AN INVESTIGATION OF THE OCCURRENCE OF URANIUM IN GROUND WATER IN GEORGIA

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GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
WATERSHED PROTECTION BRANCH
REGULATORY SUPPORT PROGRAM

ATLANTA
2011

CIRCULAR 12W

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The preparation of this report was funded in part through a grant from the U.S. Environmental Protection Agency under the provisions of Section 106 of the Federal Water Pollution Control Act of 1972, as amended.

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ATLANTA
2011

CIRCULAR 12W

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CHAPTER 1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report, covering the period March 2008 through January 2010, is the twenty-third in the Circular 12 series. The first nineteen reports of the Circular 12 series dealt with the chemical quality of ground water Statewide. Following these, a series of three reports, now completed, examined potential ground-water impairment within specific areas of Georgia or involving specific types of wells: 1) the Miocene and Surficial aquifers in the coastal region; 2) the Piedmont/Blue Ridge unconfined aquifer system; 3) the ground waters available to small public water systems. The discovery of ground water with excessive uranium content in southern Greenville County, South Carolina, prompted EPD to further examine Georgia's ground water to determine if areas with high-uranium ground water existed. The current report summarizes this effort.

These reports are among the tools used by the Georgia Environmental Protection Division (EPD) to assess trends in the quality of the State's ground-water resources. EPD is the State organization with regulatory responsibility for maintaining and, where possible, improving ground-water quality and availability. EPD has implemented a comprehensive statewide ground-water management policy of anti-degradation (EPD, 1991; 1998). Five components comprise EPD's current ground-water quality assessment program:

1. The Georgia Ground-Water Monitoring Network. The Georgia Geologic Survey Branch (GGS) of EPD and its successor, the Regulatory Support Program of the Watershed Protection Branch, maintain this program. Early in calendar year 2004, a three-part monitoring program replaced the Statewide aquifer-specific monitoring network. This program examined ground-water: a) in the coastal area for influx of connate brines, sea water, or low-quality surface water; b) in the Piedmont and Blue Ridge for impacts from development and rural land use as well as to gain a more thorough understanding of the area's ambient ground water; and c) from small public water systems to spot check for intermittent contamination that might escape detection under item 2) below. This series of reports is now completed. The new program, begun in March 2008, sampled and analyzed additional wells and springs located near sampling stations from studies b) and c) above which yielded samples with detectable uranium.

2. Sampling of public drinking water wells as part of the Safe Drinking Water Program, also of the Watershed Protection Branch. This program provides data on the quality of ground water that the residents of Georgia are using.

3. Special studies addressing specific water quality issues. Examples of these types of studies include a survey of nitrite/nitrate levels in shallow wells located throughout the State of Georgia (Shellenberger, et al., 1996; Stuart, et al., 1995), operation of a Pesticide Monitoring Network conducted jointly by the GGS and the

Georgia Department of Agriculture (GDA) (Tolford, 1999; Glen, 2001), and the Domestic Well Pesticide Sampling Project conducted jointly by the GGS and the GDA (Overacre, 2004, Berry, 2005).

4. Ground-water sampling at environmental facilities such as municipal solid waste landfills, RCRA facilities, and sludge disposal facilities. The primary branches responsible for monitoring these facilities are EPD's Land Protection (including Hazardous Waste Management) and Watershed Protection Branches.

5. The wellhead protection program (WHP), which is designed to protect the area surrounding a municipal drinking water well from contaminants. The U.S. Environmental Protection Agency (EPA) approved Georgia's WHP Plan on September 30, 1992. The WHP Plan became a part of the Georgia Safe Drinking Water Rules, effective July 1, 1993. The protection of public water supply wells from contaminants is important not only for maintaining ground-water quality, but also for ensuring that public water supplies meet health standards.

1.2 URANIUM MONITORING PROJECT

An investigation in the early 2000's by South Carolina authorities discovered an area that contained ground waters with extremely high uranium contents in that State's Piedmont Physiographic Province (Baize, 2002). The area is in the Fountain Inn-Simpsonville portion of Greenville County. This discovery prompted the Georgia Environmental Protection Division (EPD) to undertake a more intensive examination of Georgia's ground waters for similar occurrences. The lead program for this examination was the Regulatory Support Program (RSP) of the Watershed Protection Branch.

RSP had at its disposal uranium analyses for 300 wells and springs for the Piedmont Blue Ridge Monitoring Project and the Small Public Water System Monitoring Project. Of these, 58 stations yielded samples with detectable uranium, with five exceeding the Primary Maximum Contaminant Level (MCL) of 30 micrograms per liter. RSP decided to sample approximately 300 additional stations nearby to these 58 stations. Four to eight stations would be located around each of the original 58 stations, within a maximum radius of two miles from the original station. The two-mile radius was not always attainable. In Banks County, two of the original stations are close enough to be considered a common center. The five original stations that had uranium exceedances would have eight new stations located in their areas. Others would get a minimum of four new stations. Any new stations that gave samples with uranium exceedances would be resampled if used for drinking water and would have four additional stations located in the surrounding area.

RSP staff sampled a total of 310 stations, consisting of 308 wells and two springs in 43 counties in Georgia (Figure 1-1). Three hundred wells and two springs drew water from the Piedmont/Blue Ridge unconfined aquifer system; eight wells drew water from the Coastal Plain confined aquifers (Figure 1-2).

Waters from the sampled stations underwent field testing for pH, conductivity, temperature, and, where possible, dissolved oxygen. Global positioning system (GPS) receivers determined the latitudes and longitudes of the sampling stations. At 46 stations, sample waters received comparative (water versus background) radioactivity measurements. Laboratory testing for the project included analyses for volatile organic compounds (VOCs), chloride, sulfate, nitrate/nitrite, total phosphorus, and for metals, including uranium and arsenic. Well owners received copies of laboratory reports with pHs and conductivities noted on the report.

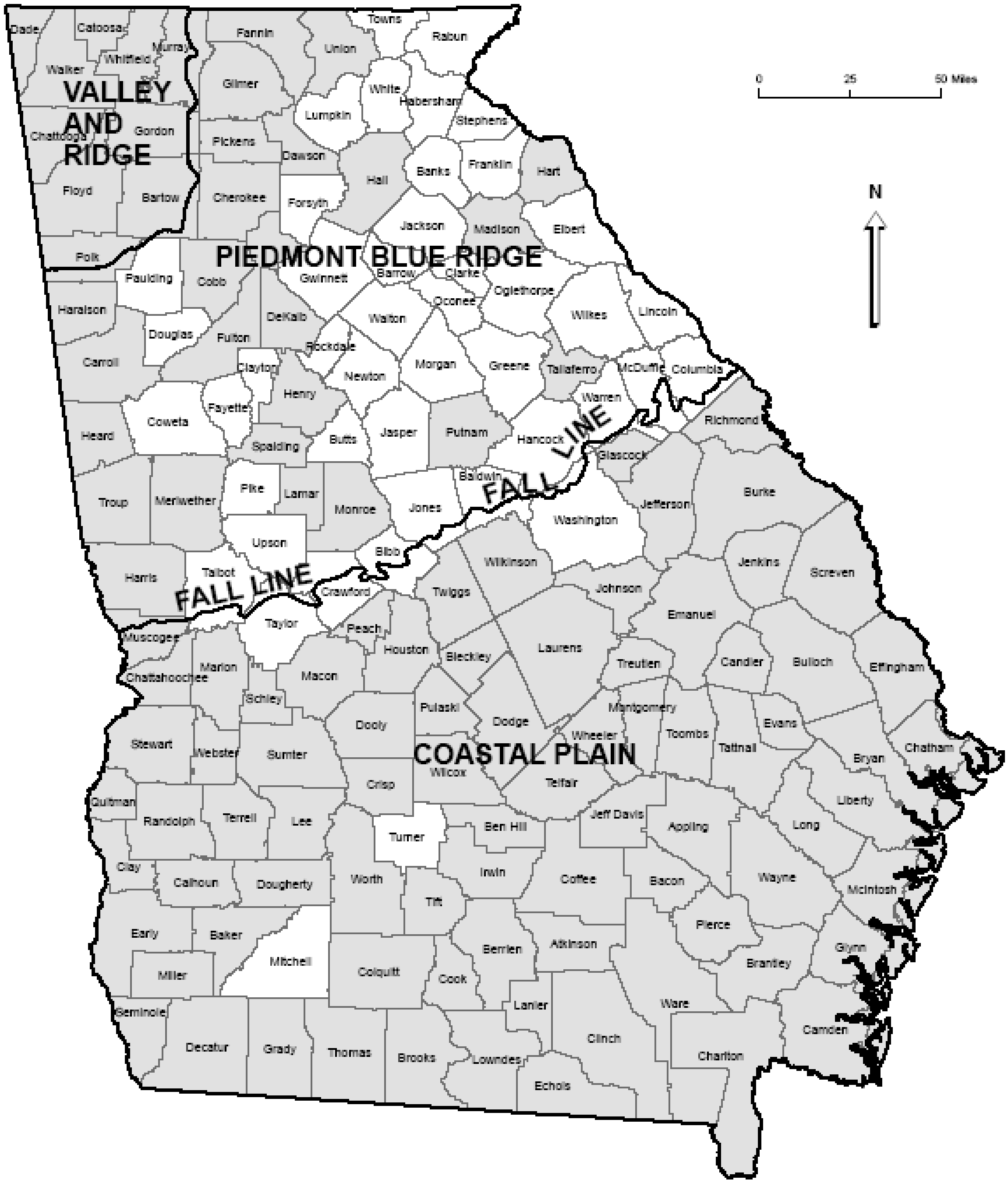

Figure 1-1. <u>Map of Georgia Showing Study-Area Counties and Physiographic Provinces.</u> The counties shown in white are those included in the current study.

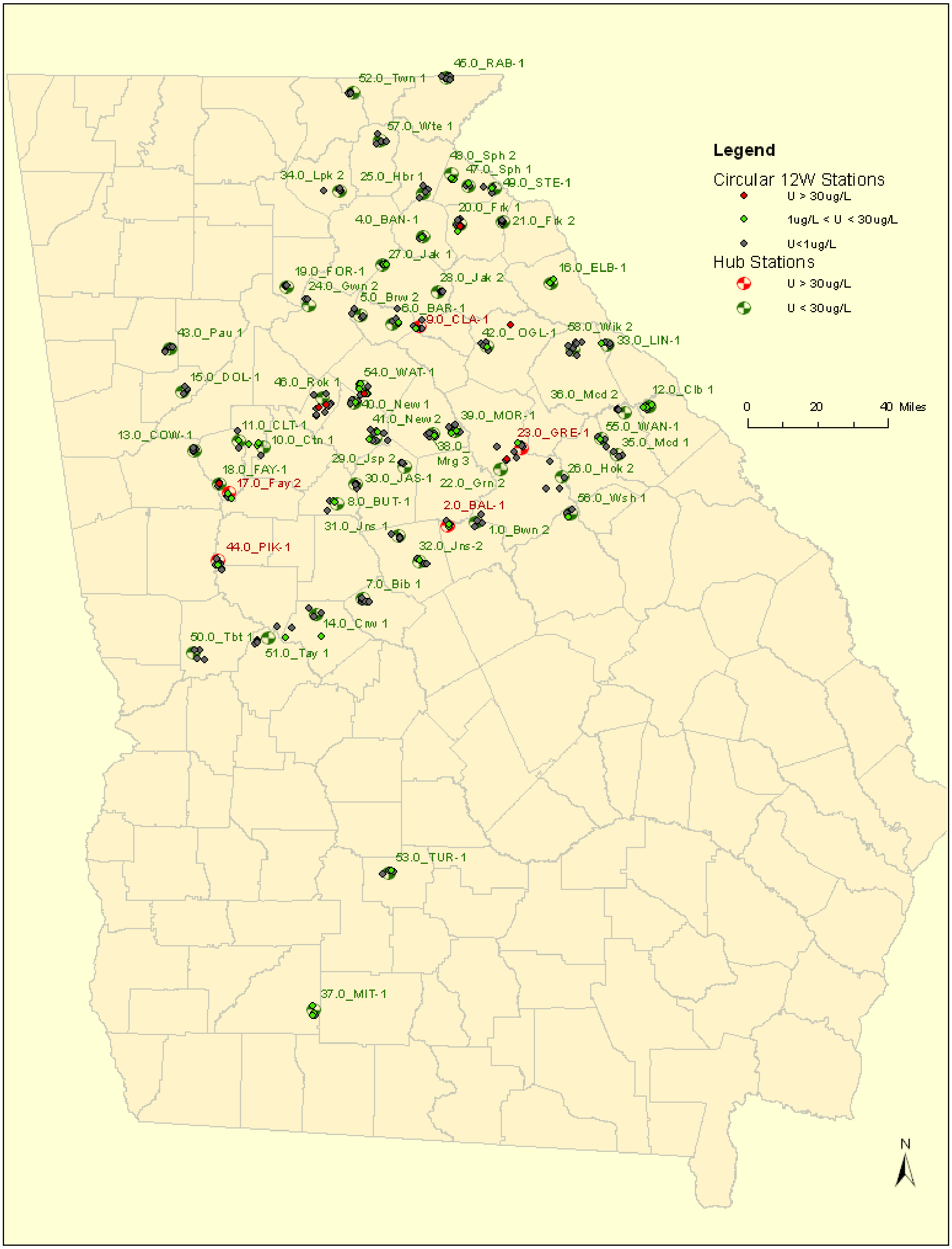

Figure 1-2. Map of Georgia Showing Locations of Hub Stations and Sampling Stations for the Current Project.

CHAPTER 2 HYDROGEOLOGIC FRAMEWORK

2.1 PIEDMONT/BLUE RIDGE AQUIFER SYSTEM

Most of the stations in this study were situated around hub stations that drew water from the Piedmont/Blue Ridge aquifer system. The Piedmont/Blue Ridge aquifer system extends from New Jersey into Alabama (Daniel and Harned, 1997). In Georgia, the Great Smoky-Cartersville fault zone forms the northwestern boundary of the aquifer system; and, the Fall Line forms the southeastern boundary (Figure 1-1). The system is unconfined or semi-confined and is composed of two major hydrologic units: regolith and fractured igneous and metamorphic bedrock (Heath, 1980; Daniel and Harned, 1997).

One hundred and ninety-seven of the 302 stations located in the Piedmont/Blue Ridge Province draw water from the fractured bedrock aquifer and 68 stations from the regolith aquifer. Which of these two aquifers provides water to the remaining 37 stations in the province cannot be ascertained.

2.1.1 Regolith

Regolith is typically composed of a veneer of soil or, along streams and former streams, alluvium, underlain by saprolite (Heath, 1980). Saprolite is bedrock that has undergone extensive chemical weathering in place. Many of the structures and textures of the fresh bedrock are faithfully preserved, with the saprolite appearing as a "rotten" version of the fresh bedrock. Saprolitization involves the leaching of alkali metals and alkaline earth and other divalent metals by downward percolating, typically acidic ground water from micas, feldspars, and other minerals composing the fresh bedrock, leaving behind a residual material rich in clay minerals.

The regolith possesses a high degree of porosity (35 to 55 percent), mostly primary void space between mineral grains (Daniel and Harned, 1998). The regolith constitutes the main reservoir containing ground water. Beneath the soil veneer, the saprolite typically grades downward through a transition zone into unweathered fractured bedrock. The transition zone contains a mix of saprolite, partially weathered bedrock, and lumps of fresh bedrock. This zone commonly exhibits greater permeability than either the upper regolith zone or the bedrock zone (Daniel and Harned, 1998). Williams et al. (2004) nevertheless found areas of poor hydraulic communication between the bedrock and the regolith at Lawrenceville, Georgia.

The regolith serves as the reservoir that feeds ground water downward into the fractured bedrock (Heath, 1980). The water table usually lies within the regolith and, at rest, is a subdued imitation of the topography, with ground-water flow typically proceeding from uplands toward valleys. Streams can be thought of as outcroppings of the water table. Conventional thinking is that little or no hydraulic communication takes place across drainage divides. Williams et al. (2004), however, found that pumping at the City of Lawrenceville's Rhodes Jordan Park well field influenced a water level station about a mile and a half from the well field, across a locally major drainage divide.

2.1.2 Fractured Bedrock

Igneous and metamorphic rocks comprise the bedrock. Granitic rocks are the most common type of igneous rocks, but mafic and ultramafic rocks are also present. Diabase, in the form of dikes, is the most common mafic rock and the most recently emplaced. A variety of metamorphic rocks are present: gneisses, schists, amphibolites, quartzites, marbles, mylonites and other cataclastic rocks. Regional metamorphic rocks are the most common, with cataclastic rocks next. Minor amounts of contact metamorphic rocks attend diabase dikes and other late intrusives.

Unlike the regolith, the bedrock has almost no primary porosity, i.e., void space between mineral grains. Nearly all the ground water in the bedrock is stored in fractures and solution voids (secondary porosity). In the North Carolina portion of the Piedmont/Blue Ridge aquifer system, Daniel and Harned (1998) found one to three percent porosity typical for bedrock.

Fractures consist of faults and joints (Heath, 1980). Faults are breaks in the rock with differential displacement parallel to the plane of the break. Fractures generally are more numerous and wider near the bedrock surface. Daniel and Harned (1998) comment that at a depth of about 600 feet, pressure from the overlying rock column becomes so great that fractures are mostly forced shut. Fractures serve to open the rock to weathering, which in turn, can enlarge the fractures and alter the rock to saprolite. Large fractures in the bedrock function as conduits, allowing wells tapping such fractures to have greater yields than those tapping the regolith. Fractures can be concentrated along fault zones, shear zones, late-generation fold axes, foliation planes, lithologic contacts, compositional layers, or intrusion boundaries. Stress-relief fractures, roughly circular subhorizontal structures, may form in certain scenarios as the bedrock rebounds from the erosional removal of overlying material (Cressler et al., 1983). These structures may be up to a few inches in thickness and may range from about a hundred feet to a quarter mile in diameter. Schists contain dense networks of fine hairline fractures along foliations and have the best developed regolith-to-bedrock transition zones (Daniel and Harned, 1998). They are not good producers of water, as the fine fractures do not accommodate conduit flow. Fractures in more massive rocks, e.g., granites and gneisses, tend to be wider and more conductive to conduit flow.

2.2 COASTAL PLAIN AQUIFERS

The Coastal Plain aquifers are developed in a wedge of generally poorly consolidated sediments that dip gently and thicken to the south and southeast. The oldest sedimentary units crop out along the Fall Line, with successively younger units exposed to the south and southeast. Recharge to the aquifers occurs in the exposed areas, where the aquifers are unconfined, although cross-aquifer leakage can be important down dip. Flow is, as a general rule, to the south and southeast. South and southeastward from the recharge areas, the aquifers become confined, as poorly permeable sedimentary units are interposed between permeable units. Eight major aquifers and aquifer systems are recognized in the Coastal Plain: the Cretaceous, the Providence, the Jacksonian, the Clayton, the Claiborne, the Floridan, the Miocene, and the Surficial. Eight of the stations, four each in Turner and Mitchell Counties, are situated around two hub stations that draw water from the Coastal Plain aquifers.

Depth data for the Mitchell County stations indicate that all draw water from the Floridan aquifer (Hayes et al., 1983; Crewes and Huddlestun, 1984; Clarke at al., 1990). The Floridan is developed in carbonate rocks. Depth data are available for Turner County stations 53.3_TUR-1 and 53.4_TUR-1 and indicate that they draw from the Floridan. Two other Turner County stations (53.1_TUR-1 and 53.2_TUR-1) are known to be drilled, suggesting that they, too, draw from the Floridan. Because detailed construction data are lacking, one cannot be certain that any of the Coastal Plain wells draws only from the Floridan. However, the overlying strata are predominantly clastic and, because of lower yield, would make less attractive targets than the Floridan for water supply.

A linear depositional feature known as the Gulf Trough (Kellam and Gorday, 1990) extends from southwestern Decatur County at the Florida State Line to Bulloch County. A dense limestone facies partially occludes the Floridan aquifer in the vicinity of the trough, leading to low well yields. High total dissolved solids and excesses of barium, sulfate, and radionuclides can impair the chemical quality of ground water in the general area of the trough. One of the hub stations, 37.0_MIT-1 near Hinsonton (See Table A-1 in Appendix), is located near the axis of the trough.

CHAPTER 3 METHODS

3.1 FIELD METHODS

Conductivity, pH, temperature, and, where possible, dissolved oxygen were monitored in the field with Horiba Model U-10 water quality meters. Garmin® eTrex Legend GPS receivers were used to measure latitude and longitude at each sampling station. At 46 stations, radioactivity readings were taken both over a five-gallon plastic bucket filled with sample water (water reading) and over ground at a distance from the bucket (background reading) (Table A-1, Part A). A Mount Sopris Instrument Co. Model SC-132 handheld scintillation counter was used to measure radioactivity.

In most cases, wells had dedicated pumps with plumbing downstream of the wellhead that included spigots or other outlets. The outlet nearest the wellhead was typically used as the monitoring and collection point. A Y-tube formed of garden hose was fitted to the outlet. The Y-tube had a plastic pitcher fitted on one branch to accommodate the water quality meter probe, and the other branch of the Y-tube was left open to be used for sampling. The meter probe was inserted into the pitcher and the well's pump was turned on to initiate the purging process. Every five minutes conductivity, pH, dissolved oxygen, and temperature readings were taken and recorded. Monitoring continued until these parameters stabilized, which typically occurred after 15 to 20 minutes of continuous purging. The final recorded readings of pH, conductivity, dissolved oxygen, and temperature are reported in Table A-1. For springs and for wells with plumbing that would not allow the attachment of the Y-tube, the water quality meter's calibration cup was used to draw aliquots for monitoring.

Once the field parameters stabilized, a metals sample was collected in a plastic 500 milliliter bottle containing a nitric acid preservative; a nitrate/nitrite and phosphorus sample was collected in a plastic 125 milliliter bottle containing a sulfuric acid preservative; and a chloride and sulfate sample was collected in a half-gallon (approx. 2 liter) plastic jug. VOC samples were collected in a triplet of septum vials containing a hydrochloric acid preservative.

When sampling was completed, the sample bottles, except for the half-gallon jug, were placed in doubled plastic bags. The bagged samples and the jug were then placed in ice water in a cooler. A trip blank, a septum vial containing clean water and a hydrochloric acid preservative prepared by EPD laboratory personnel, accompanied the VOC samples during transport.

Six wells underwent follow-up sampling. Two other wells, 47.0 SPH-1 and 27.1 Jak-1, were hub stations that underwent resampling after time lapses of 21 months and 31 months respectively to determine if changes of water quality had occurred. Lead in excess of the action level in the first sample from well 53.3 TUR-1, a domestic drinking water well, caused it to be resampled. Domestic drinking water wells 18.4 FAY-1, 20.1

FRK-1, 22.3 GRN-1, and 42.9 OGL-1 underwent resampling because of uranium in excess of the Primary MCL. Well 42.9 OGL-1 underwent a third testing because of variability in the uranium content of the water.

Comparative water-versus-background radiation measurements were made at 46 stations. A five-gallon plastic bucket was filled with sample water and the scintillation counter held over it to obtain a counts-per-second measurement of radiation involving water. Then, a second background measurement was made five or six feet away from the bucket. Both measurements were recorded and compared to see if the water were more radioactive than the background.

3.2 LABORATORY METHODS

Laboratory measurements of the concentrations of VOCs, chloride, nitrate/nitrite, total phosphorus, and metals took place at the EPD laboratory. The USEPA has approved and assigned identification numbers to various testing procedures, termed EPA methods, used in environmental venues. The EPD lab used the methods given in the table below.

Table 3-1. Analytical Methods

Analyte	EPA Method	Method Type
Metals (1)	200.7	ICP
Metals (2)	200.8	ICP/MS
Chloride and Sulfate	300.0	Ion Chromatography
Nitrate/Nitrite	353.2	Colorimetric
Total Phosphorus	365.1	Colorimetric
VOCs	524.2	GC/MS

The reporting limit is the lowest concentration of a substance that can be accurately measured. These limits are given in Table A-2 in the Appendix. The typical reporting limit for nitrate/nitrite is 0.02 parts per million (ppm) as nitrogen, and for sulfate the typical reporting limit is 10 ppm. During the current project, the high concentrations of these substances in some samples caused the reporting limits to be raised. Parts per million and parts per billion are equivalent, respectively, to milligrams per liter and micrograms per liter.

The ICP (inductively coupled plasma spectrometry) method is generally the better method for analyzing major metals and abundant minor metals: calcium, magnesium, sodium, iron, manganese, titanium, and, to a degree, potassium. The values reported in Table A-1 Part B for calcium, cobalt, iron, potassium, magnesium, manganese, sodium, titanium, and vanadium were derived from ICP analysis. The method involves ionizing analytes in plasma, then finding and measuring the intensity of their characteristic light spectra.

The ICP method is subject to interferences when used for analyzing some trace metals. These interferences can result in spuriously high reported concentrations for some metals. During this study, ICP analyses for zinc proved to be particularly vulnerable to interference. As a result, the values reported for chromium, nickel, copper, zinc, arsenic selenium, molybdenum, silver, cadmium, tin, antimony, barium, thallium, lead, and uranium were derived from ICP/MS (inductively-coupled plasma mass spectrometry) analysis. The ICP/MS method provides results for trace metals that are more accurate than those derived from the ICP method. The method involves ionizing analytes in plasma, then sorting them magnetically according to mass-to-electrical charge ratio.

Chloride and sulfate were analyzed using ion chromatography, which depends on the affinity of the analyte for an ion-exchange medium. Nitrate/nitrite and total phosphorus were analyzed using colorimetric techniques. These methods involve converting the analyte to a strongly colored substance, which can then be compared with a color standard. VOCs were analyzed with the GC/MS (gas chromatography mass spectrometry) technique.

CHAPTER 4 RESULTS

4.1 INTRODUCTION

Three hundred and seventeen samples from 310 stations underwent testing at the EPD laboratory. These same sample waters also underwent field parameter measurement. Nine of the samples were collected from eight stations drawing water from Coastal Plain aquifers. Three hundred and eight of the samples were taken from 302 stations drawing from the Piedmont/Blue Ridge aquifer system. Of these 302 stations, 197 stations yielding 202 samples were identified as drawing from the Piedmont/Blue Ridge fractured bedrock aquifer. Sixty-nine stations yielding 69 samples were identified as drawing from the Piedmont/Blue Ridge regolith aquifer. The source aquifers for 36 stations in the Piedmont/Blue Ridge remain unidentified. Sections dealing with stations in the Coastal Plain, the Piedmont/Blue Ridge, the bedrock aquifer, and the regolith aquifer follow. The section discussing the Piedmont/Blue Ridge addresses the 36 unidentified stations.

Eight stations were sampled more than once. The initial samples at stations 47.1_Sph-1 and 27.1_Jak-1 were taken for a previous study (Donahue and Kibler, 2007) and are not included in the sample total for the current study. Section 4.6 discusses the multiply-sampled stations in more detail.

4.2 COASTAL PLAIN AQUIFERS

The eight Coastal Plain stations draw water from the Floridan aquifer and gave nine samples with basic pHs (range 7.19 – 7.85). Conductivities for the nine Coastal Plain samples ranged from 166 – 234 uS/cm and were range-wise consistent with those of waters from elsewhere in the Floridan and from other carbonate aquifers in the State. The pHs (7.62 – 7.91) and conductivities (192 – 234 uS/cm) of the Mitchell County samples were generally higher than those of the Turner County samples (pHs 7.19 – 7.42 and conductivities 166 – 180 uS/cm).

All the Coastal Plain samples underwent testing for chloride, sulfate, nitrate/nitrite, total phosphorus, and selected VOCs (Table A-1 in Appendix). The sample waters also underwent field measurements for dissolved oxygen.

Neither chloride nor sulfate was detected in any of the Coastal Plain samples. Only the sample from station 53.2_TUR-1 in Turner County contained detectable nitrate/nitrite, at a concentration of 0.02 mg/L as nitrogen. Phosphorus was detected in all samples except for one in Mitchell County and for the follow-up sample from station 53.3_TUR-1 in Turner County. Phosphorus concentrations were generally higher in the Turner County samples than in their Mitchell County counterparts.

Field testing for dissolved oxygen found concentrations from 0.79 mg/L to 4.71 mg/L. The oxygen contents of the Mitchell County sample waters were generally higher than those of the Turner County waters.

No volatile organic compounds (VOCs) were detected in any of the Coastal Plain samples.

The EPD laboratory testing detected the following metals: sodium, calcium, magnesium, barium, iron, manganese, chromium, copper, zinc, lead, and uranium. Sodium, calcium, magnesium, and barium were detected in all the Coastal Plain samples. Sodium, magnesium, uranium, and chromium are higher in the samples from Mitchell County. Turner County samples are generally higher in calcium, iron, manganese, and zinc. Iron exceeded the Secondary MCL (300 ug/L) in one sample and manganese exceeded the Secondary MCL (50 ug/L) in two samples, all from Turner County.

4.3 PIEDMONT/BLUE RIDGE AQUIFER SYSTEM

Conductivity and pH measurements were made for 308 samples from all 302 stations producing from the Piedmont/Blue Ridge aquifer system. The pHs of the sample waters ranged from 3.98 to 9.04. Forty-three measurements taken at 41 stations were basic, one measurement at one station was neutral, and 264 measurements at 260 stations were acidic. Conductivities ranged from 10 uS/cm to 562 uS/cm.

Data for chloride, sulfate, and total phosphorus are available for all 308 samples from Piedmont/Blue Ridge stations. Due to the failure of the nitrate/nitrite test on the sample from station 16.2_ELB-1, nitrate/nitrite data are available for only 307 samples from just 301 Piedmont/Blue Ridge stations. All 308 samples were also analyzed for selected VOCs. Two hundred and eleven dissolved oxygen measurements are available for sample waters taken from 207 of the 302 stations.

Chloride was detected in 34 samples from 33 stations, with a range up to 170 mg/L. Forty-seven samples from 44 stations contained detectable sulfate, with concentrations ranging up to 240 mg/L. Nitrate/nitrite was detected in 267 samples from 262 stations, with concentrations ranging up to 16.0 mg/L as nitrogen. Phosphorus was detected in 249 samples from 244 stations. Levels ranged up to 0.54 mg/L. Two hundred and five stations out of the 207 tested gave sample waters with detectable dissolved oxygen, with a range up to 11.14 mg/L. Sulfate and chloride each have a Secondary MCL of 250 mg/L.

Analyses for VOCs in all 308 samples found these compounds appearing in 24 samples from 24 stations. The trihalomethanes, comprising bromodichloromethane, and dibromochloromethane, and chloroform, were the most common, occurring in 15 samples from 15 stations. The maximum total trihalomethane concentration was 41.9 ug/L. MTBE, with a maximum concentration of 2.2 ug/L, was next most common, occurring in five samples from five stations. Chlorinated hydrocarbons, which consisted of chloromethane (two samples) and PCE (one sample), were present in three samples from three stations. One sample from one station contained the BTEX compound, toluene.

Samples from four stations exceeded the Primary MCL of 10 mg/L as nitrogen. Neither chloride, nor sulfate, nor VOCs occurred in any samples in excess of applicable MCLs. Under the Primary MCL established for the trihalomethanes, the sum of the concentrations of all trihalomethane compounds may not exceed 80 ug/L. Toluene has a Primary MCL of 1,000 ug/L, and, PCE has a Primary MCL of 5 ug/L. No MCLs are established for chloromethane or MTBE.

All 308 samples from 302 stations drawing from the Piedmont/Blue Ridge aquifer system underwent testing for potassium, sodium, calcium, magnesium, barium, iron, manganese, nickel, chromium, aluminum, titanium, copper, zinc, lead, arsenic, uranium, molybdenum, and vanadium.

Detectable potassium occurred in nine samples from nine stations and ranged in concentration up to 12,000 ug/L. Detectable sodium occurred in 304 out of 308 samples from 298 out of 302 stations. Concentrations ranged from not detected to 76,000 ug/L.

Calcium occurred in 304 samples from 298 stations. Levels of the metal ranged from undetected to 170,000 ug/L. Two hundred and forty-three samples from 237 stations contained detectable magnesium, with a range up to 23,000 ug/L. Barium, detected in 289 samples from 205 stations, ranged up to 440 ug/L. Barium has a Primary MCL of 2,000 ug/L.

One hundred and seventy samples from 174 stations contained detectable iron. The metal, with a Secondary MCL of 300 ug/L, ranged in concentration from undetected to 60,000 ug/L. Manganese, with a Secondary MCL of 50 ug/L, was found in 100 samples from 98 stations and ranged up to 730 ug/L. Two samples from two stations contained detectable nickel, at levels of 13 ug/L and 31 ug/L. Twenty-four samples from 24 stations contained chromium, with a range up to 45 ug/L. Nickel and chromium each have Primary MCLs of 100 ug/L.

