APPENDIX A

Wansley Site Assessment Report 2007

PLANT WANSLEY PROPOSED COAL COMBUSTION BY-PRODUCT DISPOSAL FACILITY

SITE ACCEPTABILITY REPORT REVISION 1

October 2007



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GEORGIA POWER COMPANY PLANT WANSLEY PROPOSED COAL COMBUSTION BY-PRODUCT DISPOSAL FACILITY SITE ACCEPTABILITY REPORT REVISION 1

Prepared for

Georgia Power Company

By

Earth Science and Environmental Engineering Southern Company Generation

October 2007



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Terri H. Hartsfield ^C Civil Engineer

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Plant Wansley Proposed Combustion By-Product Disposal Facility – Site Acceptability Report Rev. 1 Georgia Power Company

EXECUTIVE SUMMARY

Plant Wansley is located in northeast Heard County and southeast Carroll County, Georgia, off Liberty Church Road, approximately 15 miles west of the city of Newnan, 9 miles northeast of the city of Franklin and 12 miles southeast of the city of Carrollton. Plant property is adjacent and west of the Chattahoochee River. Georgia Power Company proposes to develop a 325 acre portion of this property as a Coal Combustion By-Product (CCB) disposal facility.

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility.

Per Circular 14, site investigations have been performed to determine if the site is acceptable for gypsum disposal. This Site Acceptability Report presents the results of the site investigations. The following key points are discussed in the report:

- The site is not located within
 - 0 0.5 mile of a county boundary,
 - o 5,708 yards of a National Historic Site, or
 - o the 100-year floodplain.
- At least a 200-foot buffer will be maintained beyond the limits of the disposal area. A new fence and security road will be constructed parallel to the existing fence along Hollingsworth Ferry Road. The proposed 200-foot buffer will be maintained inside the proposed security road and fence.
- No threatened or endangered animal or plant species were observed at the site.
- No portion of the site is located within a significant groundwater recharge area.
- The site contains approximately 7.4 acres of wetlands associated with small streams that traverse the site. Any jurisdictional wetlands present, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis.
- No public water supply wells were identified within 2 miles of the site. The site is not within the water management area of a public water supply well. Twenty domestic wells were located within ¹/₂ mile of the site. All the wells are located upgradient of the site.
- Based on laboratory testing, the remolded permeability of the material proposed for use as a potential soil liner averages 1.6×10^{-6} cm/sec with a range of 3.7×10^{-6} cm/sec to 1.7×10^{-7} cm/sec. The recommended maximum permeability of the compacted soil liner beneath the synthetic liner is 1×10^{-5} cm/sec.
- Fate and transport modeling indicated that selenium would travel only 0.39 inches into a compacted soil liner, using a conservative estimate of permeability equal to 5 x 10⁻⁴ cm/sec, after 100 years under a realistic scenario without a synthetic liner.

- Based on fate and transport modeling, the facility will not contaminate groundwater since the leachate will not travel through a compacted soil liner and a minimum 5-foot barrier between the gypsum and groundwater.
- Groundwater pollution potential was also determined using the LeGrand Method as described in Circular 14, using measured site input parameters. The LeGrand analysis produced a score of 15.8, which means groundwater pollution potential is "possible, but not likely", depending on design.
- A groundwater monitoring network will be designed to provide early detection in the unlikely event that regulated constituents might reach groundwater and surface water.
- According to Heard County Board of Commissioners, the site complies with local zoning and land use ordinance for a private industrial solid waste disposal site.

1.0 GENERAL SITE AREA

1.1 Description of General Site Area

1.1.1 Location

Plant Wansley is located in northeast Heard County and southeast Carroll County, Georgia, off Liberty Church Road, approximately 15 miles west of the city of Newnan, 9 miles northeast of the city of Franklin and 12 miles southeast of the city of Carrollton. The physical address of the plant is 1371 Liberty Church Road, Carrollton, Georgia. The plant property encompasses approximately 5100 acres and is bounded on the east by the Chattahoochee River.

Plant Wansley consists of four gas-fired combined cycle units and two coal-fired units. Due to proposed air quality regulations, the plant is currently in the process of installing flue gas desulfurization (FGD) equipment (scrubbers) on both coal-fired units. Between 386,000 and 900,000 tons per year of gypsum disposal, depending on the percent sulfur coal burned, may be required as a result of these scrubbers.

The project proposes to develop approximately 325 acres of plant property located along the north side of Hollingsworth Ferry Road, south-southeast of the plant, as a private industry coal combustion by-product disposal area. The site is located at approximate longitude W85° 03' and latitude N33° 24'. This waste is classified in Circular 14, Appendix A, as industrial waste with a moderate potential for groundwater pollution. The site topographic map and site boundary are shown on Figure 1-1. The general area of the plant and the site are shown on Figure 1-2. Copies of the original topographic survey and signed and sealed site boundary survey drawings are located in Appendix A.

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility. This report presents the results of a site acceptability study performed for the purpose of obtaining the necessary EPD approval to develop the property as a private industry coal combustion by-product disposal facility for gypsum.

1.1.2 General Site Geology

The proposed disposal facility is located within the Southern Piedmont Physiographic province, which lies between the Blue Ridge Mountains and the Upper Coastal Plain. This province is underlain by metamorphic rocks including mica schists and granitic gneisses. The Brevard Fault Zone, a major feature that cuts across the Piedmont, occurs approximately one mile north of the proposed disposal facility. This zone is bounded by a thrust fault on the southeastern border and trends northeast, as do most of the rocks of the Piedmont.

Rock cores recovered from borings within the disposal facility are interbedded granitic gneisses, garnet mica schists, augen schists and augen gneisses with occasional quartzite veins and accessory minerals of garnet, epidote and calcite. Figure 1-3 shows the regional geology of the site area.

1.1.3 Population Trends

The population of Heard County, Georgia for the year 2005 was estimated to be 11,346. From 2000 to 2005, the county grew in population an estimated 3.0%. Carroll County, to the north of the site, had an estimated population of 105,453 in 2005, an increase of 20.8% since 2000. Coweta County, to the east of the site, had an estimated 2005 population of 109,903, with an increase of 23.3% since 2000 (U. S. Census Bureau, 2006). According to the Carroll County Plan Update, these trends are due largely to the proximity of the area to the City of Atlanta.

1.1.4 Other Permitted State/Federal Facilities

According to the Georgia Environmental Protection Division of the Department of Natural Resources, the Georgia Power Company-Plant Wansley Private Waste Disposal Facility, an inert landfill, permit number PBR-074-01IL, is the only waste disposal facility located within 2 miles of the site. No other State or Federal permitted waste disposal facility is located within 2 miles of the site.

1.1.5 Threatened and Endangered Species/Wildlife Habitat Survey

The proposed disposal area was surveyed by representatives of Georgia Power Company's Environmental Affairs for threatened and endangered species. Both database and field surveys were conducted. No threatened and endangered species or their habitats were identified during these surveys. According to the report, one known location of a federally listed species (bald eagle – federally listed threatened) occurs approximately 1600 feet northwest of the site boundary within the Plant Wansley site. The location of the active nest is outside the primary zone (750 - 1500 ft) and will not be impacted by project activities.

The field survey indicated that the site was dominated by forested community types. Primary cover types included hardwood, mixed pine/hardwood, forested wetland, and scrub/shrub wetland. The full report is located in Appendix B.

1.2 Proximity to Roads, Airports and Railroads

The site is adjacent to Hollingsworth Ferry Road, with road frontage of approximately 5600 feet. A rail spur for the plant is located along Georgia Power Road, approximately onequarter mile northeast of the proposed gypsum disposal site. Twelve airports are located in the general site vicinity. The airports, their location, and their distance to the plant are listed in Table 1-1. None of the airports are closer than 5 miles to the site. This is greater than the most stringent requirements specified by Circular 14, requiring a minimum separation distance of 10,000 feet from the end of runways servicing turbojet aircraft. Additionally, the proposed facility will not receive wastes that will attract birds.

Airport Name	ID	Latitude	Longitude	Distance from Facility
Andy Fields	2GE8	33-27-51.00N	084-39-48.00W	22.2 miles
Answered Prayer	1GE3	33-15-14.00N	085-10-13.00W	12.0
C&R Farm	78GA	33-30-15.40N	085-01-01.79W	7.0
Dresden	GA79	33-20-41.42N	084-54-40.78W	7.9
Falcons Aerie	8GA8	33-34-38.40N	085-00-10.79W	12.1
Flying W Farms	6GA8	33-30-28.00N	085-11-08.00W	10.3
Gum Creek	8GA1	33-25-16.41N	085-09-42.80W	5.9
Murphree	26GA	33-20-10.42N	084-54-49.78W	8.5
Newnan Coweta County	CCO	33-18-41.63N	084-46-11.12W	16.8
Panther Creek	17GA	33-28-00.00N	084-51-58.00W	11.0
West Georgia Regional – OV Gray Field	CTJ	33-37-51.70N	085-09-07.30W	16.2
Wilson Intl	27GA	33-39-30.39N	085-00-35.80W	17.6

Table 1-1
Airports Located in the General Vicinity of the
Proposed Gypsum Disposal Facility

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(AirportBug.org, 2007)

1.3 Proximity to County Boundaries and National Historic Sites

Although the plant property is located in both Heard and Carroll Counties, and borders Coweta County along the Chattahoochee River, the proposed disposal site is located approximately 1.9 miles east of the boundary of Heard County and Coweta County and approximately 1.5 miles south of the boundary between Heard County and Carroll County. Circular 14 states that no permit shall be issued to an applicant if any part of the site is within ½ mile of an adjoining county without the approval of the government of the adjoining county. No portion of the proposed facility is within ½ mile of an adjoining county.

The National Parks Service's National Register of Historic Places was searched for a listing of historical places in Heard, Coweta, and Carroll Counties. The search indicated two historic sites in Heard County, 14 in Carroll County, and 23 in Coweta County. None of these listings are within 3 ¹/₄ miles (5,708 yards) of the site. According to Circular 14, no industrial landfill shall be located within 5,708 yards of a National Historic Site. The complete list of historic sites in these counties, along with the approximate distance from the site is included in Appendix C.

1.4 Proximity to Flood Plains

Based on the Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Map for unincorporated Heard County, Map Number 130105A, page 4, the site is not located in the 100-year flood plain (Figure 1-4).

1.5 Proximity to Streams and Wetlands

A wetland delineation survey was performed by Georgia Power Environmental Affairs. The wetland delineation was performed in accordance with the United States Army Corps of Engineers "Wetland Delineation Manual, 1987" by two certified wetlands scientists. Several small wetlands were delineated that are associated with small streams. The total area of these wetlands is 7.4 acres. Any jurisdictional wetlands present, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis. All streams on the site property are tributaries of the Chattahoochee River which is located approximately 2000 feet east of the site boundary. Neither the river nor any of its tributaries are classified "trout streams" in Heard County. The streams and wetland areas are shown on Figure 1-5.

1.6 Proximity to Significant Groundwater Recharge Areas

According to Digital Environmental Atlas of Georgia, the site is not located in or adjacent to an area of significant groundwater recharge. The nearest significant unconfined aquifer recharge area is located approximately 2 miles southwest of the site. Figure 1-6 indicates the nearest significant recharge areas.

1.7 Proximity to Public and Domestic Water Wells

In November and December 2006, a survey was performed to identify water supply wells and surface water intakes near the site. The survey was performed by Kemron Environmental Services in accordance with the specifications for a Private Industrial Disposal Facility as outlined in Chapter 391-3-4-.05(k) of the Rules for Solid Waste Management, and Appendix A, Circular 14, Criteria for Performing Site Acceptability Studies for Solid Waste Landfills. An inventory of all privately owned (domestic) water supply wells within ½-mile radius and all public water supply wells and surface water intakes within a 2-mile radius was completed. The survey included the following:

- Obtaining tax maps of the adjacent properties from the Heard County Tax Assessors Office to identify property owners.
- Contacting the Heard County Water Authority.
- Searching the Water Resources Division of the United States Geologic Survey (USGS) and state of Georgia Environmental Protection Division (EPD) databases.
- Field reconnaissance of the 2-mile radius for public water supply wells and surface water intakes and ¹/₂-mile radius for private water supply wells.

The search produced the following information:

- The USGS database included nine private wells within the 2-mile radius of the site. Based on field observation, these wells appear to be outside the ¹/₂-mile radius for private water supply wells.
- The State of Georgia Environmental Protection Division (GAEPD) database for water supply wells and water intakes in Heard County was searched for drinking water sources. Of the 7 sources listed in Heard County 2 water intakes are located within 2 miles of the site. These 2 water intakes belong to Georgia Power Company's Plant Wansley and are listed as 1) Plant Service Pond and 2) Chattahoochee River. Neither of these intakes are used for drinking water; however the Plant Service Pond intake is used for an emergency eye-wash station. A third Plant Wansley water source, the Lake Gentry Yellow Dirt Creek intake is listed in the database. It is located outside the 2-mile radius for surface water intakes and is not used for drinking water. The locations of the plant service water intakes are shown on Figure 2 of the Kemron report located in Appendix D. 2).
- The Heard County Water Authority was contacted and indicated that the two surface water intakes belonging to them were within the City of Franklin. The city limits of Franklin are approximately 10.5 miles downstream of the site. They also indicated that they do not keep records of private water wells.
- The Heard County Tax Assessors database indicated that seven properties with water wells are located within the ¹/₂-mile radius for domestic water supply wells. All of these wells are located up-gradient of the site.
- Field reconnaissance with the ¹/₂-mile radius of the site boundaries indicated 13 additional private water wells. Field reconnaissance was not performed on Plant Wansley property. The locations of these wells are shown on Figure 4 of the Kemron report, located in Appendix D. All of these wells are located up-gradient of the site.

Table 1-2 is a summary of the domestic wells identified during the survey to be within $\frac{1}{2}$ -mile of the site. Also included are properties adjacent to the site which are connected to the public water supply, but which may have wells. The complete Kemron report is included in Appendix D. Figure 1-7 shows both the $\frac{1}{2}$ -mile and 2-mile radii from the site boundaries. No public water wells are present within the 2-miles radius. The private water wells within the $\frac{1}{2}$ -mile radius are located on the map.

Well Owner	Property Address	Мар	Parcel	Water Supply*
Wendall S. Lewis	4819 Hollingsworth Ferry Rd.	43	24	well
Jerry L. & Tim R. Hudson	4704 Hollingsworth Ferry Rd.	43	25	well
Pink & Gertrude Webb	4944 Hollingsworth Ferry Rd.	43	22	well
Matthew R. Ridley	4474 Hollingsworth Ferry Rd.	43	26	well
Gary C. Philpott	4430 Hollingsworth Ferry Rd.	43	27	well
Yellow Dirt Baptist Church	4058 Hollingsworth Ferry Rd.	43	28	well
Joe Stephens	Hollingsworth Ferry Rd.	43	10	well
Samuel Harmon	6990 Five Notch Rd.	44	18	well
Samuel Harmon	6990 Five Notch Rd.	44	18.02	well
Jud Hall	Five Notch Rd.	44	18.03	well
Wayne Morris	240 Webb Rd.	44	17	well
James D. Green & Amanda Lovell	50 Webb Rd.	43	23.01	well
Brenda Webb	212 Webb Rd.	43	20	well
Gertrude Webb	Webb Rd.	43	21	well
James R. Price	Hollingsworth Ferry Rd.	43	11	well
Wayne Webb	201 Webb Rd.	43	19	well
Steven Kirk	4986 Hollingsworth Ferry Rd.	43	16	well
Johnnie Steele	5120 Hollingsworth Ferry Rd.	43	12	well
Gertrude Webb	Hollingsworth Ferry Rd.	43	13	well
Rufus Adamson	5040 Hollingsworth Ferry Rd.	43	14	well
Jeremy Milam	6903 Five Notch Rd.	44	18.01	public
Jane Sullivan	231 Webb Rd.	44	17.01	public
James & Lisa Perry	288 Webb Rd.	44	17.02	public
Loyette Echols	4848 Hollingsworth Ferry Rd.	43	23	public
Wendall C. Lewis	Hollingsworth Ferry Rd.	43	23.02	public

Table 1-2 Water Supply Well Inventory

* - Addresses shown with a well as the water supply were either listed on the Heard County Tax Assessors office to have a well or a well was visually observed during field reconnaissance. Addresses shown with public as the water supply are adjacent properties with public water supply. However, existence of a well has not been confirmed.

Circular 14 specifies a wellhead protection area around wells and springs used as sources of water supply for public water systems serving municipalities, counties, and authorities. The site is not within the water management area of a public water supply well or surface water intake.

1.8 Zoning and Notification

A copy of the letter stating that the proposed solid waste disposal facility at Plant Wansley complies with local zoning and land use ordinance, from June Jackson, Commission Chair, Heard County Board of Commissioners, dated December 4, 2006, is located in Appendix E.

2.0 CHARACTERIZATION OF WASTES

Installation of flue gas desulfurization (FGD) equipment (scrubbers) on two coal-fired units at Plant Wansley will result in the production of gypsum ($Ca_2SO_4 \cdot 2H_2O$). FGD technologies are categorized as dry or wet, depending on the state of the reagent as it leaves the absorber. The scrubbers planned for Plant Wansley will be wet and will use limestone as the reagent. Hydrated lime is to be injected into the slurry upstream of the scrubbers to remove SO₃. Wet FGD systems are comprised of three main processing areas: sorbent handling, SO₂ scrubbing, and by-product handling.

FGD systems that use limestone continually discharge scrubber slurry from the absorber that is generally more than 90% water. The slurry can be dewatered by a number of processes, and depending on the slurry composition, it can be sold commercially as gypsum, mixed with fly ash to create a fairly impermeable fill, or handled and placed in storage. The only Georgia Power plant that currently generates gypsum is Plant Yates. When scrubbers are installed at Plant Wansley, the gypsum generated will be similar in physical and chemical properties to the gypsum that is currently generated at Plant Yates. Table 2-1 presents the range of results of total metals analyses based on 12 gypsum samples collected over a 12-day period from Plant Yates. The 12 samples were composited, and the TCLP was run on the composite. A duplicate TCLP was also run. Table 2-2 presents a summary of Plant Yates gypsum leachate data, compared to the regulatory thresholds that the EPA has set for hazardous waste. None of the elements in gypsum exceed the TCLP regulatory threshold. The laboratory reports and a figure showing the sampling location of the gypsum are located in Appendix F.

Element	Range of Results	Detection Limits
Element	mg/kg	mg/kg
Total Antimony	ND	7.4 - 8.1
Total Arsenic	ND	4.4 - 4.9
Total Barium	120 - 210	1.5 – 1.6
Total Beryllium	ND	1.5 – 1.6
Total Cadmium	ND	1.5 – 1.6
Total Chromium	ND – 1.6	1.5 – 1.6
Total Cobalt	ND	5.9 - 6.5
Total Copper	ND	1.5 - 3.3
Total Iron	260 - 560	5.9 - 6.5
Total Lead	ND	2.2 - 2.4
Total Manganese	ND	5.9 - 6.5
Total Mercury	ND – 0.77	0.37 - 0.8
Total Nickel	ND	2.9 - 3.3
Total Selenium	7.5 – 14	5.9 - 6.5
Total Silver	ND	1.6 – 1.6
Total Thallium	ND	29 - 33
Total Vanadium	ND	2.9 - 3.3
Total Zinc	10-29	2.9 - 3.3

Table 2-1

Note: Twelve separate samples were collected from 2/4/02 to 2/15/02.

Table 2-2

Element	Sample #1 TCLP Concentration, mg/L	Duplicate TCLP Concentration, mg/L	TCLP Detection Limit, mg/L	TCLP Regulatory Limit, mg/L
Antimony	ND	ND	0.1	
Arsenic	ND	ND	0.03	5.0
Barium	0.2	0.2	0.1	100.0
Beryllium	ND	ND	0.01	
Cadmium	ND	ND	0.01	1.0
Chromium	0.02	0.02	0.01	5.0
Cobalt	ND	ND	0.04	
Copper	0.03	ND	0.02	
Iron	0.35	0.31	0.01	
Lead	ND	ND	0.1	5.0
Manganese	0.10	0.10	0.04	
Mercury	ND	ND	0.005	0.2
Nickel	ND	ND	0.02	
Selenium	ND	ND	0.5	1.0
Silver	ND	ND	0.01	5.0
Vanadium	ND	ND	0.02	
Zinc	0.51	0.45	0.03	

Plant Yates Gypsum TCLP Data

Note: Samples collected on 2/4/02.

3.0 SURFACE AND SUBSURFACE EXPLORATIONS

3.1 Topography

The general topography of the area consists of rolling hills and narrow valleys. The elevations over the proposed disposal facility range from about 880 feet msl in the westernmost section to approximately 670 feet msl in the southeast corner nearest to the Chattahoochee River. A number of small wet-weather streams form a dendritic pattern and merge to drain to the river in the southeast corner. The larger portion of the site is vegetated with mature woods. High under-brush covers the areas that have been previously cleared of trees. The topography is shown on Figure 1-1

3.2 Boring and Sampling Plan

3.2.1 Basis

The boring location plan was developed based on the locations of streams and wetland areas over the site and the topography of the site. Groundwater flow was expected to be influenced by the streams and the Chattahoochee River. A minimum of three borings were drilled for each drainage area.

3.2.2 Depth Criteria

The drilling and sampling program consisted of borings drilled at 31 locations dispersed over the approximately 325 acres. Per Circular 14, the criterion was established to extend the borings to a minimum depth of 20 feet below the groundwater table. It was expected that rock would be encountered within this 20 feet in a majority of the holes. In the instances where this was the case, a minimum of 10 feet of rock core was performed or until core recovery exceeded 95% within the last 5 feet. Boring locations are shown on Figure 3-1.

3.2.3 Drilling Methods

Drilling was performed using 4.875-inch diameter hollow stem augers to auger refusal. Rock coring was performed using a HQ wire-line coring system. The borings were advanced with a CME55 drill rig by Civil Field Services, Engineering and Construction Services, Southern Company Generation, a bonded service group under the Georgia Water Well Standards Act. A copy of the bond is located in Appendix G. All soil sampling and rock cores were logged under the direct supervision of a geologist or engineer registered in the State of Georgia.

3.2.4 Sampling Methods

Split-spoon samples were taken in the soil and saprolite profile on 5-foot center-to-center spacing beginning at the ground surface or one foot below ground surface (bgs) and continuing to auger refusal. The soil samples were collected from the spoon, placed in

sample containers and labeled with boring number, depth, standard penetration counts (N), sample number, job name and date. HW size surface casing was set into the top of rock as determined by auger refusal depths. Rock coring was performed with five foot runs with a HQ coring system. The recovered core was placed in wooden boxes, labeled with the boring number, date, depth of the run and core recovery. The piezometers were installed with 2-inch diameter screen and casing, a 10-foot screened interval, and a filter pack surrounding the screen to approximately 2 feet above the top of the screen. Bentonite was placed above the filter pack to the ground surface.

Twelve undisturbed samples were collected from six locations in the upper fourteen feet for permeability and classification testing. Bag samples were also collected from a number of locations for density and remolded permeability testing. Table 3-1 presents a summary of the boring data. Boring logs and piezometer logs are located in Appendix H.

			Sum	mary Bol	ring Data	a		
		Auger]	Refusal	Bor Termi	ing nation	Ground	lwater Measu	rements
Boring	Ground Elev.	Depth, ft.	Elev.	Depth, ft.	Elev.	Depth to GW, ft.	Time GW Measured	GW Elev
GS-1	847.7	38.9	808.8	54.2	793.5	31.2	24 hrs	816.5
GS-2	834.2	21.2	813.0	45.7	788.5	-	-	-
GS-3	803.2	na	na	50.0	753.2	27.0	TOD	776.2
GS-4	805.9	17.0	788.9	35.5	770.4		-	805.9
GS-5	773.1	10.0	763.1	31.6	741.5	-	-	-
GS-6	767.1	na	na	41.5	725.6	20.5	TOD	746.6
GS-7	794.7	na	na	66.5	728.2	44.7	24 hrs	750.0
GS-8	766.5	16.3	750.2	37.4	729.1	15.1	24 hrs	751.4
GS-9	772.7	15.0	757.2	35.5	737.2	18.0	TOD	754.7
GS-10	761.4	30.0	731.4	51.8	709.6	33.7	24 hrs	727.7
GS-11	773.9	na	na	61.0	712.9	39.3	TOD	734.6
GS-12	773.2	na	na	81.0	692.2	58.7	24 hrs	714.5
GS-13	780.6	12.5	768.1	37.5	743.1	16.7	24 hrs	763.9
GS-14	737.7	6.5	731.2	44.5	693.2	20.4	24 hrs	717.3
GS-15	719.7	21.0	698.7	41.3	678.4	18.0	24 hrs	701.7
GS-16	710.5	26.9	683.6	40.1	670.4	20.7	24 hrs	689.8
GS-17	756.1	30.0	726.1	50.4	705.7	21.7	-	734.4
GS-18	731.6	7.4	724.2	32.5	699.1	15.2	-	716.4
GS-19	750.0	15.2	734.8	39.2	710.8	17.3	24 hrs	732.7
GS-20	713.8	na	na	43.5	670.3		-	(* 1)
GS-21	789.4	66.0	723.4	77.5	711.9	74.0	24 hrs	715.4
GS-22	729.3	na	na	75.0	654.3	48.7	TOD	680.6
GS-23	697.9	na	na	60.0	637.9	12.6	TOD	685.3
GS-24	725.0	na	na	65.5	659.5	39.5	TOD	685.5
GS-25	785.7	29.0	756.7	43.7	742.0	20.2	24 hrs	765.5
GS-26	744.7	50.5	694.2	60.0	684.7	-	-	170
GS-27	699.7	na	na	35.0	664.7	1	-	
GS-28	813.4	na	na	68.0	745.4		-	
GS-29	746.7	na	na	50.0	696.7	-	-	
GS-30	714.6	na	na	46.5	668.1	-	-	(#2)
GS-31	843.5	23.5	820.0	43.5	800.0	15.0	24 hrs	828.5

Table 3-1 Summary Boring Data

na – not applicable TOD – time of drilling

3.2.5 Field and Laboratory Testing

Split-spoon, undisturbed, and bulk samples were collected for laboratory soils testing. The laboratory testing was performed by Southern Company Generation in Alabaster, Alabama. The following tests were performed on the soil samples using the standard noted:

- Standard Test Method for Particle-Size Analysis of Soils R (1998) ASTM D-422
- Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits Tests) - ASTM D-4318
- Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) ASTM D-2487
- Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer E(2002) - ASTM D-854
- Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass - ASTM D-2216
- Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)) - ASTM D-698
- Fall Head Permeability Tests Corps of Engineers Method
- Cation Exchange Capacity EPA method SW-846
- Standard Test Method for Batch-Type Measurement of Contaminant Sorption by Soils and Sediments – ASTM D-4646

Remolded samples were used to test for permeability of the overburden soil. Samples were remolded to 98% maximum dry density and +1.5% optimum moisture content using the results of the compaction testing (ASTM D698). Falling head permeability tests were also run on ten undisturbed samples of the overburden soils. Additionally, slug testing was performed in the field to determine the field hydraulic conductivity of the in situ rock and saprolite aquifer. This testing is discussed in Section 3.4.4.

The cation exchange capacity and the adsorption coefficient (K_d) were also determined for five samples. The results of the laboratory testing are shown in Table 3-2 and the laboratory test reports are included in Appendix I.

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Table 3-2 Summary of Soil Laboratory Test Results

SS – Spli USCS – 1	PI – Plas % Fines -	LL – Liq	GS-29	GS-29	GS-29	GS-29	GS-29	GS-28	GS-28	GS-26	GS-26	GS-23	GS-23	GS-23	GS-22	GS-21	GS-21	GS-21	GS-19	GS-19	GS-17	GS-17	GS-17	GS-16	GS-16	GS-13	GS-13	GS-11	GS-11	GS-7	GS-7	GS-7	GS-7	GS-7	GS-4	GS-4	GS-2	GS-2	Sample
t Spoon Sar Unified Soil	- Sieve Ana	uid Limit	SS	SS	Bulk	SS	Bulk	UD	UD	UD	UD	SS	SS	SS	SS	SS	UD	UD	Bulk	Bulk	SS	SS	SS	UD	UD	Bulk	Bulk	UD	UD	SS	SS	Bulk	SS	Bulk	UD	UD	Bulk	Bulk	Туре
nple Classification Sy	lvsis		37.0 - 39.5	13.0 - 14.5	6.0 - 8.0	3.0 - 4.5	1.0 - 2.5	11.0 - 12.5	4.0 - 6.0	10.0 - 12.0	1.0 - 3.0	39.5 - 41.0	14.5 - 16.0	1.0 - 2.5	4.5 - 6.0	49.5 - 51.0	9.0 - 11.0	4.0 - 6.0	6.0 - 7.0	1.5 - 3.0	24.0 - 25.5	14.5 - 15.5	4.0 - 5.5	12.0 - 14.0	4.0 - 6.0	5.0 - 6.0	1.5 - 3.0	10.0 - 12.0	3.0 - 5.0	34.5 - 36.0	14.5 - 16.0	6.0 - 8.0	4.5 - 6.0	2.0 - 3.0	10.0 - 12.0	3.0 - 5.0	3.0 - 4.5	1.0 - 2.5	Depth, ft.
vstem Designation N		Q	Light brown sandy SILT	Light brown sandy SILT		Reddish brown silty SAND		Lavender sandy SILT	Reddish brown sandy SILT	Brown silty SAND	Light brown silty SAND	Light gray silty SAND	Light brown SILT w/sand	Reddish brown elastic SILT w/sand	Light brown SILT with sand	Gray silty SAND	Brown silty SAND	Reddish brown silty SAND	Light reddish brown sandy SILT	Light reddish brown elastic SILT w/sand	Light brown sandy SILT	Light brown sandy SILT	Reddish brown elastic SILT w/sand	Light reddish brown sandy SILT	Dark brown elastic SILT	Light brown sandy SILT	Light reddish brown elastic SILT w/sand	Light brown sandy SILT	Reddish brown elastic SILT w/sand	Light reddish brown sandy SILT	Reddish brown elastic SILT w/sand		Reddish brown elastic SILT w/sand		Light brown silty SAND	Light reddish brown sandy SILT	Light brown sandy SILT	Light reddish brown sandy lean CLAY	Description
D – Undisturbed P – Non Plastic	I – Sorption Coe S – Specific Grave	EC - Cation Exc	32	55.3		44.3		51.4	55.5	33.6	35.4	43.1	71	80.4	79.2	38.9	46.1	43.0	57.4	83.7	57.1	65.3	81.6	65.7	86.0	59.1	78.5	51.3	73.3	59.6	70.3		78.5	1	44.2	57.4	50.1	66.5	% Fines
Sample	fficient	hange Capa	NP	NP		43		NP	NP	NP	NP	NP	NP	54	NP	NP	NP	NÞ	NP	54	NP	NP	55	NP	98	NP	50	NP	51	NP	53		58		NÞ	NP	NP	47	Ę
		city	NP	NP		12		NP	NP	NP	NP	NP	NP	18	NP	NP	NP	NÞ	NP	24	NP	NP	22	NP	31	NP	17	NP	17	NP	8		26		NP	NP	NP	21	Р
			SM	ML		SM		ML	ML	SM	SM	SM	ML	MH	ML	SM	SM	SM	ML	MH	ML	ML	MH	ML	MH	ML	MH	ML	MH	ML	MH		MH		SM	ML	ML	Q	USCS
								100.4	96.9	109.9	102.5						109.9	97.5						87.0	78.6			95.0	86.1						91.9	91.6			In-Situ Density, pcf
								15.5	13.1	13.2	12.2	9/1-					13.3	11.3						22.1	40.8			15.4	27.5						22.7	15.6			Natural Moisture, %
					101.5		100.2												77.1	98.2						91.1	90.1					107.9		104.2			99.3	96.9	Max. Dry Density, (Proctor) pcf
					20.6		21.8	-											34.4	22.5						24.8	28.3					17.8		19.8			18.0	22.7	Optimum Moisture, (Proctor) %
			2.77	2.77		2.79		2.75	2.78	2.73	2.74	2.86	2.70	2.73	2.69	2.75	2.73	2.78	2.84	2.75	2.83	2.73	2.74	2.70	2.83	2.83	2.83	2.67	2.69	2.72	2.73		2.72	(41.024p.7	2.62	2.64	2.63	2.63	Gs
	2				5.7 x 10 ⁻⁷		1.7 x 10 ⁻⁷	7.1 x 10 ⁻⁵	2.3 x 10 ⁻⁵								1.4 x 10 ⁻⁴	6.6 x 10 ⁻⁵	3.7 x 10 ⁻⁶	2.4 x 10 ⁻⁶	Ŕ			2.3 x 10 ⁻⁴	8.2 x 10 ⁻⁶	1.3 x 10 ⁻⁶	1.8 x 10 ⁻⁶	7.3 x 10 ⁻⁵	4.7 x 10 ⁻⁵		2	4.0 x 10 ⁻⁷	Revenue al	1.4 x 10 ⁻⁶	9.9 x 10 ⁻⁵	1.6 x 10 ⁻⁵	3.5 x 10 ⁻⁶	3.7 x 10 ⁻⁷	Perm, cm/sec
					98.9		98.2								5 1 N				75.6	96.2						89.7	87.7				-	105.4		100.9	1		97.7	94.9	Remolded Density, pcf
					22.2		23.3			÷						3			34.4	24.0						26.3	29.8	T				19.3		21.3		*	19.5	24.2	Remolded Moisture, %
																			27.4	13.8						18.2	19.7											14.8	CEC, meq/100g
			TIC	01	111	יוור	30	0	חר	V	3/	24	191	74	7		6	28	5847	3030						5313	2345							447				4380	K _d , ml/g

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3.3 Soil and Rock Description

3.3.1 Soil Description

The soils over the proposed disposal area consist primarily of light brown to reddish brown, sandy silt, silty sand, and sandy lean clay, with occasional fragments of the underlying rock. The thickness of the soil encountered in the borings is variable, from thin (less than five feet) to as much as 61 feet. Laboratory tests classify the soils as ML, MH, SM and CL.

The soil cover is underlain by saprolite typical of Piedmont settings. This saprolite retains relict features of the parent rock such as schistocity (schists) and banding (gneisses) while having the texture of a soil. Described as dense and red to gray to black in color, the saprolite may be as much as 60 feet thick.

3.3.2 Rock Description

Rock coring began at auger refusal using an HQ (2.5 inch diameter core) wire-line coring system. Top of rock is irregular, ranging from 6.5 feet below ground surface to as much as 75 feet below the ground surface. The rock consists of interbedded dark gray to greenish gray augen schist, mica garnet schist and black and white to gray to pink and gray augen gneiss and biotite gneiss. Pyrite, calcite laminations and quartzite veins are common. Large porphyroblasts of pink feldspar occur in several intervals. Manganese oxides are observed in fractures, which are numerous and often steep. Weathering due to water movement is observed along open fractures. Iron staining from water movement along fractures is common.

Top of rock is slightly to strongly weathered but becomes unweathered with depth. Core recovery ranged from poor (26%) to excellent (100%), averaging 92%. Recovery increased significantly with depth as the rock became less weathered. RQD ranged from 0% to 100%, averaging 67%. RQD also increased significantly with depth. Geologic cross-sections A-A and B-B of the site are shown on Figure 3-2.

3.4 Hydrogeologic Assessment

3.4.1 Description of Unconfined Aquifers

Temporary piezometers were installed in borings GS-1 through GS-31 with screened intervals in either the lower portion of the saprolite or the upper part of rock. The top of casing elevations, depths to groundwater and groundwater elevations are indicated in Table 3-3. The piezometer logs are located in Appendix H. Groundwater potentiometric maps were prepared for the unconfined groundwater surface aquifer from groundwater readings taken on November 17, 2006 and April 19, 2007. The April readings represent the highest groundwater levels to date. Both maps indicate that the general groundwater flow is from the south and west towards the creek that runs from west to east to the Chattahoochee River.

This flow is generally through the saprolite and partially weathered rock and is recharged by infiltration of storm water within the site itself. The groundwater potentiometric surfaces are represented on Figures 3-3 and 3-4.

0

0

0

		Table 3-3																				
								1	Depth to G	roundwat	er and Gro	undwater	Elevations									
			Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth	GW	Depth to	GW	Depth to	GW
	Date	TOC	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	to GW	Elev.	GW	Elev.	ĠW	Elev.
Boring	Installed	Elev.	11/17/06	11/17/06	12/06/06	12/06/06	2/19/07	2/19/07	3/19/07	3/19/07	4/19/07	4/19/07	5/14/07	5/14/07	6/12/07	6/12/07	7/2/07	7/2/07	8/20/07	8/20/07	9/13/07	9/13/07
GS-1	10/12/06	850.30	32.80	817.50	33.00	817.30	33.24	817.06	33.35	816.95	33.48	816.82	33.89	816.41	34.33	815.97	34.61	815.69	34.56	815.74	34.90	815.40
GS-2	10/23/06	837.07	33.32	803.75	31.33	805.74	29.68	807.39	29.38	807.69	28.84	808.23	29.03	808.04	29.75	807.32	29.93	807.14	30.15	806.92	31.77	805.30
GS-3	10/23/06	806.32	29.25	777.07	28.30	778.02	25.03	781.29	25.10	781.22	25.15	781.17	26.01	780.31	27.69	778.63	28.85	777.47	30.38	775.94	31.09	775.23
GS-4	10/24/06	808.99	17.19	791.80	17.73	791.26	18.10	790.89	16.98	792.01	16.70	792.29	17.42	791.57	17.36	791.63	17.58	791.41	18.20	790.79	18.37	790.62
GS-5	10/22/06	775.97	26.53	749.44	26.67	749.30	26.76	749.21	26.77	749.20	26.35	749.62	26.74	749.23	27.15	748.82	27.05	748.92	26.82	749.15	26.80	749.17
GS-6	10/21/06	769.71	19.55	750.16	19.62	750.09	17.16	752.55	17.01	752.70	17.70	752.01	17.90	751.81	19.48	750.23	20.53	749.18	22.10	747.61	22.66	747.05
GS-7	10/11/06	797.43	40.65	756.78	46.36	751.07	44.98	752.45	44.60	752.83	44.56	752.87	45.13	752.30	45.93	751.50	46.09	751.34	47.69	749.74	48.40	749.03
GS-8	10/11/06	769.40	18.55	750.85	18.42	750.98	16.66	752.74	16.85	752.55	16.48	752.92	18.41	750.99	19.26	750.14	19.94	749.46	21.07	748.33	21.81	747.59
GS-9	10/12/06	776.44	26.84	749.60	26.40	750.04	24.33	752.11	24.10	752.34	23.72	752.72	24.89	751.55	26.28	750.16	27.31	749.13	28.78	747.66	29.53	746.91
GS-10	10/20/06	764.18	35.00	729.18	35.74	728.44	32.31	731.87	32.31	731.87	32.79	731.39	32.86	731.32	33.17	731.01	34.66	729.52	35.80	728.38	36.27	727.91
GS-11	10/20/06	776.63	42.61	734.02	42.32	734.31	40.97	735.66	40.58	736.05	40.36	736.27	40.73	735.90	41.43	735.20	42.35	734.28	42.88	733.75	43.19	733.44
GS-12	10/19/06	775.70	48.18	727.52	48.12	727.58	46.78	728.92	46.70	729.00	46.68	729.02	47.31	728.39	48.00	727.70	48.32	727.38	49.21	726.49	49.34	726.36
GS-13	10/10/06	783.96	18.69	765.27	18.48	765.48	14.33	769.63	13.46	770.50	13.39	770.57	14.09	769.87	16.24	767.72	17.52	766.44	19.80	764.16	20.60	763.36
GS-14	10/18/06	740.82	21.27	719.55	21.76	719.06	20.51	720.31	21.19	719.63	21.17	719.65	23.06	717.76	24.81	716.01	25.42	715.40	26.75	714.07	27.10	713.72
GS-15	10/19/06	722.61	15.51	707.10	16.84	705.77	11.26	711.35	13.15	709.46	14.57	708.04	16.04	706.57	18.32	704.29	19.33	703.28	20.95	701.66	21.57	701.04
GS-16	10/18/06	713.11	20.44	692.67	20.67	692.44	20.17	692.94	20.55	692.56	20.42	692.69	21.87	691.24	22.95	690.16	23.23	689.88	23.90	689.21	23.36	689.75
GS-17	10/5/06	758.78	22.66	736.12	22.00	736.78	19.88	738.90	21.17	737.61	20.58	738.20	20.99	737.79	21.46	737.32	21.75	737.03	24.80	733.98	25.5	733.28
GS-18	10/4/06	733.45	15.07	718.38	15.79	717.66	15.18	718.27	15.21	718.24	15.14	718.31	15.54	717.91	16.00	717.45	16.13	717.32	17.45	716.00	17.61	715.84
GS-19	9/27/06	752.89	dry	dry	dry	dry	21.99	730.90	21.91	730.98	21.68	731.21	20.79	732.10	21.83	731.06	23.13	729.76	dry	dry	dry	dry
GS-20	10/3/06	716.61	19.58	697.03	20.47	696.14	19.31	697.30	19.46	697.15	19.32	697.29	20.62	695.99	21.68	694.93	21.92	694.69	22.84	693.77	22.65	693.96
GS-21	10/2/06	792.11	35.03	757.08	35.16	756.95	33.15	758.96	32.70	759.41	32.45	759.66	32.84	759.27	33.52	758.59	33.72	758.39	35.79	756.32	36.49	755.62
GS-22	10/3/06	732.71	-	-	36.22	696.49	35.30	697.41	34.95	697.76	34.63	698.08	34.74	697.97	35.10	697.61	35.50	697.21	36.61	696.10	36.85	695.86
GS-23	10/4/06	700.73	18.03	682.70	18.45	682.28	17.93	682.80	18.44	682.29	18.52	682.21	19.65	681.08	21.29	679.44	21.68	679.05	22.49	678.24	22.22	678.51
GS-24	10/5/06	728.21	42.18	686.03	42.54	685.67	40.97	687.24	40.59	687.62	40.33	687.88	40.56	687.65	41.29	686.92	41.79	686.42	43.05	685.16	43.18	685.03
GS-25	9/26/06	788.47	18.05	770.42	20.81	767.66	18.44	770.03	18.74	769.73	19.09	769.38	19.68	768.79	20.47	768.00	21.18	767.29	22.65	765.82	23.18	765.29
GS-26	9/27/06	748.14	28.89	719.25	22.26	725.88	26.81	721.33	27.10	721.04	27.40	720.74	28.20	719.94	29.80	718.34	30.18	717.96	30.80	717.34	31.92	716.22
GS-27	10/3/06	702.67	13.61	689.06	13.95	688.72	13.77	688.90	14.15	688.52	13.78	688.89	15.25	687.42	16.91	685.76	17.38	685.29	18.76	683.91	19.17	683.50
GS-28	9/12/06	816.37	42.88	773.49	44.80	771.57	42.83	773.54	42.15	774.22	41.69	774.68	42.06	774.31	42.87	773.50	43.05	773.32	45.72	770.65	46.40	769.97
GS-29	9/14/06	749.67	19.81	729.86	19.14	730.53	17.03	732.64	- 17.51	732.16	18.03	731.64	19.06	730.61	42.87	706.80	20.98	728.69	22.03	727.64	24.29	725.38
GS-30	9/19/06	717.54	14.92	702.62	15.22	702.32	14.28	703.26	14.54	703.00	14.46	703.08	15.42	702.12	17.10	700.44	17.52	700.02	19.92	697.62	20.35	697.19
GS-31	10/21/06	846.39	26.93	819.46	24.94	821.45	24.04	822.35	23.87	822.52	23.82	822.57	24.18	822.21	24.31	822.08	24.52	821.87	25.62	820.77	25.61	820.78

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3.4.2 Description of Confined Aquifers

No confined aquifers were encountered at this site. As is typical of the Southern Piedmont Physiographic province, the groundwater aquifer is unconfined.

