.19**	1.16	0.07
2003	12	361	5.28	8.18	6.97	**674.33**	0.56	0.02
2004	12	362	6.52	8.48	7.48	**673.82**	0.46	0.01
2005	12	360	6.37	8.58	7.41	**673.89**	0.49	0.01
2006	12	357	6.32	8.96	7.74	**673.56**	0.68	0.02
2007	12	358	6.42	10.53	8.42	**672.88**	1.26	0.08
2008	12	366	7.65	10.29	8.77	**672.53**	0.6	0.02
2009	12	365	6.67	9.04	7.98	**673.32**	0.56	0.02
2010	12	365	5.92	8.72	7.55	**673.75**	0.67	0.02
2011	5	123	6.96	8.01	7.67	**673.63**	0.22	0

NOTE:
1. Water level data presented herein are in units of feet.

Graph D-13: Annual average water level, NC-193



NOTE: The average water levels for years 1989 and 2011 were considered insufficient due to their limited number of recorded water levels for those particular years.

Table D-14: Average water levels by month, NC-193

Month	Total	Day Count	Daily Average		Std. Dev.	Std. Err.
			Depth	Elevation		
Jan	4609.46	641	7.19	**674.11**	0.86	0.03
Feb	4117.56	588	7	**674.30**	0.83	0.03
Mar	4318.22	633	6.82	**674.48**	0.74	0.03
Apr	4266.18	625	6.83	**674.47**	0.75	0.03
May	4164.19	589	7.07	**674.23**	0.81	0.03
Jun	4346.81	596	7.29	**674.01**	0.98	0.04
Jul	4527.83	579	7.82	**673.48**	1.03	0.04
Aug	4903.48	597	8.21	**673.09**	1.06	0.04
Sep	4746.09	568	8.36	**672.94**	1.05	0.04
Oct	4766.3	579	8.23	**673.07**	1.08	0.05
Nov	4891.8	625	7.83	**673.47**	1.03	0.04
Dec	5009.61	678	7.39	**673.91**	0.93	0.04

NOTE:
1. Water level data presented herein are in units of feet.