Copper was detected in 147 samples from 146 stations, with a concentration range up to 510 ug/L. Zinc was detected in 144 samples from 141 stations and ranged up to 2,100 ug/L. Detectable lead occurred in 97 samples from 96 stations and ranged up to 8.9 ug/L. Arsenic was detected in one sample at a level of 7.5 ug/L. The action levels established for copper and lead are 1,300 ug/L and 15 ug/L, respectively, and, a Secondary MCL of 5,000 ug/L applies to zinc. A Primary MCL of 10 ug/L applies to arsenic.

Uranium was found in 71 samples from 66 stations and ranged in concentration up to 200 mg/L. Molybdenum was detected in eight samples from eight stations. Concentrations ranged from undetected to 46 ug/L. Seven samples from seven stations contained detectable vanadium, with concentrations ranging up to 18 ug/L.

Molybdenum and vanadium are not subject to any MCLs. A Primary MCL of 30 ug/L applies to uranium.

Detectable titanium occurred in 13 samples from 13 stations, with a concentration range up to 120 ug/L. Aluminum was detected in 58 samples from 58 stations, with a high concentration of 2,800 ug/L. A Secondary MCL range of 50 ug/L to 200 ug/L applies to aluminum, with the specific limit for a water system depending on the capabilities of the treatment regimen for removing the metal. Concentrations of all 58 samples exceeded the lower end of the Secondary MCL range.

Forty-four samples from 43 stations exceeded the Secondary MCL for iron, and thirty-three samples from 32 stations exceeded the Secondary MCL for manganese. The uranium contents of ten samples from seven stations exceeded the Primary MCL. No other metals except aluminum exceeded any MCLs or action levels.

4.4 PIEDMONT/BLUE RIDGE BEDROCK AQUIFER

Conductivity and pH measurements are available for all 202 samples from the 197 known bedrock stations out of the 302 stations in the Piedmont/Blue Ridge Province. The pH and conductivity ranges of the sample waters were the same as those for the Piedmont/Blue Ridge aquifer system overall. One hundred and sixty-two sample waters from 159 stations were acidic; 39 sample waters from 37 stations were basic; one sample from one station was neutral.

Data for chloride, sulfate, and total phosphorus are available for all 202 bedrock aquifer samples. As mentioned previously, a test failure on the sample from station 16.2_ELB-1 limited nitrate/nitrite data to 201 samples from 196 bedrock stations. One hundred and forty-three dissolved oxygen measurements are available for sample waters taken from 140 stations. All 202 samples were also analyzed for selected VOCs.

Detectable chloride occurred in 21 samples from 20 stations, with a maximum of 170 mg/L. Sulfate was detected in 36 samples from 34 stations, and ranged up to 240 mg/L. Nitrate/nitrite was found in 166 samples from 161 stations, with a maximum of 16 mg/L as N. Detectable phosphorus occurred in 172 samples from 168 stations and ranged up to 0.54 mg/L. One hundred and forty-one samples from 138 stations contained detectable dissolved oxygen, with the maximum at 9.84 mg/L.

All 202 samples underwent testing for selected VOCs, with nine samples from nine stations containing detectable amounts of various of these compounds. Trihalomethanes (chloroform, dibromochloromethane, and bromodichloromethane, in various combinations) were the most common, occurring in six samples from six stations. MTBE occurred in two samples from two stations and was the second most common. Chloromethane, the least common, occurred in one sample from one station.

Nitrate/nitrite exceeded the Primary MCL of 10 ug/L in four samples from four stations. Chloride and sulfate each have Secondary MCLs of 250 mg/L, and no samples contained these anions in excess of these levels. Concentrations of trihalomethanes remained below the Primary MCL of 80 ug/L for total trihalomethanes. No MCLs apply to MTBE or chloromethane.

All 202 samples from 197 stations drawing from the Piedmont/Blue Ridge bedrock aquifer underwent testing for potassium, sodium, calcium, magnesium, barium, iron, manganese, nickel, chromium, aluminum, titanium, copper, zinc, lead, arsenic, uranium, molybdenum, and vanadium.

Detectable potassium occurred in six samples from six stations, with concentrations ranging up to 7,800 ug/L. Detectable sodium occurred in all 202 samples from 197 stations. Concentrations ranged from 1,100 to 43,000 ug/L.

Detectable calcium occurred in 200 samples from 195 stations and ranged up to 170,000 ug/L. One hundred and seventy-two samples from 167 stations contained detectable magnesium, with levels ranging up to 23,000 ug/L. Barium, detected in 187 samples from 184 stations, ranged in concentration up to 440 ug/L. A Primary MCL of 2,000 ug/L applies to barium.

Two samples from two stations contained detectable nickel, at levels of 13 ug/L and 31 ug/L. Sixteen samples from 16 stations contained chromium, with a range up to 45 ug/L. One hundred and fourteen samples from 112 stations contained detectable iron. The metal ranged in concentration from undetected to 60,000 ug/L. Manganese was found in 68 samples from 67 stations, with a maximum level of 390 ug/L. Nickel and chromium each have Primary MCLs of 100 ug/L. A Secondary MCL of 300 ug/L applies to iron, and, a Secondary MCL of 50 ug/L applies to manganese.

Copper was detected in 77 samples from 76 stations, with levels ranging up to 170 ug/L. Zinc was detected in 89 samples from 87 stations and ranged up to 2,100 ug/L. Detectable lead occurred in 43 samples from 41 stations, with a maximum of 8.9 ug/L. Arsenic was detected in one sample at a level of 7.5 ug/L. The action levels established for copper and lead are 1,300 ug/L and 15 ug/L, respectively, and, a Secondary MCL of 5,000 ug/L applies to zinc. A Primary MCL of 10 ug/L applies to arsenic.

Uranium was found in 65 samples from 60 stations, with a maximum concentration of 200 mg/L. A Primary MCL of 30 ug/L applies to uranium. Molybdenum was detected in eight samples from eight stations. Concentrations of the metal ranged up to 46 ug/L. Five samples from five stations contained detectable vanadium, with concentrations ranging up to 12 ug/L. Molybdenum and vanadium are not subject to any MCLs.

Detectable titanium occurred in 6 samples from 6 stations, with concentrations ranging up to 120 ug/L. Aluminum was detected in 24 samples from 24 stations, with a concentration range up to 1,300 ug/L. A Secondary MCL range of 50 ug/L to 200 ug/L applies to aluminum, with the specific limit for a water system depending on the capabilities of the treatment regimen for removing aluminum. All samples with detectable aluminum exceeded the lower limit of the MCL range.

Thirty samples from 30 stations exceeded the Secondary MCL for iron. Twenty-four samples from 24 stations exceeded the Secondary MCL for manganese. Uranium exceeded its Primary MCL of 30 ug/L in 10 samples from seven stations. Aluminum exceeded its Secondary MCL in all 24 samples in which it was detected. No other metals exceeded any MCLs or action levels.

4.5 PIEDMONT/BLUE RIDGE REGOLITH AQUIFER

Sixty-nine pH measurements were taken of sample waters at 69 stations identified as producing from the Piedmont/Blue Ridge regolith aquifer. The pHs of the sample waters ranged from 4.56 to 7.48. Measurements on two samples were basic and the remaining 67 were acidic. Conductivities for the bedrock stations ranged from 16 uS/cm to 367 uS/cm.

All 69 regolith aquifer samples underwent testing for chloride, sulfate, nitrate/nitrite, and total phosphorus. The water drawn for each sample also underwent a field measurement for dissolved oxygen. Chloride was present at detectable levels in six samples from six stations and ranged in concentration up to 46 mg/L. Two samples contained detectable sulfate, one at 17 mg/L and the other at 13 mg/L. Nitrate/nitrate was detected in 67 samples and ranged in concentration up to 6.20 mg/L as nitrogen. Fifty samples contained detectable phosphorus. The concentration of this element ranged up to 0.69 mg/L. Forty dissolved oxygen measurements were made on sample waters from 40 stations. Concentrations ranged from 0.68 mg/L to 10.42 mg/L.

VOCs were found in 11 regolith aquifer samples. The trihalomethanes (in this case, some combination or other of chloroform, bromodichloro-methane, and dibromochloromethane) were the most common and were detected in eight samples, with total trihalomethane contents ranging up to 41.9 ug/L. Methyl tert-butyl ether (MTBE) was found in two samples, at levels of 2.0 ug/L and 0.51 ug/L. Other chlorinated hydrocarbons consisted of perchloroethylene (one station, 0.79 ug/L) and chloromethane (a different station, 2.0 ug/L). Toluene was detected at one station at a level of 1.1 ug/L.

Secondary MCLs for chloride and sulfate are each set at 250 mg/L. The Primary MCL for nitrate/nitrite is set at 10 mg/L as nitrogen. None of these substances exceeded their MCLs in any of the samples. The total of concentrations of all trihalomethanes must not exceed the Primary MCL of 80 ug/L and total trihalomethane contents fell below that level. A Primary MCL of 5 ug/L applies to perchloroethylene, and, a Primary MCL of 1,000 ug/L applies to toluene. Neither of these compounds exceeded their Primary MCLs. No MCLs are established for chloromethane and MTBE.

All samples from the regolith aquifer underwent testing for potassium, sodium, calcium, magnesium, barium, iron, manganese, nickel, chromium, aluminum, titanium, copper, zinc, lead, arsenic, uranium, molybdenum, and vanadium.

Two samples contained detectable potassium, one at 6,100 ug/L, the other at 6,500 ug/L. Detectable sodium was present in 66 samples, with a maximum concentration of 18,000 ug/L. All 69 regolith samples contained detectable calcium, with concentrations ranging from 1,700 ug/L to 130,000 ug/L. Forty-two stations gave samples with detectable magnesium, with concentrations ranging up to 11,000 ug/L. Barium was detected in all regolith samples and ranged in concentration from 8.1 ug/L to 330 ug/L.

Forty samples from 40 stations contained detectable iron. The metal ranged in concentration up to 1,300 ug/L. Manganese was found in 21 samples, with a maximum concentration of 730 ug/L. No nickel was detected in any of the regolith samples. Five samples from five stations contained chromium, with a range up to 15 ug/L.

Copper was detected in 52 samples, with concentrations ranging from undetected to 180 ug/L. Zinc was detected in 31 samples and ranged from undetected to 250 ug/L. Detectable lead occurred in 35 samples and ranged in concentration from undetected to 6.1 ug/L. No arsenic was detected in any of the regolith samples.

Neither molybdenum nor vanadium were detected in any of the regolith samples. Uranium was detected in three of the regolith samples and ranged up to 8.1 ug/L.

Titanium was detected in six regolith aquifer samples with a maximum level of 46 ug/L. Aluminum was detected in 28 samples and ranged up to a level of 2,800 ug/L.

Primary MCLs apply to barium (2,000ug/L), nickel (100 ug/L), chromium (100 ug/L), arsenic (10 ug/L), and uranium (30 ug/L). None of the samples contained these five metals in excess of their respective Primary MCLs. Secondary MCLs apply to iron (300 ug/L), manganese (50 ug/L), and zinc (5,000 ug/L). Iron in nine samples and manganese in five samples exceeded those levels. No samples contained zinc in excess of the Secondary MCL. A Secondary MCL range of 50 to 200 ug/L applies to aluminum, and, all 28 samples containing detectable aluminum exceeded the lower end of the range. The action levels set for copper and lead are 1,300 ug/L and 15 ug/L, respectively. Neither metal exceeded those levels.

4.6 MULTIPLE SAMPLES

Nine follow-up samples were collected from eight stations for this study. Stations 27.0_Jak-1 and 47.0_Sph-1 have already been mentioned in the Chapter 4 Introduction and were sampled after lapses of 31 and 33 months, respectively. Station 2.8_BAL-1 received sampling both upstream and downstream of a water softener. Station 53.3_TUR-1 saw follow-up sampling due to excessive lead in the original sample. The remaining four stations, 18.4_FAY-1, 20.1_Frk-1, 22.3_Grn-2, and 42.9_OGL-1, received follow-up sampling because they supplied domestic drinking water and gave initial samples with excessive uranium. Table 4-1 shows the "before-after" analysis results for these stations.

Station 47.1_Sph-1, a Piedmont/Blue Ridge bedrock station, received its initial sampling in March of 2006 (results appear in Table 4-1 but are not counted among the totals for this study) and its second sampling in December of 2008 (counted in the current study totals). Some detected parameters showed little or no change: pH, conductivity, dissolved oxygen, chloride, nitrate/nitrite, lead, and magnesium. Some showed considerable increases: calcium, sodium, iron, uranium, and phosphorus. Some appeared to decrease substantially: copper, zinc, barium, and aluminum.

Likewise, bedrock station 27.1_JAK-1 received its initial sampling in July 2006 (Table 4-1) and its second sampling in May 2009.

For station 2.8_BAL-1, a Piedmont/Blue Ridge station with bedrock or regolith status undetermined, the effect of the water softener was dramatic. The sodium concentration increased nearly seven times. The levels of many metals were driven below detection: calcium, magnesium, potassium, barium, manganese, and lead. The iron level decreased by over 90 percent. Zinc and sulfate levels appeared unaffected. Well 53.3_TUR-1 in Turner County underwent follow-up sampling because of the 35 ug/L lead concentration in the initial sample. The level exceeded the public water system action level for lead. Since the owner commented that the spigot furnishing the original sample at this station saw little use, the follow-up sample was drawn from a more frequently used spigot. In the second sample, the sodium content of the original sample was similar to that of the follow-up sample. The contents of iron, manganese, copper, and lead fell below detection in follow-up sample, and, the contents of zinc and barium declined dramatically.

Of the stations receiving follow-up sampling because of excessive uranium, 18.4_FAY-1, 20.1_Frk-1, and 22.3_Grn-2 each received one follow-up sample. Station 42.9_OGL-1 received a second follow-up sample due to the drastic difference in the uranium contents between the initial sample and the first follow-up sample. The parameter values for the uranium follow-up samples do not necessarily closely approximate the parameter values of the initial samples. For station 42.9_OGL-1, the disparity between the initial sample and the follow-up samples seems to be pronounced. The initial sample had a higher conductivity, was richer in sulfate and metals, and poorer in nitrate/nitrite and phosphorus than the follow-up samples.

Table 4-1. Comparison of Chemical Water Quality: Initial Samples Versus Follow-up Samples.

Station Number	47.0_Sph-1 3/2006	47.1_Sph-1 12/2008	27.0_Jak-1 7/2006	27.1_Jak-1 5/2009	2.8_BAL-1 soft	2.8_BAL-1 raw	53.3_TUR-1 low-use spigot	53.3_TUR-1 high-use spigot	18.4_FAY-1 (U)	18.4_FAY-1 (U)	20.1_Frk-1 (U)	20.1_Frk-1 (U)	22.3_Grn-2 (U)	22.3_Grn-2 (U)	42.9_OGL-1 (U)	42.9_OGL-1 (U)	42.9_OGL-1 (U)
Para-meter																	
pH	4.80	4.82	7.26	6.63	6.45	5.93	7.30	7.36	6.01	5.84	6.44	6.78	6.32	6.60	7.28	7.37	7.19
Conduct. uS/cm	137	133	133	116	285	299	166	166	150	149	93	101	229	209	221	136	147
dO_2 mg/L	8.90	8.12	0.45	5.44	0.78	0.99	1.22	1.70	4.22	4.28	NA	NA	4.10	4.84	0.04	0.29	NA
Temp. ^{o}C	15.9	15.6	17.0	17.2	19.5	19.0	21.5	21.0	18.0	18.0	17.7	17.4	17.6	18.4	18.1	18.3	18.3
VOCs ug/L	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cl^- mg/L	20	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	16	ND	ND	ND
SO_4^{-2} mg/L	ND	ND	ND	11	11	10	ND	ND	ND	ND	ND	ND	ND	ND	68	14	11
NOx mg N/L	16	16	9.00	0.62	ND	ND	ND	ND	0.29	0.32	0.16	0.10	6.90	4.70	0.02	0.07	0.07
P mg/L	ND	0.05	ND	0.02	0.08	0.06	0.07	ND	0.28	0.08	0.04	ND	ND	0.08	ND	0.03	0.10
Cr ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ni ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cu ug/L	69	29	ND	ND	ND	ND	7.7	ND	50	36	ND	ND	9.5	ND	ND	ND	ND
Zn ug/L	22	16	ND	ND	12	12	190	35	ND	ND	ND	ND	23	ND	88	40	44
As ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mo ug/L	ND	ND	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	ND	ND	ND	ND
Ba ug/L	590	440	6.2	17	ND	15	140	84	17	16	12	17	11	10	ND	ND	ND
Pb ug/L	2.7	2.2	ND	ND	ND	2.4	35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
U ug/L	1.1	3.0	15	7.1	ND	ND	ND	ND	33	23	70	46	200	170	100	22	63
Al ug/L	220	65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ca mg/L	15	18	24	11	ND	27	33	30	17	18	16	18	22	21	51	31	27
Fe ug/L	58	99	ND	ND	52	560	740	ND	ND	ND	100	ND	30	ND	320	140	110
K mg/L	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND	ND
Mg mg/L	7.3	7.3	8	4	ND	12	2.3	2.2	4.1	4.9	3.7	4.4	4.8	4.6	3.1	2.2	2.8
Mn ug/L	350	210	ND	ND	ND	160	17	ND	ND	ND	21	24	ND	ND	26	ND	ND
Na mg/L	5.6	8.1	11	7	76	11	2.1	2.0	9.9	12	7.4	9.2	16	17	14	11	10
Ti ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
V ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

Conduct.	= Conductivity	mg/L	= Milligrams per liter
uS/cm	= Microsiemens per centimeter	mg N/L	= Milligrams per liter as nitrogen
dO_2	= Dissolved oxyger	ug/L	= Micrograms per liter
Temp.	= Temperature	^{o}C	= Degrees Celsius

CHAPTER 5 DISCUSSION AND SUMMARY

5.1 COMPARISON OF COASTAL PLAIN SAMPLE WATERS TO PIEDMONT/BLUE RIDGE SAMPLE WATERS

The number of stations and samples from the Coastal Plain Province is much smaller than the number of those in the Piedmont/Blue Ridge Province. As the Coastal Plain sample waters in this study derive, or probably derive, from the Floridan aquifer, which is developed in carbonate rocks, the pHs of the sample waters were basic and of a relatively narrow range. The conductivity range of the Coastal Plain sample waters was relatively narrow, extending from 166 to 234 uS/cm, narrower than that of either the bedrock aquifer (10 – 562 uS/cm) or the regolith aquifer (16 – 367 uS/cm). The Mitchell County samples registered higher pHs and conductivities than the Turner County samples. This condition may reflect some compositional differences between the aquifer media in the two areas.

In contrast to the case for the Coastal Plain stations, the pHs of sample waters from both aquifers of the Piedmont/Blue Ridge Province are predominantly acidic (about 85% of the samples for the bedrock aquifer and about 97% for the regolith aquifer). The pHs and conductivities of sample waters from stations drawing from both Piedmont/Blue Ridge aquifers show a greater range than those of samples from the Coastal Plain (Floridan) stations, reflecting greater heterogeneity of the Piedmont/Blue Ridge aquifer media.

The Coastal Plain samples contained no detectable chloride or sulfate. Only one station contained detectable nitrate/nitrite. As for the Piedmont/Blue Ridge samples, 11 percent contained detectable chloride, 15 percent contained detectable sulfate, and 87 percent contained detectable nitrate/nitrite.

Similar percentages of samples contained detectable dissolved oxygen (100 percent for Coastal Plain samples versus 99 percent of Piedmont/Blue Ridge samples) and phosphorus (77 percent for Coastal Plain samples versus 81 percent for Piedmont/Blue Ridge samples). However, the ranges for the two elements were greater in the Piedmont/Blue Ridge samples than for the Coastal Plain samples. Samples from Mitchell County (Coastal Plain) showed lower phosphorus and higher dissolved oxygen contents than those from Turner County.

None of the Coastal Plain samples contained detectable aluminum, arsenic, molybdenum, nickel, potassium, titanium, or vanadium. Fifty-eight Piedmont/Blue Ridge samples, about 19 percent of the total, contained detectable aluminum. The remaining elements were found in detectable amounts in a few of the Piedmont/Blue Ridge samples. Titanium was the most widely occurring of these, being found in 13 samples. Arsenic was the least common, being found in one sample. Naturally-occurring titanium compounds are insoluble in water. Thus, if the element is detected in a sample, it is present in the form of suspended fine particles. The small number of potassium detections is due to the low sensitivity of the testing method, since the natural abundance of the element would lead one to expect more detections.

All of the Coastal Plain samples contained detectable sodium, calcium, magnesium, barium, and zinc. Sodium and magnesium are more abundant in the Mitchell County samples, while calcium and zinc are more abundant in the Turner County samples. Ninety-nine percent of the Piedmont/Blue Ridge samples contained detectable sodium and calcium. Ninety-four percent contained detectable barium, and, 79 percent contained detectable magnesium. Only 47 percent of the Piedmont/Blue Ridge samples contained zinc. The concentration ranges of these metals in the Piedmont/Blue Ridge samples are wider than in the Coastal Plain samples and the maximum concentrations are higher.

Some of the Coastal Plain samples contained detectable iron, manganese, chromium, copper, lead, and uranium. Two-thirds of the samples contained detectable iron, and, one-third contained detectable lead or manganese. Most of the manganese detections occurred in the Turner County samples. Similar numbers of Piedmont/Blue Ridge samples contained detectable amounts of these metals, although the concentration ranges were broader and maximum concentrations higher.

About 11 percent (one sample in nine) of the Coastal Plain samples contained detectable copper, about 22 percent contained detectable chromium, and about 44 percent contained detectable uranium. Most of the uranium detections occurred in the Mitchell County samples. Detectable copper occurred in about 48 percent of the Piedmont/Blue Ridge samples, detectable chromium in only about seven percent, and detectable uranium in about 23 percent. Again, the concentration ranges in the Piedmont/Blue Ridge samples were wider and the maximum concentrations higher.

In summary, the sample waters from the Coastal Plain were basic in pH, while most of those from the Piedmont/Blue Ridge were acidic. Sample waters of the Coastal Plain also had narrower ranges of pH, conductivity, and analyte concentrations than those of the Piedmont/Blue Ridge. While some differences in pH, conductivity, and chemical composition existed between the Coastal Plain samples from Mitchell County and those from Turner County, the Coastal Plain sample waters were chemically more homogeneous than those of the Piedmont/Blue Ridge.

5.2 COMPARISON OF REGOLITH AQUIFER SAMPLE WATERS TO BEDROCK AQUIFER SAMPLE WATERS

Conductivity and pH measurements are available for all 202 bedrock aquifer samples and for all 69 regolith samples. About 20 percent of the bedrock aquifer samples were neutral or basic versus about three percent of the regolith aquifer samples. Conductivities of the bedrock samples were generally higher than those of the regolith samples. The pH and conductivity ranges of the bedrock samples were also wider, with lower minima and higher maxima than those of the regolith samples.

Chloride was detectable in about 10 percent of the bedrock samples and in about nine percent of the regolith samples, with the maximum concentration higher in the bedrock samples. Sulfate (detected in 18 percent of bedrock samples versus four percent of regolith samples) and phosphorus (detected in 85 percent of bedrock samples versus 74 percent of regolith samples) were more abundant in the bedrock samples. The concentration range of sulfate was greater in the bedrock samples, but, the concentration range of phosphorus was greater in the regolith samples. Nitrate/nitrite was more abundant in regolith samples (detected in 99 percent) than in bedrock samples (82 percent). More regolith samples (19 percent) contained VOCs than did bedrock samples (four percent). Trihalomethanes, artifacts of disinfection, were the most common VOC contaminants, occurring in about three percent of the bedrock samples and in about 12 percent of the regolith samples. MTBE was the next most common, detected in one percent of the bedrock samples and about three percent of the regolith samples.

Detectable sodium occurred in 100 percent of the bedrock samples and in about 97 percent of the regolith samples. Calcium was detected in 99 percent of the bedrock samples and in 100 percent of the regolith samples. Magnesium was detected in about 85 percent of the bedrock samples and in about 62 percent of the regolith samples. Barium was detected in about 93 percent of the bedrock samples and in 100 percent of the regolith samples. Detectable potassium occurred in about three percent of both the bedrock and the regolith samples. The scarcity of potassium detections relative to detections of the other four metals reflects the insensitivity of the test method used to analyze potassium. The maximum levels for all five of these metals were higher in the bedrock samples than in the regolith samples.

Some of the bedrock and regolith samples contained detectable iron, manganese, chromium, aluminum, and titanium. About 56 percent of the bedrock samples and about 58 percent of the regolith samples contained detectable iron. The maximum iron level among the bedrock samples far exceeded the maximum among the regolith samples. About 30 percent of both the bedrock samples and the regolith samples contained detectable manganese, with the maximum level in the regolith samples exceeding the maximum in the bedrock samples. About eight percent of the bedrock samples and about seven percent of the regolith samples contained detectable chromium. The maximum chromium level in the bedrock samples exceeded that in the regolith samples. Detectable aluminum occurred in about 12 percent of the bedrock samples and in about 41 percent of the regolith samples. The maximum aluminum level in the regolith samples exceeded that in the bedrock samples. Titanium was detected in about three percent of the bedrock samples and in about nine percent of the regolith samples. The maximum level in the bedrock samples exceeded that in the regolith samples.

Detectable copper, lead, zinc, and nickel were found both in bedrock samples and in regolith samples. Arsenic was detected in one bedrock sample and nickel in two bedrock samples. Levels of both elements fell below their Primary MCLs. None of the regolith samples contained detectable arsenic or nickel. Copper was detected in about 38 percent of the bedrock samples and in about 75 percent of the regolith samples. The maximum content of the metal in the bedrock samples fell a little below that in the regolith samples.

Analyses found detectable zinc in about 44 percent of the bedrock samples and about 45 percent of the regolith samples. The maximum level in the bedrock samples exceeded that in the regolith samples. Detectable lead occurred in 21 percent of the bedrock samples and in 52 percent of the regolith samples. The maximum value occurred in the bedrock samples. As indicated by the samples from station 53.3_TUR-1, the metals copper, lead, zinc, iron, and manganese can be leached from plumbing.

Uranium was detected in about 32 percent of the bedrock samples and in about four percent of the regolith samples. The highest uranium concentration occurred in a bedrock sample. Detectable molybdenum (about four percent of the samples) and vanadium (about three percent of the samples) occurred in the bedrock samples. No regolith samples contained detectable molybdenum or vanadium.

In summary, the bedrock sample waters, though predominantly acidic in pH, have, in general, higher pHs than their regolith counterparts. The pH range among the bedrock sample waters is also broader. Bedrock sample waters also generally have higher conductivities with broader range.

Bedrock sample waters are generally richer in magnesium, uranium, chromium, molybdenum, vanadium, arsenic, nickel, sulfate, and phosphorus. Regolith sample waters are richer in dissolved oxygen, nitrate/nitrite, aluminum, titanium, barium, lead, and copper. Also, regolith sample waters contain more widespread contamination by VOCs, with generally larger concentrations and a greater variety of compounds.

5.3 URANIUM AND AQUIFER MEDIUM LITHOLOGY

For the Coastal Plain ground waters sampled for this study, the aquifer medium yielding uraniferous ground water consists of carbonate rocks.

The clay-rich Piedmont/Blue Ridge regolith aquifer yielded only three out of 69 samples containing detectable uranium, indicating its ground waters to be far less uraniferous than those of the bedrock aquifer.

The Piedmont/Blue Ridge bedrock aquifer, giving 65 out of 202 samples with detectable uranium, encompasses a number of different rock types. The State Geologic map complied by Lawton et al. (1976) divided the bedrock into a number of regionally mappable lithologic assemblages. Dicken et al. (2007) developed a digitized version of the map used in this study to locate bedrock sampling stations as to lithologic assemblage.

For each lithologic assemblage, Table 5-1 shows the number of bedrock aquifer samples taken, the number of samples containing detectable uranium, the percentage of samples containing detectable uranium, the number of samples with excessive uranium, the number of stations giving waters with detectable uranium, the percentage of such stations, and the number of stations yielding samples with excessive uranium.

Table 5-1. Bedrock Lithology with Uranium Detections and Exceedances.								
Lithology (after Lawton et al., 1976)	Total samples	U detections in samples	Percent U detections in samples	U excesses in samples	Total stations	Stations with U detections	Percent of stations with U detections	Stations with U excesses
Hornblende-Biotite Gneiss/ Amphibolite	1	1	100.0%	0	1	1	100.0%	0
Granite/ gneissic biotite granite (Elberton Granite)	8	7	87.5%	2	6	5	83.3%	1
Hornblende Gneiss/ Amphibolite	8	5	62.5%	2	7	4	57.1%	1
Sericite Schist	5	3	60.0%	0	5	3	60.0%	0
Porphyritic granite (Siloam Granite, 9 stations; Danburg Granite, 2 stations)	12	7	58.3%	2	11	6	54.5%	1
Sericite Schist/ Amphibolite/ Granite gneiss	2	1	50.0%	0	2	1	50.0%	0
Mica Schist/ Gneiss/ Amphibolite	11	5	45.5%	1	10	4	40.0%	1
Granitic Gneiss undifferentiated	22	10	45.5%	2	22	10	45.5%	2
Biotite Granite Gneiss/ Feldspathic Biotite Gneiss/ Amphibolite/ Hornblende Gneiss	8	3	37.5%	0	8	3	37.5%	0
Biotitic Gneiss / Mica Schist/ Amphibolite	34	10	29.4%	1	34	10	29.4%	1
Granite undifferentiated	7	2	28.6%	0	7	2	28.6%	0
Granite Gneiss/ Amphibolite	18	5	27.8%	0	18	5	27.8%	0
Granite/ granite gneiss	4	1	25.0%	0	4	1	25.0%	0
Metagraywacke/ Mica Schist	9	2	22.2%	0	9	2	22.2%	0
Biotite Gneiss/ Feldspathic Biotite Gneiss	11	2	18.9%	0	11	2	18.9%	0
Biotite Gneiss	14	2	14.3%	0	14	2	14.3%	0
Biotite Gneiss/ Hornblende Gneiss/ Granite Gneiss	1	0	0.0%	0	1	0	0.0%	0
Granite/ biotite granite/ amphibolite	4	0	0.0%	0	4	0	0.0%	0
Granitic Gneiss / Gneissic Granite (augen or porphyritic)	3	0	0.0%	0	3	0	0.0%	0
Meta-argillite/ Sericite phyllite/ Metavolcanics	4	0	0.0%	0	4	0	0.0%	0
Mica Schist	1	0	0.0%	0	2	0	0.0%	0
Mica Schist/ Amphibolite	4	0	0.0%	0	4	0	0.0%	0
Quartzite/ Mica Schist	1	0	0.0%	0	1	0	0.0%	0
Sillimanite Schist	1	0	0.0%	0	1	0	0.0%	0
Sillimanite Schist/ Gneiss	1	0	0.0%	0	1	0	0.0%	0
Undifferentiated Metavolcanics/ Sericite phyllite/ Meta-argillite/ Quartz mica schist, some w/ Irwinton Sand veneer	8	0	0.0%	0	8	0	0.0%	0

Ten lithologic assemblages near the top of the table are noteworthy because of the high percentage of samples with detectable uranium or because of the number of samples containing excessive uranium. Since only one sample was obtained from the hornblende biotite gneiss/amphibolite assemblage and that sample contained detectable uranium, the 100% value for the number of samples containing detectable uranium has little meaning.

Four out of seven stations obtaining water from bedrock mapped as the hornblende gneiss/amphibolite assemblage returned samples with detectable uranium. Among these, the well (20.1_Frk-1) that gave samples containing excessive uranium intersected a granitic pegmatite which, though not a regionally mappable rock body, would be capable of furnishing much uranium to ground water. Other assemblages of note are the porphyritic granite, furnishing water to eleven stations, and the granite/gneissic biotite granite assemblages, furnishing water to six stations.

Eleven stations drew water from two plutons belonging to the porphritic granite assemblage, the Siloam Granite and the Danburg Granite. One of the two Danburg Granite stations and five of the 11 Siloam Granite stations gave samples containing detectable uranium, with samples from one Siloam station exceeding the Primary MCL. Five of six stations drawing water from a pluton belonging to the granite/gneissic biotite granite assemblage, the Elberton Granite, gave samples with detectable uranium, with one station producing water with concentrations exceeding the Primary MCL.

Over half the samples from the sericite schist assemblage produced uraniferous waters. The biotitic gneiss/mica schist/amphibolite and the undifferentiated granitic gneiss assemblages are both widely occurring assemblages in the Piedmont and both gave uraniferous waters, with one station in the former and two stations in the latter giving samples with excessive uranium.