3.4.3 Uppermost Aquifer Gradient

Using depth to groundwater data collected 11/17/06, which represent the highest groundwater levels to date, the hydraulic gradient of the unconfined aquifer was computed. Gradients were computed for several areas of the site using the following equation:

hydraulic gradient = $i = \frac{(h_1 - h_2)}{I}$

where:

 h_1 = groundwater elevation at up-gradient well

 h_2 = groundwater elevation at down-gradient well

 $L = distance between h_1 and h_2$

Table 3-4 shows the gradients calculated for the site.

	F	lydraulic Gradien	ts	
Wells	h ₁ h ₂		L	i
L.2.	ft msl	ft msl	ft	ft/ft
GS-28 & GS-30	773.49	702.62	1226.2	0.058
GS-31 & GS-6	819.46	750.16	831.9	0.083
GS-25 & GS-20	770 42	697.03	963.4	0.076

Table 3-4

3.4.4 Field Hydraulic Conductivity (Slug) Tests

Field hydraulic conductivity tests (slug tests) were conducted at boring locations GS-3, GS-4, GS-18, GS-21, GS-25, GS-27, and GS-29. The tests were performed in the temporary piezometers installed during the drilling program. The piezometers were installed with 2-inch diameter screen and casing, a 10-foot screened interval, a filter pack surrounding the screen to approximately 2 feet above the top of the screen. Bentonite was placed above the filter pack to the ground surface. The piezometer construction logs are located in Appendix H. Table 3-5 presents the results of the hydraulic conductivity (K) tests. A copy of the data reduction and graphs are included in Appendix J.

Location	Material	K _{slug in} cm/sec	K _{slug out} cm/sec	K _{slug in} ft/day	K _{slug out} ft/day
GS-3	saprolite	1.68×10^{-4}	1.88×10^{-4}	4.77 x 10 ⁻¹	5.33 x 10 ⁻¹
GS-21	saprolite	1.11 x 10 ⁻³	8.41 x 10 ⁻⁴	3.14×10^{0}	$2.39 \times 10^{\circ}$
GS-27	saprolite	3.25 x 10 ⁻⁴	3.25×10^{-4}	9.22 x 10 ⁻¹	9.22 x 10 ⁻¹
GS-29	saprolite	1.59 x 10 ⁻⁴	1.61×10^{-4}	4.50×10^{-1}	4.57 x 10 ⁻¹
GS-4	rock	3.62×10^{-2}	2.06 x 10 ⁻²	1.03×10^2	5.83 x 10 ¹
GS-18	rock	2.67×10^{-4}	3.38 x 10 ⁻⁴	7.57 x 10 ⁻¹	9.58 x 10 ⁻¹
GS-25	rock	2.45 x 10 ⁻⁴	1.76 x 10 ⁻⁴	6.96 x 10 ⁻¹	5.00 x 10 ⁻¹
Average Soil			4.09 x 10 ⁻⁴		1.16×10^{0}
Average Rock			9.63 x 10 ⁻³		2.73 x 10 ¹

Table 3-5 Field Hydraulic Conductivity Tests

3.4.5 Sorption and Attenuation Capacity

Sorption (Distribution) Coefficients

Environmental risk assessment of metals depends to a great extent on fate and transport modeling based on soil-liquid partitioning coefficients. The evaluation of the potential risks of metals in soils requires an assessment of the proportion of the total metal that is in a mobile and possibly bioavailable form. This can be done using a relatively simple partitioning of the total metal concentration between the fraction bound to the soil solids and the part that is dissolved in the soil solution (pore water). The dissolved metal concentration reflects the soil metal fraction that could potentially be leached from the soil and contaminate groundwater and surface waters. Conversely, the balance of the metal is assumed to be tightly retained by the soil solids and, hence, unavailable for biological uptake or movement into groundwater (Sauve and others, 2000).

Selenium was chosen as the potential contaminant to model, based on the results of the gypsum total metals concentrations and leaching tests (Tables 2-1 and 2-2), for fate and transport modeling. The partition or distribution coefficient K_d , is required for modeling. K_d is a measure of sorption of contaminants to soils and is defined as the ratio of the contaminant concentration adhered to the solid to the contaminant concentration in the surrounding aqueous solution when the system is at equilibrium. Once groundwater is contaminated, it is important to understand how the contaminant moves in the subsurface environment. K_d is one of the most important parameters used in determining the migration potential of contaminant with a K_d value around zero would travel at the rate of water, while ones that react more strongly with the soils would have higher K_d values. The K_d value is basically used to determine how well a soil will adsorb a contaminant and thus not allow the contaminant to migrate through the groundwater.

ASTM D 4646 is the Standard Test Method for 24-hour Batch-Type Measurement of Contaminant Sorption by Soils and Sediments. The distribution coefficient (K_d) is defined identically to the distribution ratio (R_d), except K_d is considered to be an equilibrium value and independent of the concentration of solute. The distribution ratio (R_d) is the ratio of the concentration of solute sorbed on the soil or other geomedia divided by its concentration in solution. The R_d value is calculated as follows:

 $K_{d} = R_{d(at \text{ equilibrium})} = \frac{(\text{mass of solute sorbed per unit mass of geomedia})}{(\text{mass of solute in solution per unit volume of solution})}$ $= \frac{\frac{\mu g}{\mu g}}{\frac{\mu g}{mL}} = \frac{mL}{g}$

The test method can be summarized as mixing distilled water, natural water, waste leachate, or other aqueous solution containing a known concentration of a solute with a known amount of unconsolidated geologic material (e.g., soil) for 24 hours. Changes in solute concentrations are used to calculate a distribution ratio (R_d) (ASTM, 2001).

This test method is meant to allow for a rapid (24 hour) index of soil sorption affinity for given chemicals or leachate constituents. A large number of samples may be run using this test method to determine a comparative ranking of those samples, based upon the amount of solute sorbed by the soil, or by various soil or leachate constituents. The 24-hour time is used to make the test convenient and also to minimize microbial degradation which may be a problem for organic contaminants in long-timed procedures (ASTM, 2001).

After the samples have been weighed and air-dried, a moisture content has been measured, and the volume of solution has been determined, the sample can be placed in a rotary extractor to be agitated for 24 hours. The sample is then removed and the solution is removed from the solid phase by decantation and then filtered. After a clear solution is obtained, the K_d value can be calculated from the following equation:

$$\mathbf{K}_{d} = \frac{(\mathbf{A} - \mathbf{B})\mathbf{V}}{(\mathbf{M}_{s})\mathbf{B}}$$

where:

A = initial concentration of the solute defined as the mean concentration of the blanks, ug/mL,

B = final concentration of the solute after 24 hours in contact with the soil, ug/mL,

V = volume of solution used, ml,

Ms = mass of soil expressed on an oven-dried basis, grams, and

 K_d = distribution ratio, ml/g (ASTM, 2001).

Site specific sorption coefficients (K_d) were measured for soil samples collected from the Wansley site per ASTM D-4646. Five samples were collected from the site. The results of this testing are presented in Table 3-2.

3.5 Potential of Unconfined Aquifers as Sources of Drinking Water

Groundwater recharge is generally from infiltration of rainfall. The average annual rainfall for the area is 50 to 54 inches per year. Based on rainfall data collected from 1940 to 2003, the months of December through March have the highest average rainfall amounts. Determination of the seasonal fluctuation in the groundwater level is pending the collection of additional monitoring data.

Because unconfined implies interconnection between the soil and rock aquifers, there is a low potential for the unconfined aquifer in this area to be used as a source of drinking water. The USGS web site lists 345 wells in Heard and Carroll Counties (USGS, 2006). Twenty seven of these wells are less than 80 feet deep. The majority are greater than 100 feet deep. Additionally, groundwater flows toward the plant, away from any residences. Also, public water supply is provided along Hollingsworth Ferry Road.

3.6 Description of Geologic and/or Natural Hazards/Seismic Impact Zone

The proposed site is located approximately 1.5 miles south of the Brevard Fault Zone, a major feature that cuts across the Piedmont. However, no faults or fault zones, unstable areas, or shear zones were encountered during the site geologic exploration. The latest movement along the Brevard Zone was late Paleozoic to Triassic. The age date of 282 (\pm 14) million years has been assigned based on mineralogy. The date also agrees with field evidence as the final major metamorphic event of the Georgia Piedmont as a whole (Higgins, 1966).

Earthquake acceleration maps prepared for the continental United States (Algermissen and others, 1990) were reviewed to determine the seismic impact zone for the site. Map C of this series indicates the horizontal acceleration with a 90% probability of not being exceeded in 250 years. According to Map C, the horizontal acceleration for the site is 0.17g.

The Seismic Design Category for this site is a "C" classification (Table 9.4.2.1 of ASCE 7-98). The Use Group is I (i.e., represents a low hazard to human life in the event of a failure) per Table 9.1.3 of ASCE 7-98.

4.0 GROUNDWATER POLLUTION POTENTIAL

4.1 Introduction

In order to determine groundwater pollution potential and rate of leachate migration from the proposed by-product disposal area, three analyses were performed:

- Fate and transport modeling using the SESOIL model,
- LeGrand (1964) scoring method per Circular 14, and a
- Pathway analysis per Circular 14.

The results of this work showed a very low potential for leachate to contaminate groundwater, and similarly, for leachate to leave the site. Fate and transport modeling showed that under a conservative scenario ($K_d = 235 \text{ ml/g}$ for the soil), contamination would take more than 100 years to reach groundwater, and under a more realistic scenario ($K_d = 2345 \text{ ml/g}$), contamination would take more than 1000 years to reach groundwater. Two-media LeGrand analyses produced a score of 15.8 indicating groundwater pollution is "possible, but not likely".

The horizontal pathway analysis described in Circular 14 becomes relevant only after contamination has traveled vertically through at least a 2-foot compacted silty soil liner and a minimum of 5 feet of saprolite to the water table, that is, after more than 1000 years.

4.2 Fate and Transport Modeling

4.2.1 Background

The fate and transport model selected for use in this study was RISKPRO's Seasonal Soil Compartment Model (SESOIL) for Windows, Version 3, May 1998, from General Science Corporation. The model was developed as a risk screening-level model. It is a one-dimensional vertical transport model for the unsaturated soil zone. The model can only consider one chemical (pollutant) compound at a time. The model is based on mass balance and equilibrium partitioning of a chemical between different phases (dissolved, sorbed, vapor, and pure).

SESOIL is used to estimate the rate of migration of chemicals through the soil and the concentration of chemicals in the soil layers after a chemical release to the environment. The model can accept time-varying pollutant loads and can simulate up to 9,999 years of chemical transport. Applications of the model include long term leaching studies from waste disposal sites, leaking underground storage tanks, agricultural applications, and pesticide and sediment transport on watersheds (SESOIL user's guide).

According to the SESOIL's user guide, the soil column is a user-defined compartment extending from the surface through the unsaturated zone to the water table. SESOIL requires

several types of chemical- and site-specific data. The essential information needed to run the model includes the following:

- The behavior in the environment of the chemical to be modeled,
- The rate and frequency of the chemical's release into the environment,
- A description of the media in which the chemical is released, and
- Monthly estimates of climatic data. (Climate information is compiled in RISKPRO through on-line databases)

Output includes the following:

- Time-variant estimates of concentrations of pollutants in the soil column at various depths,
- Rate of leaching toward groundwater, including quantities of pollutants entering the groundwater (SESOIL does not model the saturated zone),
- Pollutant loss from the unsaturated zone in terms of surface runoff,
- Volatilization, and
- Degradation.

Pollutant transport and transformation in the unsaturated soil zone are complex processes affected by chemical, soil, and hydrogeologic properties. In SESOIL, these processes are included in one of three cycles or submodels. These submodels and their associated processes are shown below:

- 1. Hydrologic submodel (deals with moisture movement through the layers), including:
 - rainfall
 - surface runoff
 - capillary rise
 - groundwater runoff (recharge)
 - soil moisture (storage)
 - evapotranspiration
 - infiltration
- 2. Pollutant fate submodel, including:
 - advection
 - cation exchange
 - sorption
 - washload
 - volatilization
 - surface runoff
 - groundwater runoff (recharge)
 - metal complexation
 - diffusion (air phase)
 - hydrolysis

3. Sediment or washload submodel (deals with runoff from the soil surface). For this application, all precipitation is assumed to infiltrate into the subsurface (worst case) and zero runoff is assumed. Therefore, washload is not used in the Plant Wansley model.

Hydrologic Submodel

The hydrologic submodel is one-dimensional and considers vertical movement only. It focuses on the role of soil moisture (or interstitial pore water) in the soil layer. It is based on a statistical, dynamic formulation of a vertical water budget and has been adapted for either yearly or monthly simulations and for moisture variations in the soil. The submodel calculates results for the hydrology of the site and passes these results to both the pollutant fate and sediment washload cycles.

Pollutant Fate Submodel

The pollutant fate submodel breaks the soil column into several compartments, called layers. The soil column can be represented by up to 4 layers and the dimensions of these layers are defined by the user. Each layer in the pollutant cycle can be further broken up into 10 sublayers having the same soil properties as the layer of which they are a part. The total soil column is treated as a series of interconnected layers. Each layer or sublayer can receive and release pollutant to and from adjacent layers. Like the hydrologic submodel, pollutant fate is based on a mass balance equation that tracks the pollutant as it moves in the soil moisture between layers. When a pollutant enters a layer, the model assumes instantaneous and uniform distribution of the chemical throughout that layer. The model performs mass balance calculations over each entire soil layer or sublayer; there is no concentration gradient within a layer (SESOIL user's guide).

The pollutant cycle simulates transport and transformation processes in three phases present in the soil layers: soil-air or gaseous phase, soil-moisture phase, and adsorbed or soil-solids phase. The fate of the pollutant in the soil column includes both transport and transformation processes, which depend on the chemical's partitioning among these three phases. The three phases are assumed to be in equilibrium with each other at all times. The pollutant cycle in SESOIL is based on the chemical concentration in the soil water and all the mass balance equations are a function of this (SESOIL user's guide).

Theoretically, a non-reactive dissolved pollutant will travel to another soil layer or to groundwater at the same speed as the movement of moisture through the soil layer. However, the movement of a reactive pollutant will be retarded due to adsorption of the pollutant on the soil particles. Movement of pollutant may also be retarded due to the movement of bulk moisture mass due to vapor phase partitioning. For gypsum, this is not applicable (SESOIL user's guide).

SESOIL includes two partitioning processes for movement of pollutant from soil moisture to soil solids, the sorption process and cation exchange. The sorption process may be defined as the adhesion of pollutant molecules or ions to the surface of soil solids. The process is generally reversible; adsorption being the movement of a pollutant onto soil solids and desorption being the movement of pollutant off of soil solids to the liquid or gas phase. The two processes are assumed to be in equilibrium and are modeled that way (SESOIL user's guide).

4.2.2 Plant Wansley Gypsum Disposal Facility SESOIL Model

Selenium was chosen as the potential contaminant to model, based on the results of the gypsum total metals concentrations and leaching tests (Tables 2-1 and 2-2). The general design of this model simulates 100 feet plus 2 cm of gypsum atop 5 feet of silty soil representing the liner material that may be used at the site (Figure 4-1). The 2 cm of gypsum is used to directly introduce the pollutant (selenium) to the soil.

Model Assumptions

- Gypsum will be stacked to a maximum height of 100 feet (maximum assumed cell height).
- The area of the disposal facility is 20 acres (maximum assumed cell size).
- The disposal area is not capped (worst case).
- Water moves vertically through the affected soils at a constant rate.
- Changes in soil components do not affect the overall infiltration rate or vertical movement.
- Dispersion in the vadose zone is negligible.
- The soil selenium linear sorption coefficients are constant throughout the source area.
- The model is conservative and does not account for all the geochemical processes on site.
- The program models the unsaturated zone only (basically migration through the silt layer). The model assumes that the pollutant front begins at the middle of the lowest layer that has a concentration of the constituent of interest.

Input Parameters

Table 4-1 presents the input parameters for the model.

Input Parameter	Value	Source/Comments
Conoral Model Properties		
Climate data from Carrollton GA		Notional Climatic Contan and the National
rain gauge station		National Climatic Center and the National
Simulation length	100 years	Oceanographic and Atmospheric Administration
Application length	50 uppers	Longast sucilable seclication time
Sadimant weshload avala turnad	JU years	Longest available application time.
off		Assumes no surface runoff.
Number of layers	4	Model has 3 layers of gypsum totaling 100 feet plus 2 cm to directly introduce selenium to the soil. A minimum 5-foot layer of silt will underlie the gypsum.
Continuous loading of contaminant		Worst case.
Application area	$20 \text{ acres} = 8.1 \text{ x } 10^{-8} \text{ cm}^2$	Assumed cell size.
Volatilization	0.0	Forces all contaminant transport downward through the soil.
Soil/Gypsum Input Parameters		
Gypsum density	$1.36 \text{ g/cm}^3 =$ 85 lb/ft ³	
Gypsum effective porosity	0.1	RCRA Investigation Guidance, Table 10-4, Default Values for Effective Porosity; assumes gypsum behaves as a silt.
Freundlich equation exponent	1.0	Model recommended value in the absence of site- specific data; assumes linear sorption.
Disconnectedness index	12	Default value for silt and clay.
Organic carbon content	0%	Assumed
Cation exchange capacity	NA	K_d values were used in the model. Both K_d and CEC can not be used in the model.
Intrinsic permeability gypsum	$5 \times 10^{-9} \text{ cm}^2$	SCS Engineering – average value for gypsum. This is equivalent to a hydraulic conductivity of 5 x 10^{-4} cm/sec
Intrinsic permeability soil	5 x 10 ⁻⁹ cm ²	Laboratory testing average value of remolded samples was 2 x 10^{-6} cm/sec. This was raised to 5 x 10^{-4} cm/sec as to be more compatible with the program restrictions.
K _d gypsum	1 mL/g	Assumed as a worst case value
K _d silt	2345 mL/g	The lowest value from the testing performed on Plant Wansley soils.
Chemical Input Parameters – Selenium		
Selenium concentration in gypsum	14 mg/kg	By product characterization of Yates gypsum
Atomic weight of selenium	78.96 g/mole	Street Street Street
Solubility of selenium	384,000 mg/L	Agency for Toxic Substances and Disease

Table 4-1 SESOIL Model Input Parameters – Basic Model



4.2.3 Sensitivity Analysis

A sensitivity analysis of the finalized model was conducted by varying the travel time, K_d values, intrinsic permeability, and contaminant concentration. The sensitivity testing, as with the basic model, was performed using selenium as the contaminant of interest. The following models were run for the sensitivity testing:

- The basic model travel time was extended to 1000 years.
- The adsorption coefficient was varied by doubling the original number ($K_d = 4690 \text{ mL/g}$) and using an approximate order of magnitude lower ($K_d = 235 \text{ mL/g}$) than that used for the basic model.
- The intrinsic permeability of the gypsum and soil was varied by an order of magnitude higher and lower.
- Selenium concentrations of the gypsum were increased by an order of magnitude higher to 140 mg/kg.

Table 4-2 contains the results of the sensitivity testing. Appendix K contains the model inputs and outputs from each of the runs.

Case (modeled for 100 years except as noted)	Maximum Contaminant Depth Below Gypsum, inches (leading edge of contaminant)	Soil Moisture, ug/ml Lower Soil Layer	Adsorbed Selenium, mg/kg, on Lower Soil Layer
Basic Model	0.39	0.59	1394
Basic Model at 1000 years	2.8	0.59	1394
$K_{d} = 4690 \text{ mL/g}$	0	0.30	1392
$K_d = 235 \text{ mL/g}$	14.6	1.1	251
intrinsic permeability gypsum & soil = $1 \times 10^{-7} \text{ cm}^2$	0.39	0.59	194
intrinsic permeability gypsum & soil = $1 \times 10^{-9} \text{ cm}^2$	0	0.47	1093
Se gypsum = 140 mg/kg	0.39	5.9	13940

TODDD & ALL	Dest. M. J.I.	G	1.

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Summary of Results

Da

• For a K_d of 2345 (realistic case), selenium traveled 0.39 inches into the compacted soil liner after 100 years. No detectable selenium was predicted to occur beneath the soil liner after 1000 years.

- After 1000 years, the predicted depth of selenium migration into the compacted clayey soil liner is 2.8 inches. This indicates that selenium would not break through the soil liner or reach the shallow rock aquifer.
- For a K_d of 235 (very conservative case), the maximum selenium depth into the compacted clayey soil liner is 14.6 inches after 100 years; this means that for a minimum water table depth of 7 feet (2 feet of compacted soil liner and 5 feet of compacted soil), selenium would take at least 575 years to reach the water table, if then.

4.3 LeGrand Analysis

A LeGrand Analysis was performed on the proposed by-product disposal area site as described on pages 14 through 17 of Circular 14. The analysis was performed assuming a composite liner system would be installed, consisting of a synthetic liner, compacted clay and a leachate collection system. Table 4-3 gives the measured input parameters and results of the analyses (LeGrand scores). Two media analyses were used based on the following site characteristics:

- Presence of unconsolidated materials consisting of sandy, clayey silt.
- Overburden underlain at shallow depths by unweathered gneiss and schist.

Criteria	Measured Site-Specific Value	LeGrand Score Two Media Synthetic Liner w/LCS
Distance between waste management boundary and closest receptors (unnamed creek)	100 feet	1
Minimum depth below liner to water table	5 feet	0.3
Water table gradient	8.3%	5.5
Sorption	composite/clay liner	4
Permeability	fractured rock	3
Thickness of porous granular materials below disposal point	37 feet (average)	2
	Total	15.8

	Table	e 4-3	
LeGrand Analysis	Innut	Parameters and	Recul

- For a synthetic liner and a leachate collection system, as allowed by the LeGrand Analysis, a maximum sorption rating of 4 (clay) a favorable flow direction, and a permeability rating of 3, were used in the analysis.
- A minimum depth of 5 feet below the clayey soil liner to the seasonal high groundwater table will be established for this site.
- Gradients varied between 5.8% and 8.3% toward the unnamed creek on the northeast side of the site. A gradient of 8.3% was used.
- A 100-foot buffer was assumed along the potential receptor (unnamed creek).

The LeGrand analysis for a two media site produced scores of 15.8 for a composite liner system. This would indicate that groundwater pollution potential is "possible, but not likely" (Table 4-4).

Table 4-4

LeGrand Score Interpretation (from Circular 14, p. 14)				
 Total Points	Pollution Potential of a Site			
0 - 4	Imminent			
4 – 8	Probably			
8 - 12	Possible			
12 – 25	Possible, but not likely			
25+	Approaching impossible			

4.4 Pathway Analysis (Horizontal Travel Time)

4.4.1 Calculated Groundwater Velocities

Horizontal flow velocity calculations were performed using the Darcy equation on page 14 of Circular 14. The linear flow velocity can be estimated using the following formula and permeabilities:

$$v = \frac{Ki}{\eta}$$

where :

v = linear velocity (ft/sec or m/sec)

i = hydraulic gradient = $\frac{(h_1 - h_2)}{1}$ (ft / ft)

 η = estimated effective porosity

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K = hydraulic conductivity (ft/sec or m/sec)

The average hydraulic conductivity of the saprolite is 1.16 ft/day as determined by field slug tests (Table 3-5). The gradient of 0.082 ft/ft is the highest site gradient as determined from the groundwater potentiometric map (Table 3-4). A typical tabulated value for the effective porosity of gravelly clayey silts (used for site soils) is 0.10 (Maidment, 1993). The resulting flow velocity is as follows:

 $v = \frac{(1.16 \text{ ft/day})(0.083 \text{ ft/ft})}{(0.10)} = 0.963 \text{ ft/day}$

The silt and saprolite comprises the approximate top 7 to 60 feet of the unconfined aquifer above the schist/gneiss.

4.4.2 Description of the Relationship Between Groundwater Flow Directions and Potential Receptors

The groundwater flow directions indicated on the potentiometric map are towards the unnamed creek on the northeast side of the site and the Chattahoochee River. These surface water bodies would be the closest groundwater receptors. There were no private or public water sources down-gradient of the site within the ¹/₂ mile and 2 mile radii.

4.4.3 Estimated Travel Time for Leachate to Reach Potential Receptors

The estimated travel time for leachate to reach the creek northeast of the site is determined from the groundwater flow velocities of Section 4.4.1. The following travel time is calculated assuming the limits of waste will not be within 100 feet of the unnamed creek.

Using the average calculated flow velocity for the saprolite resulted in a travel time of 120 days. This figure represents the travel time beyond that required for any contaminant to travel through the 2 feet of compacted clayey soil liner or the compacted soil portion of the composite liner and the 5 feet of separation above the groundwater elevation.

4.5 Description of Relationship Between the Vadose Zone and Uppermost Aquifer

A minimum 5 feet of separation will be established between the bottom of the composite liner and the seasonal high groundwater elevations. Continued monitoring of the temporary piezometers will establish these elevations. No flow paths for any infiltrate generated within the cells would be anticipated to be generated through the liner system and the separation zone of compacted soil prior to reaching groundwater. Hydraulic conductivity of the remolded and in-place material is shown in Tables 3-2 and 3-5.

Currently, groundwater recharge is accomplished through infiltration of surface storm water. The average annual rainfall is approximately 50 to 54 inches per year. The seasonal variation in the groundwater surface is currently being determined through periodic monitoring of the temporary piezometers on site. Based on data collected in the area from 1940 through 2003, the wettest months of the year are December through March.

4.6 Mitigation of Geologic and Natural Hazards

There were no geologic or other hazards detected at this site. The jurisdictional wetlands, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis.

5.0 RECOMMENDATIONS FOR DESIGN

5.1 Favorable and Unfavorable Areas

There are no unfavorable areas for construction at the site.

5.2 Liner/Leachate Collection Systems

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility. Based on laboratory testing, the remolded permeability of the material proposed for use as a potential soil liner averages 1.6×10^{-6} cm/sec with a range of 3.7×10^{-6} cm/sec to 1.7×10^{-7} cm/sec. Based on the laboratory compaction criteria for remolded samples, the recommended maximum permeability of the compacted soil liner beneath the synthetic liner is 1×10^{-5} cm/sec.

5.3 Cell Depths

Excavation requirements for the disposal cells will be determined during site design and development (design and operation plan). Excavation will not extend below the minimum 5-foot buffer required above the seasonal high groundwater table. Continued groundwater measurements will be made to determine this seasonal high level.

5.4 Site Drainage and Erosion Control

The site will be designed and constructed to minimize soil erosion and sediment migration. Diversion ditches, berms, piping, and sedimentation ponds will be included as needed to accomplish this task as well as to prevent site storm water run-on from entering disposal areas. Areas where excavation and earth fill operations occur will be vegetated immediately.

5.5 Buffer Zones

There will be a minimum 200 feet of buffer between the limits of the CCB disposal facility and adjacent property lines. There will be a minimum 25-foot buffer between the limits of the disposal facility and streams and wetland areas. No land disturbing activities are to take place within these buffer zones except for construction of groundwater monitoring wells and site ingress and egress.

5.6 Monitoring

A groundwater and surface water monitoring network for the CCB disposal facility will be designed to provide early detection in the unlikely event that any contaminates might reach groundwater and surface water. Proposed monitoring well locations will be submitted with the Groundwater Monitoring Plan when the limits of the disposal area have been established. Monitoring locations will be located around the periphery of the site and will meet the EPD requirements. Figure 5-1 shows a diagram of a typical monitoring well design.

Sampling will commence once the Groundwater Monitoring Plan has been approved and will continue semiannually for the life of the disposal area. Four initial sampling events will be performed at eight week intervals following approval of the Plan to establish statistical base. Background data will be determined prior to site development for the up-gradient and down-gradient wells as well as any surface water monitoring points.

5.7 Disposition of Borings

Boreholes and piezometers located within the area proposed for by-product disposal will be properly abandoned upon acceptance of this Report and establishment of the seasonal high groundwater levels.

According to the *Georgia Water Well Standards Act of 1991*, all wells which are to be abandoned shall be "filled, sealed, and plugged". Guidelines for well abandonment are set forth in the *Georgia Department of Natural Resources Manual for Groundwater Monitoring*, September 1991. Existing wells at the site will be abandoned according to these guidelines.

5.8 Security Fence and Road

A security fence currently exists along the south-southwest boundary of the proposed disposal facility along Hollingsworth Ferry Road. A 75-foot section of property adjacent to Hollingsworth Ferry Road, outside the 200-foot disposal area buffer, has been set aside for potential fence realignment and replacement and construction of a 25-foot security road along the outside boundary of the disposal facility. The approximate locations of the proposed fence and security road is shown on Figure 1-1.

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PLANT WANSLEY PROPOSED COAL COMBUSTION BY-PRODUCT DISPOSAL FACILITY REGIONAL GEOLOGY 1

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- fg3 Biotitic Gneiss/Mica Schist/Amphibolite
- fg4 Biotitic Gneiss/Amphibolite
- gg1 Granite Gneiss Undifferentiated
- gg5 Calc-Silicate Granite Gneiss
- gr1 Granite Undifferentiated
- pms1 Mica Schist
- pms3 Mica Schist Gneiss
- pms5 Graphite Schist
- mm2 Hornblende Gneiss
- mm3 Hornblende Gneiss/Amphibolite
- ms1 Amphibolitic Schist
- um Ultramafic Rocks Undifferentiated

Fault

Fault Zone

Major Road

# **REFERENCES:**

GEOLOGIC MAP OF GEORGIA, 1976

# FIGURE 1-3

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 Georgia Power Company

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# GEORGIA POWER COMPANY PLANT WANSLEY PROPOSED COAL COMBUSTION BY-PRODUCT DISPOSAL FACILITY SITE ACCEPTABILITY REPORT REVISION 1

October 2007

Prepared for Georgia Power Company

Prepared by

Earth Science and Environmental Engineering Technical Services Southern Company Generation

Originator: Terri H. Hartsfield Date

Reviewer: Gary H. McWhorter

Approval: David W. Morris

Date

Date

Revision No.	Description	Date
1	Addressing comments from the EPD	9/21/07

# GEORGIA POWER COMPANY PLANT WANSLEY PROPOSED COAL COMBUSTION BY-PRODUCT DISPOSAL FACILITY SITE ACCEPTABILITY REPORT REVISION 1

Prepared for

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#### By

Earth Science and Environmental Engineering Southern Company Generation

October 2007



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October 2007

Prepared for Georgia Power Company

By

Earth Science and Environmental Engineering Southern Company Generation Birmingham, Alabama

> Rhonda J. Tinsley, PG Georgia Reg. No. 001671

Terri H. Hartsfield Civil Engineer Gary McWhorter, P. E. Georgia Reg. No. 012687

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- Appendix F Gypsum Laboratory Results
- Appendix G Drilling Company Bond Letter
- Appendix H Boring and Piezometer Logs
- Appendix I Soil Laboratory Test Results (Soil Classification, Sorption, and Cation Exchange Capacity)
- Appendix J Slug Test Data Reduction, and Graphs

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#### EXECUTIVE SUMMARY

Plant Wansley is located in northeast Heard County and southeast Carroll County, Georgia, off Liberty Church Road, approximately 15 miles west of the city of Newnan, 9 miles northeast of the city of Franklin and 12 miles southeast of the city of Carrollton. Plant property is adjacent and west of the Chattahoochee River. Georgia Power Company proposes to develop a 325 acre portion of this property as a Coal Combustion By-Product (CCB) disposal facility.

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility.

Per Circular 14, site investigations have been performed to determine if the site is acceptable for gypsum disposal. This Site Acceptability Report presents the results of the site investigations. The following key points are discussed in the report:

- The site is not located within
  - 0 0.5 mile of a county boundary,
  - o 5,708 yards of a National Historic Site, or
  - o the 100-year floodplain.
- At least a 200-foot buffer will be maintained beyond the limits of the disposal area. A new fence and security road will be constructed parallel to the existing fence along Hollingsworth Ferry Road. The proposed 200-foot buffer will be maintained inside the proposed security road and fence.
- No threatened or endangered animal or plant species were observed at the site.
- No portion of the site is located within a significant groundwater recharge area.
- The site contains approximately 7.4 acres of wetlands associated with small streams that traverse the site. Any jurisdictional wetlands present, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis.
- No public water supply wells were identified within 2 miles of the site. The site is not within the water management area of a public water supply well. Twenty domestic wells were located within ½ mile of the site. All the wells are located upgradient of the site.
- Based on laboratory testing, the remolded permeability of the material proposed for use as a potential soil liner averages  $1.6 \times 10^{-6}$  cm/sec with a range of  $3.7 \times 10^{-6}$  cm/sec to  $1.7 \times 10^{-7}$  cm/sec. The recommended maximum permeability of the compacted soil liner beneath the synthetic liner is  $1 \times 10^{-5}$  cm/sec.
- Fate and transport modeling indicated that selenium would travel only 0.39 inches into a compacted soil liner, using a conservative estimate of permeability equal to 5 x 10⁻⁴ cm/sec, after 100 years under a realistic scenario without a synthetic liner.

- Based on fate and transport modeling, the facility will not contaminate groundwater since the leachate will not travel through a compacted soil liner and a minimum 5-foot barrier between the gypsum and groundwater.
- Groundwater pollution potential was also determined using the LeGrand Method as described in Circular 14, using measured site input parameters. The LeGrand analysis produced a score of 15.8, which means groundwater pollution potential is "possible, but not likely", depending on design.
- A groundwater monitoring network will be designed to provide early detection in the unlikely event that regulated constituents might reach groundwater and surface water.
- According to Heard County Board of Commissioners, the site complies with local zoning and land use ordinance for a private industrial solid waste disposal site.

#### 1.0 GENERAL SITE AREA

#### 1.1 Description of General Site Area

#### 1.1.1 Location

Plant Wansley is located in northeast Heard County and southeast Carroll County, Georgia, off Liberty Church Road, approximately 15 miles west of the city of Newnan, 9 miles northeast of the city of Franklin and 12 miles southeast of the city of Carrollton. The physical address of the plant is 1371 Liberty Church Road, Carrollton, Georgia. The plant property encompasses approximately 5100 acres and is bounded on the east by the Chattahoochee River.

Plant Wansley consists of four gas-fired combined cycle units and two coal-fired units. Due to proposed air quality regulations, the plant is currently in the process of installing flue gas desulfurization (FGD) equipment (scrubbers) on both coal-fired units. Between 386,000 and 900,000 tons per year of gypsum disposal, depending on the percent sulfur coal burned, may be required as a result of these scrubbers.

The project proposes to develop approximately 325 acres of plant property located along the north side of Hollingsworth Ferry Road, south-southeast of the plant, as a private industry coal combustion by-product disposal area. The site is located at approximate longitude W85° 03' and latitude N33° 24'. This waste is classified in Circular 14, Appendix A, as industrial waste with a moderate potential for groundwater pollution. The site topographic map and site boundary are shown on Figure 1-1. The general area of the plant and the site are shown on Figure 1-2. Copies of the original topographic survey and signed and sealed site boundary survey drawings are located in Appendix A.

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility. This report presents the results of a site acceptability study performed for the purpose of obtaining the necessary EPD approval to develop the property as a private industry coal combustion by-product disposal facility for gypsum.

#### 1.1.2 General Site Geology

The proposed disposal facility is located within the Southern Piedmont Physiographic province, which lies between the Blue Ridge Mountains and the Upper Coastal Plain. This province is underlain by metamorphic rocks including mica schists and granitic gneisses. The Brevard Fault Zone, a major feature that cuts across the Piedmont, occurs approximately one mile north of the proposed disposal facility. This zone is bounded by a thrust fault on the southeastern border and trends northeast, as do most of the rocks of the Piedmont.
Rock cores recovered from borings within the disposal facility are interbedded granitic gneisses, garnet mica schists, augen schists and augen gneisses with occasional quartzite veins and accessory minerals of garnet, epidote and calcite. Figure 1-3 shows the regional geology of the site area.

#### 1.1.3 Population Trends

The population of Heard County, Georgia for the year 2005 was estimated to be 11,346. From 2000 to 2005, the county grew in population an estimated 3.0%. Carroll County, to the north of the site, had an estimated population of 105,453 in 2005, an increase of 20.8% since 2000. Coweta County, to the east of the site, had an estimated 2005 population of 109,903, with an increase of 23.3% since 2000 (U. S. Census Bureau, 2006). According to the Carroll County Plan Update, these trends are due largely to the proximity of the area to the City of Atlanta.

#### 1.1.4 Other Permitted State/Federal Facilities

According to the Georgia Environmental Protection Division of the Department of Natural Resources, the Georgia Power Company-Plant Wansley Private Waste Disposal Facility, an inert landfill, permit number PBR-074-01IL, is the only waste disposal facility located within 2 miles of the site. No other State or Federal permitted waste disposal facility is located within 2 miles of the site.