Graph D-14: Average water levels by month, NC-193

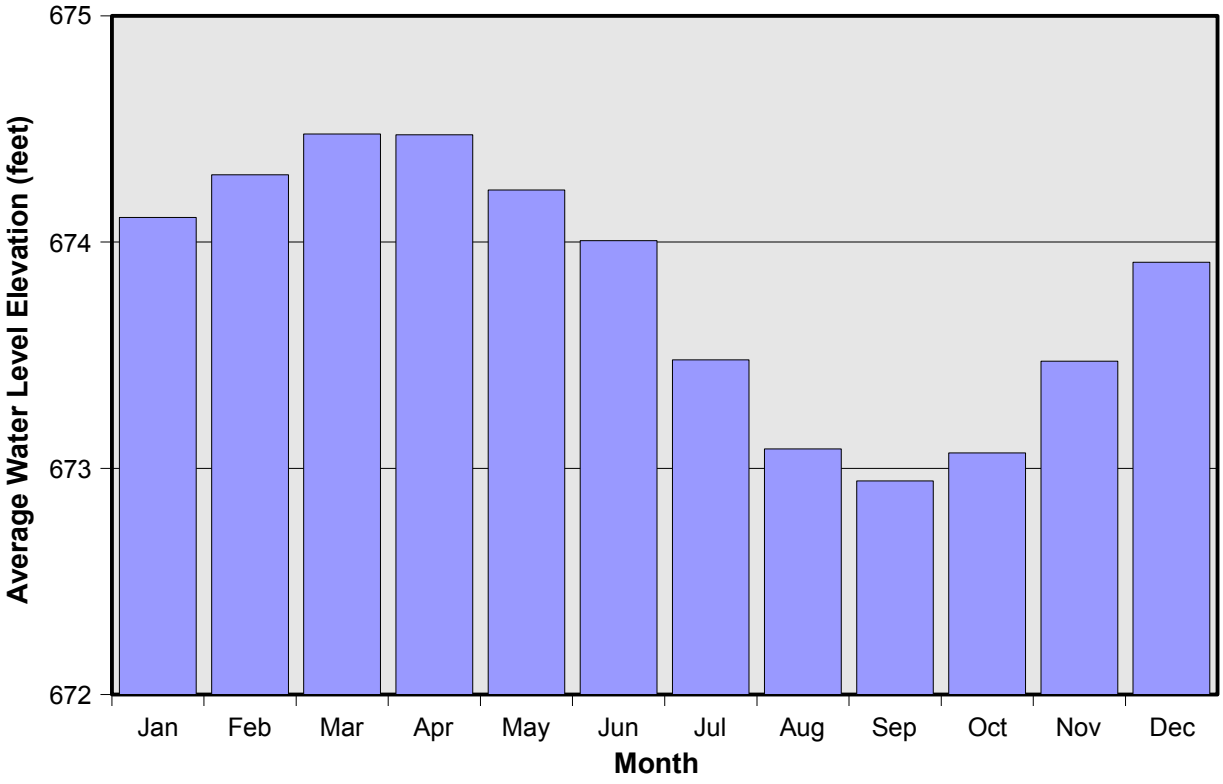


Table D-15: Supplementary Well Data

Date	MW-26D	MW-25	MW-21S
01/22/03	-	-	790.30
07/18/03	-	-	791.83
01/05/05	820.90	845.56	790.34
01/25/05	821.13	845.76	788.08
02/22/05	820.63	845.81	788.17
03/24/05	820.87	846.09	788.51
05/27/05	820.03	846.04	788.10
06/06/05	-	845.89	-
07/12/05	820.48	845.17	789.76
07/20/05	-	-	789.79
08/17/05	820.47	844.91	789.67
09/16/05	823.38	844.56	789.09
09/29/05	822.79	844.33	789.18
10/28/05	823.10	845.18	791.35
11/10/05	822.84	845.10	791.35
12/16/05	-	-	789.65
02/01/06	-	-	790.16
07/12/06	822.43	-	789.82
01/19/07	820.88	846.03	790.54
07/18/07	820.80	844.04	789.68
01/21/08	820.35	842.81	789.30
03/20/08	820.93	843.15	-
04/30/08	820.89	843.26	-
05/29/08	819.70	842.48	-
07/03/08	820.02	842.01	-
07/21/08	819.79	841.74	788.90
08/05/08	820.63	841.65	-
01/26/09	820.53	843.55	789.82
07/20/09	819.59	843.84	790.19
01/12/10	820.79	844.55	790.36
07/29/10	820.65	844.01	799.87
01/24/11	819.83	843.73	789.60
Average	820.94	844.28	790.13
Maximum	823.38	846.09	799.87
Minimum	819.59	841.65	788.08
Fluctuation	1.07	1.39	2.2

APPENDIX E

LOG OF BORING: MW-1A

Iredell County Landfill, Phase 1 - Statesville, North Carolina **Project No. G96129.7**

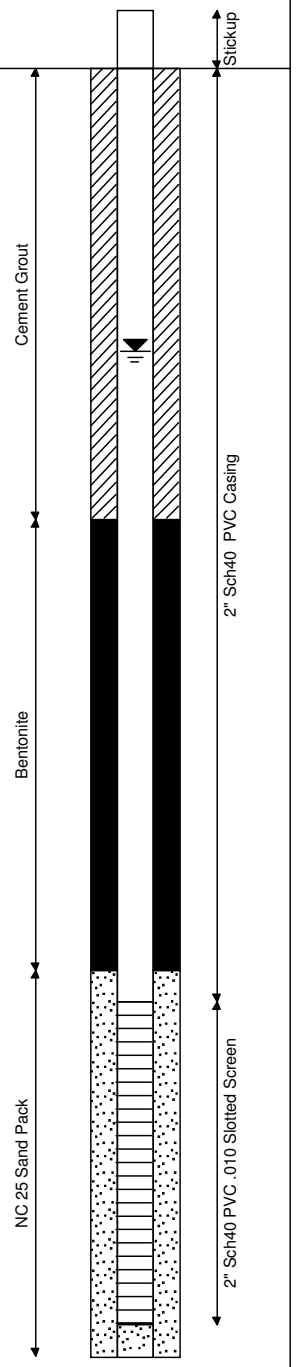
Drilling contractor: GAI
Drill rig & method: 8.5" O.D HSA
Logged by: Wendell Parker

Date started: 4/27/1993
Date ended: 4/27/1993
Completion depth: 40.00 ft
Stickup height: 1.80 ft

Surface elevation: 865.94 ft (MSL)
Top of pipe elevation: 867.74 ft (MSL)
Depth to water (TOB): 8.80 ft
Depth to water (24hrs): 8.80 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
				All soil descriptions retranscribed directy from well construction record prepared by Wendell Parker of GAI.
5				SANDY CLAY; Orange, brown.
10				
15				SILTY SANDY CLAY; Brown w/ mica.
20				
25				SILTY CLAYEY SAND; Brownish gray.
30				
35				
40				Boring terminated at 40.0 feet

Well Diagram



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

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

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Statesville County: Iredell
SR 2465
(Road, Community, or Subdivision and Lot No.)

OWNER Iredell County
ADDRESS P O Box 788
(Street or Route No.)
Statesville NC 28677
City or Town State Zip Code

DATE DRILLED 4-27-93 USE OF WELL Monitoring
TOTAL DEPTH 40'
CUTTINGS COLLECTED YES [ ] NO [x]
DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
STATIC WATER LEVEL Below Top of Casing: 11.3 FT.
(Use "+" if Above Top of Casing)
TOP OF CASING IS 2.5 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
YIELD (gpm): N/A METHOD OF TEST _____
WATER ZONES (depth): 8.8 - bottom

DEPTH From To	DRILLING LOG Formation Description
0 - 9'	Orange-brown sandy clay
9 - 23	Brown silty sandy clay w/ mica
23 - 40	Brown-gray silty clayey sand

If additional space is needed use back of form

11. CHLORINATION: Type N/A Amount _____
12. CASING:

Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
0	29		2"	Sch 40	PVC

13. GROUT:

Depth From	To	Ft.	Material	Method
0	14		cement	tremie
14	28		bentonite	pellet

14. SCREEN:

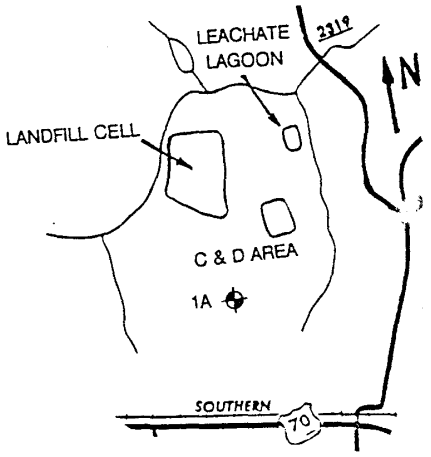
Depth From	To	Ft	Diameter	Slot Size	Material
29	39		2 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

15. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
28	40		NC 25	sand

16. REMARKS: Monitoring Well 1A

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.