The assemblages giving the least uraniferous ground water are the two eastern Piedmont assemblages containing metavolcanics (the 20th entry and the last entry on Table 5-1). Twelve stations drawing from the two assemblages gave waters devoid of detectable uranium.

5.4 URANIUM CONCENTRATION COMPARED WITH SELECTED WATER QUALITY PARAMETERS

For the Coastal Plain samples, detectable uranium seems to coincide somewhat with elevated barium levels. Otherwise, no chemical indicators are apparent.

For the Piedmont/Blue Ridge, uranium detections are almost entirely restricted to bedrock aquifer waters. Figures 5-1 and 5-2 show plots of uranium concentration versus well depth for regolith and bedrock aquifer samples from wells with known depths. Uranium levels overall seem to increase with the depth of the well. Samples containing detectable uranium, including both regolith and bedrock samples, seem to be restricted to wells deeper than 80 feet. For bedrock samples alone, no uranium occurs in samples from wells shallower than 150 feet.

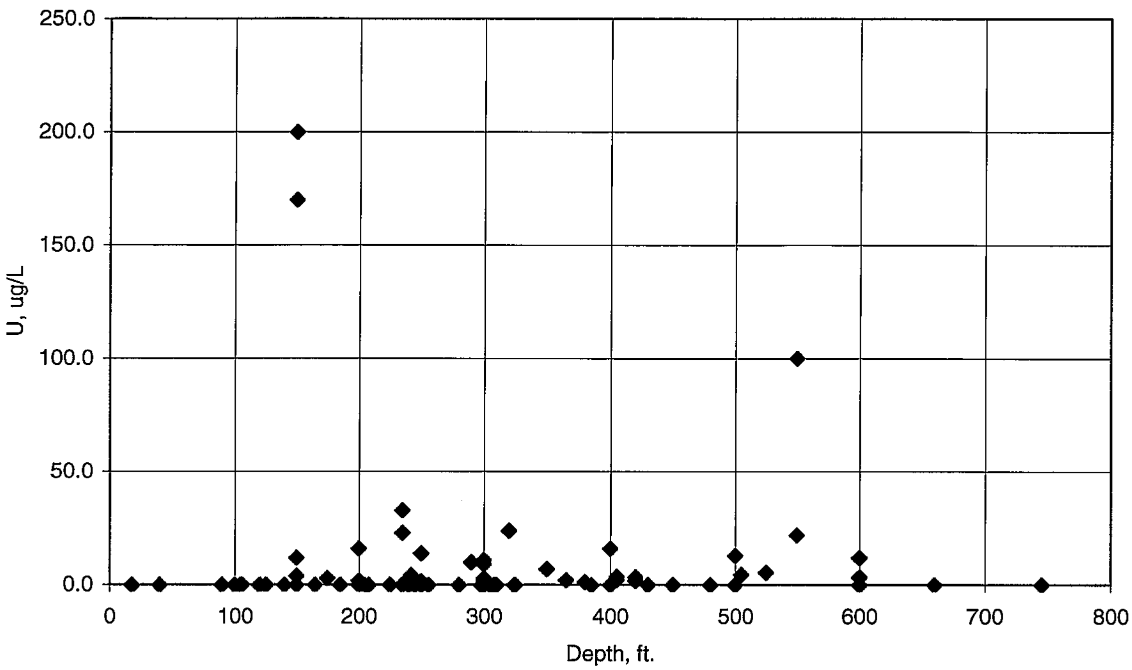

Figure 5-1. Plot of Uranium Concentration Versus Well Depth for Bedrock Aquifer Samples.

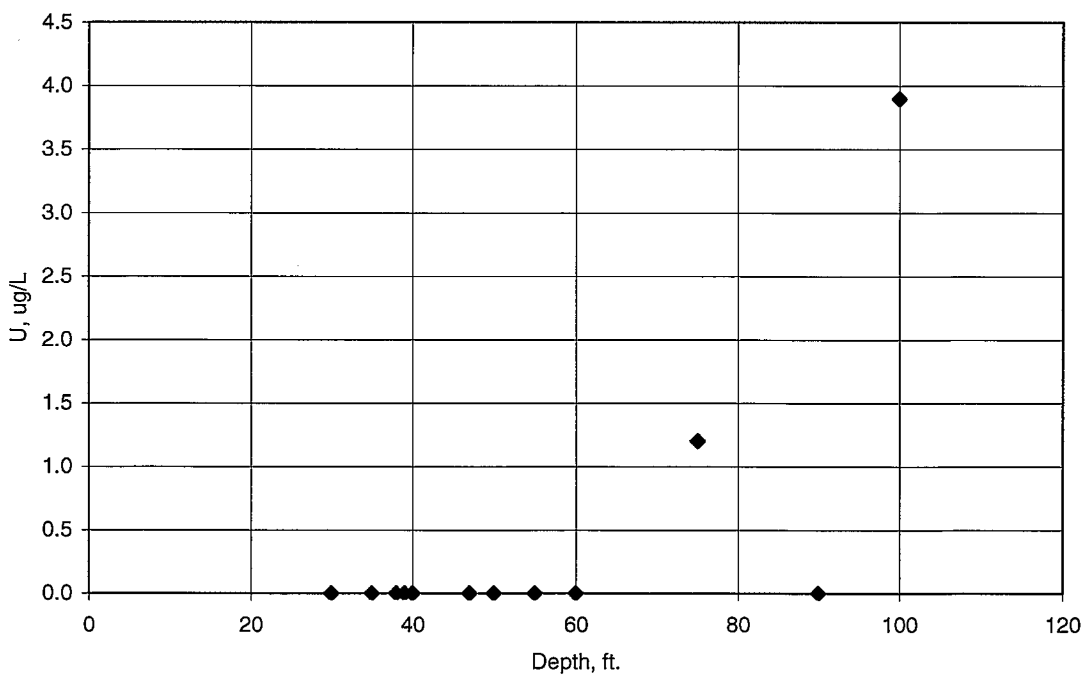

Figure 5-2. Plot of Uranium Concentration Versus Well Depth for Regolith Aquifer Samples.

For bedrock wells, Figures 5-3 through 5-14 show plots of uranium concentration versus pH, conductivity, dissolved oxygen, nitrate/nitrite, phosphorus, sulfate, aluminum, iron, sodium, calcium, magnesium, and barium. No plots of uranium concentration versus the above parameters were done for the regolith aquifer, because only three samples from three wells contained detectable uranium.

Figure 5-3, the uranium versus pH plot, shows that uranium concentrations increase with increasing pH up to a pH of about 6.4, then gradually decline with further increases in pH. Eighty-nine percent of the samples with detectable uranium and 100 percent of the samples with excessive uranium occur above a pH of 5.84. Eighty-nine percent of the samples with detectable uranium and 90 percent of the samples with excessive uranium occur below a pH of 7.49.

Figure 5-4, the uranium versus conductivity plot, shows that uranium concentrations increase as sample conductivities increase, up to 237 uS/cm, with an apparently steep rise in concentrations above a conductivity of 64 ug/L. Concentrations decrease somewhat as conductivities exceed 237 ug/L. Ninety-five percent of the

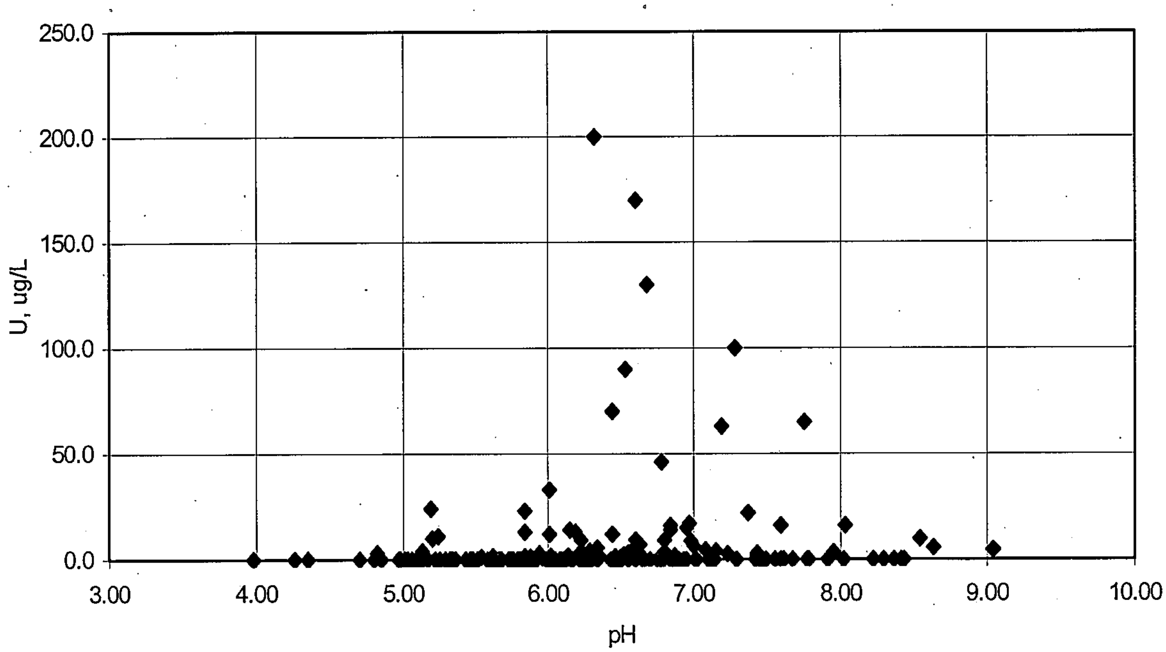

Figure 5-3. <u>Plot of Uranium Concentration versus pH, Bedrock Aquifer Samples</u>

samples with uranium detections and 100 percent of the excesses occurred in samples with conductivities at or below 237 ug/L. Ninety-one percent of the samples with uranium detections and 100 percent of the excesses had conductivities above 64 ug/L.

Figure 5-5 shows uranium concentration versus dissolved oxygen concentration. Fewer dissolved oxygen measurements are available than measurements of other

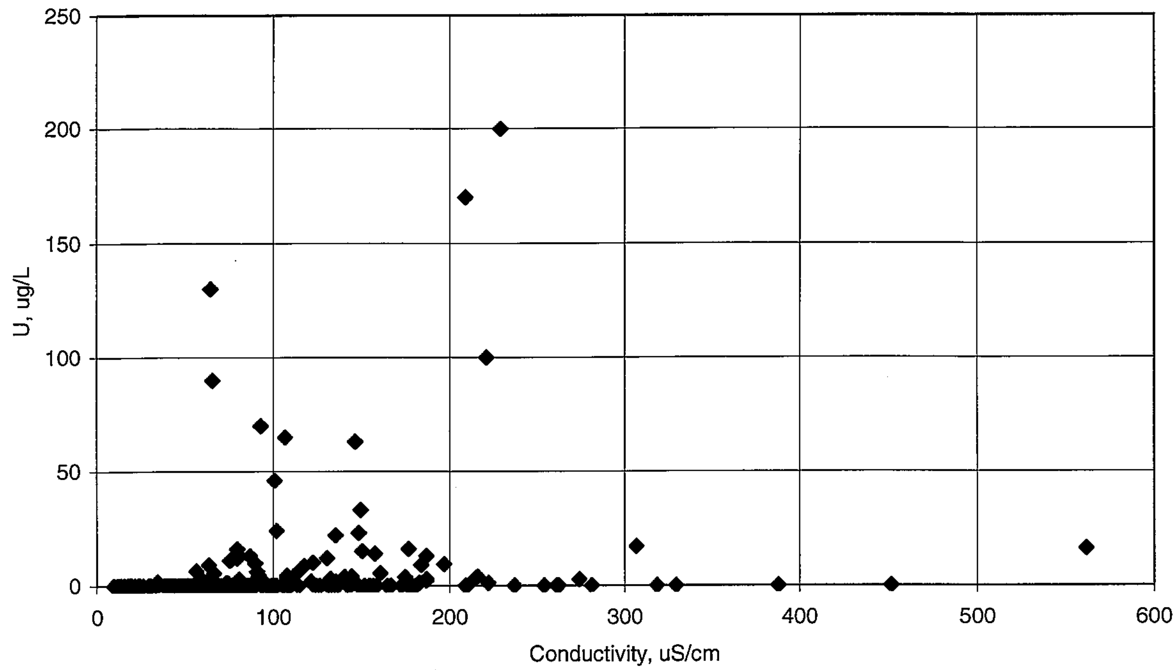

Figure 5-4. Plot of Uranium Concentration versus Conductivity, Bedrock Aquifer Samples.

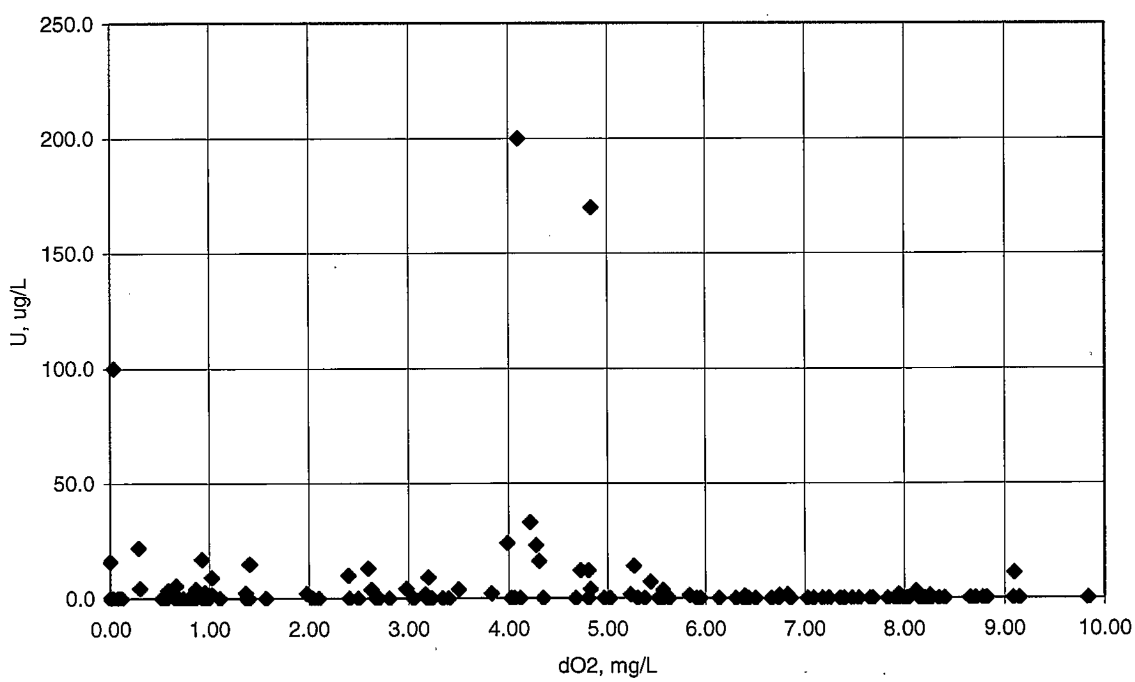

Figure 5-5. Plot of Uranium Concentration versus Dissolved Oxygen Concentration, Bedrock Aquifer Samples.

parameters. Few uranium detections of any size occur in samples where the dissolved oxygen is greater than about 5.5 mg/L. Most of the samples with excessive uranium concentrations occur in samples with oxygen levels between four and five mg/L, though most uraniferous samples have oxygen levels less than four mg/L. Ninety-one percent of the uranium detections and 75 percent of the uranium exceedances occur in samples with dissolved oxygen contents above 0.30 mg/L. Ninety-one percent of the uranium detections occur in samples with dissolved oxygen contents below 7.18 mg/L.

Figure 5-6 shows uranium concentrations plotted versus nitrate/nitrite concentrations. In general, the uranium concentration decreases as the nitrate/nitrite concentration increases. However, a suggestion of a secondary near-linear trend in which the uranium concentration increases as the nitrate/nitrate concentration increases also appears on the plot and contains the highest of the uranium exceedances. The trend appears to serve as a limit to the highest uranium values. Ninety-two percent of the uranium detections and 80 percent of the uranium exceedances occur in samples with nitrate/nitrite contents of 0.30 mg/L as nitrogen. Ninety-one percent of the uranium detections and 80 percent of the exceedances occur in samples with nitrate nitrite levels below 4.70 mg/L as nitrogen.

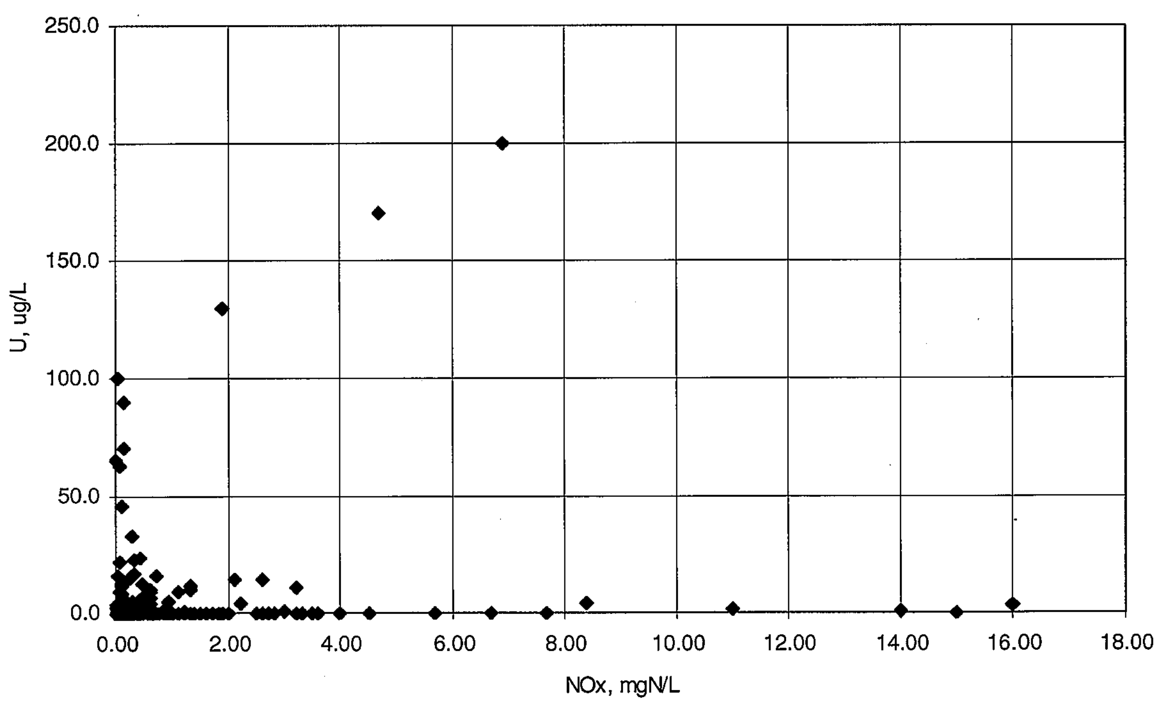

Figure 5-6. <u>Plot of Uranium Concentration Versus Nitrate/Nitrite Concentration, Bedrock Aquifer Samples.</u>

Figure 5-7 shows a plot of uranium concentration versus the total phosphorus concentration. The uranium concentration declines as the phosphorus concentration increases. Ninety-one percent of the uranium detections and 90 percent of the exceedences occur in samples with phosphorus concentrations below 0.2 mg/L. Twenty-two percent

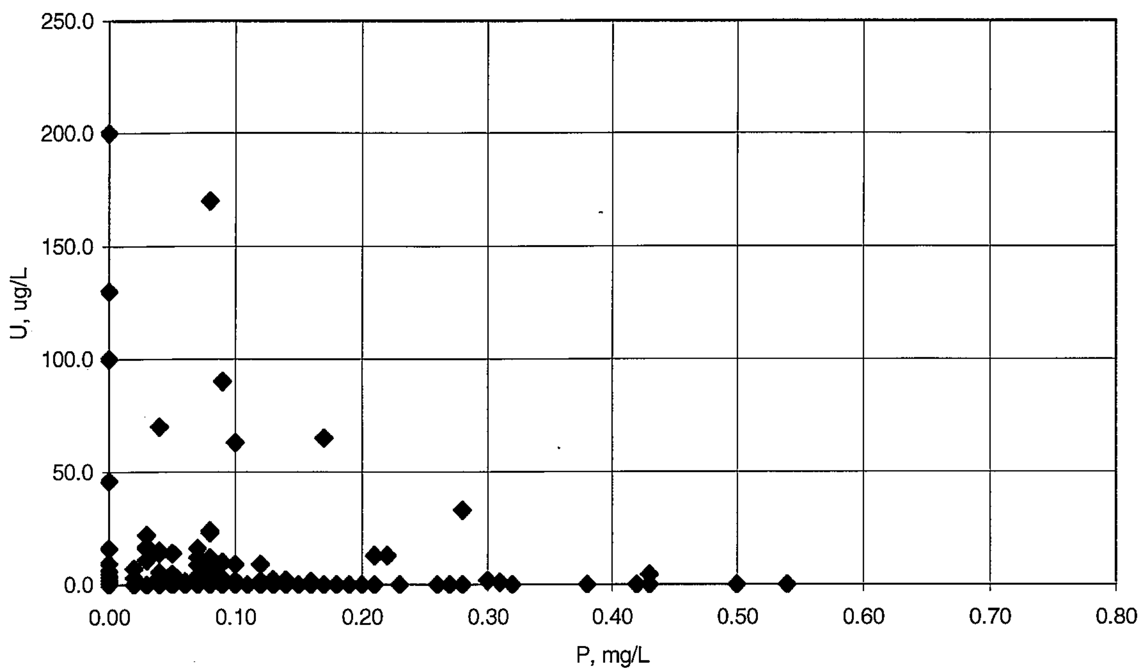

Figure 5-7. Plot of Uranium Concentration versus Phosphorus Concentration, Bedrock Aquifer Samples.

of the uranium detections and 40 percent of the exceedances occur in samples containing phosphorus at or below the reporting limit (0.02 mg/L).

Figure 5-8 plots uranium concentration versus sulfate concentration for bedrock aquifer samples. A trend line fitted by Microsoft Excel shows uranium concentration to increase slightly as sulfate concentration increases. Ninety-two percent of the uranium detections and 90 percent of the exceedances occurred in samples containing less than 29 mg/L sulfate. Seventy-four percent of the samples with detectable uranium and 80 percent of the samples with excessive uranium had sulfate contents below the reporting limit (10 mg/L).

Figure 5-9 shows a plot of uranium concentration versus aluminum concentration. The plotting of nearly all of the sample data points on either the x-axis or on the y-axis illustrates that a bedrock water sample that contains detectable aluminum generally will not contain detectable uranium and vice versa. Ninety-five percent of the uranium detections and 100 percent of the exceedances occurred in samples containing aluminum below the reporting limit (60 ug/L).

Figure 5-10 displays a plot of uranium concentration versus iron concentration (the coordinate for the iron level of 60,000 ug/L, with no detectable uranium is not shown). Uranium concentrations appear to decrease rather dramatically as iron concentrations increase. Ninety-one percent of the uranium detections and 80 percent

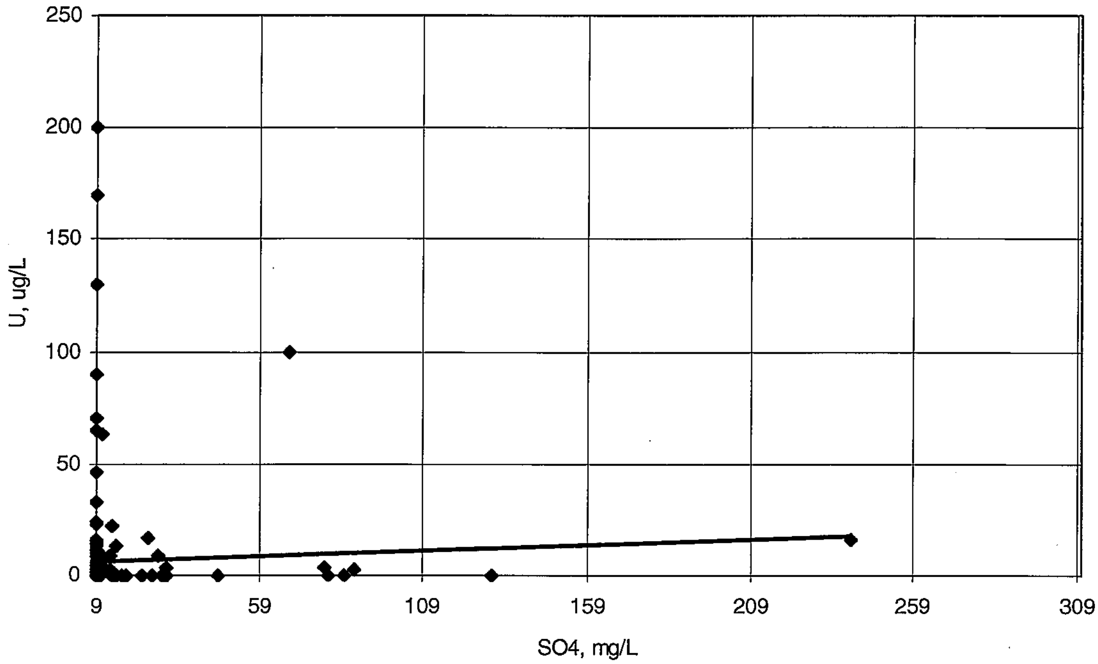

Figure 5-8. Plot of Uranium Concentration Versus Sulfate Concentration, Bedrock Aquifer Samples.

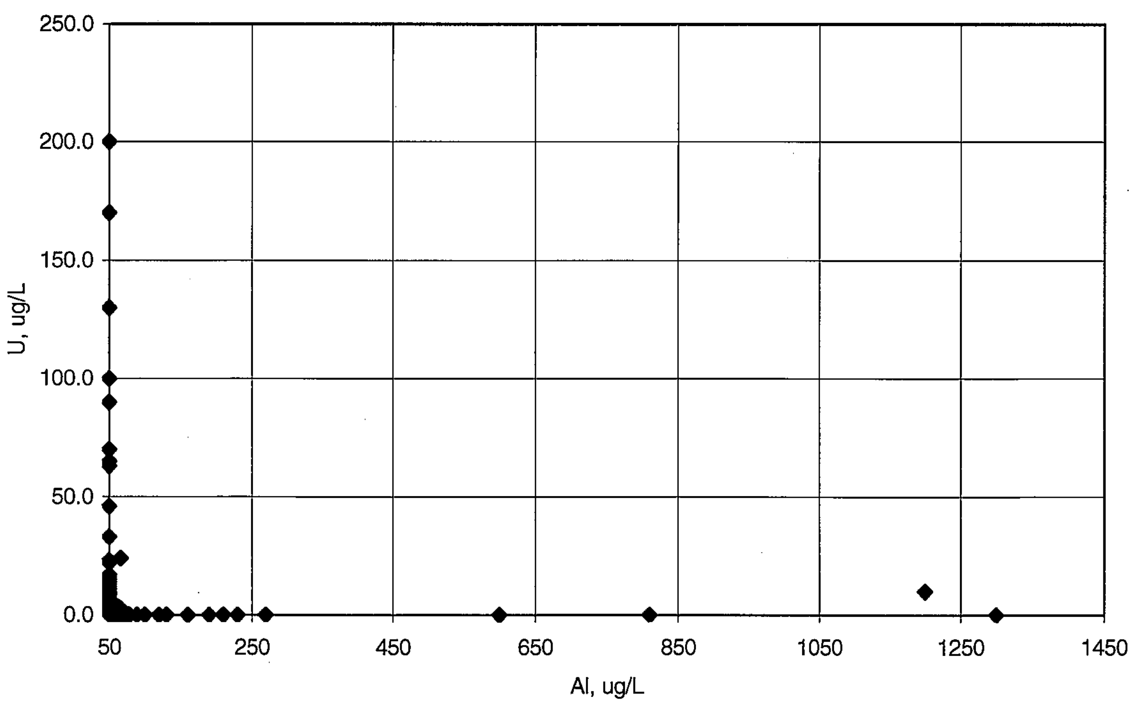

Figure 5-9. Plot of Uranium Concentration Versus Aluminum Concentration, Bedrock Aquifer Samples.

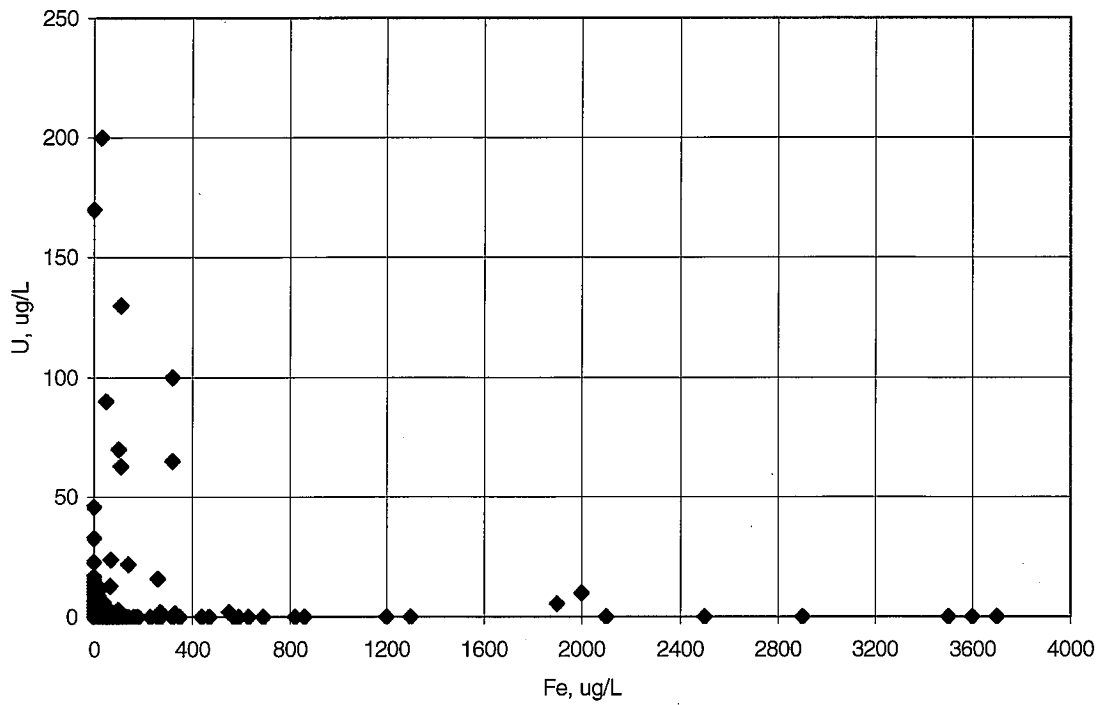

Figure 5-10. Plot of Uranium Concentration Versus Iron Concentration, Bedrock Aquifer Samples.

of the exceedences occurred in samples containing 180 ug/L iron or less. Fifty-one percent of the uranium detections and 30 percent of the exceedances occurred in samples containing no detectable iron.

Figure 5-11 shows a plot of uranium concentration versus sodium concentration. Uranium concentration rises with an increase in sodium concentration, up to a level of about 17,000 ug/L, and then declines. One hundred percent of the samples containing detectable uranium and of the samples with excess uranium have sodium contents of 5,400 ug/L or more. Ninety-four percent of the samples with detectable uranium and 100 percent of the samples with exceedances have sodium concentrations of 17,000 or less.

Figure 5-12 shows a plot of uranium concentration versus calcium concentration (coordinates for Ca = 160,000 ug/L; U = 3.4 ug/L and Ca = 170,000 ug/L; U = 16.0 ug/L are not shown). Uranium concentrations generally increase as calcium concentrations increase to a level of about 22,000 ug/L, then, more gradually decrease. Samples with calcium concentrations below about 5,000 ug/L have little or no detectable uranium. One hundred percent of the samples with detectable uranium concentrations and 100 percent of the samples with exceedances contain calcium above 4,200 ug/L. Ninety-two percent of the samples with detectable uranium and 100 percent of the samples with exceedances have calcium concentrations below 32,000 ug/L.