#### 1.1.5 Threatened and Endangered Species/Wildlife Habitat Survey

The proposed disposal area was surveyed by representatives of Georgia Power Company's Environmental Affairs for threatened and endangered species. Both database and field surveys were conducted. No threatened and endangered species or their habitats were identified during these surveys. According to the report, one known location of a federally listed species (bald eagle – federally listed threatened) occurs approximately 1600 feet northwest of the site boundary within the Plant Wansley site. The location of the active nest is outside the primary zone (750 – 1500 ft) and will not be impacted by project activities.

The field survey indicated that the site was dominated by forested community types. Primary cover types included hardwood, mixed pine/hardwood, forested wetland, and scrub/shrub wetland. The full report is located in Appendix B.

#### 1.2 Proximity to Roads, Airports and Railroads

The site is adjacent to Hollingsworth Ferry Road, with road frontage of approximately 5600 feet. A rail spur for the plant is located along Georgia Power Road, approximately onequarter mile northeast of the proposed gypsum disposal site. Twelve airports are located in the general site vicinity. The airports, their location, and their distance to the plant are listed in Table 1-1. None of the airports are closer than 5 miles to the site. This is greater than the most stringent requirements specified by Circular 14, requiring a minimum separation distance of 10,000 feet from the end of runways servicing turbojet aircraft. Additionally, the proposed facility will not receive wastes that will attract birds.

×	Propos	ed Gypsum Dis	posal Facility	
Airport Name	ID	Latitude	Longitude	Distance from Facility
Andy Fields	2GE8	33-27-51.00N	084-39-48.00W	22.2 miles
Answered Prayer	1GE3	33-15-14.00N	085-10-13.00W	12.0
C&R Farm	78GA	33-30-15.40N	085-01-01.79W	7.0
Dresden	GA79	33-20-41.42N	084-54-40.78W	7.9
Falcons Aerie	8GA8	33-34-38.40N	085-00-10.79W	12.1
Flying W Farms	6GA8	33-30-28.00N	085-11-08.00W	10.3
Gum Creek	8GA1	33-25-16.41N	085-09-42.80W	5.9
Murphree	26GA	33-20-10.42N	084-54-49.78W	8.5
Newnan Coweta County	CCO	33-18-41.63N	084-46-11.12W	16.8
Panther Creek	17GA	33-28-00.00N	084-51-58.00W	11.0
West Georgia Regional – OV Gray Field	СТЈ	33-37-51.70N	085-09-07.30W	16.2
Wilson Intl	27GA	33-39-30.39N	085-00-35.80W	17.6

Table 1-1
Airports Located in the General Vicinity of the
<b>Proposed Gypsum Disposal Facility</b>

(AirportBug.org, 2007)

#### 1.3 Proximity to County Boundaries and National Historic Sites

Although the plant property is located in both Heard and Carroll Counties, and borders Coweta County along the Chattahoochee River, the proposed disposal site is located approximately 1.9 miles east of the boundary of Heard County and Coweta County and approximately 1.5 miles south of the boundary between Heard County and Carroll County. Circular 14 states that no permit shall be issued to an applicant if any part of the site is within ½ mile of an adjoining county without the approval of the government of the adjoining county. No portion of the proposed facility is within ½ mile of an adjoining county.

The National Parks Service's National Register of Historic Places was searched for a listing of historical places in Heard, Coweta, and Carroll Counties. The search indicated two historic sites in Heard County, 14 in Carroll County, and 23 in Coweta County. None of these listings are within 3 ¼ miles (5,708 yards) of the site. According to Circular 14, no industrial landfill shall be located within 5,708 yards of a National Historic Site. The complete list of historic sites in these counties, along with the approximate distance from the site is included in Appendix C.

#### 1.4 Proximity to Flood Plains

Based on the Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Map for unincorporated Heard County, Map Number 130105A, page 4, the site is not located in the 100-year flood plain (Figure 1-4).

#### 1.5 Proximity to Streams and Wetlands

A wetland delineation survey was performed by Georgia Power Environmental Affairs. The wetland delineation was performed in accordance with the United States Army Corps of Engineers "Wetland Delineation Manual, 1987" by two certified wetlands scientists. Several small wetlands were delineated that are associated with small streams. The total area of these wetlands is 7.4 acres. Any jurisdictional wetlands present, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis. All streams on the site property are tributaries of the Chattahoochee River which is located approximately 2000 feet east of the site boundary. Neither the river nor any of its tributaries are classified "trout streams" in Heard County. The streams and wetland areas are shown on Figure 1-5.

#### 1.6 Proximity to Significant Groundwater Recharge Areas

According to Digital Environmental Atlas of Georgia, the site is not located in or adjacent to an area of significant groundwater recharge. The nearest significant unconfined aquifer recharge area is located approximately 2 miles southwest of the site. Figure 1-6 indicates the nearest significant recharge areas.

#### 1.7 Proximity to Public and Domestic Water Wells

In November and December 2006, a survey was performed to identify water supply wells and surface water intakes near the site. The survey was performed by Kemron Environmental Services in accordance with the specifications for a Private Industrial Disposal Facility as outlined in Chapter 391-3-4-.05(k) of the Rules for Solid Waste Management, and Appendix A, Circular 14, Criteria for Performing Site Acceptability Studies for Solid Waste Landfills. An inventory of all privately owned (domestic) water supply wells within ½-mile radius and all public water supply wells and surface water intakes within a 2-mile radius was completed. The survey included the following:

- Obtaining tax maps of the adjacent properties from the Heard County Tax Assessors Office to identify property owners.
- Contacting the Heard County Water Authority.
- Searching the Water Resources Division of the United States Geologic Survey (USGS) and state of Georgia Environmental Protection Division (EPD) databases.
- Field reconnaissance of the 2-mile radius for public water supply wells and surface water intakes and ¹/₂-mile radius for private water supply wells.

The search produced the following information:

- The USGS database included nine private wells within the 2-mile radius of the site. Based on field observation, these wells appear to be outside the ¹/₂-mile radius for private water supply wells.
- The State of Georgia Environmental Protection Division (GAEPD) database for water supply wells and water intakes in Heard County was searched for drinking water sources. Of the 7 sources listed in Heard County 2 water intakes are located within 2 miles of the site. These 2 water intakes belong to Georgia Power Company's Plant Wansley and are listed as 1) Plant Service Pond and 2) Chattahoochee River. Neither of these intakes are used for drinking water; however the Plant Service Pond intake is used for an emergency eye-wash station. A third Plant Wansley water source, the Lake Gentry Yellow Dirt Creek intake is listed in the database. It is located outside the 2-mile radius for surface water intakes and is not used for drinking water. The locations of the plant service water intakes are shown on Figure 2 of the Kemron report located in Appendix D. 2).
- The Heard County Water Authority was contacted and indicated that the two surface water intakes belonging to them were within the City of Franklin. The city limits of Franklin are approximately 10.5 miles downstream of the site. They also indicated that they do not keep records of private water wells.
- The Heard County Tax Assessors database indicated that seven properties with water wells are located within the ¹/₂-mile radius for domestic water supply wells. All of these wells are located up-gradient of the site.
- Field reconnaissance with the ¹/₂-mile radius of the site boundaries indicated 13 additional private water wells. Field reconnaissance was not performed on Plant Wansley property. The locations of these wells are shown on Figure 4 of the Kemron report, located in Appendix D. All of these wells are located up-gradient of the site.

Table 1-2 is a summary of the domestic wells identified during the survey to be within  $\frac{1}{2}$ -mile of the site. Also included are properties adjacent to the site which are connected to the public water supply, but which may have wells. The complete Kemron report is included in Appendix D. Figure 1-7 shows both the  $\frac{1}{2}$ -mile and 2-mile radii from the site boundaries. No public water wells are present within the 2-miles radius. The private water wells within the  $\frac{1}{2}$ -mile radius are located on the map.

Well Owner	Property Address	Мар	Parcel	Water Supply*
Wendall S. Lewis	4819 Hollingsworth Ferry Rd.	43	24	well
Jerry L. & Tim R. Hudson	4704 Hollingsworth Ferry Rd.	43	25	well
Pink & Gertrude Webb	4944 Hollingsworth Ferry Rd.	43	22	well
Matthew R. Ridley	4474 Hollingsworth Ferry Rd.	43	26	well
Gary C. Philpott	4430 Hollingsworth Ferry Rd.	43	27	well
Yellow Dirt Baptist Church	4058 Hollingsworth Ferry Rd.	43	28	well
Joe Stephens	Hollingsworth Ferry Rd.	43	10	well
Samuel Harmon	6990 Five Notch Rd.	44	18	well
Samuel Harmon	6990 Five Notch Rd.	44	18.02	well
Jud Hall	Five Notch Rd.	44	18.03	well
Wayne Morris	240 Webb Rd.	44	17	well
James D. Green & Amanda Lovell	50 Webb Rd.	43	23.01	well
Brenda Webb	212 Webb Rd.	43	20	well
Gertrude Webb	Webb Rd.	43	21	well
James R. Price	Hollingsworth Ferry Rd.	43	11	well
Wayne Webb	201 Webb Rd.	43	19	well
Steven Kirk	4986 Hollingsworth Ferry Rd.	43	16	well
Johnnie Steele	5120 Hollingsworth Ferry Rd.	43	12	well
Gertrude Webb	Hollingsworth Ferry Rd.	43	13	well
Rufus Adamson	5040 Hollingsworth Ferry Rd.	43	14	well
Jeremy Milam	6903 Five Notch Rd.	44	18.01	public
Jane Sullivan	231 Webb Rd.	44	17.01	public
James & Lisa Perry	288 Webb Rd.	44	17.02	public
Loyette Echols	4848 Hollingsworth Ferry Rd.	43	23	public
Wendall C. Lewis	Hollingsworth Ferry Rd.	43	23.02	public

Table 1-2 Water Supply Well Inventory

* - Addresses shown with a well as the water supply were either listed on the Heard County Tax Assessors office to have a well or a well was visually observed during field reconnaissance. Addresses shown with public as the water supply are adjacent properties with public water supply. However, existence of a well has not been confirmed.

Circular 14 specifies a wellhead protection area around wells and springs used as sources of water supply for public water systems serving municipalities, counties, and authorities. The site is not within the water management area of a public water supply well or surface water intake.

#### 1.8 Zoning and Notification

A copy of the letter stating that the proposed solid waste disposal facility at Plant Wansley complies with local zoning and land use ordinance, from June Jackson, Commission Chair, Heard County Board of Commissioners, dated December 4, 2006, is located in Appendix E.

### 2.0 CHARACTERIZATION OF WASTES

Installation of flue gas desulfurization (FGD) equipment (scrubbers) on two coal-fired units at Plant Wansley will result in the production of gypsum ( $Ca_2SO_4 \cdot 2H_2O$ ). FGD technologies are categorized as dry or wet, depending on the state of the reagent as it leaves the absorber. The scrubbers planned for Plant Wansley will be wet and will use limestone as the reagent. Hydrated lime is to be injected into the slurry upstream of the scrubbers to remove SO₃. Wet FGD systems are comprised of three main processing areas: sorbent handling, SO₂ scrubbing, and by-product handling.

FGD systems that use limestone continually discharge scrubber slurry from the absorber that is generally more than 90% water. The slurry can be dewatered by a number of processes, and depending on the slurry composition, it can be sold commercially as gypsum, mixed with fly ash to create a fairly impermeable fill, or handled and placed in storage. The only Georgia Power plant that currently generates gypsum is Plant Yates. When scrubbers are installed at Plant Wansley, the gypsum generated will be similar in physical and chemical properties to the gypsum that is currently generated at Plant Yates. Table 2-1 presents the range of results of total metals analyses based on 12 gypsum samples collected over a 12-day period from Plant Yates. The 12 samples were composited, and the TCLP was run on the composite. A duplicate TCLP was also run. Table 2-2 presents a summary of Plant Yates gypsum leachate data, compared to the regulatory thresholds that the EPA has set for hazardous waste. None of the elements in gypsum exceed the TCLP regulatory threshold. The laboratory reports and a figure showing the sampling location of the gypsum are located in Appendix F.

Element	Range of Results mg/kg	Detection Limits mg/kg		
Total Antimony	ND	7.4 - 8.1		
Total Arsenic	ND	4.4 - 4.9		
Total Barium	120 - 210	1.5 - 1.6		
Total Beryllium	ND	1.5 – 1.6		
Total Cadmium	ND	1.5 – 1.6		
Total Chromium	ND – 1.6	1.5 – 1.6		
Total Cobalt	ND	5.9 - 6.5		
Total Copper	ND	1.5 - 3.3		
Total Iron	260 - 560	5.9 - 6.5		
Total Lead	ND	2.2 - 2.4		
Total Manganese	ND	5.9 - 6.5		
Total Mercury	ND – 0.77	0.37 - 0.8		
Total Nickel	ND	2.9 - 3.3		
Total Selenium	7.5 – 14	5.9 - 6.5		
Total Silver	ND	1.6 – 1.6		
Total Thallium	ND	29 - 33		
Total Vanadium	ND	2.9 - 3.3		
Total Zinc	10-29	2.9 - 3.3		

Table 2-1

Note: Twelve separate samples were collected from 2/4/02 to 2/15/02.

Table 2-2

Plant Y	ates Gypsu	m TCLP Data
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Element	Sample #1	Duplicate TCLP	TCLP Detection	TCLP Regulatory
	TCLP	Concentration,	Limit, mg/L	Limit, mg/L
	Concentration,	mg/L		
	mg/L			
Antimony	ND	ND	0.1	
Arsenic	ND	ND	0.03	5.0
Barium	0.2	0.2	0.1	100.0
Beryllium	ND	ND	0.01	
Cadmium	ND	ND	0.01	1.0
Chromium	0.02	0.02	0.01	5.0
Cobalt	ND	ND	0.04	
Copper	0.03	ND	0.02	
Iron	0.35	0.31	0.01	
Lead	ND	ND	0.1	5.0
Manganese	0.10	0.10	0.04	
Mercury	ND	ND	0.005	0.2
Nickel	ND	ND	0.02	
Selenium	ND	ND	0.5	1.0
Silver	ND	ND	0.01	5.0
Vanadium	ND	ND	0.02	
Zinc	0.51	0.45	0.03	

Note: Samples collected on 2/4/02.

#### 3.0 SURFACE AND SUBSURFACE EXPLORATIONS

#### 3.1 Topography

The general topography of the area consists of rolling hills and narrow valleys. The elevations over the proposed disposal facility range from about 880 feet msl in the westernmost section to approximately 670 feet msl in the southeast corner nearest to the Chattahoochee River. A number of small wet-weather streams form a dendritic pattern and merge to drain to the river in the southeast corner. The larger portion of the site is vegetated with mature woods. High under-brush covers the areas that have been previously cleared of trees. The topography is shown on Figure 1-1

#### 3.2 Boring and Sampling Plan

#### 3.2.1 Basis

The boring location plan was developed based on the locations of streams and wetland areas over the site and the topography of the site. Groundwater flow was expected to be influenced by the streams and the Chattahoochee River. A minimum of three borings were drilled for each drainage area.

#### 3.2.2 Depth Criteria

The drilling and sampling program consisted of borings drilled at 31 locations dispersed over the approximately 325 acres. Per Circular 14, the criterion was established to extend the borings to a minimum depth of 20 feet below the groundwater table. It was expected that rock would be encountered within this 20 feet in a majority of the holes. In the instances where this was the case, a minimum of 10 feet of rock core was performed or until core recovery exceeded 95% within the last 5 feet. Boring locations are shown on Figure 3-1.

#### 3.2.3 Drilling Methods

Drilling was performed using 4.875-inch diameter hollow stem augers to auger refusal. Rock coring was performed using a HQ wire-line coring system. The borings were advanced with a CME55 drill rig by Civil Field Services, Engineering and Construction Services, Southern Company Generation, a bonded service group under the Georgia Water Well Standards Act. A copy of the bond is located in Appendix G. All soil sampling and rock cores were logged under the direct supervision of a geologist or engineer registered in the State of Georgia.

#### 3.2.4 Sampling Methods

Split-spoon samples were taken in the soil and saprolite profile on 5-foot center-to-center spacing beginning at the ground surface or one foot below ground surface (bgs) and continuing to auger refusal. The soil samples were collected from the spoon, placed in

sample containers and labeled with boring number, depth, standard penetration counts (N), sample number, job name and date. HW size surface casing was set into the top of rock as determined by auger refusal depths. Rock coring was performed with five foot runs with a HQ coring system. The recovered core was placed in wooden boxes, labeled with the boring number, date, depth of the run and core recovery. The piezometers were installed with 2-inch diameter screen and casing, a 10-foot screened interval, and a filter pack surrounding the screen to approximately 2 feet above the top of the screen. Bentonite was placed above the filter pack to the ground surface.

Twelve undisturbed samples were collected from six locations in the upper fourteen feet for permeability and classification testing. Bag samples were also collected from a number of locations for density and remolded permeability testing. Table 3-1 presents a summary of the boring data. Boring logs and piezometer logs are located in Appendix H.

			Sum	mary Bo	ring Data	a		
		Auger l	Refusal	Bor Termin	ing nation	Ground	lwater Measu	rements
Boring	Ground Elev.	Depth, ft.	Elev.	Depth, ft.	Elev.	Depth to GW, ft.	Time GW Measured	GW Elev.
GS-1	847.7	38.9	808.8	54.2	793.5	31.2	24 hrs	816.5
GS-2	834.2	21.2	813.0	45.7	788.5	-	-	-
GS-3	803.2	na	na	50.0	753.2	27.0	TOD	776.2
GS-4	805.9	17.0	788.9	35.5	770.4	21.0	-	805.9
GS-5	773.1	10.0	763.1	31.6	741.5	-	-	-
GS-6	767.1	na	na	41.5	725.6	20.5	TOD	746.6
GS-7	794.7	na	na	66.5	728.2	44.7	24 hrs	750.0
GS-8	766.5	16.3	750.2	37.4	729.1	15.1	24 hrs	751.4
GS-9	772.7	15.0	757.2	35.5	737.2	18.0	TOD	754 7
GS-10	761.4	30.0	731.4	51.8	709.6	33.7	24 hrs	727.7
GS-11	773.9	na	na	61.0	712.9	39.3	TOD	734.6
GS-12	773.2	na	na	81.0	692.2	58.7	24 hrs	714.5
GS-13	780.6	12.5	768.1	37.5	743.1	16.7	24 hrs	763.9
GS-14	737.7	6.5	731.2	44.5	693.2	20.4	24 hrs	717.3
GS-15	719.7	21.0	698.7	41.3	678.4	18.0	24 hrs	701.7
GS-16	710.5	26.9	683.6	40.1	670.4	20.7	24 hrs	689.8
GS-17	756.1	30.0	726.1	50.4	705.7	21.7	-	734.4
GS-18	731.6	7.4	724.2	32.5	699.1	15.2	-	716.4
GS-19	750.0	15.2	734.8	39.2	710.8	17.3	24 hrs	732.7
GS-20	713.8	na	na	43.5	670.3	-	-	-
GS-21	789.4	66.0	723.4	77.5	711.9	74.0	24 hrs	715.4
GS-22	729.3	na	na	75.0	654.3	48.7	TOD	680.6
GS-23	697.9	na	na	60.0	637.9	12.6	TOD	685.3
GS-24	725.0	na	na	65.5	659.5	39.5	TOD	685.5
GS-25	785.7	29.0	756.7	43.7	742.0	20.2	24 hrs	765.5
GS-26	744.7	50.5	694.2	60.0	684.7	-	-	
GS-27	699.7	na	na	35.0	664.7	-	-	-
GS-28	813.4	na	na	68.0	745.4	1.75	-	-
GS-29	746.7	na	na	50.0	696.7	() <b>-</b> (		
GS-30	714.6	na	na	46.5	668.1	1	-	-
GS-31	843.5	23.5	820.0	43.5	800.0	15.0	24 hrs	828.5

Table 3-1

na – not applicable TOD – time of drilling

## 3.2.5 Field and Laboratory Testing

Split-spoon, undisturbed, and bulk samples were collected for laboratory soils testing. The laboratory testing was performed by Southern Company Generation in Alabaster, Alabama. The following tests were performed on the soil samples using the standard noted:

- Standard Test Method for Particle-Size Analysis of Soils R (1998) ASTM D-422
- Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits Tests) - ASTM D-4318
- Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) - ASTM D-2487
- Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer E(2002) - ASTM D-854
- Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass - ASTM D-2216
- Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)) - ASTM D-698
- Fall Head Permeability Tests Corps of Engineers Method
- Cation Exchange Capacity EPA method SW-846
- Standard Test Method for Batch-Type Measurement of Contaminant Sorption by Soils and Sediments – ASTM D-4646

Remolded samples were used to test for permeability of the overburden soil. Samples were remolded to 98% maximum dry density and +1.5% optimum moisture content using the results of the compaction testing (ASTM D698). Falling head permeability tests were also run on ten undisturbed samples of the overburden soils. Additionally, slug testing was performed in the field to determine the field hydraulic conductivity of the in situ rock and saprolite aquifer. This testing is discussed in Section 3.4.4.

The cation exchange capacity and the adsorption coefficient  $(K_d)$  were also determined for five samples. The results of the laboratory testing are shown in Table 3-2 and the laboratory test reports are included in Appendix I.

Table 3-2

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Summary of Son Laboratory Test Result	Summary	of Soil Labora	tory Test Results
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Sample	Туре	Depth, ft.	Description	% Fines	LL	PI	USCS	In-Situ Density, pcf	Natural Moisture, %	Max. Dry Density, (Proctor) pcf	Optimum Moisture, (Proctor) %	Gs	Perm, cm/sec	Remolded Density, pcf	Remolded Moisture, %	CEC, meq/100g	K _d , ml/g
GS-2	Bulk	1.0 - 2.5	Light reddish brown sandy lean CLAY	66.5	47	21	CL			96.9	22.7	2.63	$3.7 \times 10^{-7}$	94.9	24.2	14.8	4380
GS-2	Bulk	3.0 - 4.5	Light brown sandy SILT	50.1	NP	NP	ML			99.3	18.0	2.63	3.5 x 10 ⁻⁶	97.7	19.5		-
GS-4	UD	3.0 - 5.0	Light reddish brown sandy SILT	57.4	NP	NP	ML	91.6	15.6			2.64	1.6 x 10 ⁻⁵				
GS-4	UD	10.0 - 12.0	Light brown silty SAND	44.2	NP	NP	SM	91.9	22.7			2.62	9.9 x 10 ⁻⁵				
GS-7	Bulk	2.0 - 3.0								104.2	19.8	*	1.4 x 10 ⁻⁶	100.9	21.3		
GS-7	SS	4.5 - 6.0	Reddish brown elastic SILT w/sand	78.5	58	26	MH	-				2.72		1			
GS-7	Bulk	6.0 - 8.0								107.9	17.8		$4.0 \times 10^{-7}$	105.4	19.3	11 - F.1.2	
GS-7	SS	14.5 - 16.0	Reddish brown elastic SILT w/sand	70.3	53	8	MH	-	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		4	2.73	1.1.1		Contraction of the		
GS-7	SS	34.5 - 36.0	Light reddish brown sandy SILT	59.6	NP	NP	ML					2.72	1				
GS-11	UD	3.0 - 5.0	Reddish brown elastic SILT w/sand	73.3	51	17	MH	86.1	27.5	-		2.69	4.7 x 10 ⁻⁵		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		
GS-11	UD	10.0 - 12.0	Light brown sandy SILT	51.3	NP	NP	ML	95.0	15.4			2.67	7.3 x 10 ⁻⁵				8
GS-13	Bulk	1.5 - 3.0	Light reddish brown elastic SILT w/sand	78.5	50	17	MH			90.1	28.3	2.83	1.8 x 10 ⁻⁶	87.7	29.8	19.7	2345
GS-13	Bulk	5.0 - 6.0	Light brown sandy SILT	59.1	NP	NP	ML			91.1	24.8	2.83	1.3 x 10 ⁻⁶	89.7	26.3	18.2	5313
GS-16	UD	4.0 - 6.0	Dark brown elastic SILT	86.0	86	31	MH	78.6	40.8			2.83	8.2 x 10 ⁻⁶				
GS-16	UD	12.0 - 14.0	Light reddish brown sandy SILT	65.7	NP	NP	ML	87.0	22.1			2.70	2.3 x 10 ⁻⁴				
GS-17	SS	4.0 - 5.5	Reddish brown elastic SILT w/sand	81.6	55	22	MH					2.74					
GS-17	SS	14.5 - 15.5	Light brown sandy SILT	65.3	NP	NP	ML					2.73					
GS-17	SS	24.0 - 25.5	Light brown sandy SILT	57.1	NP	NP	ML					2.83				1	
GS-19	Bulk	1.5 - 3.0	Light reddish brown elastic SILT w/sand	83.7	54	24	MH			98.2	22.5	2.75	2.4 x 10 ⁻⁶	96.2	24.0	13.8	3030
GS-19	Bulk	6.0 - 7.0	Light reddish brown sandy SILT	57.4	NP	NP	ML			77.1	34.4	2.84	3.7 x 10 ⁻⁶	75.6	34.4	27.4	5847
GS-21	UD	4.0 - 6.0	Reddish brown silty SAND	43.0	NP	NP	SM	97.5	11.3			2.78	6.6 x 10 ⁻⁵				
GS-21	UD	9.0 - 11.0	Brown silty SAND	46.1	NP	NP	SM	109.9	13.3			2.73	1.4 x 10 ⁻⁴				
GS-21	SS	49.5 - 51.0	Gray silty SAND	38.9	NP	NP	SM					2.75		6-10 - 10 - 10 - 10 - 10 - 10 - 10 - 10			
GS-22	SS	4.5 - 6.0	Light brown SILT with sand	79.2	NP	NP	ML	-				2.69	13		14		
GS-23	SS	1.0 - 2.5	Reddish brown elastic SILT w/sand	80.4	54	18	MH					2.73					
GS-23	SS	14.5 - 16.0	Light brown SILT w/sand	71	NP	NP	ML					2.70					
GS-23	SS	39.5 - 41.0	Light gray silty SAND	43.1	NP	NP	SM					2.86					
GS-26	UD	1.0 - 3.0	Light brown silty SAND	35.4	NP	NP	SM	102.5	12.2			2.74					
GS-26	UD	10.0 - 12.0	Brown silty SAND	33.6	NP	NP	SM	109.9	13.2			2.73					
GS-28	UD	4.0 - 6.0	Reddish brown sandy SILT	55.5	NP	NP	ML	96.9	13.1			2.78	2.3 x 10 ⁻⁵				
GS-28	UD	11.0 - 12.5	Lavender sandy SILT	51.4	NP	NP	ML	100.4	15.5			2.75	7.1 x 10 ⁻⁵	· · · · · · · · · · · · · · · · · · ·	-		
GS-29	Bulk	1.0 - 2.5						-		100.2	21.8	H //	$1.7 \times 10^{-7}$	98.2	23.3		
GS-29	SS	3.0 - 4.5	Reddish brown silty SAND	44.3	43	12	SM					2.79					
GS-29	Bulk	6.0 - 8.0								101.5	20.6		5.7 x 10 ⁻⁷	98.9	22.2		
GS-29	SS	13.0 - 14.5	Light brown sandy SILT	55.3	NP	NP	ML					2.77	a. 11				
GS-29	SS	37.0 - 39.5	Light brown sandy SILT	32	NP	NP	SM					2.77					

LL – Liquid Limit PI – Plasticity Index % Fines – Sieve Analysis SS – Split Spoon Sample USCS – Unified Soil Classification System Designation

 $\begin{array}{c} \text{CEC} - \text{Cation Exchange Capacity} \\ \text{K}_{d} - \text{Sorption Coefficient} \\ \text{Gs} - \text{Specific Gravity} \\ \text{UD} - \text{Undisturbed Sample} \end{array}$ 

NP - Non Plastic

#### 3.3 Soil and Rock Description

#### 3.3.1 Soil Description

The soils over the proposed disposal area consist primarily of light brown to reddish brown, sandy silt, silty sand, and sandy lean clay, with occasional fragments of the underlying rock. The thickness of the soil encountered in the borings is variable, from thin (less than five feet) to as much as 61 feet. Laboratory tests classify the soils as ML, MH, SM and CL.

The soil cover is underlain by saprolite typical of Piedmont settings. This saprolite retains relict features of the parent rock such as schistocity (schists) and banding (gneisses) while having the texture of a soil. Described as dense and red to gray to black in color, the saprolite may be as much as 60 feet thick.

#### 3.3.2 Rock Description

Rock coring began at auger refusal using an HQ (2.5 inch diameter core) wire-line coring system. Top of rock is irregular, ranging from 6.5 feet below ground surface to as much as 75 feet below the ground surface. The rock consists of interbedded dark gray to greenish gray augen schist, mica garnet schist and black and white to gray to pink and gray augen gneiss and biotite gneiss. Pyrite, calcite laminations and quartzite veins are common. Large porphyroblasts of pink feldspar occur in several intervals. Manganese oxides are observed in fractures, which are numerous and often steep. Weathering due to water movement is observed along open fractures. Iron staining from water movement along fractures is common.

Top of rock is slightly to strongly weathered but becomes unweathered with depth. Core recovery ranged from poor (26%) to excellent (100%), averaging 92%. Recovery increased significantly with depth as the rock became less weathered. RQD ranged from 0% to 100%, averaging 67%. RQD also increased significantly with depth. Geologic cross-sections A-A and B-B of the site are shown on Figure 3-2.

#### 3.4 Hydrogeologic Assessment

#### 3.4.1 Description of Unconfined Aquifers

Temporary piezometers were installed in borings GS-1 through GS-31 with screened intervals in either the lower portion of the saprolite or the upper part of rock. The top of casing elevations, depths to groundwater and groundwater elevations are indicated in Table 3-3. The piezometer logs are located in Appendix H. Groundwater potentiometric maps were prepared for the unconfined groundwater surface aquifer from groundwater readings taken on November 17, 2006 and April 19, 2007. The April readings represent the highest groundwater levels to date. Both maps indicate that the general groundwater flow is from the south and west towards the creek that runs from west to east to the Chattahoochee River.

This flow is generally through the saprolite and partially weathered rock and is recharged by infiltration of storm water within the site itself. The groundwater potentiometric surfaces are represented on Figures 3-3 and 3-4.

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											Table 3-3											
									Depth to G	roundwat	er and Gro	undwater	Elevations									
-			Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth to	GW	Depth	GW	Depth to	GW	Depth to	GW
	Date	TOC	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	GW	Elev.	to GW	Elev.	GW	Elev.	GW	Elev.
Boring	Installed	Elev.	11/17/06	11/17/06	12/06/06	12/06/06	2/19/07	2/19/07	3/19/07	3/19/07	4/19/07	4/19/07	5/14/07	5/14/07	6/12/07	6/12/07	7/2/07	7/2/07	8/20/07	8/20/07	9/13/07	9/13/07
GS-1	10/12/06	850.30	32.80	817.50	33.00	817.30	33.24	817.06	33.35	816.95	33.48	816.82	33.89	816.41	34.33	815.97	34.61	815.69	34.56	815.74	34.90	815.40
GS-2	10/23/06	837.07	33.32	803.75	31.33	805.74	29.68	807.39	29.38	807.69	28.84	808.23	29.03	808.04	29.75	807.32	29.93	807.14	30.15	806.92	31.77	805.30
GS-3	10/23/06	806.32	29.25	777.07	28.30	778.02	25.03	781.29	25.10	781.22	25.15	781.17	26.01	780.31	27.69	778.63	28.85	777.47	30.38	775.94	31.09	775.23
GS-4	10/24/06	808.99	17.19	791.80	17.73	791.26	18.10	790.89	16.98	792.01	16.70	792.29	17.42	791.57	17.36	791.63	17.58	791.41	18.20	790.79	18.37	790.62
GS-5	10/22/06	775.97	26.53	749.44	26.67	749.30	26.76	749.21	26.77	749.20	26.35	749.62	26.74	749.23	27.15	748.82	27.05	748.92	26.82	749.15	26.80	749.17
GS-6	10/21/06	769.71	19.55	750.16	19.62	750.09	17.16	752.55	17.01	752.70	17.70	752.01	17.90	751.81	19.48	750.23	20.53	749.18	22.10	747.61	22.66	747.05
GS-7	10/11/06	797.43	40.65	756.78	46.36	751.07	44.98	752.45	44.60	752.83	44.56	752.87	45.13	752.30	45.93	751.50	46.09	751.34	47.69	749.74	48.40	749.03
GS-8	10/11/06	769.40	18.55	750.85	18.42	750.98	16.66	752.74	16.85	752.55	16.48	752.92	18.41	750.99	19.26	750.14	19.94	749.46	21.07	748.33	21.81	747.59
GS-9	10/12/06	776.44	26.84	749.60	26.40	750.04	24.33	752.11	24.10	752.34	23.72	752.72	24.89	751.55	26.28	750.16	27.31	749.13	28.78	747.66	29.53	746.91
GS-10	10/20/06	764.18	35.00	729.18	35.74	728.44	32.31	731.87	32.31	731.87	32.79	731.39	32.86	731.32	33.17	731.01	34.66	729.52	35.80	728.38	36.27	727.91
GS-11	10/20/06	776.63	42.61	734.02	42.32	734.31	40.97	735.66	40.58	736.05	40.36	736.27	40.73	735.90	41.43	735.20	42.35	734.28	42.88	733.75	43.19	733.44
GS-12	10/19/06	775.70	48.18	727.52	48.12	727.58	46.78	728.92	46.70	729.00	46.68	729.02	47.31	728.39	48.00	727.70	48.32	727.38	49.21	726.49	49.34	726.36
GS-13	10/10/06	783.96	18.69	765.27	18.48	765.48	14.33	769.63	13.46	770.50	13.39	770.57	14.09	769.87	16.24	767.72	17.52	766.44	19.80	764.16	20.60	763.36
GS-14	10/18/06	740.82	21.27	719.55	21.76	719.06	20.51	720.31	21.19	719.63	21.17	719.65	23.06	717.76	24.81	716.01	25.42	715.40	26.75	714.07	27.10	713.72
GS-15	10/19/06	722.61	15.51	707.10	16.84	705.77	11.26	711.35	13.15	709.46	14.57	708.04	16.04	706.57	18.32	704.29	19.33	703.28	20.95	701.66	21.57	701.04
GS-16	10/18/06	713.11	20.44	692.67	20.67	692.44	20.17	692.94	20.55	692.56	20.42	692.69	21.87	691.24	22.95	690.16	23.23	689.88	23.90	689.21	23.36	689.75
GS-17	10/5/06	758.78	22.66	736.12	22.00	736.78	19.88	738.90	21.17	737.61	20.58	738.20	20.99	737.79	21.46	737.32	21.75	737.03	24.80	733.98	25.5	733.28
GS-18	10/4/06	733.45	15.07	718.38	15.79	717.66	15.18	718.27	15.21	718.24	15.14	718.31	15.54	717.91	16.00	717.45	16.13	717.32	17.45	716.00	17.61	715.84
GS-19	9/27/06	752.89	dry	dry	dry	dry	21.99	730.90	21.91	730.98	21.68	731.21	20.79	732.10	21.83	731.06	23.13	729.76	dry	dry	dry	dry
GS-20	10/3/06	716.61	19.58	697.03	20.47	696.14	19.31	697.30	19.46	697.15	19.32	697.29	20.62	695.99	21.68	694.93	21.92	694.69	22.84	693.77	22.65	693.96
GS-21	10/2/06	792.11	35.03	757.08	35.16	756.95	33.15	758.96	32.70	759.41	32.45	759.66	32.84	759.27	33.52	758.59	33.72	758.39	35.79	756.32	36.49	755.62
GS-22	10/3/06	732.71	-	-	36.22	696.49	35.30	697.41	34.95	697.76	34.63	698.08	34.74	697.97	35.10	697.61	35.50	697.21	36.61	696.10	36.85	695.86
GS-23	10/4/06	700.73	18.03	682.70	18.45	682.28	17.93	682.80	18.44	682.29	18.52	682.21	19.65	681.08	21.29	679.44	21.68	679.05	22.49	678.24	22.22	678.51
GS-24	10/5/06	728.21	42.18	686.03	42.54	685.67	40.97	687.24	40.59	687.62	40.33	687.88	40.56	687.65	41.29	686.92	41.79	686.42	43.05	685.16	43.18	685.03
GS-25	9/26/06	788.47	18.05	770.42	20.81	767.66	18.44	770.03	18.74	769.73	19.09	769.38	19.68	768.79	20.47	768.00	21.18	767.29	22.65	765.82	23.18	765.29
GS-26	9/27/06	748.14	28.89	719.25	22.26	725.88	26.81	721.33	27.10	721.04	27.40	720.74	28.20	719.94	29.80	718.34	30.18	717.96	30.80	717.34	31.92	716.22
GS-27	10/3/06	702.67	13.61	689.06	13.95	688.72	13.77	688.90	14.15	688.52	13.78	688.89	15.25	687.42	16.91	685.76	17.38	685.29	18.76	683.91	19.17	683.50
GS-28	9/12/06	816.37	42.88	773.49	44.80	771.57	42.83	773.54	42.15	774.22	41.69	774.68	42.06	774.31	42.87	773.50	43.05	773.32	45.72	770.65	46.40	769.97
GS-29	9/14/06	749.67	19.81	729.86	19.14	730.53	17.03	732.64	17.51	732.16	18.03	731.64	19.06	730.61	42.87	706.80	20.98	728.69	22.03	727.64	24.29	725.38
GS-30	9/19/06	717.54	14.92	702.62	15.22	702.32	14.28	703.26	14.54	703.00	14.46	703.08	15.42	702.12	17.10	700.44	17.52	700.02	19.92	697.62	20.35	697.19
GS-31	10/21/06	846.39	26.93	819.46	24.94	821.45	24.04	822.35	23.87	822.52	23.82	822.57	24.18	822.21	24.31	822.08	24.52	821.87	25.62	820.77	25.61	820.78

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#### 3.4.2 Description of Confined Aquifers

No confined aquifers were encountered at this site. As is typical of the Southern Piedmont Physiographic province, the groundwater aquifer is unconfined.

#### 3.4.3 Uppermost Aquifer Gradient

Using depth to groundwater data collected 11/17/06, which represent the highest groundwater levels to date, the hydraulic gradient of the unconfined aquifer was computed. Gradients were computed for several areas of the site using the following equation:

hydraulic gradient =  $i = \frac{(h_1 - h_2)}{L}$ 

where:

 $h_1$  = groundwater elevation at up-gradient well

 $h_2$  = groundwater elevation at down-gradient well

 $L = distance between h_1 and h_2$ 

Table 3-4 shows the gradients calculated for the site.

Hydraulic Gradients											
Wells	h ₁	h ₂	L	i							
L L	ft msl	ft msl	ft	ft/ft							
GS-28 & GS-30	773.49	702.62	1226.2	0.058							
GS-31 & GS-6	819.46	750.16	831.9	0.083							
GS-25 & GS-20	770 42	697.03	963.4	0.076							

Table 3-4

#### 3.4.4 Field Hydraulic Conductivity (Slug) Tests

Field hydraulic conductivity tests (slug tests) were conducted at boring locations GS-3, GS-4, GS-18, GS-21, GS-25, GS-27, and GS-29. The tests were performed in the temporary piezometers installed during the drilling program. The piezometers were installed with 2-inch diameter screen and casing, a 10-foot screened interval, a filter pack surrounding the screen to approximately 2 feet above the top of the screen. Bentonite was placed above the filter pack to the ground surface. The piezometer construction logs are located in Appendix H. Table 3-5 presents the results of the hydraulic conductivity (K) tests. A copy of the data reduction and graphs are included in Appendix J.