Wendell W. Parker 5-4-93
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

LOG OF BORING: MW-1B

Iredell County Landfill, Phase 1 - Statesville, North Carolina **Project No. G96129.7**

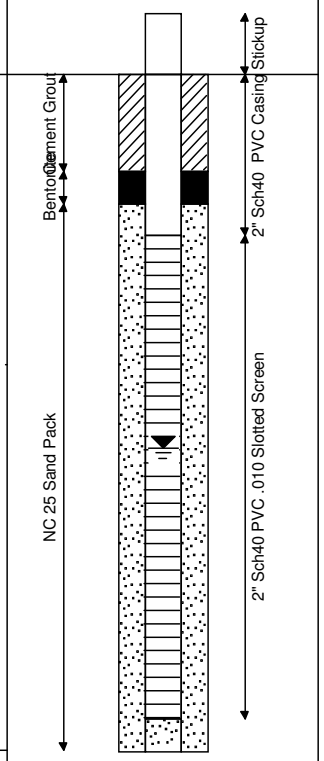
Drilling contractor: GAI
Drill rig & method: 8.5" O.D HSA
Logged by: Wendell Parker

Date started: 4/28/1993
Date ended: 4/28/1993
Completion depth: 21.00 ft
Stickup height: 1.90 ft

Surface elevation: 866.03 ft (MSL)
Top of pipe elevation: 867.93 ft (MSL)
Depth to water (TOB): 11.60 ft
Depth to water (24hrs): 11.60 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
				All soil descriptions retranscribed directy from well construction record prepared by Wendell Parker of GAI.
5				SANDY CLAY; Orange, brown.
10				
15				SILTY SANDY CLAY; Brown w/ mica.
20				
				Boring terminated at 21.0 feet
25				
30				
35				
40				

Well Diagram



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

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: Statesville County: Iredell
   SR 2465
   (Road, Community, or Subdivision and Lot No.)
2. OWNER Iredell County
   ADDRESS P O Box 788
   (Street or Route No.)
   Statesville NC 28677
   City or Town State Zip Code
3. DATE DRILLED 4-28-93 USE OF WELL Monitoring
4. TOTAL DEPTH 21'
5. CUTTINGS COLLECTED YES [ ] NO [x]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [x]
7. STATIC WATER LEVEL Below Top of Casing: 11.6 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5 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): 9.1 - bottom
11. CHLORINATION: Type N/A Amount _____
12. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	5	2"	Scn 40	PVC

13. GROUT:

	Depth From	Depth To	Material	Method
	0	3	cement	
	3	4	bentonite	pellet

14. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	5	20	2 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

15. SAND/GRAVEL PACK:

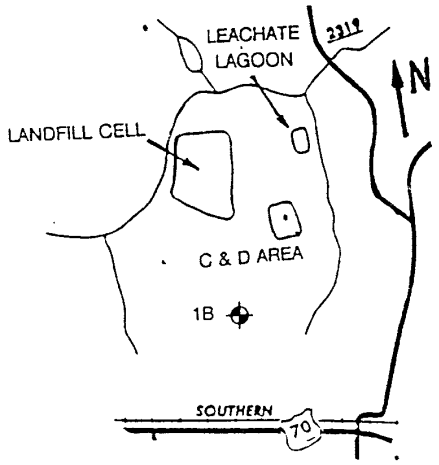
	Depth From	Depth To	Size	Material
	4	21	NC 25	sand

16. REMARKS: Monitoring Well 1B

DEPTH From To	DRILLING LOG Formation Description
0 - 9'	Orange-brown sandy clay
9 - 20	Brown silty sandy clay with mica

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.

Wendell W. Parks 5-4-93
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REV. 9/91

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

LOG OF BORING: MW-1C

Iredell County Landfill **Project No. G03013.0**

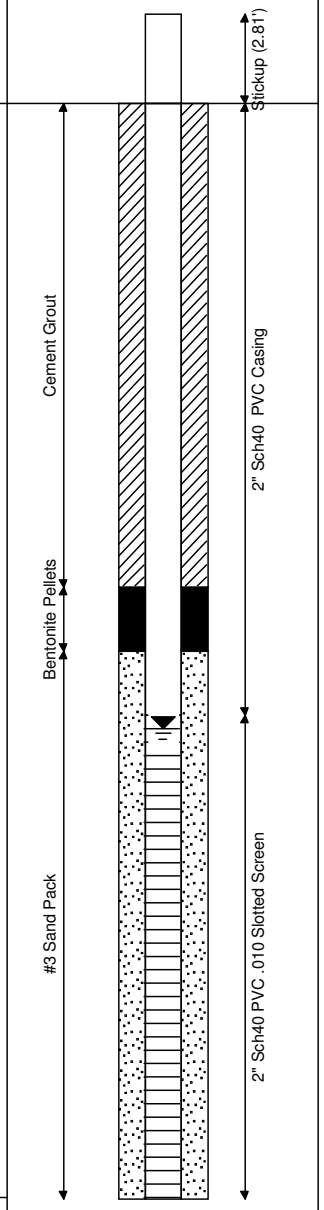
Drilling contractor: Engineering Tectonics
Drill rig & method: 8.5" O.D HSA
Logged by: Jonathan Pfohl