Figure 5-13 displays a plot of uranium concentration versus magnesium concentration (coordinates for Mg = 16,000 ug/L; U = 13 ug/L and Mg = 23,000 ug/L; U = 3.4 ug/L are not shown). Similar to the cases of calcium and sodium, uranium

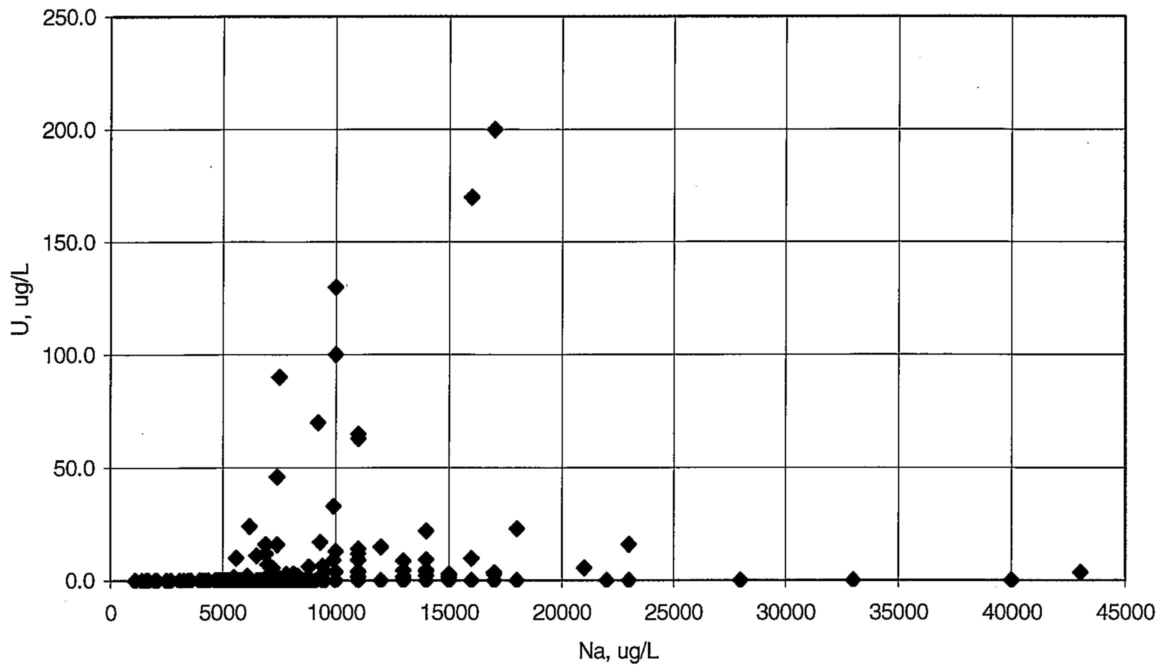

Figure 5-11. Plot of Uranium Concentration versus Sodium Concentration, Bedrock Aquifer Samples.

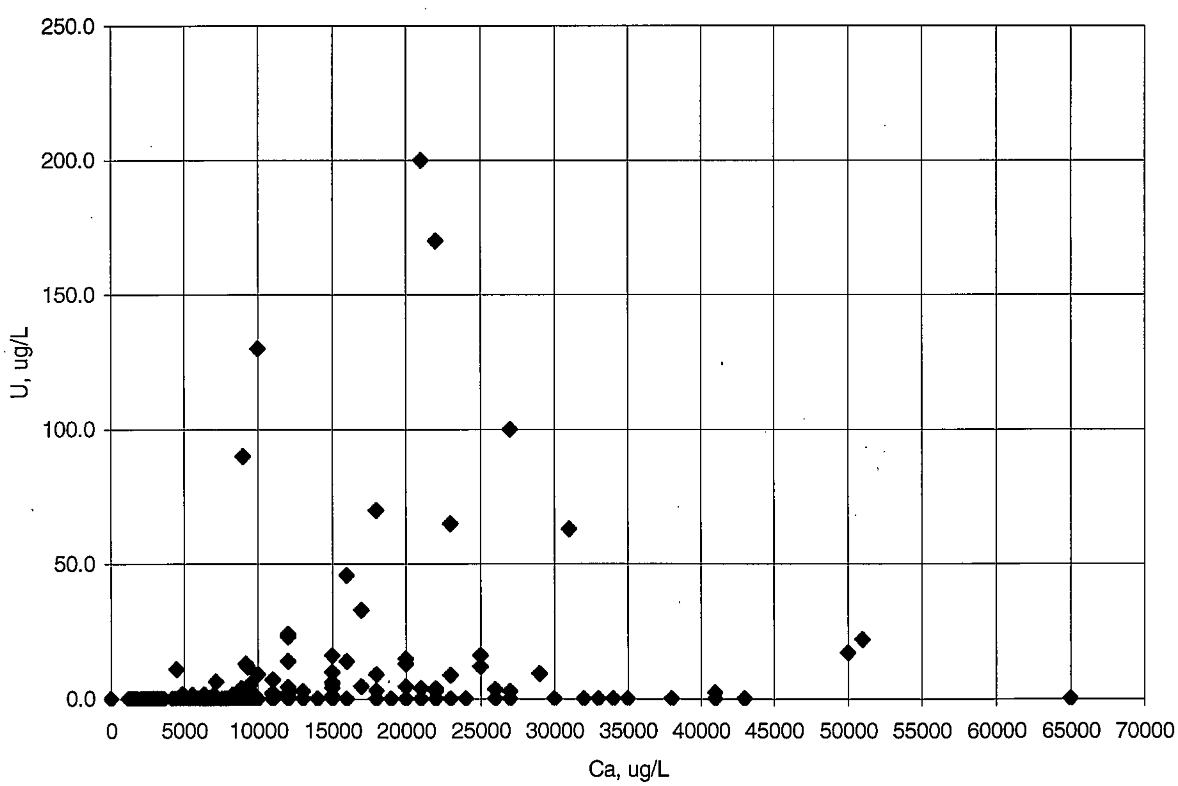

Figure 5-12. Plot of Uranium Concentration versus Calcium Concentration, Bedrock Aquifer Samples.

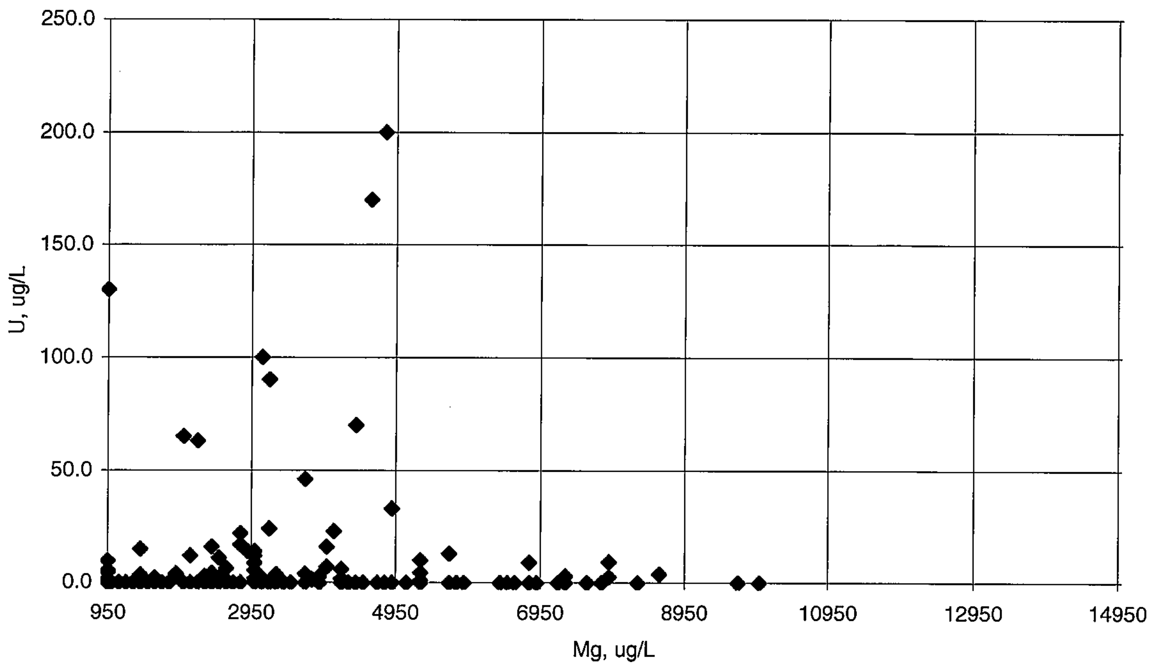

Figure 5-13. Plot of Uranium Concentration versus Magnesium Concentration, Bedrock Aquifer Samples.

concentrations rise with increasing magnesium concentrations until the magnesium concentration passes about 4,800 ug/L, after which the uranium concentration falls. Ninety-one percent of the samples with uranium detections and 90 percent of those with exceedances contained magnesium at levels of 1,400 ug/L or greater. Eighty-nine percent of the samples with uranium detections and 100 percent of the samples with exceedances contained magnesium at levels below 6,400 ug/L.

Figure 5-14 shows a plot of uranium concentration versus barium concentration. Samples with the higher uranium concentrations tend to have the lower barium concentrations. In samples with both metals present, lower barium concentrations tend to pair with higher uranium concentrations. Seventy-four percent of the samples with detectable uranium and 100 percent of the samples with exceedances had barium concentrations of 18 ug/L or less. For 89 percent of such samples, the barium content was less than 53 ug/L. Eighty-nine percent of the samples with detectable uranium and 80 percent of those with excessive uranium had barium concentrations above the reporting limit of two ug/L.

McMahon and Chapelle (2008) have set forth a succession of oxidation zones defined by the main oxidant used by ground-water microbe communities. The first is the oxygen zone or oxic zone, in which oxygen derived from the atmosphere is the primary oxidant. As oxygen becomes depleted (according to the authors, depletion becomes evident at a typical dissolved oxygen content of 0.5 mg/L), nitrate (and nitrite)

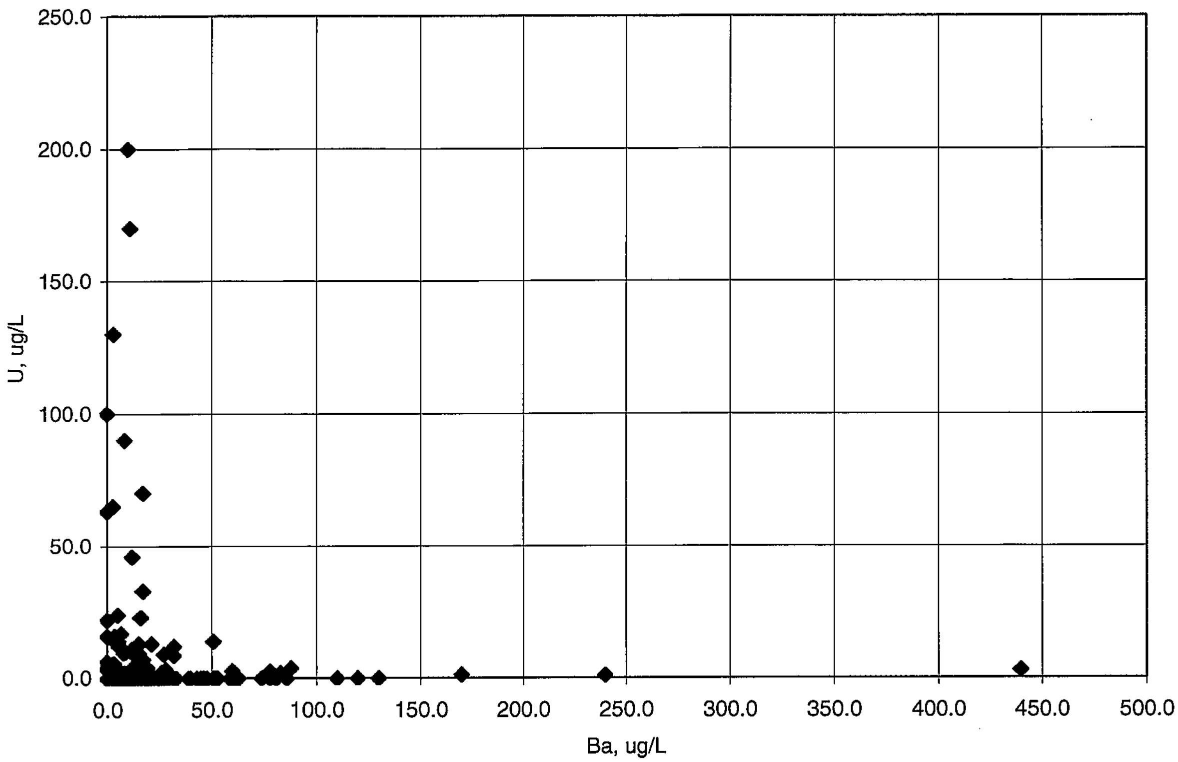

Figure 5-14. Plot of Uranium Concentration versus Barium Concentration, Bedrock Aquifer Samples.

become the dominant oxidants used by the microbial community and the water becomes anoxic. In turn, as nitrate becomes depleted (typically, below a concentration of about 0.5 mg/L as nitrogen) the solid-phase manganese IV becomes the dominant oxidant, yielding soluble manganese II. As manganese II rises above 50 ug/L (in the water), manganese IV begins to become depleted, with iron III (solid phase), then sulfate (typically soluble), becoming the primary oxidants, with iron II (soluble) then sulfide (as hydrogen sulfide or an insoluble metallic sulfide) being the reduction end products. With the depletion of sulfate (typically below about 0.5 mg/L), carbon dioxide becomes a primary oxidant and methane a typical reduction product (methanogenesis). If the dissolved oxygen content of the water is below about 0.5 mg/L but data on other oxidants is insufficient to characterize the water as to oxidation zone, the water is considered suboxic. Where characteristics of several different oxidation-reduction zones are present, e.g., low oxygen-high nitrate-high manganese, they use the term "mixed".

One hundred and forty-two samples from 139 stations tapping the bedrock aquifer have complete sets of analytic data for dissolved oxygen, nitrate/nitrite, manganese, iron, and sulfate. One hundred and thirty-four samples from 132 stations have dissolved oxygen above the 0.5 mg/L threshold and could be considered oxic. Forty-one samples from 39 of these 132 stations contained uranium, with three samples from two stations being excessive. A possible difficulty in assigning sample waters to this zone could arise because of oxygen introduced by pumping (as from jet pumps entraining air, cascading from wet fractures left above the pumping water level, etc.).

Eight samples from seven stations had dissolved oxygen levels at or below the threshold for the oxic zone. However, since the samples consisted of unfiltered water, no estimate of iron II or manganese II concentrations could be made. A further difficulty was the 10 mg/L sulfate reporting limit far exceeds the 0.5 mg/L threshold for the onset of methanogenesis. With these conditions in mind, the remaining eight samples could only be described as suboxic.

5.5 MODE OF OCCURRENCE OF URANIUM

Uranium in the examined area of the Coastal Plain occurred in basic ground water that has somewhat elevated barium levels (170 ug/L to 190 ug/L range). Uranium in the Piedmont/Blue Ridge province is far more common in the ground waters of the bedrock aquifer than in the regolith aquifer. All samples with uranium levels exceeding the Primary MCL were drawn from the bedrock aquifer.

The bedrock lithologies mapped on the Geologic Map of Georgia (Lawton et al., 1976) of the most interest by way of yielding higher numbers of uraniferous samples or of samples with uranium exceedances are these nine assemblages: 1) granite/gneissic biotite granite (Elberton Granite), 2) hornblende gneiss/amphibolite, 3) sericite schist, 4) porphyritic granite (Siloam Granite and Danburg Granite), 5) sericite schist/amphibolite/ granite gneiss, 6) mica schist/gneiss/amphibolite, 7) granitic gneiss undifferentiated, 8) biotite granite gneiss/feldspathic biotite gneiss/amphibolite/hornblende gneiss, 9) biotitic gneiss/mica schist/amphibolite. Similar lithologies elsewhere in the Piedmont/Blue Ridge area could prove to host uraniferous ground water. The one known bedrock well in central Jones County (station 32.2_Jns-2), drilled into a small granite body (mapped as "granite undifferentiated"), gave uraniferous water. On a more local scale, pegmatites could be of importance for furnishing uranium to ground water. Well-depth data indicate uraniferous ground water in bedrock lies at depths of greater than 150 feet.

The chemical quality of uraniferous ground water has the following characteristics:

1) the pH is usually over 5.00 but less than 8.00;
2) conductivities usually lie between 50 uS/cm and 300 uS/cm;
3) dissolved oxygen is almost always below 5.5 mg/L;
4) nitrate/nitrite is mostly low, below about three mg/L as nitrogen, although high or excessive nitrate-nitrate can occur with excessive uranium;
5) total phosphorus is below about 0.4 mg/L;
6) aluminum is mostly below detection (<50 ug/L);
7) iron is below about 400 ug/L;

8) sodium and calcium are each typically above about 5,000 ug/L;
9) barium is usually below about 50 ug/L for detectable uranium, except for the Floridan samples, and below about 25 ug/L for excessive uranium.

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APPENDIX

Laboratory and Well Data

LABORATORY AND WELL DATA

Table A-1 lists the values for both laboratory parameters and field parameters for each well or spring. For this table, the following abbreviations are used:

Parameters and Units of Measure

backgrd	= background
Cl	= chloride
cond.	= conductivity
cps	= counts per second
diss O2	= dissolved oxygen
ICP	= inductively coupled plasma mass spectrometry
ICP/MS	= inductively coupled plasma mass spectrometry
K	= (when following a number) times 1000
mg/L	= milligrams per liter
mgN/L	= milligrams per liter as nitrogen
NA	= not available; not analyzed
ND	= not detected
No.	= number
NOx	= nitrate/nitrite
SO4	= sulfate
Temp.	= temperature (degrees Celsius)
ug/L	= micrograms per liter
uS/cm	= microSiemenses per centimeter
VOC	= volatile organic compound

Volatile Organic Compounds

BDCM = bromodichloromethane
DBCM = dibromochloromethane
TCM = chloroform
MTBE = methyl tert-butyl ether
PCE = perchloroethylene
TCE = trichloroethylene
Tol. = toluene

Physiographic Features and Cultural Entities

AME	= African Methodist Episcopal Church
Bapt. Ch.	= Baptist Church
Chk. Sta.	= check station
Ck.	= creek
Co.	= county
Co. Rec.	= county recreation department
Dr.	= Drive
GC	= golf course
GFC	= Georgia Forestry Commission
Irrig.	= irrigation
MABG	= MABG corporation
Med. Ctr.	= medical center
Mgr's Res.	= manager's residence
MHP	= mobile home park
Mt.	= mount; mountain
Rd.	= Road
RVP	= recreational vehicle park
S/D	= subdivision
So.	= south
SP	= State Park
UMC	= United Methodist Church
WMA	= wildlife management area

Table A-2 gives the reporting limits for the various analytes. The list of abbreviations used for Table A-1 also applies to Table A-2.

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.

Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
1.0_Bwn 2 **PBR**	Erin Shores #1 **Baldwin**	**Hub**	**Hub**	12/06/06	6.94	411	NA	19.6	60	60	ND	12	180	0.03	0.02
1.1_Bwn 2 **PBR**	Island Ferry #6 **Baldwin**	unknown	bedrock	07/23/08	5.64	281	0.56	19.1	100	100	ND	52	18	0.02	0.12
1.2_Bwn 2 **PBR**	Glenwood #2 **Baldwin**	unknown	bedrock	07/23/08	6.93	319	0.53	19.7	75	75	ND	ND	ND	ND	ND
1.3_Bwn 2 **PBR**	Erin Shores #2 **Baldwin**	unknown	bedrock	07/23/08	5.75	97	5.53	18.4	90	90	ND	13	30	0.08	0.15
1.4_Bwn 2 **PBR**	Jeffers Well **Baldwin**	35	regolith	05/27/09	5.80	102	1.97	19.8	NA	NA	ND	ND	ND	0.09	0.23
2.0_BAL-1 **PBR**	Mallard Glen S/D Well **Baldwin**	**Hub**	**Hub**	10/24/07	6.99	179	NA	18.3	NA	NA	ND	ND	32	ND	0.23
2.1_BAL-1 **PBR**	Sikes Well **Baldwin**	unknown	unknown	10/07/08	7.24	366	0.63	18.4	NA	NA	ND	ND	61	ND	ND
2.2_BAL-1 **PBR**	Smallwood Well **Baldwin**	unknown	unknown	10/07/08	6.49	202	0.68	18.8	NA	NA	Tol. = 1.1	ND	17	ND	0.04
2.3_BAL-1 **PBR**	Landers Well **Baldwin**	unknown	unknown	09/24/08	6.98	246	0.11	18.6	NA	NA	ND	ND	80	ND	0.38
2.4_BAL-1 **PBR**	Walker Well #1 **Baldwin**	unknown	unknown	09/24/08	5.75	76	3.84	18.3	NA	NA	ND	ND	ND	0.06	0.53
2.5_BAL-1 **PBR**	Walker Well #2 **Baldwin**	unknown	unknown	10/07/08	7.11	412	1.13	18.6	NA	NA	ND	ND	110	ND	0.04
2.6_BAL-1 **PBR**	Harwell Well **Baldwin**	75	regolith	05/27/09	5.94	155	2.79	18.8	NA	NA	ND	ND	ND	0.05	0.16

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.

Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
1.0_Bwn 2 PBR	ND	ND	ND	370	ND	ND	ND	ND	ND	ND	ND	22	ND	3.3	**3.7**	830	ND	110K	ND	280	ND	5800	310	2600	ND	ND
1.1_Bwn 2 PBR	ND	ND	ND	28	ND	ND	13	ND	ND	ND	ND	25	ND	ND	ND	ND	ND	14K	ND	3500	ND	6900	210	40K	ND	ND
1.2_Bwn 2 PBR	ND	ND	ND	120	ND	ND	ND	ND	ND	ND	ND	19	ND	2.1	ND	810	ND	34K	ND	630	ND	6900	120	23K	ND	ND
1.3_Bwn 2 PBR	ND	ND	ND	360	ND	ND	ND	ND	ND	ND	ND	22	ND	1.1	ND	160	ND	5100	ND	3600	ND	2000	19	13K	ND	ND
1.4_Bwn 2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23.0	ND	ND	ND	ND	ND	7300	ND	140	ND	2100	ND	13K	ND	ND
2.0_BAL-1 PBR	ND	ND	ND	130	ND	ND	ND	ND	ND	ND	ND	9.9	ND	1.6	**43.0**	210	ND	39K	ND	18K	ND	2700	ND	19K	15	16
2.1_BAL-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	**3.2**	ND	ND	47K	ND	48	ND	2000	ND	28K	ND	ND
2.2_BAL-1 PBR	ND	ND	30	13	ND	ND	ND	ND	ND	ND	ND	75.0	ND	ND	**8.1**	ND	ND	20K	ND	44	ND	5500	ND	12K	ND	ND
2.3_BAL-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	**12.0**	ND	ND	52K	ND	74	ND	1300	ND	32K	ND	ND
2.4_BAL-1 PBR	5.6	ND	17	27	ND	ND	ND	ND	ND	ND	ND	62.0	ND	1.8	ND	ND	ND	9300	ND	94	ND	5000	ND	10K	ND	ND
2.5_BAL-1 PBR	ND	ND	ND	160	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	ND	ND	ND	56K	ND	920	ND	3900	160	19K	ND	ND
2.6_BAL-1 PBR	ND	ND	35	ND	ND	ND	ND	ND	ND	ND	ND	22.0	ND	ND	**1.2**	ND	ND	9600	ND	ND	ND	4300	ND	16K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.

Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	 water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
2.7_BAL-1 **PBR**	Parker Well **Baldwin**	unknown	unknown	05/27/09	5.58	129	5.28	19.4	NA	NA	ND	ND	ND	0.68	0.20
2.8_BAL-1 **PBR**	Poland Well **Baldwin**	unknown	unknown	05/27/09 09/04/09	6.45 5.93	285 299	0.78 0.99	19.5 19.0	NA NA	NA NA	ND ND	ND ND	11 10	ND ND	0.08 0.06
3.0_Bnk 1 **PBR**	Homer/Big Well (#101) **Banks**	**Hub**	**Hub**	03/22/06	7.94	198	0.29	19.6	90	90	ND	ND	84	0.06	ND
4.0_BAN-1 **PBR**	Homer/Hill St. Well **Banks**	**Hub**	**Hub**	09/06/07 05/07/08	6.54 5.40	105 122	NA NA	17.2 17.1	NA NA	NA NA	ND ND	ND ND	17 24	0.23 0.26	ND 0.03
4.1_BAN-1 **PBR**	Staats Well **Banks**	165	bedrock	06/10/09	5.34	99	7.03	17.3	NA	NA	ND	ND	ND	1.60	0.08
4.2_BAN-1 **PBR**	Hill Well **Banks**	405	bedrock	09/16/09	6.80	175	2.63	18.1	NA	NA	ND	ND	10	0.14	ND
4.3_BAN-1 **PBR**	Callaway Well **Banks**	unknown	regolith	06/10/09	4.68	55	7.48	17.9	NA	NA	ND	ND	ND	1.50	0.03
4.4_BAN-1 **PBR**	Hill Well **Banks**	105	bedrock	09/16/09	4.85	99	7.69	19.0	NA	NA	ND	10	ND	5.70	ND
5.0_Brw 2 **PBR**	Auburn MHP Well **Barrow**	**Hub**	**Hub**	07/20/06	6.49	93	NA	18.2	120	120	ND	ND	ND	3.80	0.06
5.1_Brw 2 **PBR**	Kiley Well **Barrow**	30	regolith	05/13/09	5.20	118	3.91	16.4	NA	NA	ND	15	13	1.10	ND
5.2_Brw 2 **PBR**	Healan Well **Barrow**	38	regolith	05/13/09	6.16	63	7.58	17.1	NA	NA	TCM = 10 BDCM = .94	ND	ND	0.50	0.03
5.3_Brw 2 **PBR**	Stover Well **Barrow**	125	bedrock	10/07/09	4.70	45	8.66	17.9	NA	NA	ND	ND	ND	1.50	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
2.7_BAL-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43.0	ND	ND	ND	ND	ND	7400	ND	20	ND	4100	ND	12K	ND	ND
2.8_BAL-1	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	52	ND	ND	ND	76K	ND	ND
PBR	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	15.0	ND	2.4	ND	ND	ND	27K	ND	560	12K	12K	160	11K	ND	ND
3.0_Bnk 1 **PBR**	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND	18.0	ND	ND	**14.0**	ND	ND	39K	ND	ND	ND	1100	ND	28K	ND	ND
4.0_BAN-1	ND	ND	ND	ND	ND	ND	6.9	ND	ND	ND	ND	6.1	ND	ND	**18.0**	250	ND	21K	ND	ND	ND	3000	ND	10K	ND	ND
PBR	ND	ND	ND	15	ND	ND	12	ND	ND	ND	ND	7.8	ND	ND	**22.0**	190	ND	20K	ND	ND	ND	3100	ND	11K	ND	ND
4.1_BAN-1 **PBR**	ND	ND	5.9	26	ND	ND	ND	ND	ND	ND	ND	25.0	ND	ND	ND	ND	ND	8400	ND	ND	ND	2000	ND	9500	ND	ND
4.2_BAN-1 **PBR**	ND	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	12.0	ND	ND	**3.7**	ND	ND	22K	ND	ND	ND	3300	ND	11K	ND	ND
4.3_BAN-1 **PBR**	ND	ND	37	ND	ND	ND	ND	ND	ND	ND	ND	18.0	ND	2.4	ND	ND	ND	4200	ND	ND	ND	ND	ND	5700	ND	ND
4.4_BAN-1 **PBR**	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	46.0	ND	1.8	ND	ND	ND	7000	ND	63	ND	1700	ND	9400	ND	ND
5.0_Brw 2 **PBR**	ND	ND	ND	11	ND	ND	6.6	ND	ND	ND	ND	ND	ND	ND	**2.5**	ND	ND	11K	ND	ND	ND	3900	ND	13K	ND	ND
5.1_Brw 2 **PBR**	ND	ND	9.1	15	ND	ND	ND	ND	ND	ND	ND	67.0	ND	3.9	ND	260	ND	8800	ND	140	ND	1100	730	9500	ND	ND
5.2_Brw 2 **PBR**	ND	ND	9.4	66	ND	ND	ND	ND	ND	ND	ND	8.8	ND	1.8	ND	250	ND	6200	ND	180	ND	ND	ND	5900	ND	ND
5.3_Brw 2 **PBR**	6.4	ND	16	33	ND	ND	ND	ND	ND	ND	ND	18.0	ND	ND	ND	ND	ND	2800	ND	23	ND	1200	ND	5300	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.

Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
5.4_Brw 2 PBR	Spruill Well **Barrow**	60	regolith	10/07/09	4.88	111	5.70	17.7	NA	NA	ND	ND	ND	6.10	ND
5.5_Brw 2 PBR	Green Well **Barrow**	30	regolith	12/03/09	4.79	100	4.75	16.1	NA	NA	TCM = 7.1 BDCM = 0.63	ND	ND	0.77	ND
5.6_Brw 2 PBR	Spruill Well 2 **Barrow**	55	regolith	12/03/09	4.96	55	8.41	17.4	NA	NA	TCM = 1.1	ND	ND	1.60	0.04
6.0_BAR-1 PBR	Bent Creek S/D Well #1 **Barrow**	**Hub**	**Hub**	10/04/07	6.80	84	NA	17.6	NA	NA	ND	ND	10	0.20	0.03
6.1_BAR-1 PBR	McClendon Well **Barrow**	18	bedrock	08/27/08	5.03	22	8.71	18.2	NA	NA	ND	ND	ND	0.20	ND
6.2_BAR-1 PBR	McDaniel Well **Barrow**	300	bedrock	08/27/08	6.46	89	6.83	19.0	NA	NA	ND	ND	ND	0.86	0.05
6.3_BAR-1 PBR	McClendon Rental Well **Barrow**	100	bedrock	08/27/08	5.47	60	6.86	17.7	NA	NA	ND	17	85	2.80	ND
6.4_BAR-1 PBR	Phillips Well **Barrow**	unknown	regolith	11/05/08	4.81	23	5.94	15.9	NA	NA	ND	ND	ND	1.00	0.07
6.5_BAR-1 PBR	Phillips Rental Well **Barrow**	unknown	regolith	11/05/08	6.38	64	7.27	16.0	NA	NA	ND	ND	ND	0.93	0.14
6.6_BAR-1 PBR	Prather Well **Barrow**	unknown	regolith	11/05/08	7.47	70	8.94	17.7	NA	NA	TCM = 30 BDCM = 4.5 DBCM = 2.4	ND	20	0.09	0.41
7.0_Bib 1 PBR	Oak Haven GC So. Green Well **Bibb**	**Hub**	**Hub**	08/24/06	7.16	226	NA	19.4	40	40	ND	22	ND	0.55	0.15
7.1_Bib 1 PBR	Long Well **Bibb**	unknown	unknown	09/10/08	6.58	128	NA	21.1	NA	NA	ND	14	ND	0.55	0.22

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
5.4_Brw 2 PBR	8.1	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	68.0	ND	1.6	ND	ND	ND	10K	ND	33	ND	2700	ND	8300	ND	ND
5.5_Brw 2 PBR	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	42.0	ND	1.3	ND	440	ND	12K	ND	240	ND	ND	49	6900	11	ND
5.6_Brw 2 PBR	ND	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	42.0	ND	ND	ND	380	ND	5900	ND	160	ND	ND	ND	3500	ND	ND
6.0_BAR-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	ND	ND	**12.0**	ND	ND	17K	ND	ND	ND	2000	25	9500	ND	ND
6.1_BAR-1 PBR	ND	ND	41	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	7.6	ND	ND	ND	2500	ND	39	ND	ND	41	1100	ND	ND
6.2_BAR-1 PBR	ND	ND	12	220	ND	ND	ND	ND	ND	ND	ND	9.3	ND	1.6	**1.5**	ND	ND	8300	ND	ND	ND	3100	ND	5500	ND	ND
6.3_BAR-1 PBR	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	ND	ND	ND	8700	ND	74	ND	4200	ND	3300	ND	ND
6.4_BAR-1 PBR	ND	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	35.0	ND	1.9	ND	ND	ND	2300	ND	ND	ND	1100	19	2600	ND	ND
6.5_BAR-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.0	ND	1.1	ND	75	ND	15K	ND	94	ND	1600	ND	3700	ND	ND
6.6_BAR-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.5	ND	ND	ND	ND	ND	5600	ND	ND	ND	2200	ND	12K	ND	ND
7.0_Bib 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	**1.3**	ND	ND	36K	ND	ND	ND	16K	ND	18K	ND	ND
7.1_Bib 1 PBR	5	ND	28	ND	ND	ND	ND	ND	ND	ND	ND	11.0	ND	1.9	ND	ND	ND	20K	ND	ND	ND	7100	ND	13K	ND	18

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No.	Well Name	Well Depth	Aquifer	Date	pH	cond.	diss O2	Temp	Radiation - cps		VOCS	Cl	SO4	NOx	P
Province	County	feet		sampled		uS/cm	mg/L	^0C	backgrd	water	ug/L	mg/L	mg/L	mg N/L	mg/L
7.2_Bib 1 **PBR**	Moore Well **Bibb**	unknown	unknown	09/24/08	5.70	46	4.16	19.3	NA	NA	ND	ND	ND	0.77	0.69
7.3_Bib 1 **PBR**	Foulkes House Well **Bibb**	unknown	unknown	09/10/08	6.83	136	NA	22.4	NA	NA	ND	13	ND	0.36	0.17
7.4_Bib 1 **PBR**	Kelley Well **Bibb**	unknown	unknown	09/10/08	5.15	23	NA	18.8	NA	NA	ND	ND	ND	0.04	0.12
7.5_Bib-1 **PBR**	Northrup Well **Bibb**	285	bedrock	09/10/08	6.70	127	NA	19.4	NA	NA	ND	ND	ND	ND	0.26
7.6_Bib-1 **PBR**	Johnson Well **Bibb**	unknown	unknown	09/10/08	6.18	186	NA	21.0	NA	NA	ND	30	12	1.00	0.22
7.7_Bib-1 **PBR**	Foulkes Barn Well **Bibb**	unknown	unknown	09/10/08	6.74	222	NA	20.1	NA	NA	ND	31	11	1.20	0.23
8.0_BUT-1 **PBR**	Indian Springs SP Main Well **Butts**	**Hub**	**Hub**	08/22/07	6.00	115	NA	18.0	200	200	ND	ND	15	0.17	0.05
8.1_BUT-1 **PBR**	Dillon Well **Butts**	365	bedrock	11/06/08	6.35	61	1.98	16.6	NA	NA	ND	ND	ND	0.08	0.09
8.2_BUT-1 **PBR**	Buczek Well **Butts**	unknown	bedrock	11/06/08	6.23	64	3.20	18.1	NA	NA	ND	ND	ND	0.59	0.12
8.3_BUT-1 **PBR**	Moore Well **Butts**	106	bedrock	08/19/09	4.80	39	8.35	20.0	NA	NA	ND	ND	ND	0.39	0.07
8.4_BUT-1 **PBR**	Maddox Well **Butts**	500	bedrock	08/19/09	6.50	125	0.81	19.1	NA	NA	ND	ND	ND	0.06	0.19
9.0_CLA-1 **PBR**	Crestmont Farms S/D #1 **Clarke**	**Hub**	**Hub**	10/04/07 01/31/08	6.99 7.18	87 88	NA NA	18.8 18.5	NA NA	NA NA	ND ND	ND ND	ND ND	0.25 0.24	0.04 0.03

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
7.2_Bib 1 PBR	7.3	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	57.0	ND	ND	ND	ND	ND	4100	ND	ND	ND	2200	ND	7900	ND	ND
7.3_Bib 1 PBR	ND	ND	ND	44	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	21K	ND	110	ND	9100	ND	14K	ND	12
7.4_Bib 1 PBR	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	39.0	ND	2.3	ND	ND	ND	2900	ND	ND	ND	ND	ND	33000	ND	ND
7.5_Bib-1 PBR	ND	ND	ND	ND	7.5	ND	ND	ND	ND	ND	ND	3.6	ND	1.2	ND	ND	ND	22K	ND	ND	ND	5800	ND	12K	ND	ND
7.6_Bib-1 PBR	ND	ND	ND	42	ND	ND	ND	ND	ND	ND	ND	7.9	ND	1.3	ND	ND	ND	28K	ND	51	ND	9700	ND	18K	ND	ND
7.7_Bib-1 PBR	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	9.8	ND	1.3	ND	ND	ND	35K	ND	ND	ND	14K	ND	16K	ND	18
8.0_BUT-1 PBR	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.4**	ND	ND	16K	ND	350	ND	5100	ND	16K	ND	ND
8.1_BUT-1 PBR	ND	ND	5.7	ND	ND	ND	ND	ND	ND	ND	ND	8.3	ND	ND	**2.1**	ND	ND	8900	ND	ND	ND	1600	ND	8300	ND	ND
8.2_BUT-1 PBR	ND	ND	13	17	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	**9.1**	ND	ND	10K	ND	ND	ND	33000	14	11K	ND	ND
8.3_BUT-1 PBR	ND	ND	7.2	ND	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	ND	ND	ND	2400	ND	ND	ND	ND	ND	5200	ND	ND
8.4_BUT-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15K	ND	54	ND	3900	36	9500	ND	ND
9.0_CLA-1 PBR	ND ND	ND ND	ND ND	37 55	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	4.0 8.8	ND ND	5.9 5.6	**86.0** **96.0**	130 1300	ND ND	18K 20K	ND ND	210 250	ND ND	1300 1400	ND 10	11K 11K	13 14	ND ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
9.1_CLA-1 **PBR**	Ring Well **Clarke**	unk	regolith	11/17/09	6.31	28	NA	16.1	NA	NA	ND	ND	ND	0.36	0.08
9.2_CLA-1 **PBR**	Dean Well **Oconee**	90	regolith	11/17/09	6.44	31	NA	16.2	NA	NA	ND	ND	ND	0.96	0.07
9.3_CLA-1 **PBR**	Hoag Well **Oconee**	460	bedrock	11/17/09	8.03	80	NA	17.6	NA	NA	ND	ND	ND	0.04	0.07
9.4_CLA-1 **PBR**	Phillips Well **Clarke**	unknown	bedrock	11/17/09	6.65	64	NA	17.3	NA	NA	ND	ND	ND	3.30	0.11
9.5_CLA-1 **PBR**	Dillard Well **Clarke**	50	regolith	12/17/09	5.68	23	NA	NA	NA	NA	ND	ND	ND	0.13	ND
9.6_CLA-1 **PBR**	Owen Well **Barrow**	65	regolith	11/17/09	5.85	59	NA	16.8	NA	NA	MTBE = 0.51	13	ND	3.60	0.06
9.7_CLA-1 **PBR**	McQuaid Well **Oconee**	430	bedrock	11/17/09	9.04	92	NA	16.6	NA	NA	ND	ND	ND	0.06	0.05
9.8_CLA-1 **PBR**	Barber Well **Jackson**	unknown	unknown	11/17/09	6.49	35	NA	16.9	NA	NA	ND	ND	ND	0.14	0.03
10.0_Ctn 1 **PBR**	Clayton Co./Pates Ck. Well **Clayton**	610	bedrock	11/09/06	7.60	563	NA	17.4	80	80	ND	18	140	ND	ND
10.1_Ctn 1 **PBR**	Newton well **Clayton**	280	bedrock	09/25/08	5.51	209	5.91	17.4	40	40	ND	31	ND	3.50	0.28
10.2_Ctn 1 **PBR**	Elliott well **Clayton**	unk	bedrock	09/25/08	6.50	74	6.75	17.7	40	40	ND	ND	ND	0.88	0.09
10.3_Ctn 1 **PBR**	Patterson Well **Clayton**	150	bedrock	11/06/08	6.44	131	4.73	17.4	NA	NA	ND	11	ND	1.30	0.08

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
9.1_CLA-1 **PBR**	ND	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	28	ND	1.3	ND	170	ND	3500	ND	170	ND	1300	ND	3200	ND	ND
9.2_CLA-1 **PBR**	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	27	ND	ND	ND	ND	ND	3600	ND	ND	ND	1800	ND	3700	ND	ND
9.3_CLA-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	**16**	ND	ND	15K	ND	260	ND	2400	23	7400	ND	ND
9.4_CLA-1 **PBR**	ND	ND	6.1	11	ND	ND	ND	ND	ND	ND	ND	46	ND	ND	ND	ND	ND	7300	ND	52	ND	2800	ND	6900	ND	ND
9.5_CLA-1 **PBR**	ND	ND	5.4	ND	ND	ND	ND	ND	ND	ND	ND	33.0	ND	ND	ND	ND	ND	3800	ND	ND	ND	ND	43	2100	ND	ND
9.6_CLA-1 **PBR**	ND	ND	19	13	ND	ND	ND	ND	ND	ND	ND	68	ND	1.4	ND	ND	ND	1700	ND	ND	ND	1700	32	10K	ND	ND
9.7_CLA-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.6**	ND	ND	17K	ND	27	ND	ND	ND	14K	ND	ND
9.8_CLA-1 **PBR**	ND	ND	10	38	ND	ND	ND	ND	ND	ND	ND	11	ND	1.8	ND	ND	ND	4700	ND	ND	ND	1600	ND	4600	ND	ND
10.0_Ctn 1 **PBR**	ND	ND	ND	19	ND	ND	ND	ND	ND	ND	ND	7.2	ND	ND	**3.7**	ND	ND	73K	ND	ND	ND	2400	27	41K	ND	ND
10.1_Ctn 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	ND	ND	ND	ND	ND	19K	ND	860	ND	3500	ND	14K	ND	ND
10.2_Ctn 1 **PBR**	ND	ND	ND	170	ND	ND	ND	ND	ND	ND	ND	6.5	ND	ND	**1.3**	ND	ND	7100	ND	ND	ND	ND	ND	6100	ND	ND
10.3_Ctn 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.0	ND	ND	**12.0**	ND	ND	25K	ND	ND	ND	33000	ND	11K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
10.4_Ctn 1 **PBR**	Varner well **Clayton**	unknown	bedrock	12/17/08	6.03	58	4.12	17.2	NA	NA	ND	ND	ND	0.58	0.11
11.0_CLT-1 **PBR**	Corinth Woods S/D Well #1 **Clayton**	**Hub**	**Hub**	08/22/07	6.30	350	2.11	18.4	NA	NA	ND	ND	92	0.59	ND
11.2_CLT-1 **PBR**	Milan Well **Clayton**	150	bedrock	10/07/08	6.23	216	4.83	19.4	NA	NA	ND	ND	ND	2.20	0.07
11.3_CLT-1 **PBR**	Hill Well **Clayton**	250	bedrock	10/07/08	6.15	158	5.27	17.2	NA	NA	TCM = 0.87	ND	ND	2.60	0.05
11.4_CLT-1 **PBR**	Sabree Well **Clayton**	unknown	unknown	10/07/08	6.45	95	6.93	17.4	NA	NA	ND	ND	ND	0.93	0.05
11.5_CLT-1 **PBR**	Johnson Well **Clayton**	unknown	unknown	10/22/09	5.63	91	2.80	16.0	NA	NA	ND	ND	ND	0.18	0.07
12.0_Clb 1 **PBR**	Mistletoe SP Mgr's Res. Well **Columbia**	**Hub**	**Hub**	05/10/06	6.08	86	6.56	18.8	100	100	ND	12	ND	1.80	ND
12.1_Clb 1 **PBR**	Mistletoe SP Cabin Area Well **Columbia**	unknown	bedrock	05/08/08	5.84	87	NA	18.4	NA	NA	ND	ND	15	0.46	0.22
12.2_Clb 1 **PBR**	Woods Well **Columbia**	185	bedrock	10/22/08	6.30	388	1.38	25.5	NA	NA	ND	36	29	0.30	0.16
12.3_Clb 1 **PBR**	G.J. Jones Well **Columbia**	420	bedrock	10/22/08	6.87	136	5.58	18.7	NA	NA	ND	ND	ND	0.45	0.30
12.4_Clb 1 **PBR**	Golucke Well **Columbia**	unknown	bedrock	10/22/08	6.43	155	3.40	18.5	NA	NA	ND	ND	ND	1.30	0.13
12.5_Clb 1 **PBR**	McCombs Well **Columbia**	300	bedrock	10/22/08	7.23	274	0.96	19.9	NA	NA	ND	15	ND	0.16	0.08

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
10.4_Ctn 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39	ND	ND	ND	ND	ND	7800	ND	82	ND	2700	ND	8700	ND	ND
11.0_CLT-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	**12.0**	66	ND	44K	ND	ND	ND	9400	ND	16K	ND	ND
11.2_CLT-1 **PBR**	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	19.0	ND	1.9	**3.9**	ND	ND	21K	ND	ND	5600	8600	ND	10K	ND	ND
11.3_CLT-1 **PBR**	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	51.0	ND	ND	**14.0**	ND	ND	16K	ND	ND	ND	2900	ND	11K	ND	ND
11.4_CLT-1 **PBR**	ND	ND	ND	64	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	ND	ND	ND	7000	ND	ND	ND	5600	ND	5300	ND	ND
11.5_CLT-1 **PBR**	ND	ND	19	12	ND	ND	ND	ND	ND	ND	ND	16.0	ND	7.2	ND	190	ND	8800	ND	310	ND	1400	10	8800	ND	ND
12.0_Clb 1 **PBR**	0.4	ND	ND	5.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	**7.6**	ND	ND	8000	ND	ND	ND	3900	ND	13K	ND	ND
12.1_Clb 1 **PBR**	ND	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	15.0	ND	2.3	**13.0**	ND	ND	9200	ND	ND	ND	4500	ND	10K	ND	ND
12.2_Clb 1 **PBR**	ND	ND	19	78	ND	ND	ND	ND	ND	ND	ND	33.0	ND	2.9	ND	130	ND	26K	ND	320	ND	16K	ND	33K	10	ND
12.3_Clb 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	**1.8**	ND	ND	11K	ND	ND	ND	4200	ND	13K	ND	ND
12.4_Clb 1 **PBR**	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	13	1.9	ND	ND	ND	ND	11K	ND	ND	ND	4900	ND	14K	ND	ND
12.5_Clb 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	78.0	ND	ND	**2.7**	ND	ND	27K	ND	24	ND	7900	ND	17K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No.	Well Name	Well Depth	Aquifer	Date	pH	cond.	diss O2	Temp	Radiation - cps		VOCS	Cl	SO4	NOx	P
Province	County	feet		sampled		uS/cm	mg/L	^0C	backgrd	water	ug/L	mg/L	mg/L	mg N/L	mg/L
12.6_Clb 1 **PBR**	R.T. Jones Well **Columbia**	unknown	bedrock	10/22/08	6.84	210	0.57	18.4	NA	NA	ND	ND	23	ND	0.06
12.7_Clb 1 **PBR**	Gurley Well **Columbia**	300	bedrock	10/22/08	6.23	140	3.83	17.3	NA	NA	ND	ND	ND	0.47	0.14
13.0_COW- **PBR**	The Gates S/D #1 **Coweta**	**Hub**	**Hub**	12/13/07	NA	170	NA	18.8	NA	NA	ND	ND	12	0.25	0.08
13.1_COW- **PBR**	Griffin Well **Coweta**	unknown	unknown	04/22/09	6.87	105	3.88	17.0	NA	NA	ND	ND	ND	0.52	ND
13.2_COW- **PBR**	Haynes Well **Coweta**	208	bedrock	04/22/09	5.33	51	6.44	17.4	NA	NA	ND	ND	ND	0.04	0.13
13.3_COW- **PBR**	Vise Well **Coweta**	310	bedrock	04/22/09	6.02	83	8.00	17.2	NA	NA	ND	ND	ND	0.66	0.02
13.4_COW- **PBR**	Hope Well **Coweta**	300	bedrock	04/22/09	5.85	90	8.03	17.9	NA	NA	ND	ND	ND	4.00	0.13
14.0_Crw 1 **PBR**	Musella #1 **Crawford**	**Hub**	**Hub**	08/24/06	7.15	225	NA	19.2	50	50	NA	ND	49	0.03	ND
14.1_Crw 1 **PBR**	Moore Well **Crawford**	660	bedrock	08/05/09	7.29	262	1.11	20.0	NA	NA	ND	ND	ND	ND	0.06
14.2_Crw 1 **PBR**	Walker Well **Crawford**	40	regolith	08/05/09	5.34	80	5.36	19.4	NA	NA	ND	ND	ND	1.40	0.33
14.3_Crw 1 **PBR**	Land Well **Crawford**	480	bedrock	08/05/09	7.78	152	0.94	19.2	NA	NA	ND	ND	10	0.32	0.23
14.4_Crw 1 **PBR**	Lowrey Well **Crawford**	60	regolith	08/05/09	6.64	364	2.90	19.1	NA	NA	ND	46	ND	0.56	0.27

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
12.6_Clb 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.0	ND	ND	ND	ND	ND	26K	ND	1200	ND	3100	180	12K	ND	ND
12.7_Clb 1 **PBR**	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	83.0	ND	ND	**2.1**	ND	ND	12K	ND	270	ND	3100	ND	15K	ND	ND
13.0_COW-1 **PBR**	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	3.9	ND	ND	**1.2**	ND	ND	23K	ND	ND	ND	3800	ND	10K	ND	ND
13.1_COW-1 **PBR**	ND	ND	26	17	ND	ND	ND	ND	ND	ND	ND	6.0	ND	ND	ND	ND	ND	11K	ND	25	ND	3600	ND	5200	ND	ND
13.2_COW-1 **PBR**	18	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	43.0	ND	1.2	ND	ND	ND	3600	ND	2100	ND	3100	ND	3300	ND	ND
13.3_COW-1 **PBR**	ND	ND	130	55	ND	ND	ND	ND	ND	ND	ND	33.0	ND	ND	ND	ND	ND	11K	ND	ND	ND	2000	21	4800	ND	ND
13.4_COW-1 **PBR**	ND	ND	8.7	12	ND	ND	ND	ND	ND	ND	ND	23.0	ND	ND	ND	ND	ND	7200	ND	23	ND	1400	ND	7800	ND	ND
14.0_Crw 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.0	ND	ND	**1.6**	ND	ND	51K	ND	44	ND	8400	100	13K	ND	ND
14.1_Crw 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.7	ND	ND	ND	ND	ND	35K	ND	ND	ND	3700	ND	18K	ND	ND
14.2_Crw 1 **PBR**	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	31.0	ND	ND	ND	ND	ND	5300	ND	52	ND	1200	ND	10K	ND	ND
14.3_Crw 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	ND	ND	20K	ND	ND	ND	3500	ND	6700	ND	ND
14.4_Crw 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.0	ND	ND	ND	ND	ND	42K	ND	51	ND	11K	ND	18K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
15.0_DOL-1 **PBR**	Dogwood Blossom MHP #1 **Douglas**	**Hub**	**Hub**	09/12/07	8.26	60	NA	16.0	NA	NA	ND	ND	ND	1.00	ND
15.1_DOL-1 **PBR**	Yates Well **Douglas**	87	unknown	07/24/08	5.34	106	5.23	17.3	90	70	ND	12	ND	4.60	ND
15.2_DOL-1 **PBR**	Meador Well **Douglas**	unknown	bedrock	07/24/08	6.11	137	4.68	16.9	65	65	ND	ND	14	1.60	0.03
15.3_DOL-1 **PBR**	Eley Well **Douglas**	200	bedrock	06/11/09	4.35	42	7.92	18.7	NA	NA	ND	ND	ND	0.38	0.05
15.4_DOL-1 **PBR**	Gilstrap Well **Douglas**	80	regolith	12/17/09	6.10	32	NA	14.4	NA	NA	ND	ND	ND	0.91	0.02
16.0_ELB-1 **PBR**	Beaverdam MHP #1 **Elbert**	**Hub**	**Hub**	07/11/07	6.21	104	NA	16.9	NA	NA	ND	ND	16	1.20	0.07
16.1_ELB-1 **PBR**	Cecchini Bored Well **Elbert**	47	regolith	12/04/08	6.49	81	4.48	16.6	NA	NA	ND	ND	ND	0.26	ND
16.2_ELB-1 **PBR**	Cecchini Drilled Well **Elbert**	400	bedrock	12/04/08	7.59	562	ND	14.5	NA	NA	ND	ND	240	NR	ND
16.3_ELB-1 **PBR**	Grant Well **Elbert**	600	bedrock	12/04/08	6.01	80	4.81	16.8	120	120	ND	ND	ND	0.11	0.07
16.4_ELB-1 **PBR**	Calvey Well **Elbert**	unknown	bedrock	07/23/09	5.94	81	NA	17.9	NA	NA	ND	ND	12	0.39	0.09
17.0_Fay 2 **PBR**	Brooks #1 **Fayette**	**Hub**	**Hub**	11/08/06 12/20/06	7.59 7.28	210 320	NA NA	18.2 18.4	NA NA	NA NA	MTBE = 3.7 MTBE = 3.3	ND ND	14 15	0.11 0.12	ND 0.02
17.1_Fay 2 **PBR**	Hardy Well **Fayette**	505	bedrock	09/24/08	7.08	108	0.30	19.4	NA	NA	ND	ND	ND	0.03	0.43

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
15.0_DOL-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	**1.2**	ND	ND	6400	ND	64	ND	2100	ND	4400	ND	ND
15.1_DOL-1 **PBR**	ND	ND	9.2	12	ND	ND	ND	ND	ND	ND	ND	36	ND	ND	ND	ND	ND	5300	ND	120	ND	3500	87	8600	ND	ND
15.2_DOL-1 **PBR**	ND	ND	ND	46	ND	ND	ND	ND	ND	ND	ND	45	ND	ND	ND	ND	ND	16K	ND	97	ND	2800	26	7000	ND	ND
15.3_DOL-1 **PBR**	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	23.0	ND	1.4	ND	ND	ND	2800	ND	260	ND	1300	ND	2500	ND	ND
15.4_DOL-1 **PBR**	15	ND	49	ND	ND	ND	ND	ND	ND	ND	ND	16.0	ND	1.8	ND	ND	ND	5500	ND	ND	ND	1000	ND	2700	ND	ND
16.0_ELB-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43.0	ND	ND	**2.5**	ND	ND	20K	ND	ND	ND	3600	ND	12K	ND	ND
16.1_ELB-1 **PBR**	ND	ND	24	95	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	ND	ND	24K	ND	310	ND	ND	16	4500	ND	ND
16.2_ELB-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16**	ND	ND	170K	ND	ND	ND	2400	18	23K	ND	ND
16.3_ELB-1 **PBR**	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	2.1	**12**	ND	ND	9300	ND	27	ND	2100	10	6900	ND	ND
16.4_ELB-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	ND	ND	**2.8**	ND	ND	13K	ND	32	ND	3900	ND	7800	ND	ND
17.0_Fay 2 **PBR**	ND ND	10 ND	8.6 ND	640 490	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	13.0 12.0	ND ND	4.6 2.8	**43.0** **42.0**	140 70	ND ND	56K 53K	ND ND	930 570	ND ND	4800 4500	360 320	13K 12K	ND ND	ND ND
17.1_Fay 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	**4.5**	ND	ND	20K	ND	ND	ND	5300	ND	13K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^{0}C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
17.2_Fay 2 **PBR**	Spradlin Well **Fayette**	unknown	unknown	03/06/09	5.68	68	7.48	17.4	NA	NA	ND	ND	ND	1.20	0.09
17.3_Fay 2 **PBR**	J.C. Fleming Well **Fayette**	256	bedrock	06/24/09	5.66	70	6.43	18.6	NA	NA	ND	ND	ND	1.00	0.27
17.4_Fay 2 **PBR**	Butler Well **Fayette**	298	bedrock	03/06/09	6.34	49	6.41	18.0	NA	NA	ND	ND	ND	1.10	0.12
17.5_Fay 2 **PBR**	W.C. Fleming Well **Fayette**	525	bedrock	03/06/09	8.63	161	0.67	19.2	NA	NA	ND	ND	ND	0.92	0.04
17.6_Fay 2 **PBR**	Turner Well **Fayette**	200	bedrock	03/06/09	6.05	85	2.68	18.3	NA	NA	ND	ND	ND	0.30	0.11
17.10_Fay 2 **PBR**	Clancy Well **Fayette**	unknown	regolith	09/24/08	6.04	30	5.13	18.6	NA	NA	ND	ND	ND	1.20	0.42
17.19_Fay 2 **PBR**	Simmons Well **Fayette**	40	regolith	09/24/08	5.09	22	5.84	18.3	NA	NA	ND	ND	ND	0.13	0.42
18.0_FAY-1 **PBR**	Starr's Mill Ridge Well **Fayette**	**Hub**	**Hub**	03/13/08	6.39	193	NA	18.1	NA	NA	ND	ND	55	0.08	0.05
18.1_FAY-1 **PBR**	New Hope Bapt. Ch. Spring **Fayette**	0	Regolith	07/10/08	5.79	62	NA	22.2	NA	NA	ND	ND	ND	0.54	0.04
18.3_FAY-1 **PBR**	Wilson Well **Fayette**	500	bedrock	06/24/09	6.19	187	2.60	18.6	NA	NA	ND	ND	ND	0.09	0.21
18.4_FAY-1 **PBR**	Lynch Well **Fayette**	235	bedrock	06/24/09 08/19/09	6.01 5.84	150 149	4.22 4.28	18.0 18.0	NA NA	NA NA	ND ND	ND ND	ND ND	0.29 0.32	0.28 0.08
18.5_FAY-1 **PBR**	Uy Well **Fayette**	unknown	regolith	06/24/09	4.79	52	3.73	17.0	NA	NA	TCM = 0.7	ND	ND	0.17	0.20

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U** **ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
17.2_Fay 2 **PBR**	ND	ND	5.5	ND	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	ND	ND	ND	5000	ND	ND	ND	1500	ND	6700	ND	ND
17.3_Fay 2 **PBR**	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	24.0	ND	ND	ND	ND	ND	6400	ND	ND	ND	1800	ND	5000	ND	ND
17.4_Fay 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.0	ND	ND	ND	ND	ND	3100	ND	ND	ND	1100	ND	5100	ND	ND
17.5_Fay 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND	ND	**5.5**	ND	ND	15K	ND	ND	ND	ND	ND	21K	ND	ND
17.6_Fay 2 **PBR**	ND	ND	7.6	130	ND	ND	ND	ND	ND	ND	ND	11.0	ND	ND	ND	ND	ND	8000	ND	130	ND	1800	20	7100	ND	ND
17.10_Fay 2 **PBR**	ND	ND	35	13	ND	ND	ND	ND	ND	ND	ND	19	ND	1.8	ND	ND	ND	2400	ND	ND	ND	1600	11	4900	ND	ND
17.19_Fay 2 **PBR**	ND	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	85.0	ND	2.5	ND	ND	ND	2800	ND	ND	ND	ND	ND	2100	ND	ND
18.0_FAY-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	79.0	ND	1.1	**11.0**	170	ND	33K	ND	ND	5300	7700	15	15K	ND	ND
18.1_FAY-1 **PBR**	ND	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	35	ND	ND	ND	ND	ND	3500	ND	ND	ND	1700	ND	6000	ND	ND
18.3_FAY-1 **PBR**	ND	ND	6.5	ND	ND	ND	ND	ND	ND	ND	ND	21.0	ND	ND	**13.0**	ND	ND	20K	ND	66	ND	5700	120	10K	ND	ND
18.4_FAY-1 **PBR**	ND ND	ND ND	50 36	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	17.0 16.0	ND ND	ND ND	**33.0** **23.0**	ND ND	ND ND	17K 18K	ND ND	ND ND	ND ND	4100 4900	ND ND	9900 12K	ND ND	ND ND
18.5_FAY-1 **PBR**	ND	ND	62	ND	ND	ND	ND	ND	ND	ND	ND	28.0	ND	1.5	ND	110	ND	3800	ND	42	ND	1800	ND	4500	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
18.8_FAY-1 PBR	Lone Oak Well **Fayette**	unknown	bedrock	08/05/08	6.78	237	0.55	18.7	NA	NA	ND	ND	26	ND	ND
19.0_FOR-1 PBR	Wood Creek S/D Well **Forsyth**	**Hub**	**Hub**	08/09/07	6.36	205	0.14	16.8	NA	NA	ND	ND	12	0.10	ND
19.1_FOR-1 PBR	Gibson Well **Forsyth**	unknown	bedrock	12/17/08	6.77	94	9.15	16.2	NA	NA	MTBE = 2.2	ND	ND	0.27	0.03
19.2_FOR-1 PBR	Stone Well **Forsyth**	50	Regolith	12/17/08	6.03	80	7.57	16.3	NA	NA	MTBE = 2.0	ND	ND	1.30	ND
19.3_FOR-1 PBR	Lobb Well **Forsyth**	200	bedrock	12/17/08	5.22	25	8.04	16.4	NA	NA	ND	ND	ND	0.02	ND
19.4_FOR-1 PBR	Largin Well **Forsyth**	235	bedrock	12/17/08	6.34	84	0.99	16.0	NA	NA	ND	ND	ND	ND	0.17
19.5_FOR-1 PBR	Shoemake Well **Forsyth**	120	unknown	12/17/08	4.79	46	6.03	16.2	NA	NA	ND	ND	ND	2.20	0.02
19.6_FOR-1 PBR	Shean Well **Forsyth**	unknown	unknown	12/17/08	5.03	56	5.56	15.9	NA	NA	ND	ND	ND	2.50	0.03
20.0_Frk 1 PBR	O'Connor Well **Franklin**	**Hub**	**Hub**	03/01/06 05/07/08	7.28 7.04	118 125	ND NA	16.9 17.3	30 NA	30 NA	NA ND	ND ND	ND ND	ND ND	0.10 0.02
20.1_Frk 1 PBR	Van Polen Well **Franklin**	363	bedrock	06/25/09 08/19/09	6.44 6.78	93 101	NA NA	17.7 17.4	NA NA	NA NA	ND ND	ND ND	ND ND	0.16 0.10	0.04 ND
20.2_Frk 1 PBR	Ward Well **Franklin**	405	bedrock	08/20/09	6.09	54	NA	18.2	80	80	ND	ND	ND	0.04	0.04
20.3_Frk 1 PBR	Robarts Well **Franklin**	408	bedrock	08/19/09	5.60	24	NA	16.7	NA	NA	ND	ND	ND	0.10	0.06