Location	Material	K _{slug in} cm/sec	K _{slug out} cm/sec	K _{slug in} ft/day	K _{slug ou} ft/day		
GS-3	saprolite	1.68 x 10 ⁻⁴	1.88 x 10 ⁻⁴	4.77 x 10 ⁻¹	5.33 x 10 ⁻¹		
GS-21	saprolite	$1.11 \times 10^{-3}$	8.41 x 10 ⁻⁴	$3.14 \times 10^{\circ}$	$2.39 \times 10^{\circ}$		
GS-27	saprolite	3.25 x 10 ⁻⁴	3.25 x 10 ⁻⁴	9.22 x 10 ⁻¹	9.22 x 10 ⁻¹		
GS-29	saprolite	1.59 x 10 ⁻⁴	1.61 x 10 ⁻⁴	$4.50 \times 10^{-1}$	4.57 x 10 ⁻¹		
GS-4	rock	$3.62 \times 10^{-2}$	$2.06 \times 10^{-2}$	$1.03 \times 10^2$	5.83 x 10 ¹		
GS-18	rock	2.67 x 10 ⁻⁴	3.38 x 10 ⁻⁴	7.57 x 10 ⁻¹	9.58 x 10 ⁻¹		
GS-25	rock	2.45 x 10 ⁻⁴	1.76 x 10 ⁻⁴	6.96 x 10 ⁻¹	5.00 x 10 ⁻¹		
Average Soil			4.09 x 10 ⁻⁴		$1.16 \times 10^{0}$		
Average Rock			9.63 x 10 ⁻³		2.73 x 10 ¹		

Table 3-5 Field Hydraulic Conductivity Tests

#### 3.4.5 Sorption and Attenuation Capacity

#### Sorption (Distribution) Coefficients

Environmental risk assessment of metals depends to a great extent on fate and transport modeling based on soil-liquid partitioning coefficients. The evaluation of the potential risks of metals in soils requires an assessment of the proportion of the total metal that is in a mobile and possibly bioavailable form. This can be done using a relatively simple partitioning of the total metal concentration between the fraction bound to the soil solids and the part that is dissolved in the soil solution (pore water). The dissolved metal concentration reflects the soil metal fraction that could potentially be leached from the soil and contaminate groundwater and surface waters. Conversely, the balance of the metal is assumed to be tightly retained by the soil solids and, hence, unavailable for biological uptake or movement into groundwater (Sauve and others, 2000).

Selenium was chosen as the potential contaminant to model, based on the results of the gypsum total metals concentrations and leaching tests (Tables 2-1 and 2-2), for fate and transport modeling. The partition or distribution coefficient  $K_d$ , is required for modeling.  $K_d$  is a measure of sorption of contaminants to soils and is defined as the ratio of the contaminant concentration adhered to the solid to the contaminant concentration in the surrounding aqueous solution when the system is at equilibrium. Once groundwater is contaminated, it is important to understand how the contaminant moves in the subsurface environment.  $K_d$  is one of the most important parameters used in determining the migration potential of contaminant with a  $K_d$  value around zero would travel at the rate of water, while ones that react more strongly with the soils would have higher  $K_d$  values. The  $K_d$  value is basically used to determine how well a soil will adsorb a contaminant and thus not allow the contaminant to migrate through the groundwater.

ASTM D 4646 is the Standard Test Method for 24-hour Batch-Type Measurement of Contaminant Sorption by Soils and Sediments. The distribution coefficient ( $K_d$ ) is defined identically to the distribution ratio ( $R_d$ ), except  $K_d$  is considered to be an equilibrium value and independent of the concentration of solute. The distribution ratio ( $R_d$ ) is the ratio of the concentration of solute sorbed on the soil or other geomedia divided by its concentration in solution. The  $R_d$  value is calculated as follows:

 $K_{d} = R_{d(at \text{ equilibrium})} = \frac{(\text{mass of solute sorbed per unit mass of geomedia})}{(\text{mass of solute in solution per unit volume of solution})}$  $= \frac{\mu g}{\mu g} = \frac{mL}{g}$ 

The test method can be summarized as mixing distilled water, natural water, waste leachate, or other aqueous solution containing a known concentration of a solute with a known amount of unconsolidated geologic material (e.g., soil) for 24 hours. Changes in solute concentrations are used to calculate a distribution ratio ( $R_d$ ) (ASTM, 2001).

This test method is meant to allow for a rapid (24 hour) index of soil sorption affinity for given chemicals or leachate constituents. A large number of samples may be run using this test method to determine a comparative ranking of those samples, based upon the amount of solute sorbed by the soil, or by various soil or leachate constituents. The 24-hour time is used to make the test convenient and also to minimize microbial degradation which may be a problem for organic contaminants in long-timed procedures (ASTM, 2001).

After the samples have been weighed and air-dried, a moisture content has been measured, and the volume of solution has been determined, the sample can be placed in a rotary extractor to be agitated for 24 hours. The sample is then removed and the solution is removed from the solid phase by decantation and then filtered. After a clear solution is obtained, the  $K_d$  value can be calculated from the following equation:

$$\mathbf{K}_{d} = \frac{(\mathbf{A} - \mathbf{B})\mathbf{V}}{(\mathbf{M}_{s})\mathbf{B}}$$

where:

A = initial concentration of the solute defined as the mean concentration of the blanks, ug/mL,

B = final concentration of the solute after 24 hours in contact with the soil, ug/mL,

V = volume of solution used, ml,

Ms = mass of soil expressed on an oven-dried basis, grams, and

 $K_d$  = distribution ratio, ml/g (ASTM, 2001).

Site specific sorption coefficients ( $K_d$ ) were measured for soil samples collected from the Wansley site per ASTM D-4646. Five samples were collected from the site. The results of this testing are presented in Table 3-2.

#### 3.5 Potential of Unconfined Aquifers as Sources of Drinking Water

Groundwater recharge is generally from infiltration of rainfall. The average annual rainfall for the area is 50 to 54 inches per year. Based on rainfall data collected from 1940 to 2003, the months of December through March have the highest average rainfall amounts. Determination of the seasonal fluctuation in the groundwater level is pending the collection of additional monitoring data.

Because unconfined implies interconnection between the soil and rock aquifers, there is a low potential for the unconfined aquifer in this area to be used as a source of drinking water. The USGS web site lists 345 wells in Heard and Carroll Counties (USGS, 2006). Twenty seven of these wells are less than 80 feet deep. The majority are greater than 100 feet deep. Additionally, groundwater flows toward the plant, away from any residences. Also, public water supply is provided along Hollingsworth Ferry Road.

#### 3.6 Description of Geologic and/or Natural Hazards/Seismic Impact Zone

The proposed site is located approximately 1.5 miles south of the Brevard Fault Zone, a major feature that cuts across the Piedmont. However, no faults or fault zones, unstable areas, or shear zones were encountered during the site geologic exploration. The latest movement along the Brevard Zone was late Paleozoic to Triassic. The age date of 282 ( $\pm$ 14) million years has been assigned based on mineralogy. The date also agrees with field evidence as the final major metamorphic event of the Georgia Piedmont as a whole (Higgins, 1966).

Earthquake acceleration maps prepared for the continental United States (Algermissen and others, 1990) were reviewed to determine the seismic impact zone for the site. Map C of this series indicates the horizontal acceleration with a 90% probability of not being exceeded in 250 years. According to Map C, the horizontal acceleration for the site is 0.17g.

The Seismic Design Category for this site is a "C" classification (Table 9.4.2.1 of ASCE 7-98). The Use Group is I (i.e., represents a low hazard to human life in the event of a failure) per Table 9.1.3 of ASCE 7-98.

#### 4.0 GROUNDWATER POLLUTION POTENTIAL

#### 4.1 Introduction

In order to determine groundwater pollution potential and rate of leachate migration from the proposed by-product disposal area, three analyses were performed:

- Fate and transport modeling using the SESOIL model,
- LeGrand (1964) scoring method per Circular 14, and a
- Pathway analysis per Circular 14.

The results of this work showed a very low potential for leachate to contaminate groundwater, and similarly, for leachate to leave the site. Fate and transport modeling showed that under a conservative scenario ( $K_d = 235 \text{ ml/g}$  for the soil), contamination would take more than 100 years to reach groundwater, and under a more realistic scenario ( $K_d = 2345 \text{ ml/g}$ ), contamination would take more than 1000 years to reach groundwater. Two-media LeGrand analyses produced a score of 15.8 indicating groundwater pollution is "possible, but not likely".

The horizontal pathway analysis described in Circular 14 becomes relevant only after contamination has traveled vertically through at least a 2-foot compacted silty soil liner and a minimum of 5 feet of saprolite to the water table, that is, after more than 1000 years.

#### 4.2 Fate and Transport Modeling

#### 4.2.1 Background

The fate and transport model selected for use in this study was RISKPRO's Seasonal Soil Compartment Model (SESOIL) for Windows, Version 3, May 1998, from General Science Corporation. The model was developed as a risk screening-level model. It is a one-dimensional vertical transport model for the unsaturated soil zone. The model can only consider one chemical (pollutant) compound at a time. The model is based on mass balance and equilibrium partitioning of a chemical between different phases (dissolved, sorbed, vapor, and pure).

SESOIL is used to estimate the rate of migration of chemicals through the soil and the concentration of chemicals in the soil layers after a chemical release to the environment. The model can accept time-varying pollutant loads and can simulate up to 9,999 years of chemical transport. Applications of the model include long term leaching studies from waste disposal sites, leaking underground storage tanks, agricultural applications, and pesticide and sediment transport on watersheds (SESOIL user's guide).

According to the SESOIL's user guide, the soil column is a user-defined compartment extending from the surface through the unsaturated zone to the water table. SESOIL requires

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several types of chemical- and site-specific data. The essential information needed to run the model includes the following:

- The behavior in the environment of the chemical to be modeled,
- The rate and frequency of the chemical's release into the environment,
- A description of the media in which the chemical is released, and
- Monthly estimates of climatic data. (Climate information is compiled in RISKPRO through on-line databases)

Output includes the following:

- Time-variant estimates of concentrations of pollutants in the soil column at various depths,
- Rate of leaching toward groundwater, including quantities of pollutants entering the groundwater (SESOIL does not model the saturated zone),
- Pollutant loss from the unsaturated zone in terms of surface runoff,
- Volatilization, and
- Degradation.

Pollutant transport and transformation in the unsaturated soil zone are complex processes affected by chemical, soil, and hydrogeologic properties. In SESOIL, these processes are included in one of three cycles or submodels. These submodels and their associated processes are shown below:

- 1. Hydrologic submodel (deals with moisture movement through the layers), including:
  - rainfall
  - surface runoff
  - capillary rise
  - groundwater runoff (recharge)
  - soil moisture (storage)
  - evapotranspiration
  - infiltration
- 2. Pollutant fate submodel, including:
  - advection
  - cation exchange
  - sorption
  - washload
  - volatilization
  - surface runoff
  - groundwater runoff (recharge)
  - metal complexation
  - diffusion (air phase)
  - hydrolysis

3. Sediment or washload submodel (deals with runoff from the soil surface). For this application, all precipitation is assumed to infiltrate into the subsurface (worst case) and zero runoff is assumed. Therefore, washload is not used in the Plant Wansley model.

#### Hydrologic Submodel

The hydrologic submodel is one-dimensional and considers vertical movement only. It focuses on the role of soil moisture (or interstitial pore water) in the soil layer. It is based on a statistical, dynamic formulation of a vertical water budget and has been adapted for either yearly or monthly simulations and for moisture variations in the soil. The submodel calculates results for the hydrology of the site and passes these results to both the pollutant fate and sediment washload cycles.

#### Pollutant Fate Submodel

The pollutant fate submodel breaks the soil column into several compartments, called layers. The soil column can be represented by up to 4 layers and the dimensions of these layers are defined by the user. Each layer in the pollutant cycle can be further broken up into 10 sublayers having the same soil properties as the layer of which they are a part. The total soil column is treated as a series of interconnected layers. Each layer or sublayer can receive and release pollutant to and from adjacent layers. Like the hydrologic submodel, pollutant fate is based on a mass balance equation that tracks the pollutant as it moves in the soil moisture between layers. When a pollutant enters a layer, the model assumes instantaneous and uniform distribution of the chemical throughout that layer. The model performs mass balance calculations over each entire soil layer or sublayer; there is no concentration gradient within a layer (SESOIL user's guide).

The pollutant cycle simulates transport and transformation processes in three phases present in the soil layers: soil-air or gaseous phase, soil-moisture phase, and adsorbed or soil-solids phase. The fate of the pollutant in the soil column includes both transport and transformation processes, which depend on the chemical's partitioning among these three phases. The three phases are assumed to be in equilibrium with each other at all times. The pollutant cycle in SESOIL is based on the chemical concentration in the soil water and all the mass balance equations are a function of this (SESOIL user's guide).

Theoretically, a non-reactive dissolved pollutant will travel to another soil layer or to groundwater at the same speed as the movement of moisture through the soil layer. However, the movement of a reactive pollutant will be retarded due to adsorption of the pollutant on the soil particles. Movement of pollutant may also be retarded due to the movement of bulk moisture mass due to vapor phase partitioning. For gypsum, this is not applicable (SESOIL user's guide).

SESOIL includes two partitioning processes for movement of pollutant from soil moisture to soil solids, the sorption process and cation exchange. The sorption process may be defined as the adhesion of pollutant molecules or ions to the surface of soil solids. The process is generally reversible; adsorption being the movement of a pollutant onto soil solids and desorption being the movement of pollutant off of soil solids to the liquid or gas phase. The two processes are assumed to be in equilibrium and are modeled that way (SESOIL user's guide).

#### 4.2.2 Plant Wansley Gypsum Disposal Facility SESOIL Model

Selenium was chosen as the potential contaminant to model, based on the results of the gypsum total metals concentrations and leaching tests (Tables 2-1 and 2-2). The general design of this model simulates 100 feet plus 2 cm of gypsum atop 5 feet of silty soil representing the liner material that may be used at the site (Figure 4-1). The 2 cm of gypsum is used to directly introduce the pollutant (selenium) to the soil.

#### **Model Assumptions**

- Gypsum will be stacked to a maximum height of 100 feet (maximum assumed cell height).
- The area of the disposal facility is 20 acres (maximum assumed cell size).
- The disposal area is not capped (worst case).
- Water moves vertically through the affected soils at a constant rate.
- Changes in soil components do not affect the overall infiltration rate or vertical movement.
- Dispersion in the vadose zone is negligible.
- The soil selenium linear sorption coefficients are constant throughout the source area.
- The model is conservative and does not account for all the geochemical processes on site.
- The program models the unsaturated zone only (basically migration through the silt layer). The model assumes that the pollutant front begins at the middle of the lowest layer that has a concentration of the constituent of interest.

#### **Input Parameters**

Table 4-1 presents the input parameters for the model.

Input Parameter	Value	Source/Comments
Ceneral Model Properties		
Climate data from Carrollton GA		National Climatic Conter and the National
rain gauge station		Oceanographic and Atmospheric Administration
Simulation length	100 years	Oceanographic and Atmospheric Administration
Application length	50 years	I among any itality and itality at
Sediment weekload avale turned	50 years	Longest available application time.
off		Assumes no surface runoff.
Number of layers	4	Model has 3 layers of gypsum totaling 100 feet plus 2 cm to directly introduce selenium to the soil. A minimum 5-foot layer of silt will underlie the gypsum.
Continuous loading of contaminant		Worst case.
Application area	$20 \text{ acres} = 8.1 \text{ x } 10^{-8} \text{ cm}^2$	Assumed cell size.
Volatilization	0.0	Forces all contaminant transport downward through the soil.
Soil/Gypsum Input Parameters		
Gypsum density	$1.36 \text{ g/cm}^3 =$ 85 lb/ft ³	
Gypsum effective porosity	0.1	RCRA Investigation Guidance, Table 10-4, Default Values for Effective Porosity; assumes gypsum behaves as a silt.
Freundlich equation exponent	1.0	Model recommended value in the absence of site- specific data; assumes linear sorption.
Disconnectedness index	12	Default value for silt and clay.
Organic carbon content	0%	Assumed
Cation exchange capacity	NA	$K_d$ values were used in the model. Both $K_d$ and CEC can not be used in the model.
Intrinsic permeability gypsum	$5 \times 10^{-9} \text{ cm}^2$	SCS Engineering – average value for gypsum. This is equivalent to a hydraulic conductivity of 5 $\times 10^{-4}$ cm/sec
Intrinsic permeability soil	5 x 10 ⁻⁹ cm ²	Laboratory testing average value of remolded samples was 2 x $10^{-6}$ cm/sec. This was raised to 5 x $10^{-4}$ cm/sec as to be more compatible with the program restrictions.
K _d gypsum	1 mL/g	Assumed as a worst case value
K _d silt	2345 mL/g	The lowest value from the testing performed on Plant Wansley soils.
Chemical Input Parameters – Selenium		
Selenium concentration in gypsum	14 mg/kg	By product characterization of Yates gypsum
Atomic weight of selenium	78.96 g/mole	, , , , , , , , , , , , , , , , , , ,
Solubility of selenium	384,000 mg/L	Agency for Toxic Substances and Disease

Table 4-1 SESOIL Model Input Parameters – Basic Model



#### 4.2.3 Sensitivity Analysis

A sensitivity analysis of the finalized model was conducted by varying the travel time,  $K_d$  values, intrinsic permeability, and contaminant concentration. The sensitivity testing, as with the basic model, was performed using selenium as the contaminant of interest. The following models were run for the sensitivity testing:

- The basic model travel time was extended to 1000 years.
- The adsorption coefficient was varied by doubling the original number ( $K_d = 4690 \text{ mL/g}$ ) and using an approximate order of magnitude lower ( $K_d = 235 \text{ mL/g}$ ) than that used for the basic model.
- The intrinsic permeability of the gypsum and soil was varied by an order of magnitude higher and lower.
- Selenium concentrations of the gypsum were increased by an order of magnitude higher to 140 mg/kg.

Table 4-2 contains the results of the sensitivity testing. Appendix K contains the model inputs and outputs from each of the runs.

Case (modeled for 100 years except as noted)	Maximum Contaminant Depth Below Gypsum, inches (leading edge of contaminant)	Soil Moisture, ug/ml Lower Soil Layer	Adsorbed Selenium, mg/kg, on Lower Soil Layer
Basic Model	0.39	0.59	1394
Basic Model at 1000 years	2.8	0.59	1394
$K_{d} = 4690 \text{ mL/g}$	0	0.30	1392
$K_d = 235 \text{ mL/g}$	14.6	1.1	251
intrinsic permeability gypsum & soil = $1 \times 10^{-7} \text{ cm}^2$	0.39	0.59	194
intrinsic permeability gypsum & soil = $1 \times 10^{-9} \text{ cm}^2$	0	0.47	1093
Se gypsum = 140 mg/kg	0.39	5.9	13940

Table 4-2

#### Summary of Results

• For a K_d of 2345 (realistic case), selenium traveled 0.39 inches into the compacted soil liner after 100 years. No detectable selenium was predicted to occur beneath the soil liner after 1000 years.

- After 1000 years, the predicted depth of selenium migration into the compacted clayey soil liner is 2.8 inches. This indicates that selenium would not break through the soil liner or reach the shallow rock aquifer.
- For a  $K_d$  of 235 (very conservative case), the maximum selenium depth into the compacted clayey soil liner is 14.6 inches after 100 years; this means that for a minimum water table depth of 7 feet (2 feet of compacted soil liner and 5 feet of compacted soil), selenium would take at least 575 years to reach the water table, if then.

#### 4.3 LeGrand Analysis

A LeGrand Analysis was performed on the proposed by-product disposal area site as described on pages 14 through 17 of Circular 14. The analysis was performed assuming a composite liner system would be installed, consisting of a synthetic liner, compacted clay and a leachate collection system. Table 4-3 gives the measured input parameters and results of the analyses (LeGrand scores). Two media analyses were used based on the following site characteristics:

- Presence of unconsolidated materials consisting of sandy, clayey silt.
- Overburden underlain at shallow depths by unweathered gneiss and schist.

Criteria	Measured Site-Specific Value	LeGrand Score Two Media Synthetic Liner w/LCS	
Distance between waste management boundary and closest receptors (unnamed creek )	100 feet	1	
Minimum depth below liner to water table	5 feet	0.3	
Water table gradient	8.3%	5.5	
Sorption	composite/clay liner	4	
Permeability	fractured rock	3	
Thickness of porous granular materials below disposal point	37 feet (average)	2	
	Total	15.8	

Table 4-3		
LeGrand Analysis	Innut Paramete	are and Rocul

- For a synthetic liner and a leachate collection system, as allowed by the LeGrand Analysis, a maximum sorption rating of 4 (clay) a favorable flow direction, and a permeability rating of 3, were used in the analysis.
- A minimum depth of 5 feet below the clayey soil liner to the seasonal high . groundwater table will be established for this site.
- Gradients varied between 5.8% and 8.3% toward the unnamed creek on the northeast . side of the site. A gradient of 8.3% was used.
- A 100-foot buffer was assumed along the potential receptor (unnamed creek). •

The LeGrand analysis for a two media site produced scores of 15.8 for a composite liner system. This would indicate that groundwater pollution potential is "possible, but not likely" (Table 4-4).

LeGrand Score Interpretation (from Circular 14, p. 14)			
<b>Total Points</b>	Pollution Potential of a Site		
0-4	Imminent		
4 - 8	Probably		
8 – 12	Possible		
12 - 25	Possible, but not likely		
25+	Approaching impossible		

# Table 4-4

#### 4.4 Pathway Analysis (Horizontal Travel Time)

#### 4.4.1 **Calculated Groundwater Velocities**

Horizontal flow velocity calculations were performed using the Darcy equation on page 14 of Circular 14. The linear flow velocity can be estimated using the following formula and permeabilities:

$$v = \frac{Ki}{\eta}$$

where :

v = linear velocity (ft / sec or m / sec)

i = hydraulic gradient =  $\frac{(h_1 - h_2)}{1}$  (ft / ft)

 $\eta$  = estimated effective porosity

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K = hydraulic conductivity (ft/sec or m/sec)

The average hydraulic conductivity of the saprolite is 1.16 ft/day as determined by field slug tests (Table 3-5). The gradient of 0.082 ft/ft is the highest site gradient as determined from the groundwater potentiometric map (Table 3-4). A typical tabulated value for the effective porosity of gravelly clayey silts (used for site soils) is 0.10 (Maidment, 1993). The resulting flow velocity is as follows:

 $v = \frac{(1.16 \text{ ft/day})(0.083 \text{ ft/ft})}{(0.10)} = 0.963 \text{ ft/day}$ 

The silt and saprolite comprises the approximate top 7 to 60 feet of the unconfined aquifer above the schist/gneiss.

# 4.4.2 Description of the Relationship Between Groundwater Flow Directions and Potential Receptors

The groundwater flow directions indicated on the potentiometric map are towards the unnamed creek on the northeast side of the site and the Chattahoochee River. These surface water bodies would be the closest groundwater receptors. There were no private or public water sources down-gradient of the site within the ½ mile and 2 mile radii.

### 4.4.3 Estimated Travel Time for Leachate to Reach Potential Receptors

The estimated travel time for leachate to reach the creek northeast of the site is determined from the groundwater flow velocities of Section 4.4.1. The following travel time is calculated assuming the limits of waste will not be within 100 feet of the unnamed creek.

Using the average calculated flow velocity for the saprolite resulted in a travel time of 120 days. This figure represents the travel time beyond that required for any contaminant to travel through the 2 feet of compacted clayey soil liner or the compacted soil portion of the composite liner and the 5 feet of separation above the groundwater elevation.

#### 4.5 Description of Relationship Between the Vadose Zone and Uppermost Aquifer

A minimum 5 feet of separation will be established between the bottom of the composite liner and the seasonal high groundwater elevations. Continued monitoring of the temporary piezometers will establish these elevations. No flow paths for any infiltrate generated within the cells would be anticipated to be generated through the liner system and the separation zone of compacted soil prior to reaching groundwater. Hydraulic conductivity of the remolded and in-place material is shown in Tables 3-2 and 3-5.

Currently, groundwater recharge is accomplished through infiltration of surface storm water. The average annual rainfall is approximately 50 to 54 inches per year. The seasonal variation in the groundwater surface is currently being determined through periodic monitoring of the temporary piezometers on site. Based on data collected in the area from 1940 through 2003, the wettest months of the year are December through March.

#### 4.6 Mitigation of Geologic and Natural Hazards

There were no geologic or other hazards detected at this site. The jurisdictional wetlands, if impacted, will be permitted as required by the Corps of Engineers 404 permitting process. Non-jurisdictional wetlands will be voluntarily mitigated on a 1:1 basis.

#### 5.0 **RECOMMENDATIONS FOR DESIGN**

#### 5.1 Favorable and Unfavorable Areas

There are no unfavorable areas for construction at the site.

#### 5.2 Liner/Leachate Collection Systems

The method of gypsum disposal at Plant Wansley will be by the wet stack method. In this disposal method, a synthetic liner, compacted soil liner, and drainage collection system will be used in the design of the facility. A 5-foot buffer distance from the bottom of the liner to the seasonal high groundwater elevation will be provided in the design of the facility. Based on laboratory testing, the remolded permeability of the material proposed for use as a potential soil liner averages  $1.6 \times 10^{-6}$  cm/sec with a range of  $3.7 \times 10^{-6}$  cm/sec to  $1.7 \times 10^{-7}$  cm/sec. Based on the laboratory compaction criteria for remolded samples, the recommended maximum permeability of the compacted soil liner beneath the synthetic liner is  $1 \times 10^{-5}$  cm/sec.

#### 5.3 Cell Depths

Excavation requirements for the disposal cells will be determined during site design and development (design and operation plan). Excavation will not extend below the minimum 5-foot buffer required above the seasonal high groundwater table. Continued groundwater measurements will be made to determine this seasonal high level.

#### 5.4 Site Drainage and Erosion Control

The site will be designed and constructed to minimize soil erosion and sediment migration. Diversion ditches, berms, piping, and sedimentation ponds will be included as needed to accomplish this task as well as to prevent site storm water run-on from entering disposal areas. Areas where excavation and earth fill operations occur will be vegetated immediately.

#### 5.5 Buffer Zones

There will be a minimum 200 feet of buffer between the limits of the CCB disposal facility and adjacent property lines. There will be a minimum 25-foot buffer between the limits of the disposal facility and streams and wetland areas. No land disturbing activities are to take place within these buffer zones except for construction of groundwater monitoring wells and site ingress and egress.

#### 5.6 Monitoring

A groundwater and surface water monitoring network for the CCB disposal facility will be designed to provide early detection in the unlikely event that any contaminates might reach groundwater and surface water. Proposed monitoring well locations will be submitted with the Groundwater Monitoring Plan when the limits of the disposal area have been established. Monitoring locations will be located around the periphery of the site and will meet the EPD requirements. Figure 5-1 shows a diagram of a typical monitoring well design.

Sampling will commence once the Groundwater Monitoring Plan has been approved and will continue semiannually for the life of the disposal area. Four initial sampling events will be performed at eight week intervals following approval of the Plan to establish statistical base. Background data will be determined prior to site development for the up-gradient and down-gradient wells as well as any surface water monitoring points.

#### 5.7 Disposition of Borings

Boreholes and piezometers located within the area proposed for by-product disposal will be properly abandoned upon acceptance of this Report and establishment of the seasonal high groundwater levels.

According to the *Georgia Water Well Standards Act of 1991*, all wells which are to be abandoned shall be "filled, sealed, and plugged". Guidelines for well abandonment are set forth in the *Georgia Department of Natural Resources Manual for Groundwater Monitoring*, September 1991. Existing wells at the site will be abandoned according to these guidelines.

#### 5.8 Security Fence and Road

A security fence currently exists along the south-southwest boundary of the proposed disposal facility along Hollingsworth Ferry Road. A 75-foot section of property adjacent to Hollingsworth Ferry Road, outside the 200-foot disposal area buffer, has been set aside for potential fence realignment and replacement and construction of a 25-foot security road along the outside boundary of the disposal facility. The approximate locations of the proposed fence and security road is shown on Figure 1-1.

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List of Historic Sites in the Vicinity of Plant Wansley Reference: National Register of Historic Places

County	Site	Address	City	Approximate Distance from Site
Carroll	Bonner-Sharp-Gunn House	West Georgia College Campus	Carrollton	12 miles
Carroll	Burns Quarry	Address Restricted	Carrollton	unknown
Carroll	Carroll County Courthouse	Newnan and Dixie Streets	Carrollton	12 miles
Carroll	Dorough Round Barn and Farm	N. of Hickory Level on Villa Rica Road	Hickory Level	>20 miles
Carroll	Folds, Eric Vernon House	1575 GA 16	Carrollton	> 9 miles
Carroll	Lawler Hosiery Mill	301 Brandley Street	Carrollton	12 miles
Carroll	Lovvorn, Dr. James L., House	113 E. College Street	Carrollton	12 miles
Carroll	McDaniel-Huie Place	1238 SR 166 West	Bowdon	> 15 miles
Carroll	North Villa Rica Commercial Historic District	Roughly bounded by Southern Railroad, North Avenue, and East Gordon and West Chruch Streets	Villa Rica	24 miles
Carroll	South Carrollton Residential Historic District	Roughly bounded by railroad tracks, Harmon and West Avenues, Bradley, Mill and Garrett Streets, Tillman and Hill Drives	Carrollton	12 miles
Carroll	U. S. Post Office	402 Newnan St.	Carrollton	12 miles
Carroll	Veal School	2753 Old Columbus Road	Roopville	10 miles
Carroll	Whitesburg Baptist Church	662 Main Street	Whitesburg	10 miles
Carroll	Williams Family Farm	55 Goldworth Road	Villa Rica	22 miles
Heard	Heard County Jail	Court Square and Shady Lane	Franklin	8 miles
Heard	Ware, John M., Sr., House	Address Restricted	Corinth	13 miles (assumed)
Coweta	Brannon, W. A., Store-Moreland Knitting Mills	Main Street	Moreland	17 miles
Coweta	Cole Town District	Roughly bounded Washington, Thompson, and Davis Sts., and Hooligan Alley	Newnan	14 miles
Coweta	Coweta County Courthouse	Courthouse Square	Newnan	14 miles
Coweta	Crowder, William Leonard, Home	1615 Handy Road	Newnan	4.5 miles
Coweta	Goodwyn-Bailey House	2295 Old Poplar Road	Newnan	19 miles
Coweta	Gordon-Banks House	South of Newnan on Highway 29	Newnan	>14 miles
Coweta	Grantville Historic District	Bounded by US 29, LaGrange St. W. Grantville Rd. and the city cemetary	Grantville	16 miles
Coweta	Greenville Street-LaGrange Street Hisotric District	LaGrange, Ninnons, Greenville, Powell, Reese, and Buchanan Streets	Newnan	14 miles



#### List of Historic Sites in the Vicinity of Plant Wansley

Reference: National Register of Historic Places

Coweta	Henderson-Orr House	Junction of Thomas Powers Road and GA34	Stallings Crossings	5.5 miles
Coweta	Hollberg Hotel	Seavy and Barnes Streets	Senoia	29 miles
Coweta	Newnan Commercial Historic District	Roughly bounded by Lee, Perry, Salbide, Lagrange, W. Spring, Brown, Madison, and Jefferson	Newnan	14 miles
Coweta	Newnan Cotton Mill and Mill Village Historic District	Roughly bounded by E. Washington, Wilcoxen and Farmer Streets, and CSX Railroad	Newnan	14 miles
Coweta	Oak Grove Plantation	4537 N US 29	Newnan	20 miles
Coweta	Platinum Point Historic District	Along Jackson Street, 1/2 mile north of downtown Newnan	Newnan	14 miles
Coweta	Powell Chapel School	620 Old Atlanta Highway	Newnan	15 miles
Coweta	Roscoe-Dunaway Gardens Historic District	Roughly bounded by the Chattahoochee River., Cedar Creek, Hood Branch, and White Oak Circle	Roscoe	13 miles
Coweta	Sargent Historic District	Roughly centered on the ArnallMill Complex at the junction of GA16 and Old Carrollton Road	Sargent	10 miles
Coweta	Senoia Historic District	Roughly bounded bounded by Couch St., CSX railroad tracks, GA 16, and Pylant Street	Senoia	29 miles
Coweta	Sims, George R., House	1851 Collinsworth Road	Palmetto	25 miles
Coweta	Smith, Dr. Robert L. and Sarah Alberta, House	1262 Bob Smith Road	Sharpsburg	23 miles
Coweta	Tidwell-Amis-Haynes House	1200 Sid Hunter Road	Senoia	23 miles
Coweta	Willcoxon-Arnold House	One Bullsboro Drive	Newnan	14 miles



1359A Elisworth Industrial Boulevard NW 🖬 Atlanta, GA 30318 🔳 Telephone (404) 636-0928 🗎 FAX (404) 636-7162 🔳 http://www.kemron.com

Project SE4422

December 13, 2006

Ms. Terri Hartsfield Senior Engineer Earth Science & Environmental Engineering Southern Company 42 Inverness Center Parkway Bin B 426 Birmingham, AL 35242

#### Subject: Water Supply Well and Surface Water Intake Survey Plant Wansley Proposed Gypsum Storage Facility, Roopville, Heard County, Georgia

Dear Ms. Hartsfield:

KEMRON Environmental Services, Inc. (KEMRON) is pleased to submit this letter report including the results of the water supply well and surface water intake survey conducted at the Plant Wansley Proposed Gypsum Storage Facility, Roopville, Heard County, Georgia. The purpose of this survey was to identify all reasonably identifiable private (domestic) water supply wells within ½ mile of the site and all reasonably identifiable public water supply wells/intakes within 2 miles of the site prior to the construction of a proposed gypsum storage facility.

Survey activities included site reconnaissance, contacting the Heard County Water Authority, obtaining tax maps from the Heard County Tax Assessor's office, and using the information obtained to determine the location and ownership of public or private wells in the area.

#### SITE DESCRIPTION

KEMRON located the proposed gypsum storage facility along Hollingsworth Ferry Road in Roopville, Georgia (See Figure I). Identification was made using a topographic map provided by Georgia Power, as well as a road atlas. The site is located to the south of Plant Wansley, on Georgia Power property. Based on visual observations, the site is wooded with a mixture of deciduous and evergreen hardwoods and contains no current development.
Mrs. Terri Hartsfield December 13, 2006 Page 2

#### RECORDS SEARCH

KEMRON searched the water well database of the United States Geological Survey (USGS) for water supply wells located within two miles of the site boundaries. The search yielded nine (9) wells within the two mile radius. Based on field observations, no private wells as identified by the USGS search were located within the applicable ½ mile radius for private wells. A copy of the USGS search results are included as Exhibit I.

KEMRON searched the State of Georgia Environmental Protection Division (GAEPD) database for water supply wells and surface water intakes within Heard County. The GAEPD lists seven drinking water sources in Heard County. Two are listed as belonging to the Heard County Water Authority and are located far outside of the applicable radius. Three surface water intakes are listed for Georgia Power Plant Wansley. Georgia Power provided KEMRON with the location of the surface water intakes at Plant Wansley. The locations of these intakes are shown on Figure 2. The remaining two wells are listed for the Town of Ephesus, which is well outside the applicable search radius of 2 miles.

KEMRON searched the Heard County Tax Assessors database to determine which of the properties appearing within the ½ mile radius contained a private drinking water well. According to the information available in the database, there are seven properties with private wells located within the ½ mile radius. The address of 6990 Five Notch Road was listed in the Heard County database twice. KEMRON contacted the Heard County Tax Assessors office to obtain a tax map of the area to identify the adjacent property owners. This information is summarized in Table I.

KEMRON visited the Heard County Water Authority in order to obtain any information regarding surface water intakes and private wells in the vicinity of the site. The Water Authority informed KEMRON that all intakes are within the City of Franklin. Using a tax map, KEMRON and Water Authority personnel determined that there are no public water wells or intakes within the 2 mile applicable search radius. KEMRON was also informed that Hollingsworth Ferry Road, where many of the adjacent properties are located, have county water available to the residences. The Heard County Water Authority did inform KEMRON that they do not keep any records of private water wells.

KEMRON also contacted the Heard County Health Department, but was informed the department keeps no records of private water wells in Heard County unless a particular well has been tested.

#### FIELD RECONNAISSANCE

Field reconnaissance activities were performed on October 30, 2006 and November 8, 2006. KERMON conducted a drive-through reconnaissance of the two mile radius surrounding the site and searched for public water supply wells and surface water

Mrs. Terri Hartsfield December 13, 2006 Page 3

intakes. KEMRON also searched the ½ mile radius to identify private wells not listed in the databases. KEMRON did not search those areas in the radius known to be owned by Georgia Power/Plant Wansley.

#### WELLS AND SURFACE WATER INTAKES WITHIN THE APPLICABLE RADII

None of the wells identified within the USGS Database or the GAEPD database were applicable to the search radii. However, the Heard County Tax Assessor's Office identified seven properties/parcels containing wells. KEMRON has identified these properties during the site reconnaissance as the following properties:

4474 Hollingsworth Ferry Road
4430 Hollingsworth Ferry Road
6990 Five Notch Road (listed twice in the database; consists of two parcels)
240 Webb Road
212 Webb Road
50 Webb Road

In addition, thirteen addresses were identified as containing wells. Georgia Power personnel provided KEMRON a list of properties/parcels in the area that contained a drinking water well. Mr. Robert York, P.G. of KEMRON is related to the Webb families in the area and has confirmed the presence of drinking water wells on these properties. Additionally, the parcels that were visually observed to contain a residential home and were not identified as a public water user were assumed to contain a drinking water well on the parcel. These properties are:

201 Webb Road 4944 Hollingsworth Ferry Road 4704 Hollingsworth Ferry Road 4819 Hollingsworth Ferry Road 4058 Hollingsworth Ferry Road Hollingsworth Ferry Road (no number given) Five Notch Road (no number given) Webb Road (no number given) 4986 Hollingsworth Ferry Road 5120 Hollingsworth Ferry Road Hollingsworth Ferry Road (no number given) 5040 Hollingsworth Ferry Road Hollingsworth Ferry Road (no number given)

KEMRON visually surveyed all of the above properties. However, during site reconnaissance, KEMRON did not visually observe well houses, well caps or other evidence of wells on each of these properties. Figure 3 is a tax map illustrating well locations for the properties in the immediate vicinity of the site based on information provided in the tax assessment maps. A total of nineteen (19) private drinking water

Mrs. Terri Hartsfield December 13, 2006 Page 4

wells were identified within ½ mile of the proposed gypsum storage facility. Table I contains a comprehensive list of all private drinking water wells located within the ½ mile radius of the proposed gypsum storage facility.

#### SURFACE WATER

The nearest accessible surface water shown on the topographic map provided to KEMRON was the Chattahoochee River. Three surface water intakes were identified on the GAEPD Database at Plant Wansley and have been illustrated on Figure 2. None of the three surface water intakes are for potable use. The reservoir at Plant Wansley, also shown on the topographic map, is in actuality closer to the proposed gypsum storage facility than the Chattahoochee River. However, KEMRON did not observe the private reservoir of Plant Wansley.

#### SUMMARY

KEMRON searched readily available sources of water supply information for the area, including the USGS and GAEPD databases, local health department, the local water authority, and the local tax assessor's office. KEMRON conducted a visual survey of the applicable radii for private and public water supply wells. Three surface water intakes for non-potable use were identified on the Georgia Power Plant Wansley property. Six private wells (on seven parcels) were identified via the Heard County Tax Assessor's office and field reconnaissance. Therefore, based on available information, KEMRON has located nineteen addresses that contain private drinking water wells within the applicable ½ mile radius of the subject site. KEMRON did not locate any public drinking water wells or potable surface water intakes within the 2 mile radius of the subject site outside of the three located on Plant Wansley property.

KEMRON appreciates this opportunity to be of service to Southern Company. If you have any questions regarding this well search, or if KEMRON can be of further service, please do not hesitate to call either of the undersigned at (404) 636-0928.

Sincerely, KEMBON Environmental Services, Inc.