Date started: 10/20/2003
Date ended: 10/20/2003
Completion depth: 34.00 ft
Stickup height: 2.81 ft

Surface elevation: 863.44 ft (MSL)
Top of pipe elevation: 866.25 ft (MSL)
Depth to water (TOB): 19.00 ft
Depth to water (24hrs): 19.42 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
5				
10				
15				HSA to 34' without S.S. (See Boring Logs for MW-1A & MW-1B for soil Descriptions).
20				
25				
30				
35				Boring terminated at 34.0 feet
40				

Well Diagram



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

MW-1C

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Ronald Barron CERTIFICATION # 2091

WELL CONTRACTOR COMPANY NAME Engineering Tectonics PHONE # (336) 724-6991

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ Permit # _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump water Injection ☐ other ☐ If other, list use: MW-1C

2. WELL LOCATION:
Nearest Town: Statesville County Iredelle
3260 Twin Oaks Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/ Land setting
☐ Ridge ☐ slope ☐ valley ☒ Flat
(check appropriate box)
Latitude/Longitude of well location
n/a
(degrees/minutes/seconds)
Latitude/Longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER Iredell Co. Landfill
Address Same as above
(Street or Route No)
Statesville NC 28687
City or Town State Zip code
(704) - 878 - 5430
Area Code- Phone number

4. DATE DRILLED 10-20-03
5. TOTAL DEPTH 34.0
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 22.23 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.0 FT. Above Land Surface
Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118.
9. YIELD (gpm): n/a METHOD OF TEST _____
10. WATER ZONES (depth): n/a

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	9	Sandy Clay
9	23	Silty Clay
23	34	Clayey Sand

11. DISINFECTION: Type n/a Amount n/a
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From +3.0	To 19.0	Ft	2"	sch.40	PVC
From	To	Ft			
From	To	Ft			

13. GROUT:

	Depth		Material	Method
From 0	To 15.0	Ft.	Portland	Poured
From	TO	Ft.		

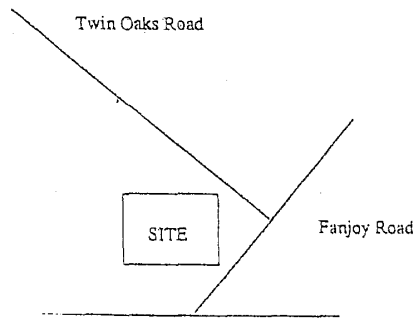
14. SCREEN

	Depth		Diameter		Slot Size		Material
From 19.0	To 34.0	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK

	Depth		Size	Material
From 17.0	To 34.0	Ft.	#3	Sand
From 15.0	To 17.0	Ft	3/8	Bentonite

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS _____

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

Ronald F. Barron For Engineering Tectonics 10-20-03

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 133-3221, within 30 days.

GW-1 REV. 07/2001

LOG OF BORING: CD3-7

Iredell County C&D Landfill Phase 3 **Project No. G04100.0**

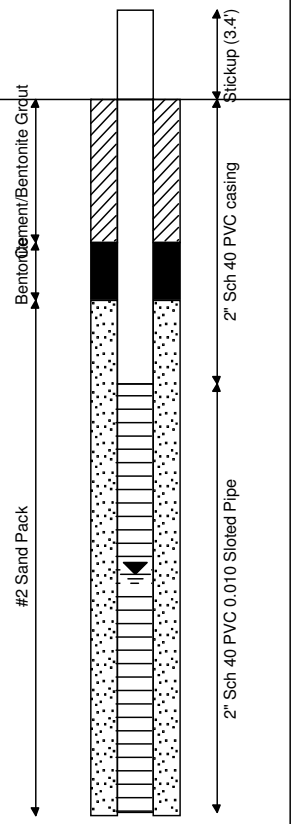
Drilling contractor: Geologic Exploration
Drill rig & method: 8.5" HSA w/SS
Logged by: Robert Hoffman

Date started: 12/8/2004
Date ended: 12/8/2004
Completion depth: 25.00 ft
Stickup height: 3.40 ft

Surface elevation: 861.76 ft (MSL)
Top of pipe elevation: 865.16 ft (MSL)
Depth to water (TOB): 16.82 ft
Depth to water (24hrs): 16.58 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
				Sandy CLAY, reddish brown, mottled black, slightly micacous, moist
5	15			Sandy CLAY, reddish brown, mottled black, slightly micacous, moist
10	22			As Above
15	48			Silty SAND, grayish brown, saprolitic, very micacous, moist
20				Silty SAND, saprolitic, Gravel = 1.4%, Sand = 50.3%, Silt = 30.9%, Clay = 17.6%, LL = 55%, PL = 34%, PI = 21%, wet
25	57			As Above
				PWR - Saprolite, interbedded black with quartz bands
				Boring terminated at 25.0 feet
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

MW-25

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MARK GETTYS CERTIFICATION # 2345

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION., INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ■ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: Statesville County Iredell
3260 Twin Oaks Road 28687
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☒ Valley ☐ Flat
(check appropriate box)
Latitude/longitude of well location
35.76362/80.82919
(degrees/minutes/seconds)
Latitude/longitude source: ☒ GPS ☐ Topographic map
(check box)

3. OWNER: Iredell Co. Landfill
Address 3260 Twin Oaks Road
(Street or Route No.)
Statesville NC 28687
City or Town State Zip Code
(704) 878-5430
Area Code – Phone Number

4. DATE DRILLED 12/08/04
5. TOTAL DEPTH: 24.93 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 20.22 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.35 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): 17.0'BGS
11. DISINFECTION: Type N/A Amount N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	10.0	Orange silty clay
10.0	24.93	Brown silt

12. CASING:

	Depth From	Depth To		Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	9.93	Ft	2 INCH	SCH 40	PVC
			Ft.			
			Ft.			