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
18.8_FAY-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	ND	ND	27K	ND	33	ND	3400	21	16K	ND	ND
19.0_FOR-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.0	ND	ND	**2.5**	ND	ND	29K	ND	180	ND	3700	62	8800	ND	ND
19.1_FOR-1 **PBR**	9.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	ND	ND	ND	11K	ND	ND	ND	4700	ND	4100	ND	12
19.2_FOR-1 **PBR**	ND	ND	6.2	11	ND	ND	ND	ND	ND	ND	ND	32.0	ND	ND	ND	100	ND	13K	ND	230	ND	1200	ND	2700	ND	ND
19.3_FOR-1 **PBR**	ND	ND	11	670	ND	ND	ND	ND	ND	ND	ND	15	ND	2.2	ND	ND	ND	1800	ND	42	ND	1000	ND	2000	ND	ND
19.4_FOR-1 **PBR**	ND	ND	ND	58	ND	ND	ND	ND	ND	ND	ND	18	ND	1.4	ND	ND	ND	13K	ND	60K	ND	2500	57	5700	ND	ND
19.5_FOR-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	ND	ND	2300	ND	ND	ND	1900	24	3700	ND	ND
19.6_FOR-1 **PBR**	ND	ND	510	21	ND	ND	ND	ND	ND	ND	ND	27	ND	1.5	ND	120	ND	2800	ND	40	ND	2100	31	5100	ND	ND
20.0_Frk 1 **PBR**	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	34.0 32.0	ND ND	ND ND	**5.7** **4.9**	ND ND	ND ND	19K 21K	ND ND	ND ND	6400 6900	6400 6600	120 130	6900 7600	ND ND	ND ND
20.1_Frk 1 **PBR**	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	12 17	ND ND	ND ND	**70** **46**	ND ND	ND ND	16K 18K	ND ND	100 ND	ND 5600	3700 4400	21 24	7400 9200	ND ND	ND ND
20.2_Frk 1 **PBR**	ND	ND	ND	480	ND	ND	ND	ND	ND	ND	ND	23	ND	ND	ND	210	ND	6800	ND	2900	ND	2700	97	6100	21	ND
20.3_Frk 1 **PBR**	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.1	ND	2.1	ND	230	ND	2800	ND	570	ND	1500	ND	4300	21	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
20.4_Frk 1 **PBR**	Wilson Well **Franklin**	80	regolith	08/20/09	6.13	62	NA	17.0	60	60	TCM = 0.86	ND	ND	0.44	0.07
20.5_Frk-1 **PBR**	Nickerson Well **Franklin**	300	bedrock	10/06/09	6.60	91	NA	17.2	80	80	ND	ND	ND	0.14	ND
20.6_Frk-1 **PBR**	Faucher-IvieWell **Franklin**	326	bedrock	10/06/09	6.17	80	NA	17.9	60	60	ND	ND	ND	0.19	0.03
20.7_Frk-1 **PBR**	Farrow Well **Franklin**	unknown	regolith	10/06/09	5.55	47	NA	17.2	40	40	ND	ND	ND	1.20	ND
20.8_Frk-1 **PBR**	Harper Well **Franklin**	300	bedrock	11/18/09	7.43	187	0.87	16.7	NA	NA	ND	ND	13	ND	0.02
21.0_Frk 2 **PBR**	GFC Franklin-Hart Unit Well **Franklin**	**Hub**	**Hub**	03/02/06	7.34	93	ND	17.3	90	90	NA	ND	11	ND	ND
21.1_Frk 2 **PBR**	Pitts Well **Franklin**	unknown	unknown	01/14/09	5.18	41	11.14	16.7	NA	NA	ND	ND	ND	0.62	ND
21.2_Frk 2 **PBR**	Taylor Well **Franklin**	unknown	regolith	01/14/09	5.43	84	2.81	11.8	NA	NA	ND	ND	ND	0.69	ND
21.3_Frk 2 **PBR**	Murphy Well **Franklin**	60	regolith	01/16/09	5.33	96	7.67	17.3	NA	NA	ND	ND	ND	4.10	ND
21.4_Frk 2 **PBR**	Craft Well **Franklin**	60	regolith	01/14/09	4.56	35	10.42	16.4	NA	NA	ND	ND	ND	1.00	ND
22.0_Grn 2 **PBR**	Oconee WMA Chk. Sta. Well **Greene**	**Hub**	**Hub**	10/18/06 10/18/06 04/16/08	7.09 7.09 7.32	88 88 88	NA NA NA	18.6 18.6 18.5	140 140 NA	140 140 NA	ND ND ND	ND ND ND	ND ND ND	1.00 1.00 1.10	0.05 0.05 0.09
22.1_Grn 2 **PBR**	Phares Well **Greene**	300	bedrock	01/28/09	5.01	50	4.97	15.5	NA	NA	ND	ND	ND	1.40	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
20.4_Frk 1 **PBR**	ND	ND	13	24	ND	ND	ND	ND	ND	ND	ND	20	ND	ND	ND	ND	ND	11K	ND	ND	ND	3400	ND	8000	ND	ND
20.5_Frk-1 **PBR**	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	**6.1**	ND	ND	15K	ND	40	ND	4200	ND	8800	ND	ND
20.6_Frk-1 **PBR**	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	8.7	ND	ND	ND	89	ND	11K	ND	160	ND	6500	ND	7200	ND	ND
20.7_Frk-1 **PBR**	ND	ND	6.6	11	ND	ND	ND	ND	ND	ND	ND	8.4	ND	ND	ND	ND	ND	6900	ND	47	ND	3000	ND	3600	ND	ND
20.8_Frk-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.8	ND	ND	**2.9**	ND	ND	22K	ND	56	ND	2300	ND	15K	ND	ND
21.0_Frk 2 **PBR**	ND	ND	ND	34	ND	ND	ND	ND	ND	ND	ND	7.1	ND	ND	**8.7**	ND	ND	18K	ND	410	ND	2500	62	6600	ND	ND
21.1_Frk 2 **PBR**	ND	ND	9.2	20	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	ND	98	ND	5600	ND	89	ND	ND	ND	1800	ND	ND
21.2_Frk 2 **PBR**	ND	ND	6.3	ND	ND	ND	ND	ND	ND	ND	ND	12.0	ND	1.8	ND	ND	ND	15K	ND	930	ND	ND	18	1600	ND	ND
21.3_Frk 2 **PBR**	ND	ND	22	19	ND	ND	ND	ND	ND	ND	ND	87.0	ND	1.9	ND	120	ND	9400	ND	64	ND	2700	41	4000	ND	ND
21.4_Frk 2 **PBR**	ND	ND	7.7	18	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	ND	200	ND	3500	ND	140	ND	ND	ND	1700	ND	ND
22.0_Grn 2 **PBR**	ND ND ND	ND ND ND	ND ND ND	ND 16 13	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	**1.0** ND **1.1**	ND ND ND	ND ND ND	15K 16K 14K	ND ND ND	ND ND ND	ND ND ND	4500 4500 4100	ND ND ND	13K 12K 11K	ND ND ND	ND ND ND
22.1_Grn 2 **PBR**	ND	ND	81	12	ND	ND	ND	ND	ND	ND	ND	4.6	ND	1.3	ND	ND	ND	3500	ND	ND	ND	ND	ND	5400	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No.	Well Name	Well Depth	Aquifer	Date	pH	cond.	diss O2	Temp	Radiation - cps		VOCS	Cl	SO4	NOx	P
Province	County	feet		sampled		uS/cm	mg/L	^0C	backgrd	water	ug/L	mg/L	mg/L	mg N/L	mg/L
22.2_Grn 2 **PBR**	Wenzel Well **Greene**	90	bedrock	01/28/09	5.48	65	7.66	19.1	NA	NA	ND	ND	ND	1.80	ND
22.3_Grn 2 **PBR**	Hodnett Well **Greene**	150	bedrock	01/28/09 03/11/09	6.32 6.60	229 209	4.10 4.84	17.6 18.4	NA 100	NA 110	ND ND	17 16	ND ND	6.90 4.70	ND 0.08
22.4_Grn 2 **PBR**	Myers Well **Greene**	305	bedrock	01/28/09	5.06	68	6.67	19.2	NA	NA	ND	ND	ND	3.20	ND
22.5_Grn 2 **PBR**	J Hodnett Well **Greene**	unknown	bedrock	03/11/09	5.41	85	5.91	17.9	70	70	ND	ND	ND	0.88	0.17
22.6_Grn 2 **PBR**	JL Myers Well **Greene**	unknown	bedrock	03/11/09	5.54	222	8.26	18.3	110	110	ND	22	ND	14.00	0.05
22.7_Grn 2 **PBR**	Hodnett Well 2 **Greene**	300	bedrock	04/29/09	5.88	183	5.84	19.0	140	140	CM = 0.97	10	ND	11.00	0.06
22.8_Grn 2 **PBR**	Bickers Well **Greene**	200	bedrock	03/11/09	6.14	122	3.17	19.2	90	90	ND	ND	ND	0.35	0.10
23.0_GRE-1 **PBR**	White Plains #1 **Greene**	**Hub**	**Hub**	06/06/07 08/23/07	6.72 6.88	124 137	NA NA	19.1 18.9	60 NA	80 NA	ND ND	ND ND	ND ND	1.00 1.20	0.10 0.09
23.1_GRE-1 **PBR**	Lacey House Well **Greene**	40	bedrock	04/29/09	5.09	143	5.63	17.9	NA	NA	ND	12	ND	6.70	0.13
23.2_GRE-1 **PBR**	Lacey Farm Well **Greene**	200	bedrock	04/29/09	5.58	71	5.38	19.5	NA	NA	ND	ND	ND	2.60	0.08
23.3_GRE-1 **PBR**	Eley Well **Greene**	40	regolith	07/08/09	4.58	84	7.53	18.9	NA	NA	ND	ND	ND	3.60	ND
23.4_GRE-1 **PBR**	Shell Well **Greene**	unknown	unknown	07/08/09	4.59	39	6.89	19.0	NA	NA	ND	ND	ND	0.36	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
22.2_Grn 2 **PBR**	ND	ND	5.2	ND	ND	ND	ND	ND	ND	ND	ND	18.0	ND	ND	ND	ND	ND	3100	ND	180	ND	1200	ND	8400	ND	ND
22.3_Grn 2 **PBR**	ND	ND	9.5	23	ND	ND	5.9	ND	ND	ND	ND	11.0	ND	ND	**200**	ND	ND	22K	ND	30	ND	4800	ND	16K	ND	ND
	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.0	ND	ND	**170**	ND	ND	21K	ND	ND	ND	4600	ND	17K	ND	ND
22.4_Grn 2 **PBR**	ND	ND	6.1	11	ND	ND	ND	ND	ND	ND	ND	47.0	ND	ND	ND	ND	ND	2800	ND	ND	ND	ND	ND	8600	ND	ND
22.5_Grn 2 **PBR**	ND	ND	10	11	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	ND	ND	ND	7000	ND	74	ND	2000	ND	8400	ND	ND
22.6_Grn 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	240.0	ND	ND	**1.1**	ND	ND	15K	ND	21	7800	5300	ND	13K	ND	ND
22.7_Grn 2 **PBR**	ND	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	170.0	ND	ND	**1.3**	ND	ND	9800	ND	ND	6400	3800	33	15K	ND	ND
22.8_Grn 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND	ND	**1.8**	ND	ND	11K	ND	ND	ND	3000	14	11K	ND	ND
23.0_GRE-1 **PBR**	ND	ND	ND	ND	ND	ND	6.7	ND	ND	ND	ND	6.9	ND	ND	**41.0**	ND	ND	21K	ND	ND	ND	7200	ND	13K	ND	ND
	ND	ND	ND	52	ND	ND	11.0	ND	ND	ND	ND	4.9	ND	ND	**60.0**	ND	ND	23K	ND	ND	ND	7500	ND	13K	ND	ND
23.1_GRE-1 **PBR**	ND	ND	11	30	ND	ND	ND	ND	ND	ND	ND	110.0	ND	2.6	ND	600	ND	9100	ND	320	6400	1400	18	10K	ND	ND
23.2_GRE-1 **PBR**	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	26.0	ND	ND	ND	57	ND	3000	ND	ND	ND	1400	29	8300	ND	ND
23.3_GRE-1 **PBR**	ND	ND	8.5	ND	ND	ND	ND	ND	ND	ND	ND	130.0	ND	1.1	ND	ND	ND	4800	ND	ND	ND	ND	ND	8800	ND	ND
23.4_GRE-1 **PBR**	ND	ND	6.7	15	ND	ND	ND	ND	ND	ND	ND	38.0	ND	1.4	ND	340	ND	3500	ND	230	ND	ND	11	4400	12	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
23.5_GRE-1 **PBR**	Edwards Well **Greene**	140	bedrock	07/08/09	5.51	149	5.03	18.5	NA	NA	ND	ND	ND	0.07	0.12
23.6_GRE-1 **PBR**	Ohanlon Well **Greene**	unknown	bedrock	07/08/09	5.13	141	3.50	19.4	NA	NA	ND	ND	ND	8.40	ND
23.7_GRE-1 **PBR**	Tanner Well **Greene**	255	bedrock	10/21/09	6.84	80	NA	19.1	NA	NA	ND	ND	ND	2.10	0.04
23.8_GRE-1 **PBR**	L. Eley Spring **Greene**	0	regolith	10/21/09	6.11	74	NA	18.5	NA	NA	ND	ND	ND	5.70	0.08
24.0_Gwn 2 **PBR**	Suwanee #1 **Gwinnett**	**Hub**	**Hub**	11/15/06	7.56	333	0.16	17.6	90	90	ND	ND	16	0.37	0.06
24.1_Gwn 2 **PBR**	Oshields Well **Gwinnett**	200	bedrock	10/07/09	5.43	109	5.57	16.8	NA	NA	TCM = 0.71	ND	ND	1.40	0.03
24.2_Gwn 2 **PBR**	Cannon Well **Gwinnett**	unknown	regolith	10/07/09	4.82	73	5.93	16.5	NA	NA	ND	ND	ND	0.17	0.03
24.3_Gwn 2 **PBR**	J. Moore Well **Gwinnett**	120	bedrock	10/07/09	5.1	45	7.69	17.2	NA	NA	ND	ND	ND	0.10	0.14
24.4_Gwn 2 **PBR**	W. Moore Well **Gwinnett**	200	bedrock	10/07/09	5.25	42	9.84	16.7	NA	NA	ND	ND	ND	0.24	0.16
25.0_Hbr 1 **PBR**	Mt. Airy City Hall Well **Habersham**	**Hub**	**Hub**	07/26/06	6.66	142	0.67	16.3	100	100	ND	ND	20	0.17	ND
25.1_Hbr 1 **PBR**	Rudeseal Well **Habersham**	800	bedrock	07/22/09	8.43	67	NA	17.7	NA	NA	ND	ND	ND	0.04	0.13
25.2_Hbr 1 **PBR**	Henson Well **Habersham**	unknown	regolith	07/22/09	6.49	45	NA	16.8	NA	NA	TCM = 1.1	ND	ND	0.87	0.06

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
23.5_GRE-1 **PBR**	18	31	5.8	110	ND	ND	ND	ND	ND	ND	ND	32.0	ND	ND	ND	ND	ND	14K	ND	67	ND	6800	ND	10K	ND	ND
23.6_GRE-1 **PBR**	ND	ND	13	21	ND	ND	ND	ND	ND	ND	ND	88.0	ND	1.8	**3.9**	ND	ND	8900	ND	26	ND	3700	33	9500	ND	ND
23.7_GRE-1 **PBR**	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	5.3	ND	ND	**14**	ND	ND	12K	ND	ND	ND	3000	ND	11K	ND	ND
23.8_GRE-1 **PBR**	ND	ND	30	32	ND	ND	ND	ND	ND	ND	ND	48	ND	1.7	ND	84	ND	6400	ND	48	ND	2800	ND	11K	ND	ND
24.0_Gwn 2 **PBR**	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	200.0	ND	ND	**3.0**	ND	ND	46K	ND	ND	ND	9000	58	12K	ND	ND
24.1_Gwn 2 **PBR**	5.2	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	20.0	ND	ND	ND	ND	ND	9800	ND	34	ND	3500	ND	9500	ND	ND
24.2_Gwn 2 **PBR**	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	26.0	ND	ND	ND	ND	ND	8000	ND	ND	ND	ND	ND	8600	ND	ND
24.3_Gwn 2 **PBR**	ND	ND	6.1	16	ND	ND	ND	ND	ND	ND	ND	33.0	ND	ND	ND	ND	ND	3400	ND	170	ND	ND	ND	5800	ND	ND
24.4_Gwn 2 **PBR**	ND	ND	11	15	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	ND	ND	ND	2900	ND	56	ND	ND	ND	6000	ND	ND
25.0_Hbr 1 **PBR**	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	**2.9**	ND	ND	35K	ND	1900	ND	5000	180	8600	ND	ND
25.1_Hbr 1 **PBR**	ND	ND	8.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	9100	ND	75	ND	ND	ND	11K	ND	ND
25.2_Hbr 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.1	ND	ND	ND	ND	ND	12K	ND	ND	ND	ND	ND	1800	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^{0}C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
25.3_Hbr 1 **PBR**	Hicks Well **Habersham**	250	bedrock	11/18/09	6.25	85	1.40	16.2	NA	NA	ND	ND	ND	ND	0.03
25.4_Hbr 1 **PBR**	Miller Well **Habersham**	600	bedrock	11/18/09	5.13	27	8.24	15.6	NA	NA	ND	ND	ND	0.86	0.09
26.0_Hok 2 **PBR**	Mayfield Utilities #2 **Hancock**	**Hub**	**Hub**	10/18/06	6.58	84	NA	20.1	80	80	ND	ND	10	1.60	0.02
26.1_Hok 2 **PBR**	Kendrick Well **Hancock**	324	bedrock	09/02/09	5.79	102	2.41	19.9	NA	NA	ND	ND	ND	ND	0.20
26.2_Hok 2 **PBR**	Hunter Well **Hancock**	240	bedrock	09/02/09	4.97	88	4.81	18.5	NA	NA	ND	ND	ND	0.25	0.09
26.3_Hok 2 **PBR**	Wallen Well **Hancock**	47	regolith	09/02/09	4.78	35	7.36	18.9	NA	NA	ND	ND	ND	0.45	0.03
26.4_Hok 2 **PBR**	Norris Well **Hancock**	400	bedrock	10/21/09	6.47	48	NA	18.9	NA	NA	ND	ND	ND	2.70	0.14
27.0_Jak 1 **PBR**	Burnett Well **Jackson**	**Hub**	**Hub**	07/26/06	7.26	133	0.45	17.0	70	80	ND	ND	ND	9.00	ND
27.1_Jak 1 **PBR**	Burnett Well **Jackson**	350	bedrock	02/25/09	6.63	116	5.44	17.2	NA	NA	ND	ND	11	0.62	0.02
27.2_Jak 1 **PBR**	Thomas Well **Jackson**	300	bedrock	02/25/09	5.46	165	8.82	11.2	NA	NA	ND	ND	ND	15.00	0.03
27.3_Jak 1 **PBR**	T. Martin Well **Jackson**	300	bedrock	02/25/09	6.80	184	1.03	17.1	NA	NA	ND	ND	13	1.10	0.10
27.4_Jak 1 **PBR**	B. Martin Well **Jackson**	250	bedrock	02/25/09	5.84	109	1.03	12.7	NA	NA	ND	ND	14	0.04	0.12

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
25.3_Hbr 1 PBR	ND	ND	6.6	10	ND	ND	ND	ND	ND	ND	ND	6.0	ND	ND	ND	ND	ND	8600	ND	ND	ND	2800	28	5400	ND	ND
25.4_Hbr 1 PBR	ND	ND	95	26	ND	ND	ND	ND	ND	ND	ND	11.0	ND	6.1	ND	78	ND	1200	ND	180	ND	1500	14	1600	ND	ND
26.0_Hok 2 PBR	ND	ND	ND	27	ND	ND	8.0	ND	ND	ND	ND	6.6	ND	ND	**13.0**	ND	ND	17K	ND	ND	ND	2000	ND	11K	ND	ND
26.1_Hok 2 PBR	ND	ND	ND	11	ND	ND	46.0	ND	ND	ND	ND	20.0	ND	ND	ND	ND	ND	6800	ND	230	ND	2200	46	9100	ND	ND
26.2_Hok 2 PBR	ND	ND	6.2	ND	ND	ND	ND	ND	ND	ND	ND	14.0	ND	ND	ND	ND	ND	6300	ND	26	ND	2600	ND	10K	ND	ND
26.3_Hok 2 PBR	ND	ND	7.3	18	ND	ND	ND	ND	ND	ND	ND	47.0	ND	1.4	ND	130	ND	3100	ND	73	ND	ND	ND	2400	ND	ND
26.4_Hok 2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.8	ND	ND	ND	ND	ND	6100	ND	ND	ND	1100	ND	8900	ND	ND
27.0_Jak 1 PBR	ND	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	6.2	ND	ND	**15.0**	ND	ND	24K	ND	ND	ND	8000	ND	11K	ND	ND
27.1_Jak 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	**7.1**	ND	ND	11K	ND	ND	ND	44000	ND	77000	ND	ND
27.2_Jak 1 PBR	ND	ND	17	15	ND	ND	ND	ND	ND	ND	ND	21.0	ND	ND	ND	ND	ND	9300	ND	ND	ND	8300	ND	7600	ND	ND
27.3_Jak 1 PBR	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	27.0	ND	ND	**9.1**	ND	ND	18K	ND	ND	ND	6800	110	9900	ND	ND
27.4_Jak 1 PBR	ND	ND	ND	2100	ND	ND	ND	ND	ND	ND	ND	26.0	ND	ND	**1.6**	ND	ND	6400	ND	330	ND	3800	35	8100	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No.	Well Name	Well Depth	Aquifer	Date	pH	cond.	diss O2	Temp	Radiation - cps		VOCS	Cl	SO4	NOx	P
Province	County	feet		sampled		uS/cm	mg/L	^0C	backgrd	water	ug/L	mg/L	mg/L	mg N/L	mg/L
28.0_Jak 2 **PBR**	Nicholson #1 **Jackson**	**Hub**	**Hub**	09/20/06	5.33	109	6.69	17.2	100	100	NA	ND	ND	5.50	0.05
28.1_Jak 2 **PBR**	J. Palmer Well **Jackson**	450	bedrock	05/13/09	6.49	67	7.36	18.0	NA	NA	ND	ND	ND	1.40	ND
28.2_Jak 2 **PBR**	T. Palmer Well **Jackson**	unknown	unknown	05/13/09	5.70	43	7.64	18.2	NA	NA	ND	ND	ND	0.44	ND
28.3_Jak 2 **PBR**	Gunderson Well **Jackson**	60	regolith	09/16/09	4.75	43	7.56	17.9	NA	NA	ND	ND	ND	0.48	0.02
28.4_Jak 2 **PBR**	Massey Well **Jackson**	unknown	unknown	09/16/09	5.05	74	7.63	17.6	NA	NA	ND	ND	ND	3.50	ND
29.0_Jsp 2 **PBR**	Shady Dale Park Well (#101) **Jasper**	**Hub**	**Hub**	07/19/06	6.13	95	5.54	18.4	80	80	ND	12	ND	3.20	0.08
29.1_Jsp 2 **PBR**	Champion Well **Jasper**	485	bedrock	06/11/09	7.11	67	NA	19.1	90	90	ND	ND	ND	0.91	0.17
29.2_Jsp 2 **PBR**	Poledor Well **Jasper**	245	bedrock	10/21/09	7.10	133	NA	18.3	NA	NA	ND	13	ND	7.70	0.07
29.3_Jsp 2 **PBR**	Skipper Well **Jasper**	50	regolith	10/21/09	6.72	75	NA	17.1	NA	NA	ND	ND	ND	0.17	0.20
29.4_Jsp 2 **PBR**	Biggs Well **Jasper**	350	bedrock	10/21/09	6.70	51	NA	18.6	NA	NA	ND	ND	ND	0.66	0.09
30.0_JAS-1 **PBR**	Martin Marina Well **Jasper**	**Hub**	**Hub**	08/22/07	6.61	142	NA	19.1	NA	NA	ND	ND	ND	ND	ND
30.1_JAS-1 **PBR**	Washington Well **Jasper**	unknown	bedrock	06/10/09	6.02	55	NA	18.9	110	110	MTBE = 1.2	ND	ND	0.64	0.04

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
28.0_Jak 2 **PBR**	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	96.0	ND	ND	**1.3**	ND	ND	6800	ND	ND	ND	3900	14	7200	ND	ND
28.1_Jak 2 **PBR**	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	7.3	ND	ND	ND	ND	ND	5000	ND	65	ND	2200	38	4700	ND	ND
28.2_Jak 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.0	ND	ND	ND	ND	ND	4300	ND	ND	ND	ND	ND	1800	ND	ND
28.3_Jak 2 **PBR**	ND	ND	12	23	ND	ND	ND	ND	ND	ND	ND	22.0	ND	ND	ND	ND	ND	5700	ND	ND	ND	1300	ND	1300	ND	ND
28.4_Jak 2 **PBR**	ND	ND	ND	41	ND	ND	ND	ND	ND	ND	ND	59.0	ND	ND	ND	ND	ND	8400	ND	ND	ND	2100	ND	1800	ND	ND
29.0_Jsp 2 **PBR**	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44.0	ND	ND	**2.2**	ND	ND	14K	ND	ND	ND	3800	ND	11K	ND	ND
29.1_Jsp 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	11K	ND	ND	ND	3200	ND	8300	ND	11
29.2_Jsp 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.7	ND	1.9	ND	ND	ND	20K	ND	82	ND	6400	ND	12K	ND	11
29.3_Jsp 2 **PBR**	6.9	ND	54	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	1.7	ND	ND	ND	12K	ND	35	ND	3100	ND	11K	ND	ND
29.4_Jsp 2 **PBR**	5.9	ND	5.1	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND	6800	ND	ND	ND	2300	ND	6800	ND	ND
30.0_JAS-1 **PBR**	ND	ND	ND	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.1**	ND	ND	32K	ND	200	ND	5600	90	11K	ND	ND
30.1_JAS-1 **PBR**	ND	ND	9.7	14	ND	ND	ND	ND	ND	ND	ND	25	ND	8.5	ND	ND	ND	6600	ND	690	ND	2100	ND	4700	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
30.2_JAS-1 PBR	Jones Well **Jasper**	unknown	regolith	12/03/09	6.35	81	NA	18.4	NA	NA	ND	19	ND	0.62	ND
30.3_JAS-1 PBR	Stansell Well **Jasper**	unknown	unknown	11/04/09	6.92	77	NA	19.3	NA	NA	ND	ND	ND	0.13	0.04
30.4_JAS-1 PBR	White Well **Jasper**	unknown	bedrock	12/03/09	5.88	31	NA	18.1	NA	NA	ND	ND	ND	0.09	0.04
31.0_Jns 1 PBR	GFC Jasper-Jones Unit Well **Jones**	**Hub**	**Hub**	06/15/06	7.71	163	0.96	19.3	60	60	ND	ND	30	0.05	ND
31.1_Jns 1 PBR	Wells Well **Jones**	unknown	regolith	04/22/09	6.79	55	NA	18.1	NA	NA	ND	ND	ND	0.14	0.18
31.2_Jns 1 PBR	Musselman Well **Jones**	400	bedrock	04/22/09	7.01	61	NA	16.6	NA	NA	ND	ND	ND	0.42	0.17
31.3_Jns 1 PBR	Jackson Well **Jones**	45	regolith	04/22/09	6.71	29	NA	17.2	NA	NA	ND	ND	ND	0.71	0.06
31.4_Jns 1 PBR	Sunshine UMC Well **Jones**	unknown	bedrock	12/17/09	5.73	43	NA	17.3	NA	NA	ND	ND	ND	1.30	0.04
32.0_Jns-2 PBR	Gray/Roberts Well **Jones**	**Hub**	**Hub**	11/30/06	6.40	204	NA	19.1	90	90	ND	ND	60	0.04	0.03
32.1_Jns-2 PBR	Baird Well **Jones**	18	regolith	05/14/09	5.40	34	NA	18.9	NA	NA	ND	ND	ND	0.54	ND
32.2_Jns-2 PBR	Gray/Bragg Well **Jones**	unknown	bedrock	05/14/09	6.60	197	NA	19.4	NA	NA	ND	ND	28	0.07	ND
32.3_Jns-2 PBR	Pace Well **Jones**	unknown	unknown	10/08/09	5.84	33	NA	20.3	90	90	ND	ND	ND	0.26	0.07

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
30.2_JAS-1 PBR	ND	ND	37	12	ND	ND	ND	ND	ND	ND	ND	68	ND	6.1	ND	250	ND	7100	ND	1300	ND	1200	95	15K	ND	ND
30.3_JAS-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND	ND	12K	ND	2200	ND	4400	46	9600	ND	ND
30.4_JAS-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	61	ND	1.1	ND	ND	ND	3100	ND	ND	ND	1700	ND	3600	ND	ND
31.0_Jns 1 PBR	ND	ND	ND	110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**13.0**	ND	ND	36K	ND	47	ND	5900	10	11K	ND	ND
31.1_Jns 1 PBR	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	9.3	ND	4.5	ND	ND	ND	6200	ND	80	ND	ND	ND	11K	ND	ND
31.2_Jns 1 PBR	ND	ND	8.4	110	ND	ND	ND	ND	ND	ND	ND	63	ND	ND	ND	ND	ND	6300	ND	110	ND	2400	ND	8600	ND	ND
31.3_Jns 1 PBR	ND	ND	42	21	ND	ND	ND	ND	ND	ND	ND	18	ND	5.2	ND	1200	ND	3600	ND	1200	ND	ND	12	1700	21	ND
31.4_Jns 1 PBR	ND	ND	170	45	ND	ND	ND	ND	ND	ND	ND	7.1	ND	2.6	ND	ND	ND	2400	ND	ND	ND	1100	ND	8500	ND	ND
32.0_Jns-2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.0	ND	ND	**1.1**	ND	ND	48K	ND	1100	ND	6500	120	16K	ND	ND
32.1_Jns-2 PBR	ND	ND	20	13	ND	ND	ND	ND	ND	ND	ND	14	ND	1.5	ND	100	ND	2600	ND	160	ND	1500	ND	4400	ND	ND
32.2_Jns-2 PBR	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	**9.3**	ND	ND	29K	ND	ND	ND	7900	70	14K	ND	ND
32.3_Jns-2 PBR	7	ND	30	12	ND	ND	ND	ND	ND	ND	ND	6.7	ND	1.3	ND	110	ND	3800	ND	60	ND	1200	ND	5000	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
32.4_Jns-2 **PBR**	Clay Well **Jones**	30	regolith	10/08/09	6.02	69	NA	19.1	NA	NA	ND	ND	ND	0.70	0.06
33.0_LIN-1 **PBR**	Fishing Ck. RVP/MHP Well **Lincoln**	**Hub**	**Hub**	07/11/07 09/06/07	7.18 6.48	71 86	NA NA	20.0 18.4	NA 100	NA 100	ND ND	ND ND	15 18	0.45 0.41	ND 0.08
33.1_LIN-1 **PBR**	Blakey Well **Lincoln**	unknown	bedrock	04/30/09	6.65	75	NA	19.7	NA	NA	ND	ND	ND	3.00	0.08
33.2_LIN-1 **PBR**	Craver Well **Lincoln**	540	bedrock	05/27/09	6.45	100	NA	18.5	NA	NA	ND	ND	ND	1.40	0.21
33.3_LIN-1 **PBR**	Laney Well **Lincoln**	unknown	bedrock	05/27/09	6.93	159	NA	17.8	40	40	ND	ND	ND	0.03	0.21
33.4_LIN-1 **PBR**	Paxton Well **Lincoln**	125	bedrock	05/28/09	5.99	42	NA	18.9	NA	NA	ND	ND	ND	2.70	0.12
34.0_Lpk 2 **PBR**	Long Branch School Well **Lumpkin**	**Hub**	**Hub**	07/27/06	7.51	116	0.04	16.0	80	80	ND	ND	19	0.12	ND
34.1_Lpk 2 **PBR**	Williams Well **Lumpkin**	500	bedrock	02/12/09	6.87	54	7.84	15.5	NA	NA	ND	ND	ND	0.48	0.20
34.2_Lpk 2 **PBR**	Westbrook Well **Lumpkin**	500	bedrock	02/12/09	8.02	124	0.03	15.7	NA	NA	ND	ND	15	ND	ND
34.3_Lpk 2 **PBR**	Moore Well **Lumpkin**	400	bedrock	03/05/09	6.01	33	3.34	15.2	NA	NA	ND	ND	ND	ND	0.12
34.4_Lpk 2 **PBR**	Nored Well **Lumpkin**	325	bedrock	03/05/09	8.22	159	ND	14.5	NA	NA	ND	ND	46	ND	0.06
35.0_Mcd 1 **PBR**	GFC McDuffie/Warren Unit Well **McDuffie**	**Hub**	**Hub**	08/09/06	5.82	68	6.36	19.5	NA	NA	ND	12	ND	1.00	0.08

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
32.4_Jns-2 **PBR**	ND	ND	12	10	ND	ND	ND	ND	ND	ND	ND	23	ND	1.2	ND	170	ND	6800	ND	71	ND	4000	ND	9900	ND	ND
33.0_LIN-1 **PBR**	ND ND	ND ND	22 ND	61 20	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	8.9 6.6	ND ND	#### 1.2	**16.0** **19.0**	ND ND	ND ND	15K 17K	ND ND	ND ND	ND ND	3300 3500	ND ND	7700 7700	ND ND	ND ND
33.1_LIN-1 **PBR**	ND	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	2.1	ND	1.8	**1.1**	ND	ND	8600	ND	36	ND	2300	22	7500	ND	ND
33.2_LIN-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	ND	ND	ND	ND	ND	12K	ND	22	ND	3000	ND	13K	ND	ND
33.3_LIN-1 **PBR**	ND	ND	ND	16	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	21K	ND	ND	ND	10K	ND	12K	ND	ND
33.4_LIN-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39	ND	ND	ND	ND	ND	3400	ND	ND	ND	ND	ND	6800	ND	ND
34.0_Lpk 2 **PBR**	ND	ND	ND	220	ND	ND	ND	ND	ND	ND	ND	74.0	ND	ND	**1.2**	ND	ND	32K	ND	51	ND	2900	53	5600	ND	ND
34.1_Lpk 2 **PBR**	ND	ND	6.2	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11K	ND	ND	ND	1500	ND	6000	ND	ND
34.2_Lpk 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	53	ND	ND	ND	ND	ND	32K	ND	79	ND	3200	26	7400	ND	ND
34.3_Lpk 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	4200	ND	41	ND	1600	ND	3500	ND	ND
34.4_Lpk 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	ND	ND	ND	ND	ND	41K	ND	ND	ND	2200	ND	7900	ND	ND
35.0_Mcd 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.0	ND	2.4	**1.2**	87	ND	13K	ND	26	ND	ND	ND	8100	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
35.1_Mcd 1 **PBR**	Newsome Well **McDuffie**	30	regolith	05/28/09	5.87	50	NA	17.5	60	60	ND	ND	ND	0.30	0.02
35.2_Mcd 1 **PBR**	Hughes Well **McDuffie**	unknown	bedrock	07/08/09	6.34	53	NA	18.8	NA	NA	ND	ND	ND	0.16	0.32
35.3_Mcd 1 **PBR**	Anderson Well **McDuffie**	350	bedrock	07/08/09	6.24	44	NA	18.7	NA	NA	ND	ND	ND	ND	0.38
35.4_Mcd 1 **PBR**	Fowler Well **McDuffie**	125	bedrock	07/09/09	6.90	78	NA	19.1	NA	NA	ND	ND	ND	ND	0.04
36.0_Mcd 2 **PBR**	Big Hart Creek Camp Well **McDuffie**	**Hub**	**Hub**	08/09/06	6.71	218	4.42	20.4	80	80	ND	20	ND	0.24	0.08
36.1_Mcd 2 **PBR**	Reverend Boles Well **McDuffie**	600	bedrock	03/04/09	7.91	177	5.31	18.0	NA	NA	TCM = 7.8	ND	ND	0.04	0.07
36.2_Mcd 2 **PBR**	B. Boles Well **McDuffie**	325	bedrock	03/04/09	7.10	167	3.05	18.1	NA	NA	ND	ND	ND	0.04	0.43
36.3_Mcd 2 **PBR**	Williams Well **McDuffie**	260	bedrock	04/29/09	5.68	52	NA	17.8	NA	NA	ND	ND	ND	0.13	0.42
36.5_Mcd-2 **PBR**	Big Hart WMA Chk. Sta. Well **McDuffie**	unknown	bedrock	04/29/09	5.82	70	NA	17.8	NA	NA	TCM = 1.5	ND	ND	0.16	0.21
37.0_MIT-1 **CP**	Hinsonton Water System #1 **Mitchell**	**Hub**	**Hub**	05/09/07	7.87	242	1.69	22.2	NA	NA	ND	ND	ND	ND	0.09
37.1_MIT-1 **CP**	Harrell Well **Mitchell**	250	Floridan	10/21/09	7.62	234	4.71	22.3	NA	NA	ND	ND	ND	ND	0.03
37.2_MIT-1 **CP**	Windhausen Well **Mitchell**	200	Floridan	10/21/09	7.85	225	2.57	21.7	NA	NA	ND	ND	ND	ND	0.02