Norman L. Schuyler Staff Scientist

Jeanette Hamm, P.E Project Manager Figures



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10		LEGEND
<u></u>		PROPERT LINE     PROAD LINE     WELL LOCATION
EMBER 2006 CT NO. 2001-001 O.	FIGURE 3	WELL LOCATION/TAX MAP PROPOSED GYPSUM STORAGE FACILITY ROOPVILLE, GA, HEARD COUNTY



Tables

#### TABLE 1: 1/2 MILE RADIUS PROPERTIES SE4422 PROPOSED GYPSUM STORAGE FACILITY ROOPVILLE, GEORGIA

Owner Name	Property Address**	Water Supply	Мар	Parcel
Lewis, Wendell Scott	4819 Hollingsworth Ferry Road	Well*	43	24
Hudson, Jerry L & Tim R	4704 Hollingsworth Ferry Road	Well*	43	25
Webb, Pink and Gertrude	4944 Hollingsworth Ferry Road	Well*	43	22
Ridley, Matthew R	4474 Hollingsworth Ferry Road	Well	43	26
Philpott, Gary C	4430 Hollingsworth Ferry Road	Well	43	27
Yellow Dirt Baptist Church	4058 Hollingsworth Ferry Road	Well*	43	28
Stephens, Joe	Hollingsworth Ferry Road	Well*	43	10
Harman, Samuel	6990 Five Notch Road	Well	44	18
Milam, Jeremy	6903 Five Notch Road	Public	44	18.01
Harman, Samuel	6990 Five Notch Road	Well	44	18.02
Hall, Jud	Five Notch Road	Well*	44	18.03
Morris, Wayne	240 Webb Road	Well	44	17
Sullivan, Jane	231 Webb Road	Public	44	17.01
Perry, James and Lisa	288 Webb Road	Public	44	17.02
Echols, Loyette	4848 Hollingsworth Ferry Road	Public	43	23
Green, James Derrick and Amanda Lovell	50 Webb Road	Well	43	23.01
Lewis, Wendell Scott	Hollingsworth Ferry Road	Public	43	23.02
Webb, Brenda	212 Webb Road	Well	43	20
Webb, Gertrude	Webb Road	Well*	43	21
Price, James R	Hollingsworth Ferry Road	Well*	43	11
Webb, Wayne	201 Webb Road	Well*	43	19
Kirk, Steven	4986 Hollingsworth Ferry Road	Well*	43	16
Steele, Johnnie	5120 Hollingsworth Ferry Road	Well*	43	12
Webb, Gertrude	Hollingsworth Ferry Road	Well*	43	13
Adamson, Rufus	5040 Hollingworth Ferry Road	Well*	43	14

* Although no Heard County Tax Accessor records exist that document a private well on this property, this property is not connected to public water, and has a well. ** Alternate mailing addresses have been obtained from the Heard County Tax Assessor's Office for addresses with no number

Exhibit I

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Georgia Dist	rict Office	130			Total Nun	iber of Pag	es-	I -
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LOCAL WELL NUMBER	(SS)@MCCI)	(SSMADOO)	(cape)	(FRET)	(COD3)	(FEET)	(FBET)	(II)	CONSTRUCTI
05BBL3	332512	0850555	RAD27	1.081.00	NGVD29	160	49	*	12-01-196
058821	332451	0850548	NAB27	1025	NGVD29	. 200	22	9	09-15-198
058823	<b>332231</b>	0850520	NAD27	810	NGVD29	200	80	9	12-19-199
058824	<b>332434</b>	0850512	NAD27	1050	NGVD29	35	1	1	190
058825	332417	8070580	NAD27	860	NGVD29	380	26	6.25	05-01-10
058926	332300	0850359	NAD27	130	NGVD29	300	16	6.25	10-27-197
056827	332354	0850520	T2UAN	880	NGVD29	300	74	6.25	12-27-199
058828	332606	0850208	NAD27	780	NGVD29	400	45	16.25	08-13-19B
053829	332432 ·	0850256	NAD27	810	NGVD29	35.45	I	27.00	161
058830	332450	0850229	NAD27	170	NGVD29	l	9	1	190
056831	332454	0850228	145027	790	NGVD29	ł	١	١	1
058832	332402	0850354	NAD27	830	kiGVD29	1	24	1	190
1DATE: 11/02/06 332400/B	350326 3 mile	radius PAGI	2 Lb						

DISCHARGE (GPM)	7.5	14	1	1	.63	2.75	S	1	ł	

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HEARD COUNTY

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## HEARD COUNTY COMMISSIONERS

JUNE JACKSON COMMISSION CHAIR

P.O. Box 40 215 East Court Square, Room 15 Franklin, Georgia 30217 BOARD OF COMMISSIONERS

	Franklin, C	Georgia 30217		
JOHN MORMAN FINANCE DIRECTOR	heardcount Phone (706) 675-3821	y@charter.net Fax # (706)	675-2493	LARRY F. HOOKS DISTRICT 1 LEE BOONE
COUNTY CLERK				Gwen Caldwell District 3
JERRY ANN CONNER COUNTY ATTORNEY		December 4, 2006		Frank Crook District 4 Joe Adams District 5
Mr. Jeff Georgia Solid W 4244 Int Atlanta,	Cown, Program Manager Environmental Protection Division aste Management Program ternational Parkway, Suite 104 Georgia 30354	n -	DECE NDEC PLANT V	VANSLEY
RE: I	Proposed Plant Wansley Gypsum I Industrial Waste Landfill	Disposal Facility		
Dear Mr	r. Cown:			
The proprogram	posed private industrial solid waste s with local zoning and land use or	disposal facility located dinance, if any.	1 at Plant Wansle	ey .
	a 🗸	Sincerely,	_ /	
		June Jacks	5	
		June Jackson, Commi Heard County Board	ission Chair of Commissioner	rs
Cc: 1	lim P. Heilbron/Plant Wansley		146 - 26 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	17   H'E
		PLAN P. Ro	ATMAN	
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## Gypsum Sampling Location









# Laboratory Results Gypsum TCLP



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Bin 39110 5131 Maner Road Smyrna, Georgia 30080 Tel 404.799.2100

consecutive duys



April 15, 2002

Rochelle Routman Georgia Power Company Environmental Affairs 241 Ralph McGill Blvd. Atlanta, GA 30308

RE: Plant Yates Gypsum Scrubber TCLP Metals Results

The Environmental Laboratory has completed the analysis of your samples and reports the results on the attached pages. All results relate only to the contents of the samples submitted. This report may not be reproduced except in full without the written consent of the Environmental Laboratory.

Please note the attached results analyzed by Analytical Services, Inc.

All samples will be disposed of after 30 days unless otherwise instructed.

If you have any questions, please advise.

Respectfully submitted,

D. A. Davis Senior Environmental Specialist

Page 1 of 1 Report Number: 041502-4638-1

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JUL 22 '02 16:56 FR GEORGIA POWER



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

## Laboratory Report

Report Number 154732

Project: Plant Yates Gypsum Scrubber, Project#4638

Prepared For: **Georgia Power** 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott

April 17, 2002



We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the dient, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Project Manager

. Alden Christy



lytical Services Inc., Norcross Laboratory maintains the following cortifications, approvals, and accreditations: Jorgia (812); NELAC (E87315) scope: CWA, SDWA, RCRA expires July 1, 2002; NSF International (04180) scope: SDWA expires August 17, 2002; Arkansas, Dakifornia (01160CA); Connecticut (PH-0250); Porida (E87315); Kansas (E-10334); Kentucky (90126); Louisiana (02059); New Jersey (GA001); New York 11762); North Carolina (381); Oklahoma (9907). South Carolina (98011); Tennessee (02994); USDA Soil Import License (S-36027). For more information visit our web site at: asi-lab.com

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JUL 22 '02 16:55 FR GEORGIA POWER

## Analytical Services, Inc.

### **Quality Control**

#### Single Analyte Data Sample Batch Information Analysis : TCLP EXT

Batch # TCLP884

Matrix : TCLP

		P	reparation	1		1. S.	Analysis	e L	
Samplo ID	Tag	Date	Time	Ву	Notes	Date	Ţime	By	
TCLPBLK		03/31/02	1700	RF	2 10 ²⁰ 875 10	11			Sec. Mager
154210-1	- N. 18.	03/31/02	1700	RF		11			a 🕺 👘 a a 🗆
154210-2	a and a second s	03/31/02	1700	RF		11			28 29 19
154221-1		03/31/02	1700	RF		11		576	A Sec. 9
TCI PBI K	1,5-1	04/02/02	1145	YC		11	1 K K	10 av	$s=(s+\frac{1}{2})^{\frac{1}{2}} \widehat{\mathcal{A}} \widehat{\mathcal{A}} \widehat{\mathcal{A}}$
154382-3		04/02/02	1145	YC	10 12	11	-10 St		4 (P 6. PT
154382-4		04/02/02	1145	YC	° es' 6 .	11		e 3 ₀	2 11 6 1 <b>2</b> 0 1
154382-5	15 QU.57	04/02/02	1145	YC		11		18 9 ¹⁸ 18	- V **
154391-1		04/02/02	1145	YC		11			
TOLEBIK	1. 1. 191	04/03/02	1400	MS	= C & _3	11			Sandar St.
154456-1	4.95	04/03/02	1400	MS		11			As Carthe Lat 19
154506-2		04/03/02	1400	MS		11		53 ¹²	19 19 19 19 19 19 19 19 19 19 19 19 19 1
154506-3	2000	04/03/02	1400	MS	a baile	11	e u eu e		15
154506-2DUP		04/03/02	1400	MS	11 C	11		a	5 50 get 1
TCIPBIK		04/04/02	1400	MS		11			1 N 12 N 1
154585-10		04/04/02	1400	MS		11	1000		· (2) · (-)
154585-11		04/04/02	1400	MS	•	11			a 81
154487-1		04/04/02	1400	MS	4 (2.2) V	11			1. 1975 F
4482-1		04/04/02	1400	MS	2 1	11			2
154487-1		04/04/02	1400	MS		11		a.	
154554-2		04/04/02	1400	MS		11		12	
154554-3		04/04/02	1400	MS		11			eti (2 11 ²
154482-1DUP		04/04/02	1400	MS		11			
TCIPBLK		04/08/02	1100	RF		- <u>11</u> +			6
154732-1		04/08/02	1100	RF		11		8	
154732-2		04/08/02	1100	RF		11			5 E
TCI PBI K		04/09/02	1400	RF		11			
154542-3	0	04/09/02	1400	RF		11			

#### Page 6 of 6

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'Analytical Services, Inc.

#### **Quality Control**

#### Single Analyte Data Sample Batch Information

Analysis : Se, Ag, As, Ba, Be, Cd, Cr, Pb, Sb, Ni, Fe, Cu, Zn, Co, V,

Matrix . TCLP

latch # 77209	Service States	and the second second	1. T	10 St. 15	100 - 400 - 400 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	- projekti se deta			14. 3. Barr
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ample ID	Tag	Date	Time	Ву	Notes	Date	Time	Ву	Inst
E4077.4		04/11/02	0920	MHU	TCLP	04/11/02	1462	MLR	icp2-
540/14	_ 17 17	04/11/02	0920	MHU	TCLP	04/11/02	1359	MLR	ICP2
54011-5		04/11/02	0920	MHU	TCLP	04/11/02	1355	MLR	ICP2
54011-2		04/11/02	0920	MHU	TCLP	04/11/02	1352	MLR	ICP2
04077-1		04/11/02	0920	MHU	TCLP	04/11/02	1349	MLR	ICP2
		04/10/02	0910	MHU	TCLP	04/10/02	1521	FBŞ	ICP3
7209DLN		04/10/02	0910	MHU	TCLP	04/10/02	1525	FBS	ICP3
7209203		04/10/02	0910	MHU	TCLP	04/10/02	1528	FBS	ICP3
72092030	-	04/10/02	0910	MHU	TCLP	04/10/02	1532	FBS	ICP3
54732-1MS	et 1	04/10/02	0910	MHU	TCLP	04/10/02	1536	FBS	ICP3
54732-1MOU	с ⁶ г.,	04/10/02	0910	MHU	TCLP	04/10/02	1540	FBS	ICP3
54732-1PUS	1997 - P. 1997	04/10/02	0910	MHU	TCLP	04/10/02	1543	FBS	ICP3
104/32-200P		04/10/02	0910	MHU	TCLP	04/10/02	1602	FBS	ICP3
54732-1	N	04/10/02	0910	MHU	TCLP	04/10/02	1605	FBS	ICP3
54752-2		04/10/02	0910	MHU	TCLP	04/10/02	1554	FBS	ICP3
04/9/-1		04/10/02	0910	MHU	TCLP	04/10/02	1558	FBS	ICP3
54/9/-2		04/10/02	0910	MHU	TCLP	04/10/02	1609	FBS	ICP3
CDI	a (2011) a (2	04/10/02	0910	MHU	TCLP	04/10/02	1613	FBS	ICP3

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## Analytical Services, Inc.

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## **Quality Control**

#### Single Analyte Data Sample Batch Information Analysis : Hg

Ratch # 77080

Matrix : TCLP

and spin for the	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997	P	reparation	1 2			Analysis			
Sample ID	Tag -	- Date	Tima—	By -	Notes	Date	Time	Ву	Inst	=
	1.20 121	04/12/02	1015	EAH	TCLP	04/12/02	1648	EAH	HG1	
BLANKU4-12		04/12/02	1015	EAH	TCLP	04/12/02	1700	EAH	HG1	
154732-2	10	04/12/02	1015	FAH	TCLP	04/12/02	1658	EAH	HG1	1
154732-1	Sheet of	04/12/02	1015	FAH	TCLP	04/12/02	1656	EAH	HG1	
154877-4	5	04/12/02	1015	FAH	TCLP	04/12/02	1654	EAH	HG1	
154877-3		04/12/02	1015	FAH	TCLP	04/12/02	1652	EAH	HG1	1. 1
154877-2	19 - 19 - 19 - 19 - 19 - 19 - 19 - 19 -	04/12/02	1015	EAH	TCLP	04/12/02	1650	EAH	HG1	E.
154877-1		04/12/02	1120	EAH	TCLP	04/08/02	1511	EAH	HG1	
77080BLK		04/08/02	1120		TCIP	04/08/02	1513	EAH	HG1	
77080LCS		04/08/02	1130		TCIP	04/08/02	1515	EAH	HG1	
77080LCSD	15	04/08/02	1130		TOUR	04/08/02	1517	EAH	HG1	8
154554-3MS		04/08/02	1130		TCLP	04/08/02	1519	EAH	HG1	
154554-3MSD		04/08/02	1130	EAH	TCLP	04/08/02	1521	FAH	HG1	
54554-3DUP		04/08/02	1130		TCLP	04/08/02	1531	EAH	HG1	
154189-1		04/08/02	1130	EAD	TOLP	04/08/02	1633	EAH	HG1	
54189-2		04/08/02	1130	EAH	TOLP	04/00/02	1535	EAH	HG1	
54554-3		04/08/02	1130	EAH	TOLP	04/00/02	4527		HG1	0.0
154482-1	51 Iŭi	04/08/02	1130	EAH	TCLP	04/08/02	1537		HG1	
154487-1		04/08/02	1130	EAH	TCLP	04/08/02	1228	EAN	ri\$1	17 B

Page 4 of 6

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### **Quality Control**

#### Single Analyte Data Post Digestion Spike Information

Batch Number	Analyte	Analysis Method		PDS %Rec	- 			%Recovery Range		2
77209	Pb	EPA 6010		97	57 F.	a a	1940 2004	76 - 124		
77209	Sb	EPA 6010		113	80 N 1941 B	-		76 - 124		and the second
77209	Ni	EPA 6010	. A.	99		3		76 - 124		
77209	Fe	EPA 6010		98				76 - 124	- 11 Mar. ¹⁰ ₁₀ 11	
77209	Cu	EPA 6010		113			8 Y 8 C	76 - 124		
77200	Zn	EPA 6010	" 39 T	109				76 - 124	а Х. А. А.	
77200	Co	EPA 6010		107		512 = 1 - ¹⁴		76 - 124		13
77200	v	EPA 6010		96	а.,		A 1104	76 - 124		
77209	Mn	EPA 6010		96				76 - 124		20 U



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### **Quality Control**

#### Single Analyte Data Lab Control Information

	SI	A	+				
Batch	(10% - 2 ¹	Analysis	LC	LCD	LC/LCD	%Recovery	RPD
Number	Analyte	Method	% Rec.	% Rec.	RPD	Range	Range
77000	Co	EPA 6010	97	96	1	76 - 124	0 - 20
77209		CRA 6010	86	84	2	76 - 106	0 - 10
77209	NA	EPA 6010	86	84	2	76 - 124	0 - 20
77209	IVIN	EPADOID		. Informati	-		

Matrix Spike Information

Batch Number	Analyte	Analysis Method	MS % Rec.	MSD % Rec.	MS/MSD RPD	%Recovery Range	RPD Range
77090	the d	EPA 7470	109	76	36	81 - 116	0 - 15
77080	riy Se	EPA 6010	106	109	3	76 - 124	0 - 20
77209	- OC	EPA 6010	102	105	3	76 - 124	0 - 20
77209	Λg	EPA 6010	100	101	1	76 - 124	0 - 20
77209	Ba	EPA 6010	90	91	1	76 - 124	0 - 20
77209	Ba	EPA 6010	83	84	1.	76 - 124	0 - 20
77209	Cd	EPA 6010	88	89	1	76 - 124	0 - 20
77209	Cr.	EPA 6010	80	81	1	76 - 124	0 - 20
77209	Dh	EPA 6010	87	88	1	76 - 124	0 - 20
77209	Sh	EPA 6010	101	103	2	76 - 124	0 - 20
77209	Ni	EPA 6010	89	90	1	76 - 124	0 - 20
77209	En	EPA 6010	85	88	3	76 - 124	0 - 20
209	. Te	EPA 6010	98	101	3	76 - 124	0 - 20
7209	70	EPA 6010	97	99	2	76 - 124	0 - 20
7209	20	EPA 6010	98	98	0	76 - 124	0 - 20
77209		EPA 6010	87	87	0	76 - 124	0 - 20
77209	Man	EPA 6010	85	87	2	76 - 124	0 - 20

#### Post Digestion Spike Information

Batch Number	Analyte	Analysis Method	PDS %Rec		%Recovery Range	
22000	6-	EPA 6010	121	2	76 - 124	1.19 A.
77209	Se Ac	EPA 6010	115		76 - 124	
77209	Ag	EPA 6010	111		76 - 124	
77209	Ba	EPA 6010	² 99		76 - 124	100
77209	Bo	EPA 6010	93		76 - 124	24. 22. L
77209	Cd	EPA 6010	99		76 - 124	
77209	Cr	EPA 6010	90		76 - 124	

#### Page 2 of 6

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## Analytical Services, Inc.

### **Quality Control**

#### Single Analyte Data Blank Results Information

Batch Number	Analyte	Analysis Method	Preparation Method	Units	Blank Result	Matrix
7080	Но	FPA 7470	Hg-Ag	mg/L	< 0.0050	TCLP
7000	Se	EPA 6010	EPA 3010	mg/L	< 0.0400	TCLP
7200	A0	EPA 6010	EPA 3010	nig/l.	< 0.0100	- TGLP
7200	As	EPA 6010	EPA 3010	mg/L	< 0.0300	TCLP
7209	Ba	EPA 6010	EPA 3010	mg/L	< 0.0100	TCLP
7209	Bo	EPA 6010	EPA 3010	mg/L	< 0.0100	TCLP
7209	Cd	EPA 6010	EPA 3010	mg/L	< 0.0100	TCLP
7209	Cr	EPA 6010	EPA 3010	mg/L	< 0.0100	TCLP
7209	Ph	EPA 6010	EPA 3010	mg/L	< 0.0150	TCLP
7209	Sh	EPA 6010	EPA 3010	mg/L	< 0.0500	TCLP
7209	Ni	EPA 6010	EPA 3010	mg/L	< 0.0200	TCLP
7209	Fe	FPA 6010	EPA 3010	mg/L	< 0.0400	TCLP
7200	Cu	EPA 6010	EPA 3010	mg/L	< 0.0200	TCLP
7200	Zn	EPA 6010	EPA 3010	mg/L	< 0.0300	TCLP
7200	Co	EPA 6010	EPA 3010	mg/L	< 0.0400	TCLF
7200	v	EPA 6010	EPA 3010	mg/L	< 0.0200	TCLF
7209	Mn	EPA 6010	EPA 3010	mg/L	< 0.0400	TCLP
TCI D884	TCLPEXT	EPA 1311	· · · ·	mg/L	0.0000	TCLP

#### Lab Control Information

utch	14 14	Analysis	LC	LCD	LC/LCD	÷.,	%Recovery	RPD	
Number	Analyte	Method	% Rec.	% Rec.	RPD		Range	Range	-
77080	Ho	EPA 7470	105	105	0		86 - 114	0 - 12	
77209	Se	EPA 6010	104	100	4		88 - 118	0 - 13	
77200	Aq	EPA 6010	100	97	3		80 - 106	0 - 12	
77200	Ac	EPA 6010	97	96	<b>1</b>		87 - 109	0 - 12	
77209	Ba	EPA 6010	89	88	1		77 - 103	0 - 13	
77209	Bo	EPA 6010	82	81	- 1		83 - 104	0 - 14	
77209	00	EPA 6010	90	87	3		83 - 106	0 - 13	
77209		EPA 6010	82	79	4		81 - 105	0 - 14	
77209	Dh	EPA 6010	86	85	1		80 - 105	0 - 12	
77209	PD	EPA 0010	101	100	1	1981	83 - 109	0 - 13	
77209	SD	EPA OUTU	00	89	1	1 1 1	82 - 103	0 - 13	
77209	Ni	EPA 6010	90	03	100		71 105	0 - 14	
77209	Fe	EPA 6010	87	84	4	100	71-105	0 10	22
77209	Cu	EPA 6010	98	93	5,		78 - 110	0 - 16	
77209	Zn	EPA 6010	97	94	3	10	78 - 124	0 - 11	

Page 1 of 6

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OCCARECARTE DI EETIGACTA

JUL 22 '02 16:57 FR GEORGIA POWER



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

#### Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 154732-2

April 17, 2002

#### Sample Description Georgia Power

Solid, Plant Yates Gypsum Scrubber, Project#4638, PTY040422-2, 463802, 04/04/2002, 12:00, received 04/05/2002

a shat and				Detection		Regulatory
Method	Analyte		Result	Limit	Units	Limit
		Toxicity Characteristic Leac	hing Procedur	e (EPA 1311)		
		TCLP Non-vola	tile Extraction		o 2404	
	Metals	-10 ⁻¹			88 <u>- 1</u> 2	
EPA 6010	D004	Arsenic (As)	BDL	0.03	mg/L	5.0
EPA 6010	D005	Barium (Ba)	0.2	0.1	mg/L	100.0
EPA 6010	D006	Cadmium (Cd)	BDL	0.01	mg/L	1.0
2A 6010	0007	Chromium (Cr)	0.02	0.01	mg/L	5.0
-A 0010	0008	Lead (Ph)	BDL	0.1	mg/L	5.0
EPA 6010	0000	Moreury (Ha)	BDL	0.005	mg/L	0.2
EPA 7470	0009	Colonium (So)	BDL	0.5	mg/L	1.0
EPA 6010	0010	Selenium (Se)	BDL	0.01	mg/L	5.0
EPA 6010	DOTI		BDI	0.01	ma/L	2
EPA 6010	174-15 198	Beryllium (Be)	BDI	0.04	ma/L	
EPA 6010	-T.	Cobalt (Co)	BDL	0.02	mo/l	the same name
EPA 6010	9 <b>444</b> , 947	Copper (Cu)	BUL	0.02	mall	definition of the structure of the struc
EPA 6010		Manganese (Mn)	0.10	0.04	mg/L	Sector Contractor
EPA 6010		Nickel (Ni)	BDL	0.02	mg/L	
EPA 6010		Antimony (Sb)	BDL	0.1	mg/L	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -
EDA 6010	a supplier of	Vanadium (V)	BDL	0.02	mg/L	V 69.
EPA 0010	: sl.63	Zinc (Zn)	0.45	0.03	mg/L	91 and - 63 a
EPA 6010		Iron (Fe)	0.31	0.01	mg/L	



**BDL - Below Detection Limit** 

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JUL 22 '02 16:56 FR GEORGIA POWER

Page 1 of 1

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Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 154732-1

April 17, 2002

#### Sample Description

Georgia Power

Solid, Plant Yates Gypsum Scrubber, Project#4638, PTY040422-1, 04/04/2002, 12:00, received 04/05/2002

Analytical Method	Analyte			Result	Detection Limit	Units	Regulatory Limit
· Part -	in Char	1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 -	1. A.	and a first	5		
		<b>Toxicity Charact</b>	eristic Lea	hing Procedur	e (EPA 1311)		
	3. 	TCI	P Non-vol	tile Extraction			a
	Metals		Ener Autorita				
EPA 6010	D004	Arsenic (As)		BDL	0.03	· mg/L	5.0
EPA 6010	D005	Barium (Ba)	. j	0.2	0.1	mg/L	100.0
EPA 6010	D006	Cadmium (Cd)		BDL	0.01	mg/L	1.0
EPA 6010	D007	Chromium (Cr)		0.02	0.01	mg/L	5.0
PA 6010	D008	Lead (Pb)	- 12	BDL	0.1	mg/L	5.0
FPA 7470	D009	Mercury (Hg)	580 5825 - 52	BDL	0.005	mg/L	0.2
EPA 6010	D010	Selenium (Se)		BDL	0.5	mg/L	1.0
EPA 6010	D011	Silver (Ag)		BDL	0.01	mg/L	5.0
EPA 6010		Beryllium (Be)		BDL	0.01	mg/L	
EPA 6010	<u></u>	Cobalt (Co)		BDL	0.04	mg/L	
EPA 6010		Copper (Cu)		0.03	0.02	mg/L	· · · · · · · · · · · · · · · · · · ·
EPA 6010		Manganese (Mn)	12	0.10	0.04	mg/L	
EPA 6010		Nickel (Ni)	¢.	BDL	0.02	mg/L	
EPA 6010		Antimony (Sb)		BDL	0.1	mg/L	
EPA 6010		Vanadium (V)		BDL	0.02	mg/L	
EPA 6010		Zinc (Zn)		0.51	0.03	mg/L	
EPA 6010	-	Iron (Fe)	0	0.35	0.01	mg/L	
	144			÷	2		

Page 1 of 1

**BDL - Below Detection Limit** 

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10 S2 . 05 16:56 FR GEORGIA POWER

31 Maner nyrna, Ge	orgia 3008	0					A IOUTHIEN COMPART
none: (404 ompany:	4) 799-2100 8-530-2100	) Fax: (40 ) Fax: 8-5	4) 799-2141 30-2141			Sample Delivery Group No	44,38
ab Conta	ct:		Project Name		Vendor Laboratory Name a	nd Address	-17
CRAT	EG SC	- AT	PLANT YATE	S SCRIBBER	AST	. /	S41SL
Fax B	lesults To:	CRAIC	6 SCOTT		1.01		
A Mail F	lesults To:	P					2 E
		- فعاد الرجلية مسرو	at months 4/12	102	Date of Sample Transfer		
urnaroun	d Time: (or	expected date	No Signature:	ECS	4	5102	
Sample	Sample	No. of	Project ID No.	Lab. ID No.	Analysis	Requested	REMARKS
Date	Time	Containers	PI-YOUND 1	1413801	TCLP METALS	(HSRA LIST)	-1
4/02	12:00		PITYNUND ~	463807			-2
14/02-	19.10		1011010108-08	TLOUL			и 11 — Д. П.
					HSPA LIST		10A-
					Aa As, Ba, Be	CA, CO CU MN, TI	1311 60108/ 741
					Ni, Pb, 50, V, Z	N, Se, Fe, Hg.	
0.11							
		6	1		-		a
	1.2				-		
	R -						normal and a second sec
2				r			
					-		
	-			* Note: Attach copy o	f original Analysis Request		TELEPHONE
TRANDER	BRED BYY	Signature)	٨		RECEIVED BY (Signature)	L. J. r	

Environmental Monitoring & Laboratory Services 110 Technology Parkway, Norcross, GA 30092 (770)734-4200 FAX (770)734-4201

## SAMPLE RECEIPT VARIANCE FORM

Atin: Mr. Craig Scott

Client: GEORGIA POWER GA SMYRNA Project: Plant Yates Gypsum Scrubber, Project#4638 Logged By: SDD Recvd : 04/05/2002

NPDES: Work Order: 154732

#### **OBSERVATIONS**

#Samples: 2 pH: n/a

#Containers: 2

Temp(C): 13

Custody Seal(s): Not Present Ice: Yes

#### CHECKLIST ITEMS**

1 COC included with Samples	Yes	
I. COC melader with Samplete	Yes	
2. Chain of Custody Complete	Yes	
3. Sample Container(s) Intact	Yes	
4. Sample Container (s) Match Coc	Yes	
5. Methods Designated by Client on COC	Yes	
o. rurans Designation of	No	
2. Sufficient Sample Volume for Analysis	Yes	
8. Sufficient Sample Volume for VOA Analyses	N/A	
9. Zero Heauspace Mantalice for the state	Yes	
10. Samples Property preserved	Yes	

Temperature above compliance level.

## Status: Samples processed as received.

Arrive Via: Client

Airbill:

By:

acted:

North Carolina Samples ONLY - When a laboratory receives samples which do not meet sample collection, holding time, or preservative requirements, the laboratory must notify the sample collector or client and secure another sample. If another sample cannot be secured, the original sample may be analyzed but the results reported must be qualified with the nature of the infraction(s) and the laboratory must notify the State Laboratory about the infraction(s). North Carolina Administrative Code, Reference 15A NCAC 2H.0805(a)(7)(N)

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JUL 22 '02 16:58 FR GEORGIA PUWER

Date:

Georgia 131 Maner Smyrna, GA	Environmenta J, Bin 39110 30080	al Labora	itory	C	ANALYS HAIN OF		JES DY	T A REC	ND OF	łD		LAB		ontrol N ampte D	o. C Dellve	ry Gro	<u>    00                               </u>
hone: (404) Company: 8-	799-2100 Fax: 530-2100 Fax:	(404) 799- 8-530-214	2141 1											1 Page			of
· · ·	2 2		c	amela Shi	omon! Data: 8	4/4/02						D		² Sland	lard 7	Turnard	ound Time
leport To	ROCHELLE ROL	MAMTC	5	ample Be	ceived Date: 9									Rush	in	•	Business Days
ddress: 2				ampled B	v: 10 CH	AIG SCO	7	0.8		Vá	_			(Must	be clea	red lhro	ugh Env. Lab. prior lo shipme
_		1.11	*	ampiou o	,,	Print Nar	ne					PRES	ERVAT	VE 20		- A.,	Sampla Type Key: 22 G-Gråb C-Compos/e
hone: 3	Fax		_		Sig	nature			-	T			_				D-Olher Malrix Key: 23
Conlact: 4	CRATE SO	DOT	/	Authorization	to subcontract ana	ilysis will be assum	ned acc	epteble .	by	1							D-Oil SW-Surface Wat S-Solid GW-Ground Wat SL-Studen WW-Waste Wat
roject Localio	ON: 5 PLANT VAT	TEŚ		CUSIONNET UNA	953 518160 00181WIS	ie.					ANA	LYSIS	REQU	ESTEL	) 21	T	W-Whee DW-Drinking V/a
Account Numb Special Instruc	oer: 6		24				Type 1	18	containers 🖶	METALS A LEST)				2	01 39. 26		H-Hydrochiolic Aeld N-Ntric Aeid S-Suftylic Aeld SH-Sodum Hydroxide SB-Sodum Bisulfids P-Phospholic Aeld ST-Sodum Missulfate I-Ice
12.13(0):13 (0)/167112 (12.15810)	Sample ¹⁴ Number	Coll Date	ection ¹⁵ Time		Sample Description	16 N	Sample	Matrix	No. of C	TCLP (HSB)	-	1989 1		1 	-		Commenter Contraction
1/3801	PLTYOYOYOJ-1	4)4/02	12.00	PLANTY.	ATES GIPSUM	SCRUBBER	C	5	I	V						1	5
163807	PLTYOYOYOZ-2	4/4/02	12:00	PLANT Y	ADES GAPSUN	- SCRUBBOR	C	5	1	V			÷.	-			
theora		- i gen				All and a second se			-					3	-		1.11
л. Л.	2 10		1	+	6 ¹²	$e^{-C_{\rm eff}}e_{\rm H}$	570		- ¹⁴ •				+1	1			
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			0.0	Ť					34 8			i k		108 10	-3 ³		
	A 1	· · · ·			1	al 1.50	- 4				÷		10 A.			-	
Relinquished	by: 28 Canton	Date	Time 4/	4/02	12:05			1		EUBE	NIX	Sampl	i Disb	潮哈门	即商助	1161	ALT TATO
Received by:	27 May 31-R	Dale	Time 41	the	1205	Type:		1		T)	/pe: _			3.2	-	Туре:	
Relinguished	by:	Date	Time	1-		Dale:			-10	- D	ate: _	ar:			- 1	Date: Contai	iner:
					10. S.	- Container.		11		- 1 -	Ji toolir (			-	- 1		+

10/211B

46-38	Location	yates	A SOUTHERN COMPANY
ample Delivery Group	<u> </u>	0	
Control Numbers 463801 - 46380	2	ni M	
		Other	
A. Method of Shipment: N Hand Delivered LI Courier L			
a. Did shipment come with a shipping air bill?	LIY		
b. If "yes" document carrier and air bill #:		2011 ¹⁶ 82 20	
B. Preliminary Examination:			
1. Was Chain of Custody initiated? If "no" proceed to number 2.	XX	N	6
a. Were custody seals intact?			XI N/A
b. Were custody papers filled out properly?	DALY NOV		54 72
c. Were custody papers signed?	NO V		
2. Are sampling time(s) present?	NOV		
3. Are sampling date(s) present?			
4. Are samples received within the specified holding times r	N V		
5. Were samples packaged properly?		<u> </u>	
C. Sample Login:	8 D		
1. Did all sample containers arrive intact?	DSI Y		
2. Did all container labels agree with custody papers?	Ka v	L N	
3. Were proper containers used for requested test(s)?	X K	D N	
4. Were samples properly preserved for requested test(s)?	U Y		X N/A
a. pH (acid)?	□ <2	. ∐ ≥2	
b. pH (base)?			
c. temperature?			-
5. Was sufficient sample received for requested test(s)?			
6. Were air bubbles present in VOA samples?	T L		
D. Corrective Action: (Complete this section only if needed)			
1. Client notified verbally - Date: Tim	ie:	<u> </u>	
(attach written notification, e.g. e-mail, memo, etc.)	172.54		
2. Samples processed as received	Πv		19 ⁸
E. Comments	N		
			12
		, ,	e 11
Al De Ritadia	Date 4	402	
Completed by:		1	



# Laboratory Results Gypsum Total Metals





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Bin 39110 5131 Manor Road Smyrna, Georgia 30080

Tel 404.799.2100



April 01, 2002

Rochelle Routman Georgia Power Company Environmental Affairs 241 Ralph McGill Blvd. Atlanta, GA 30308

RE: Plant Yates Gypsum Ash Analytical Results

The Environmental Laboratory has completed the analysis of your sample and reports the results on the attached pages. All results relate only to the contents of the samples submitted. This report may not be reproduced except in full without the written consent of the Environmental Laboratory.

All samples will be disposed of after 30 days unless otherwise instructed.

If you have any questions, please advise.