13. Grout:

	Depth From	Depth To		Material	Method
	0.0	5.0	Ft.	Portland Bentonite	Slurry
			Ft.		

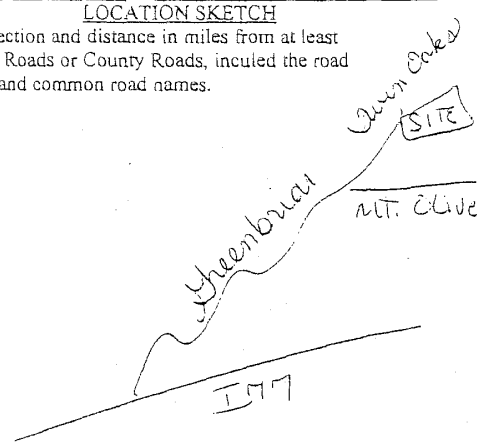
14. SCREEN:

	Depth From	Depth To		Diameter		Slot Size		Material
	9.93	24.93	Ft.	2.0	in.	0.01	in	PVC
			Ft.		in.		in	

15. SAND/GRAVEL PACK:

	Depth From	Depth To		Size	Material
	7.0	24.93	Ft.	#2	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: BENTONITE SEAL FROM 5.0 TO 7.0 FEET

I DO HEARBY 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

Mark H. Gettys 2/9/05
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

LOG OF BORING: CD3-11S

Iredell County C&D Landfill Phase 3 **Project No. G04100.0**

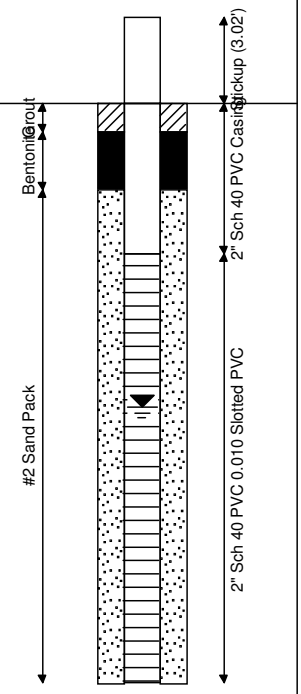
Drilling contractor: Geologic Exploration
Drill rig & method: 8.5" HSA w/SS
Logged by: Robert Hoffman

Date started: 12/15/2004
Date ended: 12/15/2004
Completion depth: 20.00 ft
Stickup height: 3.02 ft

Surface elevation: 830.52 ft (MSL)
Top of pipe elevation: 833.54 ft (MSL)
Depth to water (TOB): 10.93 ft
Depth to water (24hrs): 10.63 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	5			Clayey SAND, light brown, moist
5	6			Clayey SAND, light brown, moist
				Clayey SAND, (SC) light brown, Gravel = 4.9%, Sand = 48.5%, Silt = 19.5%, Clay = 27%, LL = 49%, PL = 23%, PI = 26%
10				
15	5			Sandy CLAY, light brown, interbedded tan/black, micacous, wet
20	6			Sandy SILT, grayish brown, saprolitic, micacous, wet
				Boring terminated at 20.0 feet
25				
30				
35				
40				
45				

Well Diagram



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PO Box 97, Garner, North Carolina 27529 (919) 772-5393PO Box 349, Boone, North Carolina 28607 (828) 262-1767

MW-26S

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION., INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ■ Recovery ☐ Heat Pump Water Injection ☐ Other☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: Statesville County Iredell
3260 Twin Oaks Road 28687
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☒ Valley ☐ Flat
(check appropriate box)
Latitude/longitude of well location
35.76340/80.82789
(degrees/minutes/seconds)
Latitude/longitude source: ☒ GPS ☐ Topographic map
(check box)

3. OWNER: Iredell Co. Landfill
Address 3260 Twin Oaks Road
(Street or Route No.)
Statesville NC 28687
City or Town State Zip Code
(704) 878-5430
Area Code – Phone Number

4. DATE DRILLED 12/15-12/22/04
5. TOTAL DEPTH: 20.25 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 13.95 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): 11.0'BGS

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	1.0	Tan silty sandy with stone
1.0	20.25	Red/brown silty sand

11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth From	Depth To		Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	5.25	Ft	2 INCH	SCH 40	PVC
			Ft.			
			Ft.			

13. Grout:

	Depth From	Depth To		Material	Method
	0.0	1.0	Ft.	Portland Bentonite	Slurry
			Ft.		