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
35.1_Mcd 1 **PBR**	ND	ND	74	27	ND	ND	ND	ND	ND	ND	ND	30	ND	1.3	ND	ND	ND	3300	ND	ND	ND	ND	ND	6500	ND	ND
35.2_Mcd 1 **PBR**	ND	ND	5.1	29	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND	5100	ND	ND	ND	2600	ND	10K	ND	ND
35.3_Mcd 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	59	ND	ND	ND	ND	ND	3200	ND	1300	ND	1500	120	7100	ND	ND
35.4_Mcd 1 **PBR**	ND	ND	ND	36	ND	ND	ND	ND	ND	ND	ND	120	ND	ND	ND	ND	ND	10K	ND	470	ND	3500	52	9500	ND	ND
36.0_Mcd 2 **PBR**	ND	18	ND	12	ND	ND	ND	ND	ND	ND	ND	93.0	ND	ND	**2.9**	ND	ND	36K	ND	ND	ND	11K	ND	21K	ND	ND
36.1_Mcd 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	ND	ND	ND	ND	ND	34K	ND	33	ND	7800	ND	18K	ND	ND
36.2_Mcd 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND	ND	ND	ND	ND	38K	ND	ND	ND	5300	ND	13K	ND	ND
36.3_Mcd 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	100	ND	5900	ND	170	ND	2200	ND	8500	ND	ND
36.5_Mcd-2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	ND	ND	ND	ND	ND	8700	ND	24	ND	2800	ND	11K	ND	ND
37.0_MIT-1 **CP**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	240.0	ND	1.1	**4.8**	ND	ND	22K	ND	ND	ND	16K	ND	5700	ND	13
37.1_MIT-1 **CP**	8.5	ND	ND	49	ND	ND	ND	ND	ND	ND	ND	190.0	ND	1.2	**3.5**	ND	ND	23K	ND	55	ND	15K	ND	6800	ND	ND
37.2_MIT-1 **CP**	ND	ND	ND	42	ND	ND	ND	ND	ND	ND	ND	190.0	ND	1.2	**3.1**	ND	ND	20K	ND	ND	ND	14K	ND	7500	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
37.3_MIT-1 **CP**	Whitston Well **Mitchell**	400	Floridan	10/21/09	7.66	224	3.79	20.9	NA	NA	ND	ND	ND	ND	0.02
37.4_MIT-1 **CP**	Windhausen Shop Well **Mitchell**	220	Floridan	10/21/09	7.91	192	3.90	21.3	NA	NA	ND	ND	ND	ND	ND
38.0_Mrg 3 **PBR**	Country Boys RVP Well **Morgan**	**Hub**	**Hub**	08/09/06	7.14	73	2.86	18.5	NA	NA	ND	ND	ND	0.32	0.07
38.1_Mrg 3 **PBR**	Lawrence Well **Morgan**	75	regolith	09/24/08	5.89	82	NA	19.3	NA	NA	ND	ND	ND	1.60	0.57
38.2_Mrg 3 **PBR**	Weiner Well **Morgan**	280	bedrock	09/24/08	5.82	127	6.31	18.6	80	80	ND	ND	ND	1.40	0.50
38.3_Mrg 3 **PBR**	Visscher Farm Well **Morgan**	308	bedrock	09/24/08	6.12	59	7.09	19.1	NA	NA	ND	ND	ND	1.30	0.10
38.5_Mrg 3 **PBR**	Chambers Well **Morgan**	280	bedrock	10/22/08	5.88	101	2.81	18.2	NA	NA	ND	ND	ND	0.08	0.11
38.7_Mrg-3 **PBR**	Banks Well **Morgan**	unknown	bedrock	10/08/08	5.92	64	7.94	18.1	90	90	ND	ND	ND	0.86	0.11
38.8_Mrg 3 **PBR**	Bailey Well **Morgan**	unknown	bedrock	10/22/08	7.55	144	0.10	17.8	NA	NA	ND	ND	17	0.02	0.03
38.9_Mrg 3 **PBR**	Goodchild Well **Morgan**	405	bedrock	10/22/08	6.52	187	1.37	18.7	100	100	ND	ND	88	0.54	0.13
39.0_MOR-' **PBR**	Triple B Restaurant Well **Morgan**	**Hub**	**Hub**	08/08/07	6.68	85	NA	21.1	NA	NA	ND	ND	ND	1.50	0.07
39.1_MOR-' **PBR**	McMahon Well **Morgan**	600	bedrock	10/09/08	7.95	215	0.59	18.5	NA	NA	ND	ND	30	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
37.3_MIT-1 **CP**	7.3	ND	ND	26	ND	ND	ND	ND	ND	ND	ND	170.0	ND	ND	**3.4**	ND	ND	19K	ND	31	ND	13K	ND	10K	ND	ND
37.4_MIT-1 **CP**	ND	ND	ND	40	ND	ND	ND	ND	ND	ND	ND	91.0	ND	ND	ND	ND	ND	9400	ND	ND	ND	5600	ND	26K	ND	ND
38.0_Mrg 3 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.0	ND	1.7	**1.2**	ND	ND	13K	ND	ND	ND	1700	ND	11K	ND	ND
38.1_Mrg 3 **PBR**	ND	ND	6.5	13	ND	ND	ND	ND	ND	ND	ND	17	ND	ND	ND	ND	ND	6800	ND	ND	ND	1300	ND	7500	ND	ND
38.2_Mrg 3 **PBR**	7.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	74	ND	ND	ND	ND	ND	8700	ND	27	ND	4300	ND	11K	ND	10
38.3_Mrg 3 **PBR**	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	4800	ND	ND	ND	1100	ND	6600	ND	ND
38.5_Mrg 3 **PBR**	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	81	ND	ND	ND	64	ND	16K	ND	74	ND	3300	ND	9400	ND	ND
38.7_Mrg-3 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	5000	ND	ND	ND	1400	ND	6300	ND	ND
38.8_Mrg 3 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.1	ND	ND	ND	ND	ND	32K	ND	120	ND	1700	ND	16K	ND	ND
38.9_Mrg 3 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26	ND	ND	**2.3**	ND	ND	41K	ND	55	ND	2400	22	14K	ND	ND
39.0_MOR-1 **PBR**	ND	ND	15	25	ND	ND	ND	ND	ND	ND	ND	21.0	ND	ND	**1.3**	ND	ND	20K	ND	ND	ND	3000	ND	9400	ND	ND
39.1_MOR-1 **PBR**	ND	ND	ND	68	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	**3.4**	62	ND	26K	ND	59	ND	1400	ND	17K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No.	Well Name	Well Depth	Aquifer	Date	pH	cond.	diss O2	Temp	Radiation - cps		VOCS	Cl	SO4	NOx	P
Province	County	feet		sampled		uS/cm	mg/L	^0C	backgrd	water	ug/L	mg/L	mg/L	mg N/L	mg/L
39.2_MOR-' PBR	M. Smith Well **Morgan**	150	bedrock	10/09/08	6.04	115	7.25	18.4	NA	NA	ND	ND	ND	3.60	0.04
39.3_MOR-' PBR	Slaughter Well **Morgan**	unknown	regolith	11/05/08	5.37	59	4.75	19.4	NA	NA	ND	ND	ND	0.59	0.10
39.4_MOR-' PBR	Edge Well **Morgan**	unknown	bedrock	11/05/08	8.41	66	8.41	18.5	70	70	ND	ND	ND	0.72	0.05
39.5_MOR-' PBR	Sellers Well **Morgan**	unknown	bedrock	11/06/08	7.61	452	0.56	19.1	NA	NA	ND	ND	130	ND	ND
39.7_MOR-' PBR	B. Smith Well **Morgan**	200	bedrock	11/05/08	6.84	177	4.31	18.1	70	70	ND	ND	ND	0.71	0.03
40.0_New 1 PBR	Dial Water System #4 **Newton**	**Hub**	**Hub**	11/08/06	7.67	115	NA	18.6	40	40	ND	ND	14	0.19	ND
40.1_New 1 PBR	Glass Well **Newton**	unknown	bedrock	09/09/09	7.43	60	NA	18.5	NA	NA	ND	ND	ND	0.46	ND
40.2_New 1 PBR	Church Well **Newton**	80	regolith	09/17/09	5.57	70	NA	19.4	NA	NA	ND	11	ND	3.60	0.22
40.3_New 1 PBR	Ellis Well **Newton**	39	regolith	11/04/09	5.35	83	8.36	17.5	NA	NA	ND	ND	ND	2.60	ND
40.4_New 1 PBR	Moore Well **Newton**	30	regolith	09/17/09	6.03	32	NA	17.6	NA	NA	TCM = 1.5	ND	ND	0.24	0.02
40.5_New 1 PBR	Hay Well **Newton**	745	bedrock	12/03/09	5.63	59	7.55	17.6	NA	NA	ND	ND	ND	0.64	0.05
41.0_New 2 PBR	Mansfield/Kellogg Street Well **Newton**	**Hub**	**Hub**	12/14/06	6.56	102	NA	18.6	100	100	TCE = 3.9	ND	12	1.80	0.04

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
39.2_MOR-1 **PBR**	ND	ND	7.7	ND	ND	ND	ND	ND	ND	ND	ND	25	ND	ND	ND	ND	ND	9700	ND	27	ND	2600	ND	7700	ND	ND
39.3_MOR-1 **PBR**	6.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41	ND	1.3	ND	240	ND	5500	ND	99	ND	1100	ND	5800	ND	ND
39.4_MOR-1 **PBR**	5.0	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	ND	ND	4400	ND	ND	ND	2500	ND	5100	ND	ND
39.5_MOR-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	28	ND	ND	ND	ND	ND	65K	ND	ND	ND	3000	15	22K	ND	ND
39.7_MOR-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16**	ND	ND	25K	ND	ND	ND	4000	ND	6900	ND	ND
40.0_New 1 **PBR**	ND	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	17.0	ND	ND	**9.0**	ND	ND	23K	ND	ND	5000	3500	30	9200	ND	ND
40.1_New 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	ND	ND	**2.1**	ND	ND	11K	ND	550	ND	2500	ND	6100	ND	ND
40.2_New 1 **PBR**	ND	ND	25	47	ND	ND	ND	ND	ND	ND	ND	330	ND	3	ND	2800	ND	8900	ND	900	6500	1800	38	6000	46	ND
40.3_New 1 **PBR**	ND	ND	9.6	ND	ND	ND	ND	ND	ND	ND	ND	93.0	ND	ND	ND	ND	ND	6900	ND	46	ND	1100	14	6800	ND	ND
40.4_New 1 **PBR**	ND	ND	11	38	ND	ND	ND	ND	ND	ND	ND	23	ND	2.5	ND	89	ND	8500	ND	38	ND	ND	ND	2300	ND	ND
40.5_New 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6	ND	ND	ND	ND	ND	5500	ND	ND	ND	1800	ND	4400	ND	ND
41.0_New 2 **PBR**	ND	ND	ND	62	ND	ND	ND	ND	ND	ND	ND	12.0	ND	ND	**15.0**	ND	ND	22K	ND	750	ND	2500	170	8900	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
41.1_New 2 PBR	King Well **Newton**	unknown	unknown	09/11/08	4.94	54	7.27	19.1	NA	NA	ND	ND	ND	1.70	ND
41.2_New 2 PBR	Blackwell/Hamilton Rd. Well **Newton**	unknown	bedrock	10/09/08	5.99	102	4.35	18.5	NA	NA	ND	ND	ND	0.40	0.08
41.3_New 2 PBR	Blackwell/Silver Lake Dr. Well **Newton**	unknown	regolith	09/11/08	5.60	41	8.53	18.6	NA	NA	ND	ND	ND	1.20	ND
41.4_New 2 PBR	Shepard Well **Newton**	385	bedrock	09/11/08	6.60	127	6.38	19.4	NA	NA	ND	ND	ND	1.20	ND
41.5A_New PBR	Mote Well **Newton**	400	bedrock	11/06/08	7.42	132	0.80	18.0	100	100	ND	ND	10	0.04	0.07
41.6_New 2 PBR	Hays Well **Newton**	50	regolith	09/11/08	4.93	107	8.11	19.7	NA	NA	CM = 2.0	14	ND	6.20	0.02
41.7_New 2 PBR	Marks Well **Newton**	unknown	unknown	09/11/08	5.61	96	5.11	19.6	NA	NA	ND	ND	ND	3.00	0.04
41.8_New-2 PBR	Johnston Well **Newton**	unknown	bedrock	10/09/08	7.15	145	0.87	17.5	NA	NA	ND	ND	ND	0.03	ND
41.9_New-2 PBR	Poplar Hill AME Church Well **Newton**	unknown	bedrock	10/08/08	6.97	307	0.93	18.1	NA	NA	ND	ND	25	0.33	0.03
42.0_OGL-1 PBR	Smokey Road Well #1 **Oglethorpe**	**Hub**	**Hub**	06/06/07	6.71	102	NA	18.1	NA	NA	Tol. = 1.9	ND	ND	2.30	0.68
42.1_OGL-1 PBR	MABG Main Well **Oglethorpe**	unknown	bedrock	11/19/08	6.55	73	0.12	15.0	NA	NA	ND	ND	10	ND	0.07
42.2_OGL-1 PBR	MABG Cabin Well **Oglethorpe**	unknown	bedrock	11/19/08	6.66	73	0.08	17.5	NA	NA	ND	ND	10	ND	0.13

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
41.1_New 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80	ND	2.4	ND	ND	ND	3800	ND	ND	ND	ND	14	4300	ND	ND
41.2_New 2 **PBR**	ND	ND	130	23	ND	ND	ND	ND	ND	ND	ND	24	ND	ND	ND	ND	ND	11K	ND	24	ND	2000	ND	7500	ND	ND
41.3_New 2 **PBR**	ND	ND	8.7	ND	ND	ND	ND	ND	ND	ND	ND	24	ND	1.7	ND	ND	ND	3200	ND	ND	ND	ND	ND	3100	ND	ND
41.4_New 2 **PBR**	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	17	ND	2.4	ND	ND	ND	14K	ND	ND	ND	2700	ND	8200	ND	ND
41.5A_New 2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	ND	ND	ND	ND	ND	16K	ND	ND	ND	2100	ND	8300	ND	ND
41.6_New 2 **PBR**	ND	ND	ND	53	ND	ND	ND	ND	ND	ND	ND	300	ND	1.5	ND	250	ND	2000	ND	ND	ND	4900	130	6500	ND	ND
41.7_New 2 **PBR**	ND	ND	6.8	15	ND	ND	ND	ND	ND	ND	ND	64	ND	1.1	ND	ND	ND	9800	ND	ND	ND	1900	ND	4800	ND	ND
41.8_New-2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.9	ND	ND	**4.0**	ND	ND	15K	ND	53	ND	1900	17	14K	ND	ND
41.9_New-2 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.8	ND	ND	**17**	ND	ND	50K	ND	ND	ND	2800	ND	9300	ND	ND
42.0_OGL-1 **PBR**	ND	ND	ND	52	ND	ND	ND	ND	ND	ND	ND	12	5.9	ND	**13**	64	ND	24K	ND	360	ND	3000	ND	5200	ND	ND
42.1_OGL-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.8	ND	ND	ND	ND	ND	7900	ND	1300	ND	4700	390	11K	ND	ND
42.2_OGL-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.5	ND	ND	ND	ND	ND	7600	ND	2500	ND	4500	120	10K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
42.3_OGL-1 **PBR**	Hayes Well **Oglethorpe**	unknown	bedrock	11/20/08	5.17	16	7.24	17.2	NA	NA	ND	ND	ND	0.71	0.03
42.4_OGL-1 **PBR**	Lassiter Well **Oglethorpe**	430	bedrock	11/20/08	5.85	40	5.95	15.7	NA	NA	ND	ND	ND	0.87	0.07
42.5_OGL-1 **PBR**	Adams Well **Oglethorpe**	unknown	bedrock	11/19/08	5.63	44	7.48	16.8	NA	NA	ND	ND	ND	0.33	0.18
42.7_OGL-1 **PBR**	Medders Well **Oglethorpe**	unknown	bedrock	11/20/08	5.81	51	5.52	17.6	180	180	ND	ND	ND	2.0	0.13
42.8_OGL-1 **PBR**	Byram Rental Well **Oglethorpe**	200	bedrock	01/15/09	6.98	118	NA	14.1	NA	NA	ND	ND	ND	0.11	0.07
42.9_OGL-1 **PBR**	Byram House Well **Oglethorpe**	550	bedrock	01/15/09 02/24/09 04/30/09	7.28 7.37 7.19	221 136 147	0.04 0.29 NA	18.1 18.3 18.3	NA NA NA	NA NA NA	ND ND ND	ND ND ND	68 14 11	0.02 0.07 0.07	ND 0.03 0.10
42.10_OGL- **PBR**	Dawson Rental Well **Oglethorpe**	unknown	regolith	02/24/09	5.38	42	9.24	16.7	NA	NA	ND	ND	ND	4.5	0.08
43.0_Pau 1 **PBR**	City of Hiram Well #1 **Paulding**	**Hub**	**Hub**	10/24/06	6.93	371	0.81	17.6	80	80	TCM = 1.2	ND	71	0.67	ND
43.1_PAU-1 **PBR**	Hiram Well #2 **Paulding**	unknown	bedrock	08/16/07	5.32	157	4.03	17.8	NA	NA	ND	ND	ND	1.40	0.02
43.2_PAU-1 **PBR**	Turner Well **Paulding**	420	bedrock	11/04/09	6.75	61	NA	17.2	NA	NA	ND	ND	ND	1.4	0.05
43.3_PAU-1 **PBR**	Woods Well **Paulding**	40	regolith	11/04/09	6.96	43	NA	19.3	NA	NA	ND	ND	ND	0.09	0.03
43.4_PAU-1 **PBR**	Nelson well **Paulding**	300	bedrock	11/04/09	8.29	100	NA	17.1	NA	NA	ND	ND	ND	ND	0.03

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
42.3_OGL-1 PBR	ND	ND	6.2	13	ND	ND	ND	ND	ND	ND	ND	17	ND	1.2	ND	ND	ND	ND	ND	36	ND	ND	ND	2700	ND	ND
42.4_OGL-1 PBR	ND	ND	7.9	12	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	190	ND	6300	ND	270	ND	2200	ND	5000	ND	ND
42.5_OGL-1 PBR	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	4800	ND	ND	ND	ND	ND	11K	ND	ND
42.7_OGL-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48	ND	ND	ND	ND	ND	6000	ND	ND	ND	2500	ND	6500	ND	ND
42.8_OGL-1 PBR	ND	ND	67	110	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	**8.7**	ND	ND	23K	ND	20	ND	3000	ND	13K	ND	ND
42.9_OGL-1 PBR	ND ND ND	ND ND ND	ND ND ND	88 40 44	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND	**100** **22** **63**	ND ND ND	ND ND ND	51K 31K 27K	ND ND ND	320 140 110	ND ND ND	3100 2200 2800	26 ND ND	14K 11K 10K	ND ND ND	ND ND ND
42.10_OGL-' PBR	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	110	ND	ND	ND	ND	ND	3000	ND	ND	ND	1800	18	4200	ND	ND
43.0_Pau 1 PBR	ND	ND	ND	94	ND	ND	ND	ND	ND	ND	ND	13.0	ND	ND	**1.9**	ND	ND	55K	ND	ND	ND	7800	82	11K	ND	ND
43.1_PAU-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.0	ND	ND	ND	ND	ND	14K	ND	ND	ND	9700	ND	6800	ND	ND
43.2_PAU-1 PBR	5.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	ND	ND	ND	65	ND	8700	ND	51	ND	6900	11	5700	ND	ND
43.3_PAU-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	220	ND	9500	ND	240	ND	1900	ND	3100	ND	ND
43.4_PAU-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16K	ND	31	ND	7600	57	7000	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
44.0_PIK-1 **PBR**	Molena Well #3 **Pike**	**Hub**	**Hub**	08/22/07 12/05/07	5.50 6.33	123 75	ND NA	18.2 18.0	NA NA	NA NA	ND ND	ND ND	15 15	0.12 0.07	0.02 ND
44.1_PIK-1 **PBR**	Hollingsworth Well **Pike**	unknown	unknown	12/03/08	5.47	35	9.58	17.6	NA	NA	ND	ND	ND	1.20	0.04
44.2_PIK-1 **PBR**	Brown Well **Pike**	unknown	unknown	12/03/08	5.01	46	7.99	17.7	NA	NA	MTBE = 0.89	ND	ND	2.60	0.06
44.3_PIK-1 **PBR**	Bohensky Well **Pike**	unknown	unknown	12/03/08	5.60	40	8.13	18.3	NA	NA	ND	ND	ND	1.80	0.09
44.4_PIK-1 **PBR**	Moultry Well **Upson**	400	bedrock	12/03/08	7.46	136	0.68	18.8	NA	NA	ND	ND	ND	0.09	0.06
44.5_PIK-1 **PBR**	Gilbert Well **Pike**	unknown	regolith	02/11/09	4.66	63	3.42	16.2	NA	NA	ND	ND	ND	2.80	0.02
44.6_PIK-1 **PBR**	Reynolds Well **Pike**	unknown	unknown	02/11/09	6.91	121	4.19	19.7	NA	NA	ND	ND	ND	0.44	0.04
44.7_PIK-1 **PBR**	Beckham Well **Pike**	unknown	bedrock	02/11/09	7.14	100	4.06	18.6	NA	NA	ND	ND	ND	1.70	0.02
44.8_PIK-1 **PBR**	Moore Well **Pike**	225	bedrock	02/11/09	5.36	75	7.40	18.2	NA	NA	ND	ND	ND	1.00	0.05
45.0_RAB-1 **PBR**	Dillard Holiday Inn Express Well **Rabun**	**Hub**	**Hub**	09/05/07	7.30	61	NA	16.0	NA	NA	ND	ND	12	ND	ND
45.1_RAB-1 **PBR**	Furrey Well **Rabun**	unknown	bedrock	01/28/09	6.45	18	8.78	13.5	90	90	ND	ND	ND	ND	0.08
45.2_RAB-1 **PBR**	Harrison Well **Rabun**	468'	bedrock	02/11/09	8.36	47	2.04	13.6	75	75	ND	ND	ND	ND	0.04

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
44.0_PIK-1	ND	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	20.0	ND	ND	**37.0**	ND	ND	11K	ND	41	ND	3000	99	7100	ND	ND
PBR	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	18.0	ND	ND	**37.0**	ND	ND	11K	ND	45	ND	3000	97	7300	ND	ND
44.1_PIK-1 PBR	ND	ND	6.1	ND	ND	ND	ND	ND	ND	ND	ND	27.0	ND	ND	ND	ND	ND	2300	ND	ND	ND	ND	ND	5300	ND	ND
44.2_PIK-1 PBR	ND	ND	15	27	ND	ND	ND	ND	ND	ND	ND	110.0	ND	3.0	ND	ND	ND	2300	ND	47	ND	1500	38	4000	ND	ND
44.3_PIK-1 PBR	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	24.0	ND	ND	ND	ND	ND	5100	ND	ND	ND	ND	ND	1600	ND	ND
44.4_PIK-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	ND	ND	ND	19K	ND	ND	ND	2400	ND	10K	ND	ND
44.5_PIK-1 PBR	ND	ND	13	35	ND	ND	ND	ND	ND	ND	ND	81.0	ND	2.9	ND	340	ND	3000	ND	140	ND	1100	210	5300	ND	ND
44.6_PIK-1 PBR	ND	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	15.0	ND	ND	**1.1**	ND	ND	15K	ND	ND	ND	2400	ND	7200	ND	ND
44.7_PIK-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.0	ND	ND	ND	ND	ND	11K	ND	ND	ND	2600	ND	5600	ND	ND
44.8_PIK-1 PBR	ND	ND	37	43	ND	ND	ND	ND	ND	ND	ND	19.0	ND	ND	ND	ND	ND	4400	ND	97	ND	2200	47	7000	ND	ND
45.0_RAB-1 PBR	ND	ND	6.6	250	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5	**2.6**	ND	ND	11K	ND	920	ND	1500	13	7100	ND	ND
45.1_RAB-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2200	ND	ND	ND	ND	ND	4000	ND	ND
45.2_RAB-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9300	ND	ND	ND	ND	ND	6900	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
45.3_RAB-1 **PBR**	Chastain Well **Rabun**	147	bedrock	02/11/09	5.74	14	9.09	13.6	NA	NA	ND	ND	ND	ND	0.04
45.4_RAB-1 **PBR**	Grist Well **Rabun**	350	bedrock	03/11/09	5.61	14	NA	15.2	NA	NA	ND	ND	ND	ND	0.02
45.5_RAB-1 **PBR**	Henderson Well **Rabun**	265	bedrock	01/28/09	7.02	51	0.74	14.1	NA	NA	ND	ND	10	ND	0.04
45.6_RAB-1 **PBR**	Martin Well **Rabun**	250	bedrock	06/24/09	6.29	20	NA	14.7	NA	NA	ND	ND	ND	0.03	0.10
46.0_Rok 1 **PBR**	Rockdale Med. Ctr. Irrig. Well **Rockdale**	**Hub**	**Hub**	10/19/06	5.76	60	NA	18.4	160	160	ND	ND	ND	0.67	0.04
46.1_Rok 1 **PBR**	Cullen Well **Rockdale**	400	bedrock	07/09/09	5.76	64	NA	18.1	NA	NA	ND	ND	ND	1.90	0.17
46.2_Rok 1 **PBR**	Strawn Well **Rockdale**	185	bedrock	09/09/09	7.75	107	NA	19.5	NA	NA	ND	ND	ND	ND	0.17
46.3_Rok 1 **PBR**	Anderson Well **Rockdale**	unknown	regolith	11/04/09	4.65	64	5.75	17.9	NA	NA	ND	ND	ND	1.80	0.02
46.4_Rok 1 **PBR**	Bailey Well **Rockdale**	unknown	regolith	11/04/09	4.95	51	6.86	17.4	NA	NA	PCE = 0.79	ND	ND	0.16	0.02
46.5_Rok 1 **PBR**	Cox Well **Rockdale**	40	regolith	12/03/09	6.44	27	NA	16.5	NA	NA	ND	ND	ND	0.16	0.06
46.6_Rok 1 **PBR**	Singleton Well **Rockdale**	unknown	bedrock	12/03/09	6.49	56	NA	17.1	NA	NA	ND	11	ND	2.50	0.03
46.7_Rok 1 **PBR**	Cook Well **Rockdale**	220'	bedrock	12/03/09	6.68	65	NA	17.8	NA	NA	ND	ND	ND	1.90	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
45.3_RAB-1 **PBR**	ND	ND	ND	270	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	ND	ND	ND	1600	ND	ND	ND	ND	ND	2500	ND	ND
45.4_RAB-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	ND	1700	ND	ND	ND	ND	ND	3100	ND	ND
45.5_RAB-1 **PBR**	ND	ND	8.2	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	7300	ND	44	ND	2000	18	7100	ND	ND
45.6_RAB-1 **PBR**	ND	ND	ND	320	ND	ND	ND	ND	ND	ND	ND	3.9	ND	ND	ND	ND	ND	2500	ND	ND	ND	ND	70	4100	ND	ND
46.0_Rok 1 **PBR**	ND	14	ND	1600	ND	ND	ND	ND	ND	ND	ND	20.0	ND	2.2	**19.0**	ND	ND	9400	ND	62	ND	2000	22	8700	ND	ND
46.1_Rok 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	8100	ND	27	ND	2000	ND	8500	ND	ND
46.2_Rok 1 **PBR**	ND	ND	11	240	ND	ND	ND	ND	ND	ND	ND	2.7	ND	7.4	**65**	ND	ND	23K	ND	320	ND	2000	53	11K	ND	ND
46.3_Rok 1 **PBR**	ND	ND	22	11	ND	ND	ND	ND	ND	ND	ND	25.0	ND	2.6	ND	ND	ND	4300	ND	ND	ND	ND	15	8400	ND	ND
46.4_Rok 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6	ND	ND	ND	210	ND	6100	ND	540	ND	ND	35	4600	ND	ND
46.5_Rok 1 **PBR**	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	1.2	ND	1000	ND	5200	ND	540	ND	3300	ND	ND	29	ND
46.6_Rok 1 **PBR**	ND	ND	8.3	10	ND	ND	ND	ND	ND	ND	ND	52	ND	ND	ND	190	ND	5700	ND	140	ND	3100	18	5300	ND	ND
46.7_Rok 1 **PBR**	ND	ND	ND	16	ND	ND	10	ND	ND	ND	ND	3	ND	ND	**130**	ND	ND	10K	ND	110	ND	ND	26	10K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
46.8_Rok 1 **PBR**	C. Martin Well **Rockdale**	30	regolith	12/04/09	6.31	26	NA	17.9	NA	NA	ND	ND	ND	1.20	0.07
46.9_Rok 1 **PBR**	Frey Well **Rockdale**	160	bedrock	01/27/10	6.00	67	NA	9.1	NA	NA	TCM = 11 BDCM = 4.0 DBCM = 1.5	10	ND	0.34	0.54
46.10_Rok 1 **PBR**	Morgan Well **Rockdale**	unknown	bedrock	01/27/10	3.98	43	NA	9.9	NA	NA	ND	ND	ND	2.00	0.06
46.11_Rok 1 **PBR**	Jacobs Well **Rockdale**	425	bedrock	01/27/10	5.33	57	NA	16.8	NA	NA	ND	ND	ND	0.63	0.14
46.12_Rok 1 **PBR**	J. Martin Well **Rockdale**	38	regolith	01/27/10	4.86	28	NA	16.2	NA	NA	ND	ND	ND	0.33	0.08
47.0_Sph 1 **PBR**	Cheek well **Stephens**	**Hub**	**Hub**	03/02/06	4.80	137	8.90	15.9	80	80	NA	20	ND	16.00	ND
47.1_Sph 1 **PBR**	Cheek well **Stephens**	175	bedrock	12/03/08	4.82	133	8.12	15.6	NA	NA	ND	19	ND	16.00	0.05
47.2_Sph 1 **PBR**	Timms well **Stephens**	unknown	bedrock	12/03/08	6.02	35	7.95	16.8	60	60	ND	ND	ND	0.32	0.14
47.3_Sph 1 **PBR**	Dooley well **Stephens**	unknown	unknown	12/03/08	5.47	69	NA	15.4	NA	NA	ND	ND	ND	6.60	ND
47.4_Sph 1 **PBR**	Ballew well **Stephens**	54	regolith	09/16/09	7.48	367	NA	18.6	NA	NA	ND	ND	ND	1.40	0.04
48.0_Sph 2 **PBR**	Toccoa Falls College #2 **Stephens**	**Hub**	**Hub**	08/10/06	7.14	159	1.14	19.0	100	100	NA	ND	12	ND	0.03
48.1_Sph 2 **PBR**	Meeks Well **Stephens**	535	bedrock	06/25/09	6.34	67	NA	17.4	NA	NA	ND	ND	ND	0.28	0.04