Respectfully submitted,

D. A. Davis Senior Environmental Specialist

CC:

David Parks Jim Redwine √

> Page 1 of 1 Report Number: 040102-4395-1



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

## Laboratory Report

Report Number 153897

Project: Yates-Gypsum, Project#4395

Prepared For: Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott

April 2, 2002



We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the dient, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Judy Ma t Manager

**Quality Assurance** 

alytical Services Inc., Norcross Laboratory maintains the following certifications, approvals, and accreditations:

corgia (812); NELAC (E87315) scope: CWA, SDWA, RCRA expires July 1, 2002; NSF International (04180) scope: SDWA expires August 17, 2002; Arkansas; California (01 160CA); Connecticut (PH-0250); Florida (E87315); Kansas (E-10334); Kentucky (90126); Louisiana (02069); Nebraska; New Jersey (GA001); New York (11762); North Carolina (381); North Dakota (R-116); Oklahoma (9907); South Carolina (98011); Tennessee (02994); USDA Soil Import License (S-36027); Virginia (00026). For more information visit our web site at: asiHab.com

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Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-1

April 2, 2002

Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 01GYP020402, 439501, 02/04/2002, 14:00, received 03/22/2002

Analytical						
Method	Analyte	¹¹ = fa		Result	<b>Detection Limit</b>	Units
	General Chemistry			0 ŭ		- <u>"</u> ." ." .
	Moisture			34.1	0.04	%
	Metals					4.00
EPA 6010	Total Antimony (Sb)			BDL	7.6	mg/kg
EPA 6010	Total Arsenic (As)			BDL	4.6	mg/kg
EPA 6010	Total Barium (Ba)		122	150	1.5	mg/kg
EPA 6010	Total Beryllium (Be)		. 5.	BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)			BDL	1.5	mg/kg
EPA 6010	Total Chromium (Cr)			BDL	1.5	mg/kg
EPA 6010	Total Cobalt (Co)			BDL	6.1	mg/kg
EPA 6010	Total Copper (Cu)			BDL	1.5	mg/kg
EPA 6010	Total Iron (Fe)	ac a	.e.*	360	6.1	mg/kg
EPA 6010	Total Lead (Pb)	5%		BDL	2.3	mg/kg
EPA 6010	Total Manganese (Mn)			BDL	6.1	mg/kg
EPA 7471	Total Mercury (Hg)			0.40	0.8	mg/kg
EPA 6010	Total Nickel (Ni)			BDL	3.0	mg/kg
EPA 6010	Total Silver (Ag)			BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)			11	6.1	mg/kg
EPA 6010	Total Thallium (TI)		±1	BDL	30	mg/kg
EPA 6010	Total Vanadium (V)		_ R	BDL	3.0	mg/kg
EPA 6010	Total Zinc (Zn)			26	3.0	mg/kg

BDL - Below Detection Limit

Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

### Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-2

April 2, 2002

**Sample Description** 

Georgia Power

Soil, Yates-Gypsum, Project#4395, 02GYP020502, 439502, 02/05/2002, 13:55, received 03/22/2002

Analytical	10 10 11 12 De 10 10 10 10 10		2	
Method	Analyte	Result	<b>Detection Limit</b>	Units
		+-		
100	General Chemistry	÷.,		
07 18 <b>9</b> 2011	Moisture	36.2	0.04	%
9 D	Metals	2		
EPA 6010	Total Antimony (Sb)	BDL	7.8	mg/kg
EPA 6010	Total Arsenic (As)	BDL	4.7	mg/kg
EPA 6010	Total Barium (Ba)	160	1.6	mg/kg
EPA 6010	Total Bervilium (Be)	BDL	1.6	mg/kg
EPA 6010	Total Cadmium (Cd)	BDL	1.6	mg/kg
EPA 6010	Total Chromium (Cr)	BDL	1.6	mg/kg
EPA 6010	Total Cobalt (Co)	BDL	6.3	mg/kg
EPA 6010	Total Copper (Cu)	BDL	3.1	mg/kg
EPA 6010	Total Iron (Fe)	350	6.3	mg/kg
EPA 6010	Total Lead (Pb)	BDL	2.4	mg/kg
EPA 6010	Total Manganese (Mn)	BDL	6.3	mg/kg
EPA 7471	Total Mercury (Hg)	BDL	0.39	mg/kg
EPA 6010	Total Nickel (Ni)	BDL	3.1	mg/kg
EPA 6010	Total Silver (Ag)	BDL	1.6	mg/kg
EPA 6010	Total Selenium (Se)	9.4	6.3	mg/kg
EPA 6010	Total Thallium (TI)	BDL	31	mg/kg
EPA 6010	Total Vanadium (V)	BDL	3.1	mg/kg
EPA 6010	Total Zinc (Zn)	22	3.1	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis

Page 1 of 1

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Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

### Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-3

April 2, 2002

**Sample Description** 

Georgia Power

Soil, Yates-Gypsum, Project#4395, 03GYP020602, 439503, 02/06/2002, 14:00, received 03/22/2002

Analytical Method	Analyte			Result	Detection Limit	Units
Method	, indigite the second s			04 		714044C
	General Chemistry	98				a a a
	Moisture			38.6	0.04	%
	Metals					ь і в э.
EPA 6010	Total Antimony (Sb)	=	in ing an	BDL	8.1	mg/kg
EPA 6010	Total Arsenic (As)		the Base	BDL	4.9	mg/kg
EPA 6010	Total Barium (Ba)			180	1.6	mg/kg
EPA 6010	Total Bervilium (Be)	19 B.		BDL	1.6	mg/kg
EPA 6010	Total Cadmium (Cd)			BDL	1.6	mg/kg
EPA 6010	Total Chromium (Cr)	1.2		BDL	1.6	mg/kg
EPA 6010	Total Cobalt (Co)		1	BDL	6.5	mg/kg
EPA 6010	Total Copper (Cu)			BDL	3.3	mg/kg
EPA 6010	Total Iron (Fe)	943		380	6.5	mg/kg
EPA 6010	Total Lead (Pb)			BDL	2.4	mg/kg
EPA 6010	Total Manganese (Mn)			BDL	6.5	mg/kg
EPA 7471	Total Mercury (Hg)			BDL	0.41	mg/kg
EPA 6010	Total Nickel (Ni)			BDL	3.3	mg/kg
EPA 6010	Total Silver (Ag)	e ⁸³		BDL	1.6	mg/kg
EPA 6010	Total Selenium (Se)	÷.		10	6.5	mg/kg
EPA 6010	Total Thallium (TI)		. AND 1	BDL	33	mg/kg
EPA 6010	Total Vanadium (V)			BDL	3.3	mg/kg
EPA 6010	Total Zinc (Zn)		55 <u>67</u> 19	23	3.3	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-4

April 2, 2002

**Sample Description** 

Georgia Power

Soil, Yates-Gypsum, Project#4395, 04GYP020702, 439504, 02/07/2002, 14:25, received 03/22/2002

Analytical Method	A	nalyte	1 - 19-40 - 19-40	$\int_{-\infty}^{+\infty} d_{\mu} \cdot \theta_{\mu}^{(0)}$	2 ⁶ 1	Result	t De	tection Limit	Units	2
	2 - 3	52			84					
	G	eneral Ch	emistry				a	2 8 ⁴ 2		
	м	oisture	-	н . Э	4	38.9		0.04	%	
1.00 B	M	etals							2	
EPA 6010	Т	otal Antimo	onv (Sb)			BDL		8.1	mg/kg	
EPA 6010	Т	otal Arseni	c (As)	10	_; ≥	BDL	le es a l'a	4.9	mg/kg	1
EPA 6010	Ť	otal Barium	n (Ba)	2	e interes	180	3 - 19 <b>-</b> 1	1.6	mg/kg	
EPA 6010	Ť	otal Bervili	um (Be)	* 2 8	11110	BDL	12 18	1.6	mg/kg	
EPA 6010	Ť	otal Cadmi	ium (Cd)	21 80 19832a 308 8	- 18 C	BDL	2.24	1.6	mg/kg	1
EPA 6010	т	otal Chrom	nium (Cr)	1217	2000년 1	BDL		1.6	mg/kg	
EPA 6010	Ť	otal Cobalt	(Co)	50 200		BDL	ec.com.75	6.5	mg/kg	
EPA 6010	- T	otal Coppe	r (Cu)	in in	10 A A A A A A A A A A A A A A A A A A A	BDL	°, ≥ `si ,	3.2	mg/kg	
EPA 6010	Ť	otal Iron (F	e)	3.55		370	N 86 10 181	6.5	mg/kg	
EPA 6010	Ť	otal Lead (	Pb)		V 5.45 T 81	BDL		2.4	mg/kg	2 ^{- 5}
EPA 6010	Т	otal Manga	anese (Mi	n)		BDL	1919 - 198 - I	6.5	mg/kg	
EPA 7471	т	otal Mercu	ry (Ha)			BDL		0.41	mg/kg	
EPA 6010	÷	otal Nickel	(Ni)			BDL	, a 👘	3.2	mg/kg	
EPA 6010		otal Silver	(Aq)			BDL	, az - a	1.6	mg/kg	
EPA 6010	in 10 10	otal Seleni	ium (Se)	5 540		10	100.5	6.5	mg/kg	
EPA 0010	- 4	otal Thallin	(TI)	3 e		BDL	<ul><li>≤ 8</li></ul>	32	mg/kg	
EPA 0010	<del>-</del>	otal Vanac			20 A	- BDL		3.2	mg/kg	
EPA 6010	י. ד	otal Zinc (	Zn)	8. 10	о 2 2 2 21	28	18. 18.	3.2	mg/kg	

BDL - Below Detection Limit Note: Results reported on dry-weight basis

Page 1 of 1



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-5

April 2, 2002

Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 05GYP020802, 439505, 02/08/2002, 13:00, received 03/22/2002

Analytical	33				80		
Method	9	Analyte			Result	Detection Limit	Units
			848 - 10 F				
	ĩ	General Chemistry					
8 W N 2		Moisture			35.1	0.04	%
		Metals	811				1. 1. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.
EPA 6010		Total Antimony (Sb)			BDL	7.7	mg/kg
EPA 6010	15	Total Arsenic (As)	(and 10) (1)	Q1 - 22.2	BDL	4.6	mg/kg
EPA 6010		Total Barium (Ba)			210	1.5	mg/kg
EPA 6010	1.000	Total Beryllium (Be)			BDL	1.5	mg/kg
EPA 6010		Total Cadmium (Cd)		15	BDL	1.5	mg/kg
EPA 6010		Total Chromium (Cr)	n. ^{11 A} n ca	- 198 ⁽¹¹⁾	1.6	1.5	mg/kg
EPA 6010		Total Cobalt (Co)		-	BDL	6.2	mg/kg
EPA 6010		Total Copper (Cu)			BDL	3.1	mg/kg
EPA 6010		Total Iron (Fe)			560	6.2	mg/kg
EPA 6010		Total Lead (Pb)			BDL	2.3	mg/kg
EPA 6010		Total Manganese (Mn)			BDL	6.2	mg/kg
EPA 7471		Total Mercury (Hg)	3		0.65	0.39	mg/kg
EPA 6010		Total Nickel (Ni)			BDL	3.1	mg/kg
EPA 6010		Total Silver (Ag)	-		BDL	1.5	mg/kg
EPA 6010		Total Selenium (Se)			14	6.2	mg/kg
EPA 6010	4	Total Thallium (TI)			BDL	31	. mg/kg
EPA 6010		Total Vanadium (V)			BDL	3.1	mg/kg
EPA 6010	i a	Total Zinc (Zn)			14	3.1	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

## Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-6

April 2, 2002

### Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 06GYP020902, 439506, 02/09/2002, 14:00, received 03/22/2002

Analytical	Read Hard		Detending 1 logit	Unite
Method	Analyte	Result	Detection Limit	Units
			No. 1 (1997) 1 (1)	4
	General Chemistry		는 소리는 전에 독교 (B) -	
	Moisture	34.3	0.04	%
	Metals		-14 	1
EPA 6010	Total Antimony (Sb)	BDL	C 7.6	mg/kg
EPA 6010	Total Arsenic (As)	BDL	4.6	mg/kg
EPA 6010	Total Barium (Ba)	190	1.5	mg/kg
EPA 6010	Total Beryllium (Be)	BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)	BDL	1.5	mg/kg
EPA 6010	Total Chromium (Cr)	BDL	1.5 · · ·	mg/kg
EPA 6010	Total Cobalt (Co)	BDL	6.1	mg/kg
EPA 6010	Total Copper (Cu)	BDL	3.0	mg/kg
EPA 6010	Total Iron (Fe)	480	6.1	mg/kg
EPA 6010	Total Lead (Pb)	BDL	2.3	mg/kg
EPA 6010	Total Manganese (Mn)	BDL	6.1	mg/kg
EPA 7471	Total Mercury (Hg)	0.49	0.38	mg/kg
EPA 6010	Total Nickel (Ni)	BDL	3.0	mg/kg
EPA 6010	Total Silver (Ag)	BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)	- 10	(1.1.1.1.1.6.1	mg/kg
EPA 6010	Total Thallium (TI)	BDL	30	mg/kg
EPA 6010	Total Vanadium (V)	BDL	3.0	mg/kg
EPA 6010	Total Zinc (Zn)	24	3.0	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis

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Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

### Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-7

April 2, 2002

#### **Sample Description**

Georgia Power

Soil, Yates-Gypsum, Project#4395, 07GYP021002, 439507, 02/10/2002, 14:00, received 03/22/2002

Analytical					25. Sec.
Method	Analyte	1	Result	Detection Limit	Units
	General Chemistry	1 		en di ^{en} ti di d	а. Марияна Аларияна
	Moisture		37.4	0.04	%
	Metals				e dat f
EPA 6010	Total Antimony (Sb)		BDL	8.0	mg/kg
EPA 6010	Total Arsenic (As)		BDL	4.8	mg/kg
EPA 6010	Total Barium (Ba)		170	1.6	mg/kg
EPA 6010	Total Beryllium (Be)	38 ¹⁰	BDL	1.6	mg/kg
EPA 6010	Total Cadmium (Cd)	Her strate	BDL	1.6	mg/kg
EPA 6010	Total Chromium (Cr)	i Sach sh	BDL	1.6	mg/kg
EPA 6010	Total Cobalt (Co)		BDL	6.4	mg/kg
EPA 6010	Total Copper (Cu)	a stat	BDL	3.2	mg/kg
EPA 6010	Total Iron (Fe)	NAME AND A MARKED	400	6.4	mg/kg
EPA 6010	Total Lead (Pb)	3 P	BDL	2.4	mg/kg
EPA 6010	Total Manganese (Mn)	e 18	BDL	6.4	mg/kg
EPA 7471	Total Mercury (Hg)		0.43	0.40	mg/kg
EPA 6010	Total Nickel (Ni)		BDL	3.2	mg/kg
EPA 6010	Total Silver (Ag)		BDL	1.6	mg/kg
EPA 6010	Total Selenium (Se)		8.8	6.4	mg/kg
EPA 6010	Total Thallium (TI)		BDL	32	mg/kg
EPA 6010	Total Vanadium (V)		BDL	3.2	mg/kg
EPA 6010	Total Zinc (Zn)	8 6 8 U	16	3.2	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-8

April 2, 2002

**Sample Description** 

Georgia Power

Soil, Yates-Gypsum, Project#4395, 08GYP021102, 439508, 02/11/2002, 13:30, received 03/22/2002

Analytical		ottor a si			
Method	Analyte		Result	<b>Detection Limit</b>	Units
			*		
x + 6	General Chemistry	61 F 33			2
	Majatura		24.4	0.04	0/
. dl ²	Moisture	· ·	34.1	0.04	70
	Metals		a e Militer 11	50 B	
EPA 6010	Total Antimony (Sb)		BDL	7.6	mg/kg
EPA 6010	Total Arsenic (As)		BDL	4.6	mg/kg
EPA 6010	Total Barium (Ba)		170	1.5	mg/kg
EPA 6010	Total Beryllium (Be)		BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)		BDL	1.5 🔬 .	mg/kg
EPA 6010	Total Chromium (Cr)		BDL	1.5	mg/kg -
EPA 6010	Total Cobalt (Co)		BDL	6.1	mg/kg
EPA 6010	Total Copper (Cu)		BDL	3.0	mg/kg
EPA 6010	Total Iron (Fe)		340	6.1	mg/kg
EPA 6010	Total Lead (Pb)		BDL	2.3	mg/kg
EPA 6010	Total Manganese (Mn	1)	BDL	6.1	mg/kg
EPA 7471	Total Mercury (Hg)		BDL	0.38	mg/kg
EPA 6010	Total Nickel (Ni)	stola ja	BDL	3.0	mg/kg
EPA 6010	Total Silver (Ag)		BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)		9.7	6.1	mg/kg
EPA 6010	Total Thallium (TI)		BDL	30	mg/kg
EPA 6010	Total Vanadium (V)		BDL	3.0	mg/kg
EPA 6010	Total Zinc (Zn)		17	3.0	mg/kg
			¥.0		

BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-9

April 2, 2002

Page 1 of 1

Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 09GYP021202, 439509, 02/12/2002, 13:35, received 03/22/2002

Analytical				Defending Linet	Autor Co
Method	Analyte	Sec. 1	Result	Detection Limit	Units
10 11			27	1251	
a 1911	General Chemistry			N Harrow and the	
1:3	Moisture		33.5	0.04	%
	Metals			1 182 A. A.	× , 18
EPA 6010	Total Antimony (Sb)		BDL	7.5	mg/kg
EPA 6010	Total Arsenic (As)	201 1	BDL	4.5	mg/kg
EPA 6010	Total Barium (Ba)		130	1.5	mg/kg
EPA 6010	Total Beryllium (Be)		BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)		BDL	1.5	mg/kg
EPA 6010	Total Chromium (Cr)	22 MILL #	BDL	- 1.5	mg/kg
EPA 6010	Total Cobalt (Co)		BDL	6.0	mg/kg
EPA 6010	Total Copper (Cu)		BDL	3.0	mg/kg
EPA 6010	Total Iron (Fe)		270	6.0	mg/kg
EPA 6010	Total Lead (Pb)		BDL	2.3	mg/kg
EPA 6010	Total Manganese (Mn)	<i>5</i> .	BDL	6.0	mg/kg
EPA 7471	Total Mercury (Hg)		BDL	0.38	mg/kg
EPA 6010	Total Nickel (Ni)	•. •.	BDL	3.0	mg/kg
EPA 6010	Total Silver (Ag)		BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)	112	7.9	6.0	mg/kg
EPA 6010	Total Thallium (TI)	<i>x</i>	BDL	30	mg/kg
EPA 6010	Total Vanadium (V)		BDL	3.0	mg/kg
EPA 6010	Total Zinc (Zn)	« "	13	3.0	mg/kg

BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

### Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-10

April 2, 2002

**Sample Description** 

Georgia Power

Soil, Yates-Gypsum, Project#4395, 10GYP021302, 439510, 02/13/2002, 13:00, received 03/22/2002

Analytical		Pocult	Detection Limit	Unite
Method	Analyte	Result	Detection Linit	Unita
	a 2 a a			
	General Chemistry		1 A.	
- 10 B - 10 - 10 - 10 B - 10 - 10 - 10 - 10 - 10 - 10 - 1	Moisture	37.2	0.04	%
	Metals	2. 		
FPA 6010	Total Antimony (Sb)	BDL	8.0	mg/kg
EPA 6010	Total Arsenic (As)	BDL	4.8	mg/kg
EPA 6010	Total Barium (Ba)	200	1.6	mg/kg
EPA 6010	Total Bervilium (Be)	BDL	1.6	mg/kg
EPA 6010	Total Cadmium (Cd)	BDL	1.6	mg/kg
EPA 6010	Total Chromium (Cr)	BDL	1.6	mg/kg
EPA 6010	Total Cobalt (Co)	BDL	6.4	mg/kg
EPA 6010	Total Copper (Cu)	BDL	3.2	mg/kg
EPA 6010	Total Iron (Fe)	430	6.4	mg/kg
EPA 6010	Total Lead (Pb)	BDL	2.4	mg/kg
EPA 6010	Total Manganese (Mn)	BDL	6.4	mg/kg
EPA 7471	Total Mercury (Hg)	0.61	0.40	mg/kg
EPA 6010	Total Nickel (Ni)	BDL	3.2	mg/kg
EPA 6010	Total Silver (Ag)	BDL	1.6	mg/kg
EPA 6010	Total Selenium (Se)	11	6.4	mg/kg
EPA 6010	Total Thallium (TI)	BDL	32	mg/kg
EPA 6010	Total Vanadium (V)	BDL	3.2	mg/kg
EPA 6010	Total Zinc (Zn)	29	3.2	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis

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Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131 Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-11

April 2, 2002

Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 11GYP021402, 439511, 02/14/2002, 13:00, received 03/22/2002

Analytical Method	Analyte	Result	Detection Limit	Units
T and the second			··· ··· ··· ··· ··· ··· ··· ··· ··· ··	
	General Chemistry		81 10- 81 0	1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -
	Moisture	33.3	0.04	%
	Metals			2
EPA 6010	Total Antimony (Sb)	BDL	7.5	mg/kg
EPA 6010	Total Arsenic (As)	BDL	4.5	mg/kg
EPA 6010	Total Barium (Ba)	120	1.5	mg/kg
EPA 6010	Total Beryllium (Be)	BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)	BDL	1.5	mg/kg
EPA 6010	Total Chromium (Cr)	BDL	1.5	mg/kg
EPA 6010	Total Cobalt (Co)	BDL	6.0	mg/kg
EPA 6010	Total Copper (Cu)	BDL	3.0	mg/kg
EPA 6010	Total Iron (Fe)	260	6.0	mg/kg
EPA 6010	Total Lead (Pb)	BDL	2.2	mg/kg
EPA 6010	Total Manganese (Mn)	BDL	6.0	mg/kg
EPA 7471	Total Mercury (Hg)	0.46	0.37	mg/kg
EPA 6010	Total Nickel (Ni)	BDL	3.0	mg/kg
EPA 6010	Total Silver (Ag)	BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)	7.5	6.0	mg/kg
EPA 6010	Total Thallium (TI)	BDL	30	mg/kg
EPA 6010	Total Vanadium (V)	BDL	3.0	mg/kg
EPA 6010	Total Zinc (Zn)	10	3.0	mg/kg
				AND DESCRIPTION OF ADDRESS



BDL - Below Detection Limit Note: Results reported on dry-weight basis



Environmental Monitoring & Laboratory Analysis 110 Technology Parkway Norcross, GA 30092 (770) 734-4200 FAX (770) 734-4201

Laboratory Report

Georgia Power 5131-Maner Road Smyrna, GA 30080

Attention: Mr. Craig Scott Report No. 153897-12

April 2, 2002

#### Sample Description

Georgia Power

Soil, Yates-Gypsum, Project#4395, 12GYP021502, 439512, 02/15/2002, 13:00, received 03/22/2002

Method	Analyte	a 85	Result	<b>Detection Limit</b>	Units
100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 -	2.5		* · · · *	e e fe	
2010	<b>General Chemistry</b>				0.
n 11	Moisture	а ¹⁴	32.0	0.04	%
1	Metals		2) 17 1340 11922		
EPA 6010	Total Antimony (Sb)	5, 8, 81 Y	BDL	7.4	mg/kg
EPA 6010	Total Arsenic (As)		BDL	4.4	mg/kg
EPA 6010	Total Barium (Ba)		160	1.5	mg/kg
EPA 6010	Total Bervilium (Be)	a line as a line a	BDL	1.5	mg/kg
EPA 6010	Total Cadmium (Cd)	1963 A. 197	BDL	1.5	mg/kg
EPA 6010	Total Chromium (Cr)		BDL	1.5	mg/kg
EPA 6010	Total Cobalt (Co)		BDL	5.9	mg/kg
EPA 6010	Total Copper (Cu)	- mg e a	BDL	2.9	mg/kg
EPA 6010	Total Iron (Fe)	38	360	5.9	mg/kg
EPA 6010	Total Lead (Pb)		BDL	2.2	mg/kg
EPA 6010	Total Manganese (Mn)		BDL	5.9	mg/kg
EPA 7471	Total Mercury (Hg)		0.77	0.37	mg/kg
EPA 6010	Total Nickel (Ni)	a Contra de	BDL	2.9	mg/kg
EPA 6010	Total Silver (Ag)	6 A D N B N	BDL	1.5	mg/kg
EPA 6010	Total Selenium (Se)		11	5.9	mg/kg
EPA 6010	Total Thallium (TI)	la n	BDL	29	mg/kg
EPA 6010	Total Vanadium (V)	· Les ·	BDL	2.9	mg/kg
EPA 6010	Total Zinc (Zn)		18	2.9	mg/kg



BDL - Below Detection Limit Note: Results reported on dry-weight basis

## **Quality Control**

### Single Analyte Data Blank Results Information

Batch Number	Analyte	Analysis Method	Preparation Method	Units	Blank Result	Matrix
76819	Sb	EPA 6010	EPA 3050	mg/kg	< 0.0500	SOLID
76819	Ba	EPA 6010	EPA 3050	mg/kg	< 0.0100	SOLID
76819	Be	-EPA 6010 -	EPA 3050	:ng/kg	< 0.0100	SCLID
76819	Cd	EPA 6010	EPA 3050	mg/kg	< 0.0100	SOLID
76819	Cr	EPA 6010	EPA 3050	mg/kg	< 0.0100	SOLID
76819	Co	EPA 6010	EPA 3050	mg/kg	< 0.0400	SOLID
76819	Cu	EPA 6010	EPA 3050	mg/kg	< 0.0200	SOLID
76819	Fe	EPA 6010	EPA 3050	mg/kg	< 0.0400	SOLID
76819	Pb	EPA 6010	EPA 3050	mg/kg	< 0.0150	SOLID
76819	Ni	EPA 6010	EPA 3050	mg/kg	< 0.0200	SOLID
76819	Ag	EPA 6010	EPA 3050	mg/kg	< 0.0100	SOLID
76819	As	EPA 6010	EPA 3050	mg/kg	< 0.0300	SOLID
76819	Mn	EPA 6010	EPA 3050	mg/kg	< 0.0400	SOLID
76819	Se	EPA 6010	EPA 3050	mg/kg	< 0.0400	SOLID
76819	Т	EPA 6010	EPA 3050	mg/kg	< 0.2000	SOLID
76819	V	EPA 6010	EPA 3050	mg/kg	< 0.0200	SOLID
76819	Zn	EPA 6010	EPA 3050	mg/kg	< 0.2000	SOLID
77070	Hg	EPA 7471	Hg-Solid	mg/kg	0.0000	SOLID
			Lab Control Inform	nation	19 - Mar - Mar - The Car	

Batch	AL SA	Analysis	LC	LCD	LC/LCD		%Recovery	RPD
lumber	Analyte	Method	% Rec.	% Rec.	RPD	14 - 14 14 - 14	Range	Range
76819	Sb	EPA 6010	94	91	3		76 - 124	0 - 20
76819	Ba	EPA 6010	86	86	0		81 - 92	0 - 8
76819	Be	EPA 6010	83	82	. 1	35 ¹ 5 ¹⁰⁵	81 - 96	0 - 7
76819	Cd	EPA 6010	89	89	0	*187 	80 - 93	0-4
76819	Cr	EPA 6010	82	82	0		82 - 95	0 - 5
76819	Co	EPA 6010	94	95	1		82 - 95	0 - 7
76819	Cu	EPA 6010	90	89	1	2	84 - 97	0 - 5
76819	Fe	EPA 6010	88	88	0		86 - 118	0 - 12
76819	Pb	EPA 6010	88	88	0		78 - 95	0 - 5
76819	Ni	EPA 6010	88	89	1		82 - 93	0 - 5
76819	ρĄ	EPA 6010	78	78 -	0		75 - 88	0 - 5
76819	As	EPA 6010	85	85	0		77 - 90	0 - 6
76810	Mn	EPA 6010	86	86	0		79 - 100	0 - 11
76819	Se	EPA 6010	84	85	1		73 - 86	0 - 7



### Page 1 of 5

**Quality Control** 

Single Analyte Data Lab Control Information

Batch Batch	Analvte	Analysis	LC % Rec.	LCD % Rec.	LC/LCD RPD	%Recovery Range	RPD Range	
76819	TI	EPA 6010	87	86		77 96	0-8	1
76819	v .	EPA 6010	86	85	1	81 - 94	0 - 5	
76819	Zn	EPA 6010	92	97	5	82 - 95	0 - 8	
77070	Hg	EPA 7471	92	93	1	81 - 114	0 - 13	
(*†1) · · ·			Matrix Spike	Informati	on and		2 ²	

Matrix Spike Information

Batch	•	Analysis	MS	MSD	MS/MSD	%Recovery	RPD
Number	Analyte	Method	% Rec.	% Rec.	RPD	Range	Range
76819	Sb	EPA 6010	22	29	28	76 - 124	0 - 20
76819	Ba	EPA 6010	98	90	5	76 - 124	0 - 20
76819	Be	EPA 6010	82	82	1	76 - 124	0 - 20
76819	Cd	EPA 6010	87	87	0	76 - 124	0 - 20
76819	Cr	EPA 6010	82	78	4	76 - 124	0 - 20
76819	Co	EPA 6010	90	90	0	76 - 124	0 - 20
76819	Cu	EPA 6010	92	87	5	76 - 124	0 - 20
76819	Fe	EPA 6010	0	102	200	76 - 124	0 - 20
76819	Pb	EPA 6010	84	82	2	76 - 124	0 - 20
76819	Ni	EPA 6010	86	79	5	76 - 124	0 - 20
76819	Ag	EPA 6010	80	80	0.	76 - 124	0 - 20
76819	As	EPA 6010	83	81	2	76 - 124	0 - 20
76819	Mn	EPA 6010	101	119	4	76 - 124	0 - 20
76819	Se	EPA 6010	84	84	1	76 - 124	0 - 20
76819	T	EPA 6010	52	59	9	76 - 124	0 - 20
76819	v	EPA 6010	85	82	3	76 - 124	0 - 20
76819	Zn	EPA 6010	116	80	19	76 - 124	0 - 20
77070	Ha	EPA 7471	105	97	6	82 - 120	0 - 13

Post Digestion Spike Information

Batch Number	Analyte	Analysis Method	9.0	PDS %Rec	24 845 10	015 (7 7)	%Recovery Range	5 6 - 2 - 8	
76819	Sb	EPA 6010		102	1. j.	- Alger	76 - 124		.1
76819	Ba	EPA 6010	0-	90		184 E. R.	76 - 124		a.
76819	Be	EPA 6010	12	101		a that is	76 - 124		
76819	Cd	EPA 6010		108		5 B	76 - 124		
76819	Cr	EPA 6010		95	-		76 - 124	8 ( ⁶⁷ - 5	²⁸

Page 2 of 5 Uncontrolled Copy 3/24/2017 1:16:28 PM

## **Quality Control**

### Single Analyte Data Post Digestion Spike Information

Batch Number	Analyte	Analysis Method	PDS %Rec		a a	%Recovery Range	an da a
76819	Co	EPA 6010	109	la a s	2	76 - 124	- 
76819	Cu	EPA 6010	109			76 - 124	and the second second
76819	Fe	EPA 6010	196			76 - 124	1997 - 1984 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -
76819	Pb	EPA 6010	103		- e -	76 - 124	
76819	Ni	EPA 6010	96	19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		76 - 124	
76819	Ag	EPA 6010	103	3		76 - 124	
76819	As	EPA 6010	103		30 ar	76 - 124	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
76819	Mn	EPA 6010	0		5	76 - 124	
76819	Se	EPA 6010	103			76 - 124	* t = 6.5
76819	TI	EPA 6010	81			76 - 124	
76819	۷.	EPA 6010	101			76 - 124	1.00
76819	Zn	EPA 6010	- 98			76 - 124	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -



Analytical Services, Inc.

## **Quality Control**

### Single Analyte Data Sample Batch Information

Analysis : Sb, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Ni, Ag, As, Mn, Se, Tl,

Batch # 76819

Matrix : SOLID

and a star in the second s	aVad Northern	<b>P</b>	reparatio	n	and the second s	an a	Analysis	e e consecu	4411 ( Lig	14 1980 1 10 18 10 10	1.16
Sample ID	Tag	- Date	Time	By -	Notes	Date	Time -	Byc		Inst -	
153897-12BS	an a	03/26/02	1030	мни	TRACE	03/27/02	1400	FBS	a - 11	ICP3	
HPS2	金服	03/26/02	1030	MHU	TRACE	03/27/02	1355	FBS	S 0	ICP3	
HPS1	. C+ 4	03/26/02	1030	MHU	TRACE	03/27/02;	1352	FBS	:	ICP3	
76819BLK	2 - A 2 - 0	03/26/02	1030	MHU	TRACE	03/27/02	1206	FBS		ICP3	
76819LCS	-78 -1	03/26/02	1030	MHU	TRACE	03/27/02	1209	FBS	18 18	ICP3	
76819LCSD	1.1.2	03/26/02	1030	MHU	TRACE	03/27/02	1213	FBS		ICP3	1
153901-1MS		03/26/02	1030	MHU	TRACE	03/27/02	1217	FBS		ICP3	
153901-1MSD	10.00	03/26/02	1030	MHU	TRACE	03/27/02	1221	FBS		ICP3	
153901-1PDS	E.W.	03/26/02	1030	MHU	TRACE	03/27/02	1224	FBS		ICP3	
153901-1DUP	24 - VQ	03/26/02	1030	MHU	TRACE	03/27/02	1228	FBS		ICP3	
153901-1		03/26/02	1030	MHU	TRACE	03/27/02	1232	FBS	·	ICP3	
153901-2		03/26/02	1030	MHU	TRACE	03/27/02	1235	FBS		ICP3	
153901-3		03/26/02	1030	MHU	TRACE	03/27/02	1239	FBS		ICP3	
153901-4	13	03/26/02	1030	MHU	TRACE	03/27/02	1251	FBS		ICP3	
153901-5		03/26/02	1030	MHU	TRACE	03/27/02	1255	FBS		ICP3	
153897-1		03/26/02	1030	MHU	TRACE	03/27/02	1259	FBS	0 10 10 20	ICP3	
153897-2		03/26/02	1030	MHU	TRACE	03/27/02	1302	FBS	5 m m	ICP3	
153897-3		03/26/02	1030	MHU	TRACE	03/27/02	1306	FBS	5 1400	ICP3	g 10
153897-4		03/26/02	1030	MHU	TRACE	03/27/02	1310	FBS		ICP3	. 1
53897-5		03/26/02	1030	MHU	TRACE	03/27/02	1314	FBS		ICP3	1
53897-6	ag i e	03/26/02	1030	MHU	TRACE	03/27/02	1317	FBS	- K.,	ICP3	
153897-7		03/26/02	1030	MHU	TRACE	03/27/02	1321	FBS	8 ₆ - 1993	ICP3	
153897-8		03/26/02	1030	MHU	TRACE	03/27/02	1325	FBS		ICP3	
153897-9		03/26/02	1030	MHU	TRACE	03/27/02	1337	FBS	*	ICP3	
153897-10		03/26/02	1030	MHU	TRACE	03/27/02	1341	FBS		ICP3	
153897-11		03/26/02	1030	MHU	TRACE	03/27/02	1344	FBS		ICP3	
153897-12		03/26/02	1030	MHU	TRACE	03/27/02	1348	FBS		ICP3	

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Analytical Services, Inc.

## **Quality Control**

### Single Analyte Data Sample Batch Information Analysis : Hg

Batch # 77070

Matrix : SOLID

		P	reparatio	n	81	72	Analysis	5	88	
Sample ID	Tag	Date	Time	Ву	Notes	Date	Time	Ву	9	Inst
WIPEBLK	and the second second	03/27/02	1100	EAH		03/27/02	1652	EAH.		HG1
153990-6		03/27/02	1100	EAH	A.	03/27/02	1650	EAH		HG1
153990-5		03/27/02	1100	EAH		03/27/02	1648	EAH	5 m	HG1
153990-4	3	03/27/02	1100	EAH		03/27/02	1646	EAH		HG1
153990-3		03/27/02	1100	EAH	13	03/27/02	1644	EAH		HG1
153897-12		03/27/02	1100	EAH		03/27/02	1637	EAH	- 18g	HG1
153897-11		03/27/02	1100	EAH		03/27/02	1635	EAH		HG1
153897-10		03/27/02	1100	EAH		03/27/02	1633	EAH		HG1
153897-9		03/27/02	1100	EAH		03/27/02	1631	EAH	*	HG1
153897-8		03/27/02	1100	EAH		03/27/02	1629	EAH		HG1
153897-7	14 C	03/27/02	1100	EAH		03/27/02	1627	EAH		HG1
153897-6		03/27/02	1100	EAH		03/27/02	1624	EAH	33	HG1
153897-5	10	03/27/02	1100	EAH	·	03/27/02	1622	EAH	14114	HG1
153897-4		03/27/02	1100	EAH	02	03/27/02	1620	EAH		HG1
153897-3		03/27/02	1100	EAH		03/27/02	1618	EAH	2058 F.	HG1
153897-2		03/27/02	1100	EAH		03/27/02	1509	EAH		HG1
153897-1	1 P.	03/27/02	1100	EAH		03/27/02	1507	EAH	1995	HG1
153674-2		03/27/02	1100	EAH		03/27/02	1505	EAH		HG1
153674-1		03/27/02	1100	EAH	or ⁶ 1	03/27/02	1503	EAH		HG1
53897-2DUP		03/27/02	1100	EAH		03/27/02	1457	EAH	- 5	HG1
153897-2MSD		03/27/02	1100	EAH	12 B	03/27/02	1455	EAH		HG1
153897-2MS		03/27/02	1100	EAH	tyre i l	03/27/02	1452	EAH		HG1
77070LCSD		03/27/02	1100	EAH	Ne na	03/27/02	1442	EAH		HG1
77070LCS		03/27/02	1100	EAH		03/27/02	1444	EAH		HG1
77070BLK		03/27/02	1100	EAH	SOIL	03/27/02	1440	EAH	έc.	HG1

Georgia P 5131 Maner Hoad, Bin 39110 Smyrna, GA 30080	al Laboratory		UES	ST A REC	ND COF	Ŋ	LA US ONI	B C E S	ontrol N ample D	o. CC )elivery (	Group: 2	<u>53</u> 1395
Phone: (404) 799-2100 Fax: Company: 8-530-2100 Fax:	(404) 799-2141 8-530-2141			сы) ² ж	1.				II Page	 l	 of	_2
Company: 1 GA. Power Con Report To Rochelle Rou Address: 2 241 RALPH Mc	MPANY TMAN GUCBUDINE	Sample Shipment Date: 8 Sample Received Date: 9 Sampled By 10 DAVAD D. PARKE	•2	•					Stand Rush	ard T rn in e cleared t	around T Bu	ime Isiness Days Lab. prior to shipment)
ATLANTA, GA. 30	0308		me	đ			PRES	ERVAT	IVE 20		Samp G-Gri	le Type Key: 22 ab C-Composite
Phone: 38-506-7780 Fax &- Contact: 4 Rocheue Rouza	-506-1499 AN	Authorization to subcontract analysis will be assur customer unless stated otherwise.	med acc	ceptable l	 by	1	ANALYSIS	REQU	IESTED	21	O-Oli Matrix O-Oli S-Sol SL-SI W-Wi	ier :: : Key: 23 SW-Surface Water id GW-Ground Water udge WW-Waste Water page DW-Drinkton Water
Project Location: 5 PLANT /AT	es	s # "	17	18	19	N	,		-04		Prese	Invative Key: 24
Account Number: 6 Special Instructions: 7 Metals H	SRA LIST		Type		Containers	A LIST	-	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			H-Hy N-Nit S-Su SH-S SB-S P-Ph ST-S I-Ice	frochloric Acid furic Acid odium Hydroxide odium Bisulfide osphoric Acid odium Thiosulfate
LAB USE Sample 14 ONLY 13 LAB (D) Number	Collection ¹⁵ Date Time	Sample ¹⁶ Description	Sample	Matrix	No. of C	HSR		2	2	-	U-Un	
13950 0194020402	2/4/02 1400	GYPSUM FROM UNIT SCRUBBO	G	56	1	~		i.			1.0	
439502 0264P020502	2/5/02 1355	BYPSUM FROM UNIT I SCRUBBER	G	SL	1	1						
439503 03000020602	2/6/02 1400	GYPSUMFRON UNIT SCRUBBER	G	SL	1	5	-	820			*	
439504 04GYP020702	2/7/02 1425	GYPSUM FROM UNIT 1 SCRUBBER	G	5L	1	1			51			
43505 05GYP020802	2/8/02 1300	GYPSUM FROM UNIT / SCRUBBER	G	5L	1	5				<u> </u>		2 - 2
4395No 06GYP020902	2/9/02 1400	GYPSUM FROM UNIT / SCRUBBER	G	SL.	1	1	1.1		1	× 1	_	
43507 07GYP021002	2/10/02 1400	GYPSUE FROM UNIT / SCRUEDER	G	SL	1	1				· ·		R *
139518 08GYP021102	2/11/02 1330	BUPSHIN FROM UNIT / SCRUB ACT	G	SL	1	14						
439509 09GV7021202	2/12/02/1335	BRYPSUM FROM UNIT / SPUBBER	G	SL	1	-	(a					
439510 10GYP021302	2/13/02 1300	GYPSUM FROM UNIT! SRUBBEL	G	SL	1		-100 Dr. 6 -01- 01- 11				BACTT TRUES	
Relinquished by: ²⁶	Date/Time	adora da	4 - CA 1 CA 1 CA	in age to be	- TEV Y	MISEUO	NLYA Samp	al Dian	nsition li	normatic		a zana ana ang kanana ang kanang Kanang ang kanang ang kanang ang kanang kanang ang kanang ang kanang kanang kanang kanang kanang kanang kanang k
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707211B MAC	Uncontrolle	WHITE, CANARY & PINK-Laboratory	^{IVI} G	OLDEN	ROD	-Original	or				(See l	Back For Instructions)

Georgia Environmen 5131 Maner Hoad, Bin 39110 Smyrna, GA 30080	ıtal Laboratory	ANALYS CHAIN OF	CUSTO	JEST JY R	ANE	B		LAB USE	Conti	ol No. C ble Deliv	C-	中 山 ス分
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Company: 1 (SGORDANA Poult Report To ROCHELLE ROUT	GL COMPANY CMAN	Sample Shipment Date: ⁹ . Sample Received Date: ⁹ .	a/19/0					2		tandard ush in _	Iurnarot	Ind Time Business Days
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Project Location: 5 R.ANT I	MT65			4	19			-		-		Preservative Kay: 24 H-Hydrochloric Acid
Spacial Instructions: 7 Merries 1	HSRA LIST			Type	containers	1517 t 5714	14					N Nitric Acid S-Suffurc Acid SH Sodium Hydroxide SH-Sodium Bisuffide ST-Sodium Thiosuffale 5T-Sodium Thiosuffale I-tee
CLABUSE ONLY 3 UABID Vumber	Collection ¹⁵ Date Time	Sample ¹ Description	0	Sample	Matrix No. of C	₩ ₩	354 I		-	- -		U-Unpreserved HAMANUS AONIN 7735
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)F SAMPLES Sample Delivery Group No	Vendor Laboratory Name and Address	Date of Sample Transfer ろフン (のつ	Analysis Requested		Ao. AS. Bo. Ro. Cd. Co. Cu.	M, N', Th, Sb, V, Zn, Sz, H				ti M				riginal Analysis Request	RECEIVED BY (Signature)		-Originator PINK-Laboratory
<b>H</b> H			do.	7	12	7	14	1- 1	4 4	011	11-	2	in the	copy of o			CANARY-
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04) 799-2141 -530-2141	N. Project Name	te of results) 3 28	Project ID No.	OIG/PODOLO	CUYUCUA/SEO	CHGYPIDOTO2	COPACITY 201	CIGY HIDIOCO	CACYDRICK	10GVPm1300	ILEYPORTYON	TAX TTIXST					LIHM
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Environmental Monitoring & Laboratory Services 110 Technology Parkway, Norcross, GA 30092 (770)734-4200 FAX (770)734-4201

### LOG-IN CHECKLIST

Ann: Mr. Craig Scott

Client: <u>GEORGIA POWER GA SMYRNA</u> Project: <u>Yates-Gypsum</u>, Project#4395 Recvd : <u>03/22/2002</u>

Logged By: BAM

NPDES: Work Order: 153897

#### **OBSERVATIONS**

#Samples: <u>12</u> #Containers: <u>12</u> pH: <u>n\a</u>

Temp(C): 6

Ice: Yes Custody Seal(s): Not Present

#### **CHECKLIST ITEMS****

1. COC included with Samples	Yes
2. Chain of Custody Complete	Yes
3. Sample Container(s) Intact	Yes
4. Sample Container(s) Match COC	Yes
5. Methods Designated by Client on COC	Yes
6. Params Designated by Client on COC	Yes
7. Temperature in Compliance	Yes
8. Sufficient Sample Volume for Analysis	Yes
9. Zero HeadSpace Maintained for VOA Analyses	N/A
10. Samples properly preserved	Yes
11. Samples Received within Allowable Hold Times	Yes



	IZAE	2	inte	A SOUTHERN COMPAN
a	mple Delivery Group	Location	fales_	
0	ntrol Numbers 439501 - 4395	512	J	
1		a _g	2 M 1. M	
-	Method of Shipment:Hand Delivered Delivered	UPS/Feder	- Other _	<u> </u>
	a. Did shipment come with a shipping air bill?	ΩY	□ N [′]	X N/A
	b. If "yes" document carrier and air bill #:	<del>-</del> 1. 12		
	Preliminary Examination:	2 °2-		
	1. Was Chain of Custody initiated? If "no" proceed to number 2.	K Y	<b>N</b>	
	a. Were custody seals intact?	ΠY	□ N	□ N/A
	b. Were custody papers filled out properly?	ΠY		
	c. Were custody papers signed?	ΠY		
	2. Are sampling time(s) present?	X Y	D N	
	3. Are sampling date(s) present?	SQ Y	D N	24
	4. Are samples received within the specified holding times?	X Y	<b>N</b>	·
	5. Were samples packaged properly?	ND Y	<b>N</b>	· · · · · · · · · · · · · · · · · · ·
	Sample Login:		5) 50 - 1000 (14)	
	1. Did all sample containers arrive intact?	. <b>X</b> Y		
	2. Did all container labels agree with custody papers?	Σίγ.		25.04
	3. Were proper containers used for requested test(s)?	159 Y		
	4 Were samples properly preserved for requested test(s)?	N R		
	a. pH (acid)?	□ <2	$\square \ge 2$	X N/A
	b. pH (base)?	□ ≥ 12	□ < 12	X N/A
	c. temperature?	Ø <b>3.</b> < 4	□ ≥4	□ N/A
	5. Was sufficient sample received for requested test(s)?	X BY	<b>N</b>	
	6. Were air bubbles present in VOA samples?	ΠY	N	A N/A
	Corrective Action: (Complete this section only if needed)		8	
	1. Client notified verbally - Date: Time:	8		
	(attach written notification, e.g. e-mail, memo, etc.)		196	
	2. Samples processed as received	ΠY	□ N	
			25	
	Comments	<b>4</b> 14		
			1	
				57
		2		160 20
	()		1 1	



#### CONTINUATION CERTIFICATE

SAFECO INSURANCE COMPANY OF AMERICA

, Surety upon

a certain Bond No. 4993104

dated effective June 30 2005 (MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc. (PRINCIPAL)

and in favor of Georgia - Dept. of Natural Resources

(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30 2006

(MONTH-DAY-YEAR)

d ending on June 30 2007

(MONTH-DAY-YEAR)

Amount of bond \$10,000

Description of bond License Bond - Water Well Contractors and Drillers

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on	June 19 2006	
ii ii	(MONTH-DAY-YEAR) SAFECO INSURANCE COMPANY OF AMERICA	
8	By <u>ATTORNEY-IN-FACT</u> Laurel D. Huss	SEAL SEAL
0	Agent 3475 Piedmont Road NE, Suite 1200, Atlanta, GA 30305 Address of Agent	offic of WASHINGTON
	(404) 995-3702 Telephone Number of Agent	

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#### POWER OF ATTORNEY

SAFECO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE: SAFECO PLAZA SEATTLE, WASHINGTON 98185

No. 6724

KNOW ALL BY THESE PRESENTS:

S 14 -

That SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby appoint

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA have each executed and attested these presents

•	this	23rd	day of	August	, 2004	
CBA	nead		/	inte p	1 garicle	
CHRISTINE	MEAD, SECRETARY		0	MIKE MCG	AVICK, PRESIDENT	

CERTIFICATE

#### Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA:

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with uthority to execute on behalf, of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its isiness... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

(i) The provisions of Article V, Section 13 of the By-Laws, and

(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and

(iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof."