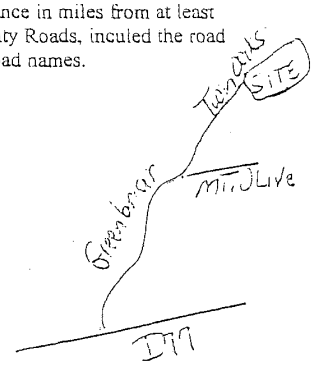
14. SCREEN:

	Depth From	Depth To		Diameter		Slot Size		Material
	5.25	20.25	Ft.	2.0	in.	0.01	in	PVC
			Ft.		in.		in	

15. SAND/GRAVEL PACK:

	Depth From	Depth To		Size	Material
	3.0	20.25	Ft.	#2	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: BENTONITE SEAL FROM 1.0 TO 3.0 FEET

I DO HEARBY 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

Mike McConahey 2/9/05
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

LOG OF BORING: CD3-11D

Iredell County C&D Landfill Phase 3 **Project No. G04100.0**

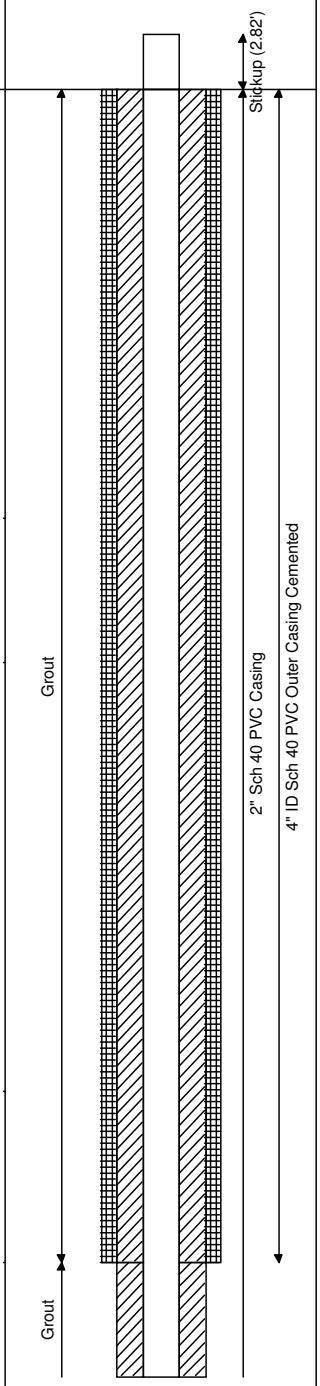
Drilling contractor: Geologic Exploration
Drill rig & method: 4" OD HQ Core (2.5" ID)
Logged by: Robert Hoffman

Date started: 12/17/2004
Date ended: 12/17/2004
Completion depth: 62.00 ft
Stickup height: 1.92 ft

Surface elevation: 830.86 ft (MSL)
Top of pipe elevation: 832.78 ft (MSL)
Depth to water (TOB): NA
Depth to water (24hrs): NA

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	5			Soil Description to 35.5 feet transcribed from adjacent CD3-11M. ClayeySAND, light brown, moist
5	6			Clayey SAND, light brown, moist
10				Clayey SAND, (SC) light brown, Gravel = 4.9%, Sand = 48.5%, Silt = 19.5%, Clay = 27%, LL = 49%, PL = 23%, PI = 26%
15	5			Sandy CLAY, light brown, interbedded tan/black, micacous, wet
20	6			Sandy SILT, grayish brown, saprolitic, micacous, wet
25	6			No retrival
30	25			Sandy SILT, grayish brown, peppered black, wet
35	14			Silty SAND, grayish brown, wet
40				Weathered rock, no core recovery
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

Converted to MW-26D

LOG OF BORING: CD3-11D

Iredell County C&D Landfill Phase 3 **Project No. G04100.0**

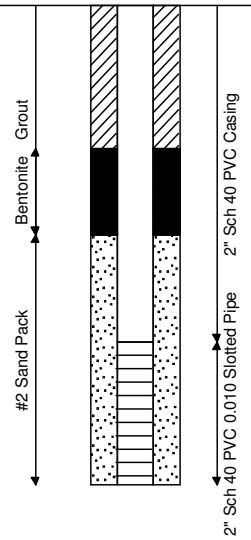
Drilling contractor: Geologic Exploration
Drill rig & method: 4" OD HQ Core (2.5" ID)
Logged by: Robert Hoffman

Date started: 12/17/2004
Date ended: 12/17/2004
Completion depth: 62.00 ft
Stickup height: 1.92 ft

Surface elevation: 830.86 ft (MSL)
Top of pipe elevation: 832.78 ft (MSL)
Depth to water (TOB): NA
Depth to water (24hrs): NA

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
				Run #1; (REC) 8.0'/8.0'=100%, (RQD) 8.0'/8.0'=100% (45.0'-53.0') GNEISS; banded white/black, fresh, weak foliation at 15 degrees, medium grain
				Fractures at 46.4', 48', 49.5', 51.5', 52.4'
50				
				Run #2; (RQD) 9.0/9.0=100%, (RQD) 8.5/9.0=94.4% (53.1' - 62.1') GNEISS, fractures at 53.5', 53.7', 54.2' 55', 55.9', 57.6', 57.8', 58.8', 60.2', 61.1', 61.7'.
55				
60				
				Boring terminated at 62.0 feet
65				
70				
75				
80				
85				
90				

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

MW-26D

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION., INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ■ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: Statesville County Iredell
3260 Twin Oaks Road 28687
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☒ Valley ☐ Flat
(check appropriate box)
Latitude/longitude of well location
35.76340/80.82791
(degrees/minutes/seconds)
Latitude/longitude source: ■ GPS ☐ Topographic map
(check box)

3. OWNER: Iredell Co. Landfill
Address 3260 Twin Oaks Road
(Street or Route No.)
Statesville NC 28687
City or Town State Zip Code
(704) 878-5430
Area Code – Phone Number

4. DATE DRILLED 12/17/04
5. TOTAL DEPTH: 61.76 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 13.07 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.85 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): 60.0'BGS
11. DISINFECTION: Type N/A Amount N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	1.0	Tan silty sandy with stone
1.0	20.0	Red/brown silty sand
20.0	34.27	Brown/yellow/tan silty sand
34.27	61.76	Tan weathered rock

12. CASING:

	Depth From	Depth To		Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	56.76	Ft	2 INCH	SCH 40	PVC
	0.0	41.0	Ft.	4 INCH	SCH 40	PVC
			Ft.			