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
46.8_Rok 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35	ND	1.9	ND	1100	ND	4300	ND	450	ND	ND	25	ND	13	ND
46.9_Rok 1 PBR	ND	ND	6.4	ND	ND	ND	ND	ND	ND	ND	ND	7.7	ND	ND	ND	ND	ND	4300	ND	ND	ND	ND	ND	7600	ND	ND
46.10_Rok 1 PBR	ND	ND	15	14	ND	ND	ND	ND	ND	ND	ND	45	ND	ND	ND	ND	ND	1700	ND	54	ND	1500	14	3600	ND	ND
46.11_Rok 1 PBR	ND	ND	39	59	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND	4300	ND	87	ND	1800	ND	5800	ND	ND
46.12_Rok 1 PBR	ND	ND	77	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	3900	ND	ND	ND	ND	ND	1400	ND	ND
47.0_Sph 1 PBR	ND	ND	69	22	ND	ND	ND	ND	ND	ND	ND	590.0	ND	2.7	**1.1**	220	ND	15K	ND	58	ND	7300	350	5600	ND	ND
47.1_Sph 1 PBR	ND	ND	29	16	ND	ND	ND	ND	ND	ND	ND	440	ND	2.2	**3.0**	65	ND	18K	ND	99	ND	7300	210	8100	ND	ND
47.2_Sph 1 PBR	ND	ND	9.4	ND	ND	ND	ND	ND	ND	ND	ND	6.9	ND	ND	**1.7**	ND	ND	4900	ND	ND	ND	ND	ND	7300	ND	ND
47.3_Sph 1 PBR	ND	ND	62	23	ND	ND	ND	ND	ND	ND	ND	100	ND	1.3	ND	92	ND	11K	ND	52	ND	1500	ND	6600	ND	ND
47.4_Sph 1 PBR	ND	ND	8.8	ND	ND	ND	ND	ND	ND	ND	ND	320	ND	ND	ND	92	ND	130K	ND	86	6100	1400	ND	5600	ND	ND
48.0_Sph 2 PBR	ND	ND	ND	63	ND	ND	8.5	ND	ND	ND	ND	13.0	ND	ND	**1.3**	ND	ND	39K	ND	ND	ND	7100	ND	7900	ND	ND
48.1_Sph 2 PBR	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	**5.5**	ND	ND	9500	ND	1900	ND	3000	ND	7200	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
48.2_Sph 2 **PBR**	Rice Well 1 Shop **Stephens**	290	bedrock	11/18/09	5.20	123	2.40	16.7	NA	NA	ND	ND	ND	0.60	0.09
48.3_Sph 2 **PBR**	Rice Well 2 House **Stephens**	320	bedrock	11/18/09	5.19	102	3.99	16.6	NA	NA	ND	ND	ND	0.43	0.08
48.4_Sph 2 **PBR**	Rice Well 3 Old House **Stephens**	205	bedrock	11/18/09	5.79	110	7.69	16.3	NA	NA	ND	ND	ND	0.07	0.07
49.0_STE-1 **PBR**	Lake Harbor Shores #4 **Stephens**	**Hub**	**Hub**	09/05/07	6.36	103	NA	17.4	60	60	ND	ND	ND	0.09	0.03
49.1_STE-1 **PBR**	Smith Well **Stephens**	625	bedrock	09/03/09	7.77	110	NA	18.6	80	80	ND	ND	ND	0.38	0.04
49.2_STE-1 **PBR**	Dortch Well **Stephens**	65	regolith	09/03/09	5.34	16	NA	17.3	NA	NA	ND	ND	ND	1.10	ND
49.3_STE-1 **PBR**	Watson Well **Stephens**	unknown	bedrock	10/07/09	5.60	41	NA	17.3	80	80	ND	ND	ND	0.30	0.02
49.4_STE-1 **PBR**	Morgan Well **Stephens**	400	bedrock	10/07/09	6.02	57	NA	17.5	60	60	ND	ND	ND	0.20	ND
50.0_Tbt 1 **PBR**	Hucheson Farm Well **Talbot**	**Hub**	**Hub**	02/02/06	6.80	297	0.58	16.6	60	60	NA	19	11	0.23	0.03
50.1_Tbt 1 **PBR**	Biggs Well **Talbot**	62	regolith	12/16/08	5.27	30	NA	18.9	60	60	ND	ND	ND	0.20	0.06
50.2_Tbt 1 **PBR**	Ray Well **Talbot**	250	bedrock	01/14/09	6.22	59	2.70	17.1	NA	NA	ND	ND	ND	0.62	0.18
50.4_Tbt 1 **PBR**	Riley Well **Talbot**	unknown	regolith	12/16/08	5.41	33	NA	18.7	NA	NA	ND	ND	ND	1.20	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
48.2_Sph 2 **PBR**	8.3	ND	15	53	ND	ND	ND	ND	ND	ND	ND	8.9	ND	7.2	**10.0**	1200	ND	15K	ND	2000	ND	5300	34	5600	50	ND
48.3_Sph 2 **PBR**	ND	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	5.0	ND	1	**24.0**	66	ND	12K	ND	69	ND	3200	ND	6200	ND	ND
48.4_Sph 2 **PBR**	45	ND	11	71	ND	ND	ND	ND	ND	ND	ND	4.1	ND	4.4	ND	76	ND	12K	ND	3700	ND	7300	11	3100	ND	ND
49.0_STE-1 **PBR**	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	21.0	ND	ND	**3.5**	ND	ND	18K	ND	ND	ND	7000	ND	8700	ND	ND
49.1_STE-1 **PBR**	ND	ND	ND	180	ND	ND	ND	ND	ND	ND	ND	6.6	ND	ND	ND	ND	ND	18K	ND	ND	ND	1600	ND	17K	ND	ND
49.2_STE-1 **PBR**	ND	ND	6.2	15	ND	ND	ND	ND	ND	ND	ND	34	ND	ND	ND	ND	ND	1700	ND	ND	ND	ND	ND	1700	ND	ND
49.3_STE-1 **PBR**	7.2	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	ND	ND	5400	ND	37	ND	1500	ND	5900	ND	ND
49.4_STE-1 **PBR**	ND	ND	15	16	ND	ND	ND	ND	ND	ND	ND	20	ND	ND	**1.2**	ND	ND	7000	ND	ND	ND	2600	ND	6900	ND	ND
50.0_Tbt 1 **PBR**	ND	ND	13	28	ND	ND	ND	ND	ND	ND	ND	25.0	ND	1.1	**6.8**	79	ND	46K	ND	66	ND	16K	ND	26K	ND	ND
50.1_Tbt 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38	ND	ND	ND	ND	ND	2500	ND	34	ND	ND	ND	8900	ND	ND
50.2_Tbt 1 **PBR**	6.4	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	61	ND	4.2	ND	ND	ND	11K	ND	ND	ND	1800	ND	6200	ND	ND
50.4_Tbt 1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44	ND	ND	ND	ND	ND	3600	ND	ND	ND	ND	ND	6700	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
50.5_Tbt 1 **PBR**	Hammock Well **Talbot**	unknown	regolith	12/17/09	6.28	81	NA	18.4	NA	NA	ND	ND	ND	0.12	0.30
51.0_Tay 1 **PBR**	Antioch Bapt. Ch. Well **Taylor**	**Hub**	**Hub**	08/24/06	7.90	170	NA	19.5	70	70	NA	ND	10	ND	0.03
51.1_Tay 1 **PBR**	B.P. Wade Well **Taylor**	300	bedrock	11/19/08	7.59	330	0.74	17.4	NA	NA	ND	ND	80	ND	0.03
51.2_Tay 1 **PBR**	Clark Well **Taylor**	90	regolith	11/19/08	5.82	97	4.56	17.3	NA	NA	ND	ND	ND	0.10	0.20
51.3_Tay 1 **PBR**	Hickman Well **Taylor**	300	bedrock	11/19/08	5.96	131	6.40	18.5	NA	NA	ND	ND	ND	1.20	0.31
51.4_Tay 1 **PBR**	Hickman Son Well **Taylor**	450	bedrock	11/19/08	6.02	181	3.19	16.0	NA	NA	ND	ND	ND	0.05	0.10
51.5_Tay 1 **PBR**	Chandler Well **Taylor**	420	bedrock	11/19/08	6.55	108	5.57	17.5	NA	NA	ND	170	79	0.31	0.04
51.6_Tay 1 **PBR**	C.H. Wade Well **Taylor**	600	bedrock	12/03/08	7.67	173	0.66	19.6	NA	NA	ND	ND	ND	ND	0.08
51.7_Tay 1 **PBR**	Carpenter Well **Taylor**	unknown	bedrock	11/19/08	6.16	100	0.86	18.8	NA	NA	ND	ND	ND	0.03	0.04
51.8_Tay 1 **PBR**	Kimble Well	unknown	unknown	12/03/08	6.18	257	3.26	18.1	NA	NA	ND	15	14	1.40	0.14
52.0_Twn 1 **PBR**	Young Harris/Swanson Rd. Well **Towns**	**Hub**	**Hub**	11/29/06	7.10	96	NA	15.6	20	20	ND	ND	21	0.04	ND
52.2_Twn 1 **PBR**	Cohen Well **Towns**	unknown	bedrock	10/28/08	6.78	165	0.70	15.5	NA	NA	ND	ND	ND	ND	0.08

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
50.5_Tbt 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.1	ND	ND	ND	ND	ND	7700	ND	22	ND	3800	ND	17K	ND	ND
51.0_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	230.0	ND	ND	**3.9**	ND	ND	37K	ND	ND	ND	5400	19	18K	ND	ND
51.1_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND	43K	ND	350	ND	1300	ND	28K	ND	ND
51.2_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	64.0	ND	ND	ND	ND	ND	8400	ND	ND	ND	2700	ND	10K	ND	ND
51.3_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	**1.0**	ND	ND	12K	ND	ND	ND	2500	ND	13K	ND	ND
51.4_Tay 1 PBR	ND	ND	25	20	ND	ND	ND	ND	ND	ND	ND	51.0	ND	1.5	ND	ND	ND	23K	ND	140	ND	4400	10	8400	ND	ND
51.5_Tay 1 PBR	ND	ND	ND	ND	ND	ND	9.2	ND	ND	ND	ND	28.0	ND	ND	**3.4**	ND	ND	160K	ND	24	ND	23K	48	43K	ND	ND
51.6_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62.0	ND	ND	ND	ND	ND	21K	ND	36	ND	6600	120	8900	ND	ND
51.7_Tay 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.3	ND	ND	ND	ND	ND	6600	ND	110	ND	5700	32	7600	ND	ND
51.8_Tay 1 PBR	ND	ND	ND	150	ND	ND	ND	ND	ND	ND	ND	2.7	ND	ND	ND	ND	ND	24K	ND	22	ND	12K	ND	18K	ND	ND
52.0_Twn 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	81.0	ND	ND	**7.0**	ND	ND	20K	ND	ND	ND	4400	21	3800	ND	ND
52.2_Twn 1 PBR	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	6.9	ND	ND	ND	ND	ND	19K	ND	820	ND	2200	130	11K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
52.3_Twn 1 **PBR**	Sosebee Well **Towns**	unknown	bedrock	10/28/08	5.22	19	8.21	13.6	NA	NA	ND	ND	ND	ND	0.03
52.4_Twn 1 **PBR**	Russo Well **Towns**	unknown	bedrock	10/28/08	5.46	35	8.27	15.2	NA	NA	ND	ND	ND	ND	0.11
52.5_Twn-1 **PBR**	Hudnall Well **Towns**	300	bedrock	04/23/09	7.49	86	NA	15.1	NA	NA	ND	ND	10	ND	0.04
53.0_TUR-1 **CP**	Ashburn/Turner Co. Rec. Well **Turner**	**Hub**	**Hub**	05/10/07	7.68	158	0.54	20.8	NA	NA	ND	ND	ND	ND	ND
53.1_TUR-1 **CP**	Robbins Well **Turner**	unknown	Floridan	07/22/09	7.19	168	1.73	21.1	NA	NA	ND	ND	ND	ND	0.10
53.2_TUR-1 **CP**	Ward Well **Turner**	unknown	Floridan	07/22/09	7.42	166	1.97	20.9	NA	NA	ND	ND	ND	0.02	0.03
53.3_TUR-1 **CP**	Gravitt Well **Turner**	unknown	Floridan	07/22/09 10/21/09	7.30 7.36	166 166	1.22 1.70	21.5 21.0	NA NA	NA NA	ND ND	ND ND	ND ND	ND ND	0.07 ND
53.4_TUR-1 **CP**	Kennedy Well **Turner**	440	Floridan	07/22/09	7.21	180	0.79	21.0	NA	NA	ND	ND	ND	ND	0.16
54.0_WAT-1 **PBR**	Jersey/Water Tank Rd. Well **Walton**	**Hub**	**Hub**	08/23/07	6.34	60	NA	22.7	NA	NA	ND	ND	ND	1.50	0.03
54.2_WAT-1 **PBR**	Gower Well **Walton**	605	bedrock	08/04/09	8.54	90	NA	18.3	105	105	ND	ND	10	1.30	0.09
54.3_WAT-1 **PBR**	McDaniel Well **Walton**	450	bedrock	08/05/09	7.00	57	NA	18.7	90	90	ND	ND	ND	0.48	0.08
54.5_WAT-1 **PBR**	Needham Well **Walton**	185	bedrock	08/05/09	6.08	62	NA	17.2	NA	NA	ND	ND	ND	0.14	0.07

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
52.3_Twn 1 **PBR**	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	2.3	ND	ND	ND	1400	ND	110	ND	ND	ND	2100	ND	ND
52.4_Twn 1 **PBR**	ND	ND	35	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND	2600	ND	ND	ND	ND	ND	4100	ND	ND
52.5_Twn-1 **PBR**	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	26	ND	1.4	ND	270	ND	14K	ND	590	ND	2300	72	8500	25	ND
53.0_TUR-1 **CP**	ND	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	48.0	ND	ND	**1.1**	ND	ND	30K	ND	ND	ND	1300	ND	1700	ND	ND
53.1_TUR-1 **CP**	ND	ND	ND	37	ND	ND	ND	ND	ND	ND	ND	190.0	ND	ND	**1.0**	ND	ND	30K	ND	ND	ND	2400	ND	2600	ND	ND
53.2_TUR-1 **CP**	ND	ND	ND	37	ND	ND	ND	ND	ND	ND	ND	57.0	ND	ND	ND	ND	ND	30K	ND	100	ND	1300	190	2600	ND	ND
53.3_TUR-1 **CP**	ND ND	ND ND	7.7 ND	190 35	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	140.0 84.0	ND ND	35.0 ND	ND ND	ND ND	ND ND	33K 30K	ND ND	740 ND	ND ND	2300 2200	17 ND	2100 2000	ND ND	ND ND
53.4_TUR-1 **CP**	ND	ND	ND	160	ND	ND	ND	ND	ND	ND	ND	910.0	ND	ND	ND	ND	ND	33K	ND	43	ND	1400	91	2000	ND	ND
54.0_WAT-1 **PBR**	ND	ND	ND	91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.2**	94	ND	8300	ND	ND	ND	4200	ND	5200	ND	ND
54.2_WAT-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	ND	1.6	**9.8**	ND	ND	15K	ND	ND	ND	ND	ND	16K	ND	ND
54.3_WAT-1 **PBR**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.4**	ND	ND	7200	ND	21	ND	2600	ND	9400	ND	ND
54.5_WAT-1 **PBR**	7.1	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	8800	ND	ND	ND	5700	ND	4900	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp °C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
54.6_WAT-1 **PBR**	Dunn Well **Walton**	unknown	bedrock	08/05/09	6.53	66	NA	17.8	NA	NA	ND	ND	ND	0.14	0.09
54.7_WAT-1 **PBR**	Pitts Well **Walton**	unknown	bedrock	11/04/09	5.88	47	8.71	17.4	NA	NA	ND	ND	ND	0.71	0.14
54.8_WAT-1 **PBR**	Foster Well **Walton**	600	bedrock	11/04/09	5.80	106	6.74	16.7	NA	NA	ND	ND	ND	0.20	0.05
54.9_WAT-1 **PBR**	Butler Well **Walton**	unknown	bedrock	11/04/09	6.95	151	1.41	17.8	NA	NA	ND	ND	ND	0.24	0.04
54.11_WAT- **PBR**	Campobello Well **Walton**	165	bedrock	11/04/09	5.63	66	6.14	17.3	NA	NA	ND	ND	ND	0.90	0.11
54.12_WAT- **PBR**	Kelly Well **Walton**	unknown	regolith	12/03/09	4.87	49	6.39	15.8	NA	NA	ND	ND	ND	0.74	0.08
54.13_WAT- **PBR**	Shelhimer Well **Walton**	300	bedrock	12/03/09	5.24	76	9.10	17.5	NA	NA	TCM = 0.76	ND	ND	3.20	0.03
54.14_WAT- **PBR**	Bacom Well **Walton**	unknown	bedrock	12/03/09	6.29	112	2.98	17.1	NA	NA	ND	ND	ND	0.59	0.05
55.0_WAN-' **PBR**	Camak Quarry Well #1 **Warren**	**Hub**	**Hub**	07/12/07	6.54	118	NA	18.6	100	100	ND	ND	ND	0.02	ND
55.1_WAN-' **PBR**	Edelen House Well **Warren**	unknown	unknown	08/20/08	5.72	116	0.58	18.1	NA	NA	ND	ND	ND	ND	0.04
55.3_WAN-' **PBR**	Pearson House Well **Warren**	unknown	unknown	08/20/08	5.46	82	4.05	19.0	NA	NA	TCM = 0.54	ND	ND	1.60	ND
55.4_WAN-' **PBR**	Reese House Well **Warren**	300	bedrock	08/20/08	5.62	95	5.24	19.0	NA	NA	ND	ND	ND	0.94	0.16

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
54.6_WAT-1 PBR	ND	ND	ND	35	ND	ND	ND	ND	ND	ND	ND	8.5	ND	ND	**90**	ND	ND	9000	ND	49	ND	3200	14	7500	ND	ND
54.7_WAT-1 PBR	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	43.0	ND	ND	ND	ND	ND	3100	ND	320	ND	ND	ND	5900	ND	ND
54.8_WAT-1 PBR	ND	ND	8.5	25	ND	ND	ND	ND	ND	ND	ND	33.0	ND	ND	ND	71	ND	10K	ND	120	ND	5900	ND	5000	ND	ND
54.9_WAT-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5	ND	ND	**15.0**	ND	ND	20K	ND	ND	ND	1400	18	12K	ND	ND
54.11_WAT- PBR	ND	ND	44	ND	ND	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	5400	ND	ND	ND	1100	ND	8000	ND	ND
54.12_WAT- PBR	ND	ND	180	ND	ND	ND	ND	ND	ND	ND	ND	36.0	ND	5.2	ND	920	ND	5700	ND	760	ND	1100	17	2700	32	ND
54.13_WAT- PBR	ND	ND	35	27	ND	ND	ND	ND	ND	ND	ND	12.0	ND	ND	**11.0**	ND	ND	4500	ND	ND	ND	2500	ND	6500	ND	ND
54.14_WAT- PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.2**	ND	ND	12K	ND	ND	ND	2400	ND	11K	ND	ND
55.0_WAN-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	**1.5**	ND	ND	14K	ND	280	ND	5000	110	22K	ND	ND
55.1_WAN-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9800	ND	410	ND	2300	76	11K	ND	ND
55.3_WAN-1 PBR	ND	ND	14	10	ND	ND	ND	ND	ND	ND	ND	41	ND	1.3	ND	ND	ND	8600	ND	60	ND	1200	ND	3600	ND	ND
55.4_WAN-1 PBR	ND	ND	18	14	ND	ND	ND	ND	ND	ND	ND	9.1	ND	ND	**1.5**	ND	ND	5600	ND	ND	ND	2400	20	11K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
55.5_WAN-' PBR	McCorkle House Well **Warren**	300	bedrock	08/20/08	5.51	133	2.50	19.0	NA	NA	ND	ND	18	0.12	0.13
56.0_Wsh 1 PBR	Hamburg SP Well **Washington**	**Hub**	**Hub**	12/13/06 04/16/08	7.27 7.28	142 139	NA NA	19.1 18.8	60 NA	60 NA	TCM = 0.68 ND	13 13	ND ND	0.05 ND	0.13 ND
56.1_Wsh 1 PBR	Brown Well **Washington**	100	regolith	08/21/08	4.58	46	6.05	18.8	NA	NA	ND	ND	ND	1.80	ND
56.2_Wsh 1 PBR	Pfeil Well 1 **Washington**	200	bedrock	08/21/08	4.26	30	7.91	18.3	NA	NA	ND	ND	ND	1.70	0.02
56.3_Wsh 1 PBR	Pfeil Well 2 **Washington**	unknown	bedrock	08/21/08	6.28	144	0.66	18.1	NA	NA	ND	ND	ND	ND	0.13
56.4_Wsh 1 PBR	Downs Well **Washington**	unknown	unknown	08/21/08	4.75	20	7.61	19.5	NA	NA	ND	ND	ND	0.75	0.02
57.0_Wte 1 PBR	Unicoi SP #2 **White**	**Hub**	**Hub**	05/18/06	6.35	56	8.01	15.2	90	90	ND	ND	ND	ND	0.06
57.1_Wte 1 PBR	Allan Well **White**	unknown	bedrock	06/10/09	5.67	13	NA	14.7	NA	NA	ND	ND	ND	0.12	ND
57.2_Wte 1 PBR	Canup Well **White**	165	bedrock	05/13/09	6.85	24	NA	15.5	NA	NA	ND	ND	ND	ND	0.04
57.3_Wte 1 PBR	Mooty Well **White**	325	bedrock	06/10/09	5.62	12	NA	15.3	NA	NA	ND	ND	ND	ND	ND
57.4_Wte 1 PBR	Kimsey Well **White**	100	bedrock	06/24/09	5.29	10	NA	15.1	NA	NA	ND	ND	ND	0.02	0.04
58.0_Wik 2 PBR	Tignall #6 **Wilkes**	**Hub**	**Hub**	04/27/06	7.55	150	0.76	19.5	40	40	NA	ND	34	0.42	0.03

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
55.5_WAN-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.2	ND	1.8	ND	ND	ND	10K	ND	ND	ND	2300	54	13K	ND	ND
56.0_Wsh 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	86.0	ND	ND	**11.0**	ND	ND	27K	ND	77	ND	2800	260	19K	ND	ND
	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	90.0	ND	ND	**11.0**	ND	ND	26K	ND	35	ND	2700	270	18K	ND	ND
56.1_Wsh 1 PBR	ND	ND	24	250	ND	ND	ND	ND	ND	ND	ND	28	ND	5	**3.9**	150	ND	2200	ND	50	ND	1200	54	3000	ND	ND
56.2_Wsh 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	2.2	ND	77	ND	1300	ND	61	ND	1000	ND	1600	ND	ND
56.3_Wsh 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	6100	ND	1200	ND	7200	180	17K	ND	ND
56.4_Wsh 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND	ND	ND	1100	ND	ND	ND	1400	ND	ND	ND	ND
57.0_Wte 1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.3	ND	ND	**4.5**	ND	ND	11K	ND	ND	ND	ND	ND	3900	ND	ND
57.1_Wte 1 PBR	ND	ND	35	55	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	ND	ND	ND	ND	ND	75	ND	ND	ND	1400	ND	ND
57.2_Wte 1 PBR	ND	ND	5.0	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND	2100	ND	ND	ND	ND	ND	5500	ND	ND
57.3_Wte 1 PBR	ND	13	21	15	ND	ND	ND	ND	ND	ND	ND	9.2	ND	1.2	ND	ND	ND	1400	ND	ND	ND	ND	ND	1700	ND	ND
57.4_Wte 1 PBR	ND	ND	ND	29	ND	ND	ND	ND	ND	ND	ND	8.1	ND	ND	ND	ND	ND	1300	ND	ND	ND	ND	ND	1700	ND	ND
58.0_Wik 2 PBR	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	17.0	ND	ND	**2.5**	ND	ND	31K	ND	ND	ND	ND	ND	19K	ND	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Well Depth feet	Aquifer	Date sampled	pH	cond. uS/cm	diss O2 mg/L	Temp ^0C	Radiation - cps backgrd	Radiation - cps water	VOCS ug/L	Cl mg/L	SO4 mg/L	NOx mg N/L	P mg/L
58.1_Wik 2 **PBR**	Maher Well **Wilkes**	300	bedrock	08/06/08	5.89	173	7.18	18.8	100	100	ND	21	ND	4.50	0.16
58.2_Wik 2 **PBR**	Wiggins Well **Wilkes**	245	bedrock	08/06/08	6.85	99	6.51	20.3	50	50	ND	ND	ND	0.75	0.09
58.3_Wik 2 **PBR**	P. Brown Well **Wilkes**	unknown	bedrock	08/06/08	6.79	261	1.57	19.0	60	60	ND	12	ND	ND	0.10
58.4_Wik 2 **PBR**	Corely Well **Wilkes**	500	bedrock	02/25/09	6.45	89	3.23	17.2	NA	NA	ND	ND	ND	0.07	0.14
58.5_Wik 2 **PBR**	B. Brown Well **Wilkes**	unknown	regolith	08/06/08	5.46	31	4.49	19.1	50	50	ND	ND	ND	0.24	0.03
58.6_Wik 2 **PBR**	S. Bufford Well **Wilkes**	280	bedrock	08/06/08	6.95	254	2.41	18.9	60	60	ND	11	ND	0.14	0.13
58.7_Wik 2 **PBR**	M. Bufford Well **Wilkes**	unknown	bedrock	08/06/08	7.45	179	2.10	18.8	50	50	ND	ND	ND	0.18	0.08
58.8_Wik 2 **PBR**	Neville Well **Wilkes**	unknown	bedrock	08/06/08	4.98	40	8.16	19.0	50	50	ND	ND	ND	2.50	ND

Table A-1. Ground-Water Quality Analyses for Uranium Project Stations.
Part B: Metals.

Station No. Province	Cr ug/L	Ni ug/L	Cu ug/L	Zn ug/L	As ug/L	Se ug/L	Mo ug/L	Ag ug/L	Cd ug/L	Sn ug/L	Sb ug/L	Ba ug/L	Tl ug/L	Pb ug/L	**U ug/L**	Al ug/L	Be ug/L	Ca ug/L	Co ug/L	Fe ug/L	K ug/L	Mg ug/L	Mn ug/L	Na ug/L	Ti ug/L	V ug/L
58.1_Wik 2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	86	ND	ND	ND	ND	ND	12K	ND	33	ND	3300	ND	15K	ND	ND
58.2_Wik 2 PBR	ND	ND	11	920	ND	ND	ND	ND	ND	ND	ND	11	ND	3.1	ND	ND	ND	9600	ND	50	ND	2000	ND	8200	ND	ND
58.3_Wik 2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	29	ND	ND	ND	120	ND	33K	ND	440	6200	4300	330	12K	ND	ND
58.4_Wik 2 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	28	ND	ND	ND	ND	ND	13K	ND	ND	ND	4500	ND	9400	ND	10
58.5_Wik 2 PBR	ND	ND	9.3	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	ND	ND	3600	ND	ND	ND	ND	ND	1800	ND	ND
58.6_Wik 2 PBR	ND	ND	ND	570	ND	ND	ND	ND	ND	ND	ND	8	ND	1.1	ND	ND	ND	30K	ND	47	ND	4800	120	11K	ND	ND
58.7_Wik 2 PBR	ND	ND	70	110	ND	ND	ND	ND	ND	ND	ND	6.7	ND	8.9	ND	1300	ND	24K	ND	2500	ND	5100	74	7200	120	ND
58.8_Wik 2 PBR	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	78	ND	1.6	ND	ND	ND	1300	ND	ND	ND	ND	13	4200	ND	ND

TABLE A-2. ANALYTES AND REPORTING LIMITS.

Component	Reporting Limit	Component	Reporting Limit
Vinyl Chloride	0.5 ug/L	Chloromethane	0.5 ug/L
1,1-Dichloroethylene	0.5 ug/L	Bromomethane	0.5 ug/L
Dichloromethane	0.5 ug/L	Chloroethane	0.5 ug/L
Trans-1,2-Dichloroethylene	0.5 ug/L	Fluorotrichloro-methane	0.5 ug/L
Cis-1,2-Dichloroethylene	0.5 ug/L	1,1-Dichloroethane	0.5 ug/L
1,1,1-Trichloroethane	0.5 ug/L	2,2-Dichloropropane	0.5 ug/L
Carbon Tetrachloride	0.5 ug/L	Bromochloro-methane	0.5 ug/L
Benzene	0.5 ug/L	Chloroform	0.5 ug/L
1,2-Dichloroethane	0.5 ug/L	1,1-Dichloropropene	0.5 ug/L
Trichloroethylene	0.5 ug/L	Dibromomethane	0.5 ug/L
1,2-Dichloropropane	0.5 ug/L	Bromodichloro-methane	0.5 ug/L
Toluene	0.5 ug/L	Cis-1,3-Dichloropro-pene	0.5 ug/L
1,1,2-Trichloroethane	0.5 ug/L	Trans-1,3-Dichloropropene	0.5 ug/L
Tetrachloroethylene	0.5 ug/L	1,3-Dichloropropane	0.5 ug/L
Chlorobenzene	0.5 ug/L	Chlorodibromo-methane	0.5 ug/L
Ethylbenzene	0.5 ug/L	1,2-Dibromoethane	0.5 ug/L
Total Xylenes	0.5 ug/L	1,1,1,2-Tetrachloroethane	0.5 ug/L
Styrene	0.5 ug/L	Bromoform	0.5 ug/L
p-Dichlorobenzene	0.5 ug/L	Isopropylbenzene	0.5 ug/L
o-Dichlorobenzene	0.5 ug/L	1,1,2,2-Tetrachloroethane	0.5 ug/L
1,2,4-Trichlorobenzene	0.5 ug/L	Bromobenzene	0.5 ug/L
Dichlorodifluoro-methane	0.5 ug/L	1,2,3-Trichloropropane	0.5 ug/L

TABLE A-2. ANALYTES AND REPORTING LIMITS, CONTINUED.

Component	Reporting Limit	Component	Reporting Limit
n-Propylbenzene	0.5 ug/L	Barium (ICP)	10 ug/L
o-Chlorotoluene	0.5 ug/L	Beryllium (ICP)	10 ug/L
1,3,5-Trimethylbenzene	0.5 ug/L	Calcium (ICP)	2000 ug/L
p-Chlorotoluene	0.5 ug/L	Cobalt (ICP)	10 ug/L
Tert-Butylbenzene	0.5 ug/L	Chromium (ICP)	20 ug/L
1,2,4-Trimethylbenzene	0.5 ug/L	Copper (ICP)	20 ug/L
Sec-Butylbenzene	0.5 ug/L	Iron (ICP)	20 ug/L
p-Isopropyltoluene	0.5 ug/L	Potassium (ICP)	5000 ug/L
m-Dichlorobenzene	0.5 ug/L	Magnesium (ICP)	1000 ug/L
n-Butylbenzene	0.5 ug/L	Manganese (ICP)	10 ug/L
1,2-Dibromo-3-chloropropane	0.5 ug/L	Sodium (ICP)	1000 ug/L
Hexachlorobutadi-ene	0.5 ug/L	Nickel (ICP)	20 ug/L
Naphthalene	0.5 ug/L	Lead (ICP)	90 ug/L
1,2,3-Trichlorobenzene	0.5 ug/L	Antimony (ICP)	120 ug/L
Methyl-tert-butyl ether (MTBE)	0.5 ug/L	Selenium (ICP)	190 ug/L
Chloride	10 mg/L	Titanium (ICP)	10 ug/L
Sulfate	10 mg/L	Thallium (ICP)	200 ug/L
Nitrate/nitrite	0.02 mg/L as Nitrogen	Vanadium (ICP)	10 ug/L
Total Phosphorus	0.02 mg/L	Zinc (ICP)	20 ug/L
Silver (ICP)	10 ug/L	Chromium (ICP/MS)	5 ug/L
Aluminum (ICP)	60 ug/L	Nickel (ICP/MS)	10 ug/L
Arsenic (ICP)	80 ug/L	Copper (ICP/MS)	5 ug/L

TABLE A-2. ANALYTES AND REPORTING LIMITS, CONTINUED.

Component	Reporting Limit	Component	Reporting Limit
Zinc (ICP/MS)	10 ug/L	Tin (ICP/MS)	30 ug/L
Arsenic (ICP/MS)	5 ug/L	Antimony (ICP/MS)	5 ug/L
Selenium (ICP/MS)	5 ug/L	Barium (ICP/MS)	2 ug/L
Molybdenum (ICP/MS)	5 ug/L	Thallium (ICP/MS)	1 ug/L
Silver (ICP/MS)	5 ug/L	Lead (ICP/MS)	1 ug/L
Cadmium (ICP/MS)	0.7 ug/L	Uranium (ICP/MS)	1 ug/L