I, Christine Mead, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

une day of

. .....



S-0974/SAEF 2/01



CHRISTINE MEAD, SECRETARY

A registered trademark of SAFECO Corporation
 08/23/2004 PDF

Southern Company Services, Inc. 30 Ivan Allen Jr. Boulevard NW Atlanta, Georgia 30308



June 30, 2006

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

#### RE: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2007.

Please let us know if you need additional information.

Best Regards,

achsn

Annie Jackson Southern Company Services, Inc. Risk Management Department

/aj

Enclosure

cc: Alan Garrard, SCS

#### PERFORMANCE BOND FOR WATER VELL CONTRACTORS

AND DRILLERS Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER

KNOW ALL NEN BY THESE PRESENTS.

WHERRAN, the Water Well Standards Act of 1985 (Ga. Luve 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be word; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its oblightion on this bond, and does hereby waive notice of any such amendment, adoption, or modification.

This bond shall be effective from date of issuence er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obliges; provided that the rights of the Obliges and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2006

3/24/2017-

SOUTHERN COMPANY SERVICES

IN WITNESS WHEREOF the Principal and Sursty have caused these presents to be duly signed and sealed, this 15th day of April 2003

Uncontrolled Copy

SAFECO

#### POWER OF ATTORNEY

SAFECO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE: SAFECO PLAZA SEATTLE, WASHINGTON 98185

MIKE MCGAVICK. PRESIDENT

No.	6724

November

day of

#### (NOW ALL BY THESE PRESENTS:

hat SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby

*SANDRA S. CARTER; JUDY GAY CERA; GARY D. EKLUND; JUDY S. FLEMING; VIRGINIA B. MCMANUS; BARBARA S. MACARTHUR; EDWARD L. MITCHELL; ppoint JANCY NIX; BARBARA THOMPSON; CYNTHIA I. RUDOLPH; LAUREL D. HUSS; Atlanta, Georgia*******

ts true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character ssued in the course of its business, and to bind the respective company thereby.

N WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA have each executed and attested these presents

RAGierson

R.A. PIERSON, SECRETARY

CERTIFICATE

#### Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA:

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that y the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to h behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any pun

ent making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

this 14th

(i) The provisions of Article V, Section 13 of the By-Laws, and

(ii) A copy of the power-of-attomey appointment, executed pursuant thereto, and

(iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof."

I, R.A. Pierson, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation



RAPierson

R.A. PIERSON, SECRETARY

SOUT		GEOLOGIO	AL SE	RVICES			Hole No. Shee	GS- at 1 of 2	2
.nergy i	USETVE TO	Plant Wansley				54 2	SUBEE	1 EV	847.7
		Gungum Storage Eacility	COOPD		- 12381	47.8	60111.	2023921	8
LOCATI	ON		COURD	INATES IN	909	47.0		CME 55	0
ANGLE		BEAHING	. CONTR.	ACTOR	303		UFR	0	<u>,</u>
DRILLIN	IG METHO	D HSA/HQ Core NO. SAMPL	ES	8	NO.1	U.D. SAMP	LES	700/	1
CASING	SIZE		COI	HE SIZE	04 hrs		. % REG.	10%	
WATER	TABLE DE	ртн31.2 ⁻ ELEV		R COMP	24 ms			10/12/20	06
TYPE G	ROUT		M	IX	UF	AILLING ST		10/12/20	06
DRILLE	R	M. Hugnes RECORDER Filipovicri/Grissoni APPA	Sample	Stan	dard Penetration Test		MP. DATE	10/17/20	1
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% R	ec R
0	847.70	Topsoil to 0.5'				- 7	к с	14	
0	011.10	Red/brown sandy CLAY (CL) with abundant		0.1.5	4.4.0	10	Dulli comple telu	4) 	
1		mica flecks, dry	1'	0-1.5	4-4-8	12	at 1.0 - 2.0 feet	nı,	
2		- 15 A				28 ¹⁰	PL-26, PI-21	1. 2.8	
3	1					1925	sand - 32.1%	and the	
0.0					8 ×		silt - 25.3%		. –
4		Yellow brown silty sand to sandy SILT (ML) with					uay - 41.270	×	
5		abundant mica flecks, dry	2	4-5.5	6-10-11	21	Bulk sample take	en in	
6	1		-	1 N	_		nonplastic	1.	1
8-					1 ⁹⁹		gravel - 0.5% sand - 49.4%	12	
/							silt - 35.6%	6 G 8	
8	1		4 4 8			25	clay - 14.5%		
9		ann an		5				91 ¹⁰ 86	
10		SAA, reddish brown & yellow	3	9-10.5	3-4-5	9		1 ad	
10				1.75	1 24			1. J.	
11					1 K K				low
12					1.5				
13									
		9 2 9 4 ⁴ 4 5 5 5	ł					4. 	
14		Orange brown, fairly dry, slightly sandy SILT	-						+
15		with trace of black minerals	4	14-15.5	2-2-4	6	el o o	1 200 C	
16	8		-	1					
					0			- /	
17					8				
18							-		a 1
19	-							* * ^{**}	
00		Brown & tan, moist, sandy SILT with abundant	5	19-20 5	2-4-6	10		1	
20			5	13-20.5	2-4-0				
21	1.1.1				a a		e" (.).		
22							1 al an		
00	1.1	2					- 8	1	
23		the first the second					a = * #		-
24					1.00			1.3	

SOU1	HERN COMP	DRILLII GEOLOGICA	NG L	.OG RVICES	2 ₁₂		Hole No. Sheet 2 of 2	GS-1	
SITE		Plant Wansley	14	ips -	TOTAL DEPTH	54.2	SURF.ELEV.	8-	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25		Orange brown to brown, moist, slightly silty fine SAND (ML) with some mica	6	24-25.5	3-3-4	7.	a B MINITERE		
26		ar an r r - Capifia e a e ^{br}	-						
27	.94 181						21		
28			= * = 1	R	i	81			a
29				đ			a (6) (8)	₁₀	a
30	-	SAA, less orange	7	29-30.5	2-2-4	6			(**) 
31			н. м. т. т.	ve jo	* 8 ×	,Ba			
32							= ⁸	- 2	
33									
34				j.		2			
35		Dark burgundy to brown, moist, silty Saprolite	8	34-35.5	43-43-50	93			24
36			-					2	
37									
38				8	16230X				D
39		Auger refusal @ 38.9'							
40		Grow to white weathered CNEISS			150. ¹⁹⁷⁷		*		
41	$z_{\mu}$	abundant pyrite growths and iron staining along fractures,		30.2			2 3/5 0	16	0
42	_		tε	44.2			2.3/3.0	40	Ů
43									85 
44								0.0	
45			-	1.00	500 B				8
46		a			17				
47				44.2-			4.7/5.0	94	100
48	- R Ø	9 P 255		10.2					
49			-82				4	e	15
50				8 S	945 IF MI		1	2	
51		2. 10 10 10	Ľ.	10000000	5		s to Records	al gamer	10000
52			64	49.2- 54.2			4.8/5.0	96	50
53				8					
54		BOH @ 54.2'			-		· · · · · ·		-
55	/	an a			° ली			â	
Form GSG	001 7-26-	2004		1		L			L

	COMP	GEOLOGIC	AL SE	RVICES			Hole No. Sheet	GS-2 1 of 2	71
nergy	0 52702 104	Plant Wansley				45.7	SUBE ELE	W 83	42
-	011	Gunsum Storage Facility	COORD	INATES N	1237856	12	E 2	024760.5	1.1
ANGLE	ON	BEADING	CONTR	ACTOR	SCS		DRILL NO. (	ME 550	1000
		D HSA/HQ Core NO. SAMPLE	s	5	NO. U.I	D. SAMPL	ES	0	1
CASING	SIZE	LENGTH	CO	RESIZE	HQ	TOTAL	% REC.	77%	
WATER	TABLE DE			R COMP.		DAT			-
TYPE G	ROUT	QUANTITY	м	IX	DRIL	LING ST	ART DATE 1	0/23/2006	762
DRILLE	R	S. Milan RECORDER Bearce/Hartsfield APPR	OVED	1	DRIL	LING CO	MP. DATE 1	0/24/2006	1
Depth	Flev	Material Description Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	Τ
oopui	Clov.	Waterial Description, Dissincation and Hemanika		8				ATTRO	T
0	834.20	1				E	Bulk sample taken		
1		Beddish brown and brown very silty fine SAND				a L	at 1.0-2.5 feet _L-47 PI-21		8
2	11 - 4		1	1-2.5	4-5-7	12 9	gravel - 1.4%	5	8
3			-		-		sand - 32.1% silt - 25.3%	64 S	
			1.1	1.		C	clay - 41.2% Bulk sample taken		
4						1	3.0-4.0 feet	a sad	
5		Pale orange silty fine SAND, hard, dry	2	4.5-6	5-7-8	15	non-plastic gravel - 0.5%		
6			-				sand - 49.4%	a l	
7	ALC: NO				2	i	clay - 14.5%		
8			1.1			8			
0									
9			82						
10		SAA	3	9.5-11	6-8-13	21		1.12	1
11	19								8
12			1	1				19-2 1	
10									
13	14				· · · ·			a la come	
14						1 a - 1			
15		SAA	4	14 5-16	5-5-7	12			
16			Ľ	1-1.0-10	007		1		
17	=								
	1		1. 12	= =					
18			1				x == 000		
19		State in 197			1.		9 19		
20		Tan silty fine SAND, relic bedding		10.5.01	E 40 E014		2000 A	Set 1	
21	- 94		5	19.5-21	5-10-50/4			the second	
		Chart parties at 01 01	- A.,		open fracture		4 0/4 5		+
22		Biotite GNEISS, pink & black with phenoblasts		21.2-	open nacture		lost water @ 22	2'	
23		of feldspar		25.7			never regained circulation	8	38
			- A				1.000	. F	

SOU1	HERN COMP		LING LO	DG RVICES	adheanglasatan ana san A	nistenin polonin.	Hole No. Sheet 2 of 2	GS-2	
SITE _	nungis- (s. 4 Status di seu	Plant Wansley	ng te sa lana sa 856 na ng sa		TOTAL DEPTH	45.7	SURF.ELEV	. 834	$\bigcirc$
Depth	'Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25		at a start and a start of the		- 19 132 - 112	The stars and				
26		SAA	1.13		The second second	A.J.			
07	200	T 1703 - 1 5423 and 245 3470 and 25		-		2 ^{Cal} 2	100 B 80	14	
		and and a second se		25.7-			4.9/5.0	98	69
- 28	71	that the set of the se	- State	30.7		-1457			
29	ngipti te Malakati		12 Sheet	and a set of the second se Second second s	na stan na stan sa	1994 a		3.	
30			N Shee Areas		2,0 10 11			1	
31	Sec. 1	SAA	12						
32	-			$P_{k}(\{t_{k}\}, q_{k}) \in \mathbb{N}$	(	20 B.		1	23 1.592 1.2
33				30.7-			3.8/5.0	76	79
34	12.	and the second		agii to to			5 M 2	e . 4	
35	Provension The A		in the second	1		224			
36	1997 y 1997 1997 y 1997	SAA						1. S.	
37		Smokey quartz vein Biotite GNEISS		N.	е . с			4	
38			1.4	35.7-	end puis a		1.5/5.0	30	0
39	5			40.7	^а ж _{ана}				
40	25			19	* * s*	- 10	97 - F		
41	* e. *	Biotite GNEISS	N ( 10 10			1			
42	1			1. 200		÷C. S		19	
43			80 II.	40.7-			4.8/5.0	96	95
10			e de la P	45.7					
45	-			1					8
40	1.0	BOH @ 45.7'		i i i i i i i i i i i i i i i i i i i		+ +		1.00	
40			100		17 ge * g			81 D	2
4/			-		a i	1		10	
48							1	9 E	
49	15		10					1 10 11	0
50			10.0			+			
51		1 Partie State		1.					180
52	1 april 1							1	
53	state Ve		10.00	anger dig.	A BARA		ar a la l		6
54	the -				a safe tra				
50	n nier y	and the second	a angan a sa		AN - 48		e a k Severa (kje		

Form GS9901 7-26-2004

SOU I	COMP	DRILI GEOLOGI	LING L	OG RVICES			Hole No	Sheet	GS-3 1 of 2	4
SITE	6	Plant Wansley	ł		HOLE DEPTH	50'		URF.ELE	v. 80	)3.2
LOCAT		Gypsum Storage Facility	COORD	DINATES N	12383	37.1	E	20	24864.7	
ANGLE		BEARING	CONTR	ACTOR	SCS	(	DRILL NO.	C	ME 550	
DRILLIN	NG METHO	D HSA NO. SAMPI	ËS	- 11	NO.	U.D. SAMP	LES		0	1.1
CASING	3 SIZE	LENGTH	co	RE SIZE		TOTAL	. % REC.	2		
WATER	TABLE DE	PTH ELEV	TIME AFTE	R COMP.	TOD	DA		10	/20/2006	3
TYPE G	BROUT	QUANTITY	M	IIX	DR	ILLING ST		10	/23/2006	5
DRILLE	R	M. Hughes RECORDER K. Hobbs APP	ROVED	а. Ц		ILLING CO	MP. DATE	10	/23/2006	;
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comm	ents	% Bec	B
0	803 20	14								
0	000.20	Reddish brown SILT, soft					8	-		1
1			1	0-1.5	2-2-2	4			a	e a
2	8								19 ² - 1	
3									e 6	
4	5		-							
4			2	3.5-5	5-7-10	17				
5	A	Reddish brown SILT, medium stiff								
6	24				12 IS					
7	2									
0						10			5. ⁶	
0				2						
9		Red brown SILT, slightly damp, soft	3	8.5-10	2-2-3	5				2
10									-	2
11	54 	a	22 I						17 F	
10								8.8	540	
12			22							
13						2				
14		SAA		10000000	11 A 1	1			1	5
15			4	13.5-15	2-4-3	7		. 1	4.7	۰,
10	7.				6 B	52 3				Die D
10				2						
17		а — — — — — — — — — — — — — — — — — — —		9						
18			الله:	29 M					14	
19		SAA/relic banding	8		121				1	
20			5	18.5-20	2-2-4	6				
20									1.0	
21	2									
22			1							
23								11 Mar 19		
									a ann	
24	0001 7 00 /	2004							_	1

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SITE	S SET PE YOU	Plant Wansley			TOTAL DEPTH	50'	SURF.ELEV.	803	3.2
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	lard Penetration Test Blows	N	Comments	% Rec	RQD
36		Wet yellowish orange, sandy SILT,	6	23.5-25	2-4-4	-8	-		1
20	1. 1.		<b>H</b>	a 1	8 11	1	Ka ⁿ a ⁿ a a		
26				-			5. 50 B		
27	-	андан ^{ан} жа ^{дан} ж		- 6 °	5 gr - 14		20 U 10 0		3 *
28	<u>18</u>	1 10 18 27 1751 ¹⁰						2 .	10
29		Clayey sandy SILT,	-	28 5 20	2.2.4	6			
30		medium sun, saturated	1	20.0-30	2-2-4		а ^н		
31	a t ^a			8.5	en l		3 9		
32									10 A
02						. ×	- ¹⁰		
33							55 - 545		
34	L	SAA, soπ, medium stiff	8	33.5-35	2-2-3	5	2 2 n		
35			-		a				
36						8 ₁₄			
37							Ц		-
38		an a state of the			-	20 20			P
39		SAA, medium stiff	-						
40		27 43 ¹⁰ 100 100	9	38.5-40	2-4-6	10	25		
40				1			38 31		
41							10 14		
42		-				4	9 85		
43				¹⁵ а	i i			24	1
44	· s	Light brown, mika flakes, saturated, SILT, verv soft	10	43.5-45	(dropped)		13		8
45		-	Ē	6					
46		2			iti ar				
47			-			11			
48					÷			創	
49		SAA, medium stiff	-						
50		a	11	48.5-50	2-3-4	7	8		L
51		Boring terminated at 50'	Γ		5				
50					н ^н н				1
52	1								
53	-				n n				
54					0		81 ₁₂₁₀		Γ
55	e server i			d Spar	a 20		127 (444) 14		
56						1	102		1

	HERN Serve You	DRILL GEOLOGIC	ING LO	OG AVICES	* * * * *	0 2** *	Hole No. Shee	GS-4	
SITE		Plant Wansley	- C	- 24 - 1	HOLE DEPTH	35.5	SURF.	ELEV. 8	05.9
	Ň	Gypsum Storage Facility	COORDI	NATES N	123857	0.9		2025555.	3
ANGLE		BEARING	CONTRA	ACTOR	SCS	÷.	DRILL NO.	CME 550	)
DRILLING	METHOD	HSA/HQ Coring NO. SAMPLE	ŝ	4	NO. U	.D. SAM	PLES	2	+*
CASING	SIZE	LENGTH	COF	E SIZE	HQ	TOTA	L % REC.	95%	
WATER T		этн ELEV Т	IME AFTEF	COMP.		DA		- the sea	
TYPE GR	OUT	QUANTITY	M	x	DRI	LING ST		10/24/200	6
DRILLER		S. Milam RECORDER K. Hobbs APPR	OVED	20	DRI		OMP. DATE	10/24/200	6
Donth	Elev	Material Description Classification and Remarks	Sample No.	Stand From To	ard Penetration Test Blows	N	Comments	% Re	
O	805.90						н 10 л	्रात्म	
1	000.00	i la m							
-		Reddish brown sandy SILT, medium stiff		105	446	10		100022012	
2	ő.			1-2.5	4-4-0		6	1	di la
3							UD taken @		
4						58	3.0-5.0 feet in		:
5		Buff sandy SILT, Relic banding & feldspar crystals					onset noie	0 82 80 901 1	
6		stiff	2	4.5-6	5-7-11	18			1
-								all _a da n	1.
1							11052	19 AL	
8				-		2 243		$\mathbb{C}_{i} = \mathbb{P}_{i-1}^{*}$	
9			1.5		1		10	14	
10		Buff sandy SILT, relic banding with dark oxidation		0.5.44		10	UD tokan @	1	
11		stains, stiff	3	9.5-11	6-9-9	18	10.0-12.0 feet in		
10					-		offset hole		
12								1.00	
13							1		9. 9. 2
14			2	· 1			2 - 100		
15	- 7	SAA, saprolite, hard		145.10	0 7 50/4			14	10
16			4	14.5-16	3-7-50/4		a 1		2
17							22		C= 1
10		Begin Coring					coarse-orain	ed	
18		some large feldspar crysals, highly weathered,		17-21.7		-	granitic	85	71
19		red oxidation stains on large fractures						8	1
20					34 ^{- 14}			a rate -	
21					12				10
22		SAA, highly fractured, heavy iron staining				-		an al alguna	la de la composición de la composición Reference de la composición de la composi Reference de la composición de
22	2.4							1	00 50
23		-		21.7-25.5					
24			-	-				1-140 11 10	

Form GS9901 7-26-200

SOUT	HERN COMP	DRILLI GEOLOGIC	NG L AL SE	OG RVICES		2	Hole No. Sheet 2 of 2	GS-4
	1975 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 19	Plant Wansley	12.10		TOTAL DEPTH	35.	.5' SURF.ELEV	8
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Star From To	ndard Penetration Test Blows	N	Comments	% Re
25	1	Grav/pink GNEISS, banding of quartz, mica,	1.1.1.1	21.7-	1			
26		feldspar		25.5				100
20		En anno i a di	3.	an c		,		
21	t- 		· 1	05.5		12	10 0	
28	4 1	SAA	2 ¹⁴ -1	30.5				1
29	lenous			and serve	16- F			2.2
30		1	an ende					
31	9 ⁵⁵ 1	7,51 77 17 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19			en nis v		<i>2</i> /	
32	а 			11. 14				
33		SA, highly fractured, heavy iron staining		30.5-				1
34				55.5			16	
35	с ₀ я							
36		BOH @ 35.5'				- 10		+
37								
38	19						<u>10</u>	
39					+		2	
40					8			
41	-				101 1			
41	- <u>19</u> -							
42				a -				
43	a .		ε.,	5			d.	
44				100				
45								
46				15	1 = S	inter.		
47	1			12			30 ²⁶	
48			- 04	907 			a	
49	1 × 2		8		1963) 1672 - 16		2 - A	
50				25	1.1		и Ф. П.	
51						54	a	
52				0			÷	
53	8 O							
54				м ^с			00 12 m	с. 413
55		1. A A A A A A A A A A A A A A A A A A A			а,	14	3	
56			1	16 De	01 × × 1		11	1

OUT		DRILLI GEOLOGIC	NG L AL SEI	RVICES			Hole No. Shee	GS-5	1	
TE	Serve Ion	Plant Wansley		- 410 - 241 -		31.6'	SUBEE	EV 77	31	
		Guncum Storage Eacility	COORD	INATES N	- 10287	07.0	30hr.c	2026220 1	0.1	
OCATIC	UN		COURD	ACTOR	600	57.0	E	CME 550	5220.1	
NGLE			-	ACTOR	303	U	HILL NO.	0	141	
RILLIN	G METHO	B HSA/HQ Core NO. SAMPLE	·	3	NO.1	J.D. SAMPL	ES	1000/		
CASING	SIZE	LENGTH	_ ^{col}		HQ	TOTAL	% REC.	100%		
VATER	TABLE DE	PTH ELEV TI	ME AFTER	R СОМР	1	DAT			6	
YPE GI	ROUT	QUANTITY	M	IX	DR	ILLING STA		10/22/2006	) <u> </u>	
RILLEF	<u></u>	M. Hughes RECORDER K. HODDS/Bearce APPRO	VED	Stan	DR	ILLING CON	IP. DATE	10/22/2006	-	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec		
0	773 10							고 가슴		
	770.10	SILT, buff., gravel interlayers	1	0-0.5	50/5			1.3. 8	t	
1					34			1		
2	22		a -					1.5		
3								3		
-		2 J 2 2		22				1		
4	\$									
5	1-12				10					
6		Yellowish orange silty SAND	2	5-5.5	50/5				1	
-					2		Se pr		1	
7				9				-		
8	8) 		1		19 12			1		
•										
5	2	SAA	3	-	38-50/1			ogeni i		
10	72	Begin Coring				+			╀	
11		Degin Comig								
12		Light gray, hard GNEISS with large feldspar crystals								
12		very fractured	1	10-14.4	90			100		
13	_				a 8					
14				10				π. Ε	•)	
15			-			+ +	N. Contraction		+	
13										
16	-			1				1 1 1		
17		SAA with Fe, Mn oxides on larger vertical fracture	1	14.4-				100	D	
18	4	faces		19.4						
10						- 25		Star Card		
19						20		and a start of the		
20	- 14						2		†	
21	e	<i>n</i>						¥.		
21		SAA		19.4-				100		
22				24.4					e	
23					1 1 1 1 1					
-			1.00					10.00		

SOUT	HERN COMP	ANY Ar World	an a construction of	DRI	LING L	OG RVICES		1	9	Hole St	No. neet 2 of	GS-5	
		an and a second second	- den surren Pla	int Wansley			TOTAL DI	EPTH	31	.6'	SURF.E	LEV77	3.
Depth	I Elev.	N	Material Description, Cla	assification and Remarks	Sample No.	Star From To	ndard Penetrat Blov	ion Test ws	N	Co	omments	% Rec	R
25		-					10000000000 29 <u>4</u>				- ಇ.ಜ. ಜ್ಞಾನದ		
26				$\max_{\substack{i=1,\dots,n\\i=1,\dots,n\\i=1}} \frac{e^{i(i)}}{e^{i(i)}} = \frac$	ald t			22 ¹¹		<b>8</b> 5			2
27		Gray/pink GN	NEISS with large	e feldspar crystals, bande	d	24.4-	$g^{di}$ .		- 12		20 20	100	
28		quartz, felds	par and mica, Fe	e/Mn oxides on all		29.4			eit i		a a	1	
20				a an		and Theory plate	3 ×			8	1. B	4 C C	
29	an a start and	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		$ \begin{split} & \tilde{\mathbf{v}} &= (\mathbf{u}_{1}^{2})_{\mathbf{v}_{1}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{1}} (\mathbf{v}_{2}^{2})_{\mathbf{v}_{1}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} \\ & \tilde{\mathbf{v}}_{1}^{2} \frac{\partial \mathbf{v}_{1}}{\partial \mathbf{v}_{1}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} \\ & \tilde{\mathbf{v}}_{1}^{2} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{1}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{2}^{2})_{\mathbf{v}_{2}} (\mathbf{v}_{2}^{2$	- 280 	$+ \frac{1}{2} $			100 A			i Si	
30	- 644 . ·	SAA			-	29.4-	1.1.1.16.15	625 - 61				100	
31	13.02	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.				31,6	4		- 84		5		
32	100	BOH @ 31.6									a 2	8	
33					20 20		42		88 11		82 °		
34					1. area					No.	100	m.	
35	ж 10									10 1	3	a	
36	8.8					5 ⁶ 1			(4)4)			- K 	
37		1° .	- 12 - T		* a ⁸		×					1 0	
38					1	a ^h			8			50 U	
39		- 11 V			1	1	2						
40	- 185 		÷.		2 1	к я а	8 2 7						
41	ni Ny series any	100	a ĝela			1			2.			÷.,	L
42	i.	÷			1	1 33	a second		. *				
43	114				1000 100		1		1 - 399 - 1 			ii. S	
44						2. **			- 8				
45	- 6		а. •			а — С 							
46	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.1.1	1	i e sete								85 	10 1
47		1							-	<u>A</u>		Σ	
48	8				( . Not	an ∉#So	r Torre E ⁿ	a J Rep					
49			j=x , 1			÷		7			8		
50						. N							
51					1918		8 ⁸			12			
52						8.8		2		2		с °	
53												80	
54		19 e ^{n -} 1					1					S. 8	2
55	a s		1 A	a a se se								sel : i	
EC	A. 2. 87	and the second second	a di se	$\sum_{i=1}^{2N(1)} \frac{1}{N_{i}} \sum_{i=1}^{N} \frac{1}{N_{i}} $	· · · · · · · · ·	e alut - celor					4	100	

iou1	COMP	DRILL World" GEOLOGIC	DRILLING LOG GEOLOGICAL SERVICES			a	Hole No.	Sheet 1	GS-6 of 2		
SITE	推进	Plant Wansley		21	HOLE DEPTH 41.5'		SURF.ELEV. 767.1				
LOCATION Gypsum Storage Facility				NATES N	1238189.4		E	202	6022.5		
ANGLE BEARING			CONTR	ACTOR	SCS DRI		RILL NO.	ILL NO. CME 550			
DRILLING METHOD HSA NO. SAMPLES				9	NO. U.D. SAMPLES		ES	s 0			
CASING	-	LENGTH	co	RE SIZE		TOTAL	% REC.	and the second s			
WATER	TABLE DE	 РТН 20.5' ELEV.		R COMP.	TOD	DAT	E TAKEN	10/2	21/2006		
TYPE GROUT QUANTITY			N		DRILLING START D		RT DATE	ATE 10/21/2006			
DRILLE	R	M. Hughes BECORDER T. Hartsfield APP	artsfield APPROVED			DRILLING COMP. DATE			10/22/2006		
			Sample	Stan	idard Penetration Test				in the second se	T	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comme	nts	% Rec	RC	
0	767.10			1		-	84	-			
-		Dark reddish brown sandy SILT	1	0-15	2-3-3	6	<i>v</i>				
				0 1.0	2.0.0			2			
2	14							5 N	- 1	5 N 19	
3				8	~		72	•			
4	R. (4.1)				2 E		12. L.		34 LU 1		
7								a ^D LA		1	
5		SAA with dark minerals		-			ť	5 27 3			
6			2	5-6.5	3-4-4	8		an intera		1	
7		0 0				- S		2	5 E	228 1	
-						80	10				
8						12			1	1	
9							- 3	1. Should	73 - 55 4452		
10	0				a:				4	1	
10		Brown SILT					12				
11			3	10-11.5	3-2-3	5		n# 8 2			
12			-				9.				
13					*			т ³⁸ т	14		
							0 1/8	144.000		1	
14					. S			Ng I			
15			1					8. 0. A	1		
16		Gray brown SILT with relic bedding, damp, contains mica and black minerals	4	15-16.5	3-2-4	6				1	
10			SER		-				12		
17					3				4		
18										23	
10				8							
19									5 N 7		
20		Sanrolite venumicaceous									
21		כמאיטוופ, יפוץ וווכמטפטעט	5	20-21.5	3-4-4	8	.8		5 1		
20		м 2 м	-		a		8				
22					2	- K		8	3		
23					10						
		NY A A A						A (*	·	1	

Form GS9901 7-26-2004
	DRILLIN GEOLOGICA	IG L	OG RVICES			Hole No. GS-6 Sheet 2 of 2				
SITE	Plant Wansley	and an and a second	n de la constancia de la c	TOTAL DEPTH	41.5	SURF.ELEV.	76	7.1		
Depth Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N	Comments	% Rec	R		
25		a yearda.	wysian e				2 			
26	SAA	6	25-26.5	8-26-45	71	960 ^{16 16} 1 16				
07		32 W				ж. ж				
21		а В		1		2 8 C 1	sie.			
28		il 1 mai Holtai	- () <u>*</u> 	e den a concerna de la	18	9 = 10 10 ±00	2 061			
<b>29</b>		130 - 130 130 - 130					*			
30	SAA (saprolite)	- 100		5						
31	B L B L	7	30-31.5	6-12-11	23	43.		13		
32		2				3 N 14				
33			2				<u>^</u>			
34	areadan, sak gun s		11 1	- 8 Å - *			- 5			
35	Sappolite contains quartz crystals $(1/8^{*})$ and bands	1 <u>.6</u>	2 ⁸¹							
36	of orange-brown silt	8	35-36.5	11-13-27	40			1		
37							. 12.1			
38		1		- 22			- <b>S</b> _1	-		
39				5 ×		8				
40			0							
41	Saprolite, contains feldspar and dark brown staining	9	40-41.5	14-30-50	80					
42	BOH @ 41.5'							+		
43										
44			i e	a a a a a a a a a a a a a a a a a a a			-			
45			a	1.4.8						
46		a de la	tes ^{er} - Pi	ante en e			the second	15		
40			8 8							
4/		i e	3							
48		it.		0						
50						9 s				
51				8 						
52			92				- * 			
53							ł			
54				²⁵ to ₁ = 10			d.	2		
55	and the second s	-					2 3			
		1. 1	9 × - × -	2.12				11		

m GS9901 7-26-2004

TUO	COMP	GEOLOGI	CAL SER	VICES			HOIE NO.	Sheet 1	of 3	
nergy to	o Serve You	Plant Wansley			HOLE DEPTH	66.5'	s	URF.ELEV.	79	4.7
	-	Gyosum Storage Facility	COORDI	NATES N	123741	19.6	E	202	5643.0	
OCATI	ON	BEADING	- CONTRA	CTOR	SCS	D	RILL NO.	СМ	E 550	
ANGLE			-	14	NO. L	D. SAMPL	ES	C	)	
DELLA	IC METHOD		 COB	E SIZE	· · · · · · · · · · · · · · · · · · ·	TOTAL	% REC.			-
CASING	I SIZE				24 hrs.	DAT	E TAKEN		ê (;	
VATER	TABLE DEF		M	x	DR	LLING STA	RT DATE	10/1	1/2006	
		M Hughes BECORDER B Mudd APP	BOVED		DR	ILLING CO	MP. DATE	10/1	1/2006	15
AILLE		M. Hughoo M.Conbell	Sample	Stan	ndard Penetration Test		in the second second		C	T
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comme	ents	% Rec	ł
0	794.70	Surface raked by bulldozer						·	÷	ļ
4	1.5	Red slightly sandy SILT Sand portion is medium & appears to be highly	1	0-1.5	6-8-9	17			e e	
-		weathered rock, very stiff, moist		1219 1357505	1				- A	
2										
3	8			8					9 8	
4				Sec.					$b_{12} b_{2}$	
3- 1		Deddiate brown alastic CII T with accid (AILI):					L-58			
5		weathered rocks larger - size of small to medium	2	4.5-6	7-11-15	26	PI-26			
6	a di	very angular pebbles				9	gravel - 0.3 sand - 21.2	%		
7	-			2			silt - 29.6%			
							ay - 48.9%	n na ka	46	
0					10 R				1	
9									1	
10		SAA	2	9 5-11	2-8-14	22				
11			3	0.0-11	2014				1. A.	
40			8						\$	
12								112 N	1. 1	
13		이 가지는 것이 같아. 이 것이 있었다.	1					±1	1 8	-
14			- 2	24 ()						
15		Reddish brown elastic SILT with sand (MH):	100		10 ×		LL-53		8	
		with interbedded layers of a yellowish clay of	4	14.5-16	3-4-8	12	PI-8 gravel 0.6%	6		
16		same nature as above - less weathered lock					sand - 29.1	%		
17				6			silt - 45.9% clay - 24.4°	%		
18	- 31		- *	92 2			1997 ( <b>1</b> 997 ( <b>1</b> 99		Ĩ.	
10			an all						12 A	
19								22,5	(best	
20		Red, very clayey SILT, with very thin layers of extremely friable black rock.	5	19.5-21	2-4-5	9			Sec.	
21		medium to stiff, slightly moist								
22										
22						100	2		1	
23										
24			a 1							_

CO	RNA	DRILLING L				Hole No.	GS-7	-
SITE	Plant Wansley		i saladi i a	TOTAL DEPTH	66.5	SURF.ELEV	. 79	4
Depth E	ev. Material Description, Classification and Ren	narks Sample	Stan From To	ndard Penetration Test Blows	I.N	Comments	% Rec	RC
25	SAA, with feldspar		ner j.e.	e grane en e		946 A. 121 P 44		
26		6	24.5-26	4-4-7	11			
07	and the second	2012			in schi		1	
21				201 - C				
28		and the second se	12 /M	Karanan (Karana)			2	
29		and the second s	le a cha ca	ante a potenti di la	and and a second se		40 92	
30	Light red, white, black clayey weathered ro large pebble sized pieces of intact rock qu	ock with artz - 7	29.5-31	2-4-7	11			
31	like in appearance, stiff							
32			1.1	$\sum_{i=1}^{n-1} \frac{1}{n_{i}} $	(p ¹		n = 1	8 8
33			j.		ю ^с	40 10		
34			$q_{i}^{\alpha} = 0$		1		13	
35	Mottled pink, white, yellow & black sandy s	SILT (ML)			n	on-plastic		
36	with very small angular pebbles (weathere black material makes a "C" shape in x-sec	d rock), 8 btion,	34.5-36	1-2-3	5 g	ravel - 1.0% and - 39.4%		
37	wet, medium stiff				s c	ilt - 44.2% lay - 15.4%	1	
38				8				
30				P. 2	3			
40	Saprolite with	wich white	1.2		- 1			
40	clayey SILT interbedded - very distinct lay	ering, some 9	39.5-41	5-5-13	18	1 4 90	- 10	
41				55.4			59	12
42			690 - 18 -	<i>«</i>				
43		1200	2 N 10				1	
44								2
45	Dark brown, black & white interbedded mi	caceous	1997 - 20				+	
46	saprolite - heavily weathered, moist	10	44.5-46	5-7-22	29		1	35
47			n Table de	1. 19 C 18		na než		
48			1. S.		1			
49				a Ng a		N L		
50	SAA wet						2	
51		11	49.5-51	9-15-34	49	Cat Cas		- 242
52		1	10.0	18 July 1	4. I	5.4		
53			- CL					
54			2	1.1				2
55	0.0.0			±.		e # 4.		
56	SAA, more weathered, very little intact roo very wet	ж, 12	54.5-56	8-29-40	69			

	DRII GEOLOG	LLING L	OG RVICES	5 	2	Hole No. Sheet 3 of 3	GS-7
SITE	Plant Wansley			TOTAL DEPTH	66.5	SURF.ELEV.	794.7
Depth Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec F
57		1		ومودعون الدار			
58					1 1		
50			2 	a.		×	
60				- ^{- 2}		a =	, ên
00	SAA	12	50 6-61	11-21-46	77		2.4
61			33.0-01	11-51-40	"	*	
62				12	18		
63	-				- 84	24	2
64			8			143 154	8
65	SAA		64 5 66	14.04.50		40 g	
66	BOH @ 66.5'	14	64.5-66	14-31-50	81		1 <u>.</u>
67						28 - 10 j	1
68		đ.		0			
69		* 1	τ.	25		2	1
70				8			1 - S
71			8	22		124	
72		9. T	-5	8		s - 18	
73							10
74			100	×			21.0
75							
76	· · · · · · · · · · · · · · · · · ·		3				
77	_						
78							4 e
79		10 A					
80	-						8
81			15				× - 5
82		100					
83	_					а ⁸ а е_ ⁰	
84					25		
85		а.				* 2	1." 10
86			-				
87		2				***	
88			1				