13. Grout:

	Depth From	Depth To		Material	Method
	0.0	50.0	Ft.	Portland Bentonite	Slurry
	0.0	41.0	Ft.	Portland Bentonite	Slurry

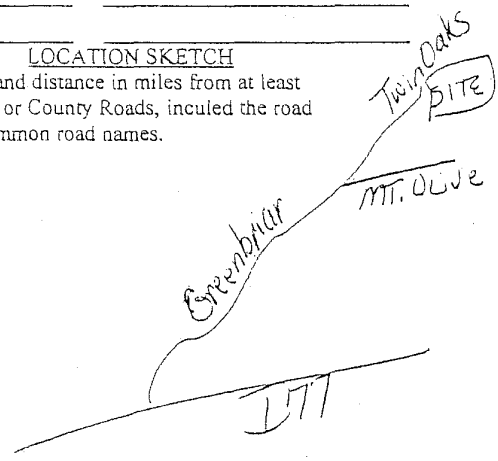
14. SCREEN:

	Depth From	Depth To		Diameter		Slot Size		Material
	56.76	61.76	Ft.	2.0	in.	0.01	in	PVC
			Ft.		in.		in	

15. SAND/GRAVEL PACK:

	Depth From	Depth To		Size	Material
	53.0	61.76	Ft.	#2	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: BENTONITE SEAL FROM 50.0 TO 53.0 FEET

I DO HEARBY 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 PERSON CONSTRUCTING THE WELL — DATE 2/9/05

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

LOG OF BORING: CD3-11M

Iredell County C&D Landfill Phase 3 **Project No. G04100.0**

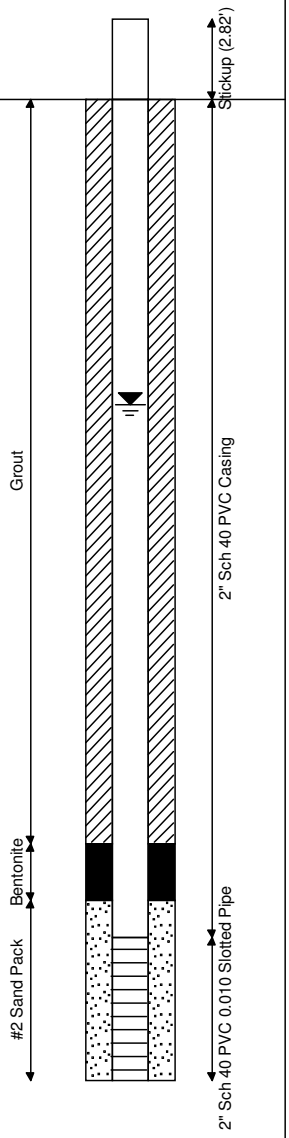
Drilling contractor: Geologic Exploration
Drill rig & method: 8.5" HSA w/SS
Logged by: Robert Hoffman

Date started: 12/15/2004
Date ended: 12/15/2004
Completion depth: 35.00 ft
Stickup height: 2.82 ft

Surface elevation: 831.53 ft (MSL)
Top of pipe elevation: 834.35 ft (MSL)
Depth to water (TOB): 26.59 ft
Depth to water (24hrs): 10.68 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	5			Soil Description to 20.0 feet transcribed from adjacent CD3-11S. ClayeySAND, light brown, moist
5	6			Clayey SAND, light brown, moist
				Clayey SAND, (SC) light brown, Gravel = 4.9%, Sand = 48.5%, Silt = 19.5%, Clay = 27%, LL = 49%, PL = 23%, PI = 26%
10				
15	5			Sandy CLAY, light brown, interbedded tan/black, micacous, wet
20	6			Sandy SILT, grayish brown, saprolitic, micacous, wet
25	6			No retrival
30	25			Sandy SILT, grayish brown, peppered black, wet
35	14			Silty SAND, grayish brown, wet
				Boring terminated at 35.0 feet
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

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION., INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☒ If Other, list Use Temp. Piez. for Hydro Study

2. WELL LOCATION:
Nearest Town: Statesville County Iredell
3260 Twin Oaks Road 28687
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☒ Valley ☐ Flat
(check appropriate box)
Latitude/longitude of well location
35.76343/80.82790
(degrees/minutes/seconds)
Latitude/longitude source: ☒ GPS ☐ Topographic map
(check box)

3. OWNER: Iredell Co. Landfill
Address 3260 Twin Oaks Road
(Street or Route No.)
Statesville NC 28687
City or Town State Zip Code
(704) 878-5430
Area Code – Phone Number

4. DATE DRILLED 12/15-12/22/04
5. TOTAL DEPTH: 34.27 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 29.41 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.71 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): 26.51'BGS
11. DISINFECTION: Type N/A Amount N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	1.0	Tan silty sandy with stone
1.0	20.0	Red/brown silty sand
20.0	34.27	Brown/yellow/tan silty sand

12. CASING:

	Depth From	Depth To	Ft	Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	34.27	Ft	INCH	SCH 40	PVC
			Ft.			
			Ft.			

13. Grout:

	Depth From	Depth To	Ft.	Material	Method
	0.0	26.0	Ft.	Portland Bentonite	Slurry
			Ft.		

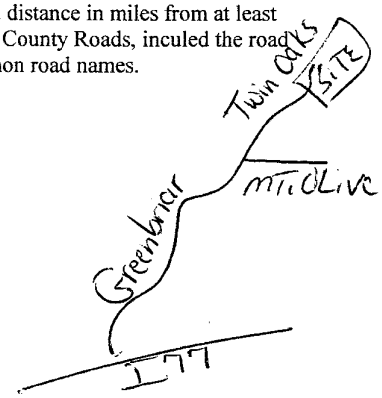
14. SCREEN:

	Depth From	Depth To	Ft.	Diameter	Slot Size	Material
	29.27	34.27	Ft.	2.0 in.	0.01 in	PVC
			Ft.	in.	in	

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	28.0	34.27	Ft.	#2	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: CD3-11M BENTONITE SEAL FROM 26.0 TO 28.0 FEET

I DO HEARBY 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

Mike McConahey 2/9/05
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

LOG OF BORING: P-15S

Iredell County Landfill, Phase 3 - Statesville, North Carolina **Project No. G99087.6**

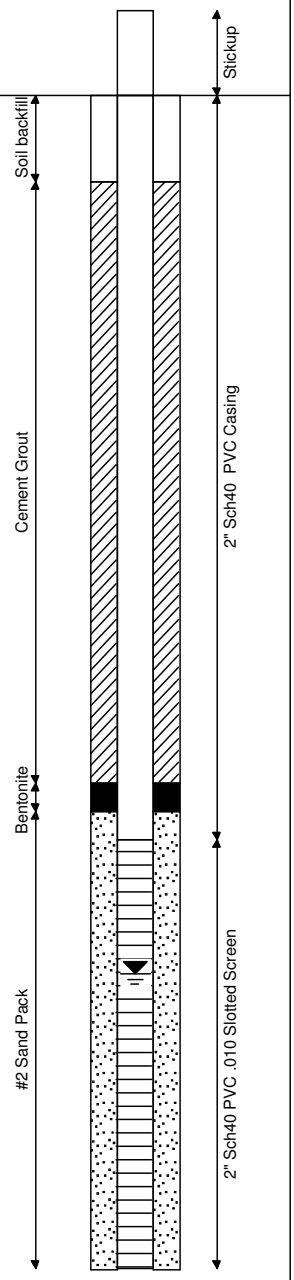
Drilling contractor: Geologic Explorations
Drill rig & method: 8.5" O.D HSA
Logged by: C. (Nathan) Nallainathan

Date started:
Date ended:
Completion depth: 41.00 ft
Stickup height: 2.94 ft

Surface elevation: 821.03 ft (MSL)
Top of pipe elevation: 823.97 ft (MSL)
Depth to water (TOB): 30.50 ft
Depth to water (24hrs): 30.70 ft

Depth (ft)	SPT (bpf)	Soil Type Symbol	Sample	Description of Material & Remarks
	36			CLAYEY SILT; Reddish Brown, micaceous w/quartz fragments. Dry to moist.
5	26			SILT; Orangish brownish tan, micaceous w/sand and quartz fragments. Saprolite. Dry to moist.
10	14			- Same as above.
15	18			- Olive gray to tan, micaceous. Saprolite. Moist.
20	18			- Same as above w/horizontal layering.
25	26			- Same as above.
30	21			- Same as above w/quartz fragments. Wet at end of sample.
35	12			- Same as above. Some partially weathered rock fragments. Wet.
40	8			- Same as above.
45				Boring terminated at 41.0 feet

Well Diagram



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

JUL-23-2002 13:30 GEOLOGIC EXPLORATION 704 872 0248 P.05/07

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MARK GETTYS CERTIFICATION # 2345

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION, INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

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

2. WELL LOCATION:
Nearest Town: STATESVILLE County IREDELL
TWIN OAKS RD.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: IREDELL CO. SOLID WASTE FACILITY
Address 354 TWIN OAKS RD.
(Street or Route No.)
STATESVILLE NC 28625
City or Town State Zip Code
( )
Area Code – Phone Number

4. DATE DRILLED 6-2-00
5. TOTAL DEPTH: 41.0 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: _____ FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.94 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0113.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount _____

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	14.0	ORANGE/BROWNISH/TAN SILT
14.0	41.0	OLIVE/GREY TO TAN MICACEOUS SILT

Converted from P-15S to MW-21S

12. CASING:

	Depth From	To	Ft	Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	26.0	Ft	2 INCH	SCH 40	PVC
			Ft.			
			Ft.			

13. Grout:

	Depth From	To	Ft.	Material	Method
	0.0	24.0	Ft.	Portland Bentonite	Slurry
			Ft.		

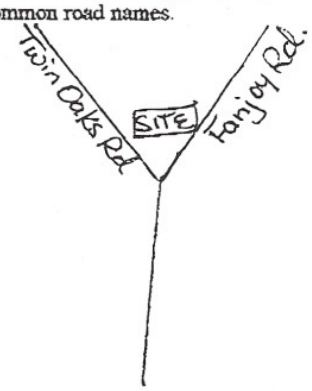
14. SCREEN:

	Depth From	To	Ft.	Diameter	in.	Slot Size	in	Material
	26.0	41.0	Ft.	2.0	in.	.010	in	PVC
			Ft.		in.		in	

15. SAND/GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	25.0	41.0	Ft.	20-40	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: MW-21S BENTONITE SEAL FROM 24.0 TO 25.0 FEET

I DO HEARBY 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

Mark K. Gettys 5/28/02
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001