	HERN COMP	DRILL GEOLOGIC	ING L	OG RVICES		-	Hole No. S	heet 1	GS-8 of 2	
SITE		Plant Wansley			HOLE DEPTH	37.4	su	RF.ELEV.	76	6.5
000	ON	Gypsum Storage Facility	COOR	DINATES N	123731	42	F	2026	3576.3	
		BEADING	CONTR	BACTOR	SCS			CM	E 550	-
ANGLE			S	4	NO 11			0	2000	
JHILLIN					HO. 0.	TOTAL	* PEC	0	70/	-
CASING	SIZE				24 bro				1 18	2
WATEH	TABLE DE			H COMP.	241115			10/1	2/2006	1
TYPE G					DRIL	LING ST		10/1	2/2000	-
DHILLEI			Sample	Stand	dard Penetration Test		MP. DATE	10/1	2/2000	-
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comment	S	% Rec	R
0	766.50	1			4	s - 1	10	÷		² 70
		Red SILT,		0.1.5			e 1 ²⁴	and the second		
1		ary, medium stiπ	1	0-1.5	3-4-4	8				
2				1				- 	upite 🖡	
2					a N	8		1		
3					9		2 R 2	$c_{i} = c_{i}$	1	
4						0.05		2.1	gar 1	
5		SAA, slightly moist, stiff	-						1	
5			2	4.5-6	5-5-7	12		i den se la	1.14 	
6				4	22					1
7		deserve addention in the second se					1	·		
		а 1				1280		218	1.5587	
8		2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			-	- 22				
9		2					62	2	-	
10		6" rod SILT, with modium angular pabbles		1. 10. 10	15			1100	10 J	
10		(black)	3	9.5-11	3-8-9	17		1000	2 N 1	
11		6" white powdery very fine sandy SILT	-				1	Î	•	
12		6" dark green to black CLAY, with distinct lavering, some weathered rock at bottom of sample						•		
12							34 12	60 17	12.	
13					24			î	- 1	
14										
1982				4	2 <u> </u>			1	- 43	
15		Hed sandy SILI (ML) with medium angular pebbles, last 6" white & gray lavers of very friable weathered	4	14.5-16	13-8-5	13		а - Ц		60 12
16		rock - breaks down to silt	2-07		and the second second			1	1	
17		Begin Coring @ 16.3'	-			+				-
17								a sult	<b>9</b> 2	
18	-	Highly fractured/weathered dark gray interbedded						area a fa		5
19	61	flecks on the more weathered material		16.7-20.2				ř.	85	0
10								21 B 20		-
20			8					- ¹	1957	14
21	1.1	12		-	) ii ₁₂		1 K (2)		<u>.</u> 8	
		Light gray interbedded SCHIST/GNEISS; fractured			8			28 1/2	Á.	
22		40 deg bedding		20.2-25.2				100	100	7
23					-			4	1	-
					10 18			= []	1	
24		P V	_	1			N <del>T</del> 75		-	L

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SOU1	HERN COMP	DRILLI World GEOLOGICA	Hole No. Sheet 2 of 2	GS-8				
SITE _	a tali Na seriesa	Plant Wansley		e staan de	TOTAL DEPTH	37.4	SURF.ELEV.	766.
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec RQE
25	а 			ر ( ¹ ۲۰۱۰) المحمد والتعليم				
26					la s ^B ung	67		
07	284 a.,						10	
21	nga 14	SAA -		05 0 00 0	÷	10	· · · ·	100 00
28	1			20.2;00.2	5		4	100 90
29	-		2	12 a P	2 X			
30				- 1992	2			
31				194 I.	665	*		21 A2
32	S.	SAA -			23			*
33	e.		8	30.2-35.2			50 12 12	100 100
34	a			31	a		0 8	
35	4		8				2 2	
36			-	:12		a na	- -	5
37		SAA		35.2-37.4	0.0		8	100 0
38	W 3	BOH @ 37.4'	-			$\vdash$		-0
30				~	1. 		N	-
40	11							
41	a	a a a a a			a			22
41		20 205 10 ² 0 2 20 20 20 20		100	5 590 ²⁵			
42			1.2		a - 9,8			
43							46 ¹⁰	
44		5 a 8 6		19 17				
45		# ⁰ #						
46	1		·	2) 	21 - 221 - 22 8 ¹¹ 7 6 ¹²	- 48 1	£ e	62
47	12						2010 1	5
48				10 D			5	**************************************
49				6			M	
50			1	$= \epsilon^{4}$	Ve e P	100	C .	
51		ана ст. 18. 19. 19. 19. 19. 19. 19. 19. 19. 19. 19.					8	X
52								~
53	17	n an	- • · •		10.5		e	
54			1	1	= 32 v		а 1	
55	3			10			1121	3
56	2. XX	2000 10 10 10 10 10 10 10 10 10 10 10 10		1.3 C 2	3	08	:	

001	COMP		CAL SEP	RVICES	êdina 's	1 E	Hole N	lo. Sheet 1	GS-9 of 2	-
nergy to	Serve You	Plant Wansley	SAL OLI		HOLE DEPTH	35.5'		SURF.ELEV.	772	2.7
	1	Gynsum Storage Facility	COOBD	INATES N	123764	10.6	E	202	7036.9	
		BEADING	- CONTRA	ACTOR	SCS		DRILL NO.	CM	E 550	
		HSA/HO Core NO SAMPI	- ES	4	 NO. L	D. SAMP	LES		) )	· · · ·
			COF	BE SIZE	НО	TOTAL	. % REC.		37%	
MATED					TOD	DA'	TE TAKEN	10/1	7/2006	
			M	x	DBI	LLING ST	ART DATE	10/1	2/2006	1
		S Milam BECORDER B Mudd APP	BOVED		DBI	LLING CO	MP. DATE	10/1	7/2006	
JHILLEP		S. Milan Recorden 11: Wadd	Sample	Stand	dard Penetration Test					115
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Con	nments	% Rec	R
0	772.70			25627	-	1.00	£″			
1		Light tan clayey SAND, very stiff, very dry	1	0-1.5	10-13-15	28		08Q		
-						1				1
2						2.0		. K		
3	0				3 N		118 - 25			
4							22 ·*	8	- 5 ¹	
-							14	907 - 80 - 80	6.6	
5		SAA	2	4.5-6	31-18-22	40	1.444		026 S	
6	3				5 - C					
7					18					
-		2				10			12 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -	
8	<i>b</i>							an Ini		
9		A A			-					
10		Red SILT, moist, medium stiff		- *			12			
			3	9.5-11	5-4-5	9		1.000	2.5	
11		White powdery SIL1, dry, medium sum							1	
12								3 8 K N	e_ 11	
13										
								1	1910 - 1	
14								° 8	A second	
15	-	Light Tan clayay SAND, very stiff, dry	4	14.5-16	50/1*	ref				
16		Begin coring @ 15.5'	- <u>Ľ</u>	1.1.0-10	- OUT	101	1			
47			1		1.1.1					
17										
18		Medium gray, slightly weathered interbedded GNEISS		15.5-					48	5
19	9							and the		
						6.0			-	
20							14 ¹⁴	8 0 S	l. de	1
21						e .				1
22				52.024500						
				20.5-					100	
23				20.0						1

SCU1	DRILLING LOG GEOLOGICAL SERVICES							Hole No. GS-9 Sheet 2 of 2			
		Plant Wansley	1 18 -1	A 15 The common of the		35.5	SURF.ELEV.	77	_		
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD		
25	9 1945-1	Dark grey augen GNEISS, slightly weathered					е ₁₀ (К	4			
26	e = ⁸	N 102 8		8	d a second	<u> </u>					
27			* 20	. Star		а (		100704340	616-923A		
28	i.			25.5- 30.5	1		2000 - 120 120	100	85		
29	(t.			<u>,</u> ]]			= n	i = a i			
30				21 2							
01	100					$\vdash$					
. 31				43.1	8						
32		Hard, competent	14	30.5-			a e ⁸ a	100	100		
33		n un ^{der K} ie v B		35.5							
34	*. 9					1	割		ŧ		
35		BOH @ 35.5'									
36			æ		8 8 8				60		
37								19 ⁶⁶ -	6		
38	-				81				0		
39				0.00				2			
40				9					2529		
41	°,				0.3.2						
42					12 5 5 698						
43	(? 		1 BX				15				
44							5				
45	_	¥					1				
46					14 A.	e e e		12			
47				a 0	1		200. 19. 551				
48				20 08	10			悲			
49				5 84j	2 - OM				17		
50						18					
51					5				-		
52					10						
53									6		
54									P		
55	1							1. 187			
56	1	10 10 10 SHORE 10 10 10 10 10 10 10 10 10 10 10 10 10			45° 805			9 E			

SOU"	COMP	ANY world	GEOLOGIC	ING L	OG RVICES			Hole No. Sh	eet 1	GS-10 of 2	
SITE	14-200	Plant Wansley	1 2 2 2 3	11 IUE		HOLE DEPTH	51.8'	SUR	F.ELEV.	76	1.4
LOCAT	ION	Gypsum Storage Facility	141 I.M.	COORD	INATES N	1238	583.6	E	202	7008.5	
ANGLE		BEARING		CONTR	ACTOR	SCS	D	RILL NO.	СМ	E 550	
DRILLI	NG METHO	HSA/HQ Coring	NO. SAMPLE	s	. 7.	. NO.	U.D. SAMPL	ES	C	)	
CASING	G SIZE	LENGTH		co	RE SIZE	HQ	TOTAL	% REC.	9	4%	
WATER	TABLE DE	ртн 33.65 Elev	T	IME AFTER		24 hrs	DAT		(2)、22年) - 22年)		
TYPE G	BROUT	QUANTITY		м	IX	D	RILLING STA		10/2	0/2006	
DRILLE	R	M. Hughes RECORDER T. Hartsfie	d APPR	OVED		DI	RILLING CON	IP. DATE	10/2	0/2006	
Depth	Elev.	Material Description, Classification and Rer	narks	Sample No.	Stan From To	dard Penetration Tes Blows	t N	Comments	and the	% Rec	B
•	701 40	n ang standar ang standar ang sa	1 - 1		1.1		e	a_1.2	11 A A	A.P.	
0	761.40	Dark reddish brown SILT with clay,					- 29 	11	5		14
1		white sandy lenses and pebbles		. 1	0-1.5	1-1-3	4				8. 6
2	#								))		
3										ethi i i	
			. ⁴		22	17				100	
4				18						19	
5	-	Stiff reddish brown SILT		2	45.6	4.6.10	16		. 1	131	
6					4.5-0	4-0-10	10		10		
7											
-	0					8 - 2					
8										Star II	
9	11					12 B				11	8.2
10	4	Saprolite, micaceous		-					「		22
11				3	9.5-11	5-15-20	35			- Cap 1	ñ
11									-	-	
12			- <u>5</u>	- × .					a de		5
13		6 6 8 8 8 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8							ST I		
14	1.42	a second s							8 m	1	171
		644				2				-	а 
15		SAM	[	4	14.5-16	5-10-11	21		-		
16						6					
17		· · · · · ·				÷					
18	11 - F	n" ×		å	59 19						
			la en j							94 g -	
19					-					843	
20		Saprolite and weathered rock			10 5 64	50/5				S	П. 135
21		and the second		5	19.5-21	50/5				10	
				100					аЧ.		
22									11 ( 1997)		
23						- 1			1	12	
24				1.1							

e gli

SOUTHERI COM Energy 10 Serve Y	DRILLI GEOLOGIC	NG L AL SE	OG RVICES		đ	Hole No. Sheet 2 of 2	GS-10	
SITE	Plant Wansley	41	-10- 		51.8	SURF.ELEV.	76	J
Depth Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	lard Penetration Test Blows	N	Comments	% Rec	RQD
. 25				•				-
26	Saprolite	6	24.5-26	23-23-18	20. 			
07	le e cec					10 I. 10	1.8	
21		•		1 eā si		2 ⁻		
28						а ж. к	25 141	
29	Rock fragments			1961 11				
30	Begin coring @ 30'	7	29,5-30	50/5				
31	Gray mica SCHIST with garnet and quartz throughout,		30-34.3	un air		19 8 17 10	70	40
32					-	19		100
33						21周		
34	64 av					90 		
35		$\vdash$			1. FO			
36			34.3-39.3			200 ₂ 0	100	50
37		a :		8			-	
29	Fresher with less weathering along fractures				10			0
					44			
39	a the second					2 ⁸		
40		5 0	39.3-44.3	19 (1) 11			100	85
41				¥1:			- 5	
42	2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2							
43			98 P.	ta a consector				
44								
45			44 3-49 3		1		100	88
46						22	100	
47	41							84 - 25
48								
49			=	, v		25 95		
50			40.0.54.0					
51			49.3-51.8	×		6 8 ²¹	100	80
52	BOH @ 51.8'	1				P.		
53								
54	8						(	
55	177 E 264 (2			182			Ean	
56			- 10	64 - 40 				ж. Ж.
-								

inergy to	COMP o Serve You	TWorld [®] DRILL GEOLOGIC	ING L	OG RVICES	6	a (* 86	Hole No	Sheet 1	GS-11 of 3	2.4
SITE	19 min 11	Plant Wansley	175	1	HOLE DEPTH	61.0	120	SURF.ELEV.	773	3.9
OCATIO	ON	Gypsum Storage Facility	COORD	INATES N	123914	10.5	E	202	7081.8	
		READING	CONTR	ACTOR	SCS	¥C. I	DRILL NO.	CM	E 550	
			s	13	NO, U.D. SAMPLE		#FS 0			1
	IG METHO!	NO. SAMPLE			NO, C	TOTA				-
JASING	I SIZE				TOD		TE TAKEN		71	-
WATER	TABLE DE	PIH		- COMP.	100		-		1	
TYPE G	ROUT		M				-		94, 15 - 1 8,	-
DRILLER	н	S. Milam RECORDER N. HOUDS APPR	Sample	Stan	dard Penetration Test		-			-
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Com	ients	% Rec	R
0	773.90									L
1				4 18				- K	-	5
2		Beddish brown elastic SILT with SAND (MH) soft		1-2.5	2-2-3	5		t) Angele		1.44
2			Ľ					n - 1- (r 2 a		1
3					P		UD taken @	<b>3</b>		
4							3.0-5.0 fee			
5		a terrar a succession de la companya	102	1 S		22	In offset ho LL-51 PI-1	le 7	1 8	
	10	Reddish brown SILT (ML), stiff	2	4.5-6	3-7-11	18	gravel - 0.3	1%	1	
6					8		sand - 26.4 silt - 32.9%	~~~ >	777 1 1 10	
7		et an					clay - 40.44	%		
8							6			
-					10	1			C.B.	
9						1	5	19 TO 19		1.8
10		Buff. Hard SILT (ML) with mica flakes, saprolite	3	9 5-11	22-50/2	ref	UD taken (	а		1
11			Ű	0.0 11	EL OUL		10.0 - 12.0	feet		
10				1 5 1			in offset ho non-plastic	le	1	
12	-						sand - 48.7	%		
13							silt - 42.6% clay - 8.7%	, ,	£	
14				-			21.1	1.1	1	
15		Light brown/reddish SILT (ML) with dark fractures			201 - E	12 10	se to *		1	
13	45 E (S	some quartz in fractures	4	14.5-16	2-4-5	9			e a	
16			-			34 - St	6			
17							110			1
18			32				1	98 19 10		
1.1	0		- I.a.,	1 11						
19										
20		SAA	5	10 5 21	2.25	6	ant.		\$** <u>;</u>	
21			5	19.5-21	3-3-5		* 		-	
22						2		and the	-	
22						1				
23						-	70		1. ¹ .	
24	0 0 2				50			0.00	1	

SOU1	HERN COMP	DRILLI GEOLOGIC	NG L AL SE	OG RVICES	in an	- w ana	Hole No. Sheet 2 of 3	GS-11	
	ing in the second se	Plant Wansley	NACORI Intel Intel	e nur 1995 - Martine - Microso	TOTAL DEPTH	61.0	SURF.ELEV.	<u>-11</u> 77	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25		Reddish brown SILT with mica flakes,				ľ			
26	national dis Alternational distribution dist	medium stiff —	6	24.5-26	- 3-4-7	-11	1		
27	and the second			alanga g S	ugar (				
	$\sqrt{C_{\rm eff}} = \frac{1}{2} \left( \frac{1}{2} + \frac{1}{2} $	and the second	Sec.				* 8 8		
20				enter en enter	el . (			lo I	
29		(1) And the second sec second second sec	a - regularia - y		а	10 - 10 (4		25 ¹⁰	0
30		SAA	7	29.5-31	0-5-4	9			1
31	* 1019* - 21			i in ng sasa	6 28 (P.S.)	8.18			÷
32								5 an	÷
33	-		11.				t a ⁿ D-3t	1.0	
34	5 1 C			1.4	an d			L 1	κ.
35	8 Y	SAA	-						- 5
36			8	34.5-36	3-4-4	8			
37	an a		14	n		200		24	
38						1		111	6
39	1			1 . M	112 J				P
40		SAA verv moist	-	4					
40			9	39.5-41	2-3-4	7		1.1	8
41			-	1 - N. ¹⁶ .	n				
42				23					
43	kji i								
44	- 7			1.1	1.5			-	
45		Yellowish orange SILT, very stiff with fractures and dark stains on fractures	10	44.5-46	9-14-31	45			a
46			Buil	Sec. at	i se santi	·;			
47				8	11.00				
48				14 M	na Si				
49			a . "		201 G				1
50	24	Yellowish orange SILT, hard, with relic banding	11	49 5-51	11-20-50/2	rof			
51				40.0-01	11-29-50/3				
52								1	-
53	100				le:				
54									5
55		SAA							-
- Distant	addition of the	and the second	12	54.5-56	41-50/3	ref	с 1	1	1.

SOUTHERN COMI	DRILLI GEOLOGIC	NG L	OG RVICES	8 5	0.3	Hole No. Sheet 3 of 3	GS-11
SITE	Plant Wansley			TOTAL DEPTH	61.0	SURF.ELEV.	773.9
Depth Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec F
57			÷.,				
58	5		and the second				
59		. 1	(*				
60	Vellowish orange SILT with mica flakes			2			
00		13	59.5-61	*: 84		8 8 8	15 -
61							9
62	4	1				* * * * * * *	
63						820 -	
64					12		
65			10		²	8 ⁸	
66		1				*	-
67						2 2	5. J. I.
68		1 100	÷.,			8 W 8	
69				25 82			- 85 - 85
70					- 1 - 1		
71				85 B	a.		
72				·		102	
73			3			<i>*</i>	a =
74			a c				9°
75							
76			×				
77							1
	-					w.	
78				188 <i>5</i>		1	-74
79							
80	4			2 V			-
81	The Manager and The Television					1	3.4
82	10 10 10 10 10 10 10 10 10 10 10 10 10 1						
83				21			
84			6	¥2. ".	- 18		
85							
86	-			22 10			12
87				5 32		1.0	
88			1				

OUT	COMP		AL SEP	RVICES			Hole N	lo. Sheet	GS-12 1 of 3	_
ergy to	Serve You	-World GLOCOGO		TTICLO		81.0'	1.1	SUPE ELE	v 77	32
TE	1.1				. HOLE DEPTH	4.0		SUHF.ELE	07471 4	0.2
DCATIO	ON	Gypsum Storage Facility	COORD	INATES N	123900	4.2			ME 550	
NGLE		BEARING	CONTRA	ACTOH		L	FO.		0	
HILLIN	G METHOL	NO. SAMPLES	·	17	NO. U.	D. SAMPI	.ES	44.171		T
ASING	SIZE		COF		04 hrs		% REU.	-		-
ATER	TABLE DE	PTH58.7' ELEV TI	ME AFTER	1 COMP.	24 hrs	DA1	ETAKEN		10/0006	1
YPE GI	ROUT	QUANTITY	M	×			AHI DATE		19/2000	
RILLER	R	S. Milam RECORDER A. Grissom APPRO	Sample	Stan	DHIL	LING CO	MP. DATE	-	1 234	1
epth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Cor	nments	% Rec	
0	773 20	a la lay				-				
Ť	110.20					12			3	Γ
1		Reddish brown, clayey, slightly sandy SILT,			32					
2	72	very stiff	1	1.0-2.5	7-8-8	16				
3										
Ŭ	2			-					e seri	
4										
5		Very firm, layered light gray/yellow/red, dry, sandy		150						
6		silty highly weathered rock Saprolite	2	4.5-0	13-10-11	21				
-									1 m. 1	
7				31.1						
8	1				23				0	1
9		ະ ເປັນ 10 M			- 10.0					
-	100				- ² -			5 II 39 8		
10		SAA	3	9.5-11	10-19-27	46			-	
11				eno tar					•	
12						a 1				Ŀ
									15 - 2 - 3	
13	10									
14				12				ē _ 3		<u>()</u> (
15		SAA with some mica								
			4	14.5-16	10-18-32	50			4 4	
16	-	а	-							
17	-			54				1242		
18	- 0 - a		2	12 03				173	1	
			3	2	2					
19					5 4					
20		Very dense, layered light gray to red to black, dry,	E	10 5 21	13-28-50/4	rof			14.1	
21		gneissic banding and minerals	5	19.5-21	10-20-00/4				a Sila	
			1						A LOUGH	
22	-							71		
23					2				- Jak	

OUT	HERN COMP	DRILL GEOLOGIC	ING L	OG RVICES	9 N	5 <u>8</u> 8	Hole No. Sheet 2 of 3	GS-12
SITE	19. Jan 19	Plant Wansley	t	and and a second se	TOTAL DEPTH	81.0	SURF.ELEV.	77
Death	Elou	Meterial Description Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec
Depin	Elev.	CAA with mice lover		14				
25	an the state		6	24.5-26	50/4	ref	ale e <del>sta</del> rra da	20.70 × 10.10
26	-		-	7 <u>0</u>				2
27			1	8 T.	14			
28	la Silan				24	-	88 - 15 187 - 187	a
29	(va)		al a s				19 ₄₀ - 12	
30	11	SAA, with mica	7	29 5-31	50/4	ref		8
31	1993	17 A. A. A. S. M.		20.0 01	00/4			6
32	-							
33	27			2			2 F	8
34	8			-	а, 14 а		96 B	
25		SAA more silty	-			20	5. ^{8 1}	
00			8	34.5-36	0-4-5	9	10 N 10 N	<i>≈</i> ⁿ
30				1	a n			
37					8		*	121
38	<u> </u>					10. 1 1945		
39		e B				12		
40	6-18- <del>6</del>	Firm, layers of orange/red/black, dry, silty sandy highly weathered Saprolite with small mica flakes	9	39.5-41	3-6-8	14	U 181	
41		-		10	8	8.	N 8	
42				•	Æ		· · · · ·	
43							11 N 2004	
44			8			1		
45		SAA		1			ŝ	
46	Q	a construction and a second	10	44.5-46	31-10-8	18		
47					10 ²⁰ - 1		.4 .+	1
48								
40						-		12
50		Very dense, layers of brown/red/orange/black	-	-				2.2
51		and mica, dry, sandy silty highly weathered Saprolite (abundant mica)	11	49.5-51	11-30-31	61		
52	12			30	¥		a ²	
52	а. С				10 RH-10858			
55								1
54	-	CAA plug di of worthorod quate	-	-			ж   В	eu 2 (
55	in the second	SAA plus ~4 of weathered quartz	12	54.5-56	6-6-11	17	1 A. A.	2

iou1	HERN COMP	DRILLI GEOLOGICA	NG L	OG RVICES	· · · ·		Hole No. Sheet 3 of 3	GS-12	3 ° -
		Plant Wansley			TOTAL DEPTH	81.0	0' SURF.ELEV.		3.2
Depth	¹ Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57	¥.	237 34		1					
57	1. 1.1 ^{.1.4}		20144				1. 19 C	4 (1)	
58	1	4 A A A A A A A A A A A A A A A A A A A		35					
59	101	20 		# E	128 ¹			-	
60		Very dense, layered red/orange/brown/black,		50.5.01	44.00.40			0 	
61		fairly dry, sandy silty weathered Saprolite and mica with several large rock fragments	13	59.5-61	11-26-46	12	an Sa 👘	3	
60								8	
02	2				23				3
63									
64						31 - 5 40		-	i la A
65		SAA			10 50/4		125	22	52
66	1		14	64.5-66	12-50/4	rer	* 2	14	
67		× ×				-		1	
07	2					- 1		-	
68					8				
69	6				a × -			1 a a	
70		SAA	15	69 5-71	22-50/4	rof			
71	-			05.5-71	22-30/4	101			
72					-				
70			1 2	橋	8 8				
73		3 m 2		1		2		-	
74	100	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		10	a		5 S	٠s.,	
75		Light brown /grey hard, dry Saprolite with banding	16	74.5-76	19-50/4	ref			
76				т.	¥0				1
77		1 8 g.s. 1 g.s.	$\pi^{-2}$	-					
78		20 X						a	
10					50 E	1		1.1	
79	0	SAA, very stiff	17	79.5-81	6-9-12	21			
80			-					- a-	
81		BOH @ 81'	-					i si'	
82							n) i	1.	
83									
84					а 19		101 AN	-	
85							8	1	
86							12	1	
00							8 1		
87		-			82 		a w 🕸	1	
88	1.1								

Form GS9901 7-26-2004

mergy	COMP COMP	TWorld" GEOLOGIC	AL SE	RVICES	с 2. й ²		Hole No.	Sheet 1	GS-13 of 2	
SITE	91. II	Plant Wansley	4		HOLE DEPTH	37.	5' S	URF.ELEV.	780	).6
LOCATI	ON	Gypsum Storage Facility	COORD	INATES N	12372	95.0	E	202	7246.4	
ANGLE		BEARING	CONTR	ACTOR	SCS	1.	DRILL NO.	CM	E 550	. 8
DRILLIN	IG METLIO	HSA/HQ Cara HS SAMPL		3	NO. U	J.D. SAM	PLES	<b>.</b>	)	
CASING	SIZE	LENGTH	CO	RE SIZE	HQ	тот	AL % REC.	1	00%	
WATER	TABLE DF	РТН 16.7' ELEV. Т		R COMP.	24 hrs.	D	ATE TAKEN	10/1	0/2006	
TYPE G	ROUT	QUANTITY	м		DR	ILLING S	TART DATE	10/1	0/2006	
DRILLE	R	M. Hughes RECORDER R. Mudd APPR	OVED		DR	ILLING C	OMP. DATE	10/1	0/2006	
			Sample	Stan	dard Penetration Test		1	aleren !	HUN .	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comm	ents	% Rec	RQ
0	780.60			1					1962 (A) 	
1	- 1	Light readish brown elastic SILT with sand (MH), dry, soft	1	0-1.5	2-3-1	4	Bulk sample	taken		2.7
						8	at 1.5-3.0 fe	et	The second	
2	100 B						sand - 21.59	%		
3	- **			- 1			silt - 32.2%			
4							Ciay - 46.3%	•	200	
10 mm						1.	non island	- 4 + 4 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +		1.20
5		Hed micaceous sandy SILT (ML), moist, Imedium to stiff	2	4.5-6	3-3-6	9	sand - 40.9	%		
6				1			silt - 39.1%		1.000	
7	14.500						ciay - 20.0%	0	1- j.	
							1	5 . 19		1
8				2× 4	all a				- 1	
9		1								
10		Reddish brown & black micaceous SII T						e 1 2		
10	24	moist, medium to stiff - flakes apart along planes	3	9.5-11	2-2-7	9			25.4	
11		relict bedding							1	1
12								2		
10	4	TOR @ 12.5'				-			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-
13		Grey to greenish grey, hard interbedded GNEISS	-	12.5-14			1.5/	1.5	100	9
14		and SCHIST with abundant pyrite				-	<u> </u>		1	+
15								1. 3.		
10					1 S			natar Mila A D	-	
10		SAA, rust - water		14-19			5/:	5	100	9
17		27 E 9		8						
18	8 ¹⁹							1.1	121	
10			15		10- 1			~	19	1
19			-	1		+	112	4		1
20										
21	10.00	9 10 10 10 10 10 10 10 10 10 10 10 10 10							1.0	4
		SAA		19-24	4.7/5				100	1
22			<i></i>						1 I.	
23							1		11	
			1				1 -			

Damage is Some Wave Wind         District Waneley         TOTAL DEPTN         37.5         Supplementation           STE	EV. 78
Diff         Link is writing         Difference         Differen	% Rec F
Deph         Eev.         Material Decipion, Case-rational and Hermins         Prior. 10         Down         It         Owner         It           25	
25	
26	100
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	100
28	
29	24 - R
30	
31     SAA     29-32.5     3.5/3.5	
32	100
33	
34	
35     SAA     32.5-37.5     5/5       36	·
36	100
37     BOH @ 37.5'       38	
38     39	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(±)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	8
44       45       46       47       48       49	
45       46       47       48       49	
46       47       48       49	-
47       48       49	
<u>48</u> <u>49</u>	
49	
	8 1 - 2
50	
51	
52	
53	
54	

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SOU1	HERN COMP	TWorld [®] DRILL GEOLOGIC	AL SE	RVICES	-	е 15-3	Hole No. S	heet 1	GS-14 of 2	
SITE	tar di se	Plant Wansley		50 ^{(†}	HOLE DEPTH	44.5'	su	RF.ELEV.	737	7.7
LOCATI	<b>ON</b>	Gypsum Storage Facility	COORD	DINATES N	12394	60.6	E	202	8315.3	yas A
ANGLE		BEARING	CONTR	ACTOR	SCS		DRILL NO.	CM	IE 550	
DRILLIN	IG METHOD	HSA/HQ Core NO. SAMPLE	S	2.	NO.	I.D. SAMPL	.FS	. (	)	a.e.
CASING	SIZE	LENGTH	co	RE SIZE	HQ	TOTAL	% REC.	Ş	3%	
WATER	TABLE DE	ртн20.4' ELEV Т	IME AFTE	R COMP.	TOD	DAT		10/1	9/2006	
TYPE G	ROUT	QUANTITY	N	lix	DF	ILLING ST		10/1	8/2006	
DRILLE	R	S. Milam RECORDER A. Grissom APPR	OVED		DF	ILLING CO	MP. DATE	10/1	9/2006	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comment	s	% Rec	RC
0	737.70			1			'a d'		1	
14					1		:			
-	-	No recovery	-							
2			1	1-2.5	25-50/4	ref			1911 (A.) 4., 11 (A.)	2 I I I
3							5. ⁸		1 · · ·	
4		a contraction of the same					и _н т.,			
F	- 1	Medium grow to dark brown fairly day. Soprelite	-			10			S 1	
5		Medium gray to dark brown, fainy dry, Sapronite	2	4.5-6	50/4	ref	2	* T	2 -	4
6			-							20
7	* (2)	Begin Coring @ 6.5'	1		10 12			F		
8		Dark to medium gray, weathered interbedded GNEISS		6.5-9.5	2		3.0/0.8	3	26	0
0		and SCHIST; steep fractures; heavy iron staining; y low recovery								
			-						-	_
10				19	14 N			Į.	10	
11					<i>u</i>					
12				9.5-14.5	17		5.0/1.3	3	26	0
13							-		1	
	12								S	
14								- 91-	1	1×
15										
16	3				54		D	1	6	
17							from 6.5' t	o 25'		
10							Restarted at 25	coring	121 1	
10		k k			1					
19										
20				1 I					-	
21					20					1
22								- Alexandre		
22	-							1		
23	-								- <u>-</u> -	
24								_	-	

SITE         Plant Wansley         TOTAL DEPTH         44.5'         SUFF.           0x90h         Elw         Mainial Deciption, Classification and Reinasa         He.         From To         Bloos         N         Commente           25         Dark gray, slightly weathered GNEISS; v. fractured heavy ion stating:         Bloos         N         A.5/4.0           26         Dark gray, slightly weathered GNEISS; v. fractured heavy ion stating:         Bcomes light gray to almost while around 28',         I         I         4.5/4.0           27         Image of the stating gray to almost while around 28',         I         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the stating gray to almost while around 28',         Image of the sta	GS-14	Hole No. Sheet 2 of 2		n i soudoutsisse e - D -	OG RVICES	NG L		HERN OMP	SOUT
Depth         Description         Maximal Description, Classification and Remarks         Service         From To         Books         N         Commertie           25         Dark gray, slightly weathered GNE(SS; v. fractured heavy ion statining;         Books         N         A.5/4.0           26         heavy ion statining;         Becomes light gray to almost white around 28°.         25-29.5         I         I         4.5/4.0           27         I         I         I         I         I         I         4.5/4.0           28         I         I         I         I         I         I         4.5/4.0           27         I         I         I         I         I         I         4.5/4.0           38         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I	ELEV. 737	SURF.ELEV.	ртн 44.5'	TOTAL DEPTH		en 194-20 19 - 1942 19 - 1942	Plant Wansley		SITE
25       Dark gray, slightly weathered GNEISS; v. fractured heavy iron staining;       25-29.5       4.5/4.0         28       Becomes light gray to almost white around 28',       25-29.5       4.5/4.0         29       30       1       1       25-29.5       4.5/4.0         30       31       5.0/4.5       5.0/4.5       5.0/4.5         33       34       35       5.0/4.5       5.0/4.5         34       34       34       34.5-39.5       5.0/5.0         38       39       40       41       42       extremely weathered zone from 42 - 42.5'       39.5-44.5       5.0/4.7         44       BOH @ 44.5'       5.0/4.5       5.0/4.7       5.0/4.7         48       49       1       1       1	% Rec RQD	Comments	on Test s N	ard Penetration Test Blows	Standa From To	Sample No.	Material Description, Classification and Remarks	Elev.	Depth
26       Dark gray, slightly weathered GNEISS; v. fractured heavy iron staining;       25-29.5       4.5/4.0         28       29       25-29.5       4.5/4.0         28       29       25-29.5       4.5/4.0         29       30       25-29.5       5.0/4.5         30       31       5.0/4.5       5.0/4.5         33       34       29.5-34.5       5.0/4.5         34       34       34.5-39.5       5.0/5.0         38       34       34.5-39.5       5.0/5.0         38       39       39.5-44.5       5.0/4.7         41       41       44       BOH @ 44.5'       39.5-44.5       5.0/4.7         48       49       49       49       40       41.5       5.0/4.7		8. N				ger -	$(e^{-it})_{12} = e^{-it} e^{$		25
28       neary not stating.       25-29.5       4.5/4.0         29		ar a			a ce A	e. X.	Dark gray, slightly weathered GNEISS; v. fractured		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	88 0	4.5/4.0		La setting	25-29.5	1994 - I	Becomes light gray to almost white around 28',		26
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2	а. П. р.				002 1035			27
29	19 10		1		and Server at			-	28
30 $31$ $32$ $34$ $32$ $34$ $32$ $33$ $34$ $32$ $33$ $34$ $33$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $5.0/4.5$ $5.0/4.5$ $38$ $34$ $34$ $34.5$ $33.5$ $5.0/5.0$ $5.0/5.0$ $38$ $39$ $40$ $41$ $42$ $extremely weathered zone from 42 - 42.5' 39.5 - 44.5 5.0/4.7 43 44 80H @ 44.5' 45.5' 5.0/4.7 46 47 48 49 49 44.5' 45.5' 45.5'$	in a T	e station data		and the second sec	alle son anna agus anns an staite	er cett 11-46	A second GI consider space scheduler for the second space scheduler and space sched	12 C 112	29
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						Te -		24	30
32       SAA       29.5.34.5       5.0/4.5         33	2 2 1 2 4							症 "	31
33       33         34       35         35       36         36       37         38       34.5-39.5         39       34.5-39.5         40       39         40       41         42       extremely weathered zone from 42 - 42.5'         39.5-44.5       5.0/5.0         43       44         BOH @ 44.5'         46       47         48       49	90 20	5.0/4.5			29.5-34.5	1	SAA		32
34       35       34         35       36       34,5-39.5       5.0/5.0         38       39       34,5-39.5       5.0/5.0         38       39       39       34,5-39.5       5.0/4.7         40       41       39,5-44.5       5.0/4.7         42       extremely weathered zone from 42 - 42.5'       39,5-44.5       5.0/4.7         43       BOH @ 44.5'       44.5       5.0/4.7         45       46       47       48       49		8 . E				÷		-	33
34				2-	a. • )	1		19. m.	24
35       36       37       34.5-39.5       5.0/5.0         38       39       34.5-39.5       5.0/5.0         38       39       34.5-39.5       5.0/4.7         40       41       42       extremely weathered zone from 42 - 42.5'       39.5-44.5       5.0/4.7         43       44       BOH @ 44.5'       5.0/4.7       39.5-44.5       5.0/4.7         45       46       47       48       49       44				0	1			3	34
36       37       34.5-39.5       5.0/5.0         38       39       39       34.5-39.5       5.0/5.0         40       41       41       42       44       42       44       5.0/4.7         43       44       BOH @ 44.5'       39.5-44.5       5.0/4.7       5.0/4.7         45       46       47       48       49       44.5'       45       45			• · · · · · · · · · · · · · · · · ·	V	kara jas	1 2 2			35
37       34.5-39.5       5.0/5.0         38	100 50	5.0/5.0	s 12				SAA	-	36
38	100 50	5.0/5.0		Ran ora	34.5-39.5		A second se	- party - man	37
39		8 I N N						10.11	38
40					a a ⁿ 1 - a	1		£	39
41		n ¹²							40
42       extremely weathered zone from 42 - 42.5'       39.5-44.5       5.0/4.7         43					5 ²⁸ 0 1			6	41
43       44       44       45       46       47       48       49	94 35	5.0/4.7			39.5-44.5	-	extremely weathered zone from 42 - 42.5		42
44     BOH @ 44.5'       45				ata -	e i E			1	42
44     BOH @ 44.5'       45     46       47     48       48     49				*		1.1			43
45 46 47 48 49				1.12	1	-	вон @ 44.5'		44
46       47       48       49				19	en a	-	and the second		45
47 48 49					2010 - 11 1240 - 11			-	46
48 49		а на на в						с. — с. 1. — с.	47
49						- 12			48
								Q	49
50				1		1			50
51	s-	15				1 2		θ.	51
52						1.		: / 1992	52
53					10 gr	1			53
54		*						1	54
55					10.02	2			55
56	Solar Contraction		124		an an an		and a second second Second second		56

-26-2004

ruo	COMP		AL SEF	RVICES	e e e		Hole N	No. ( Sheet 1	GS-15 of 2	
ITE	o Serve You	Plant Wanslev			HOLE DEPTH	41.3'	a	SURF.ELEV.	719	9.7
11E		Gypsum Storage Facility	COORDI	NATES N	123961	7.3	E	2028	3782.9	1
OCATI	ON		CONTRA	ACTOR	SCS	C	RILL NO.	CM	E 550	S.
NGLE			s	5	NO. U	D. SAMPL	.ES		-	
RILLIN				E SIZE	HQ	TOTAL	% REC.	9	7%	Part .
CASING					24 hrs		TE TAKEN		1993	10.5
WATER			M	x	DBI	LLING ST	ART DATE	10/1	9/2006	1
TYPE G		M Hughes BECORDER A Grissom APPR	OVED		DRI	LLING CO	MP. DATE	2000-11 - 11	Van 11	The state
HILLE	н Г	W. Hughes Recorden <u>A. andoom</u> Atta	Sample	Stand	ard Penetration Test				\$ • 1	1
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Co	mments	% Rec	3
0	719.70	Topsoil to 0.5'			4			8		L
		Stiff, reddish brown, fairly dry, slightly sandy SILT	1	0-1.5	3-5-6	11		1. 13 <u>77</u> 4 -		
1		with lew peoples		0		1000			· ·	j.
2								1	10	
3	1									
	1							Ē.	an ai g	
4	14	the second second		18 G					12	
5		Stiff, red and yellowish orange mottled,	2	4.5-6	3-5-6	11.		10 / MIEL	18.1	÷
6									in the second	
7	I							8	84 12 1	
1	1					5			993	
8				3	× "		723		12.0	
9	10 A								reg 5	1
10	1.0	Soft, orange brown, slightly moist, clayey SILT		· 1		1.85	-			
	10 1000 C	with trace of pebbles	3	9.5-11	1-1-1	2			1.1	
11	5			5			~ ~	1. 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		
12						1.1			icar 1	A REAL
13					2					
				° 8				fac.	المشترية	
14							-		11	
15		Stiff, light tannish gray to red orange, slightly damp,	4	14.5-16	1-1-10	11	27		2	
16		highly decomposed rock		ALLER THE BOTH	640500020064				1.2 2	
17										
17	10 m			12				Service and	2 -	
18	-	-						1.000	- 19 T	
19									- 2	
20		Dense, gravish brown, dry, silty sandy highly		-		a		*	13 0	
20		weathered rock (Saprolite)	5	19.5-21	10-21-21	42	25	- 10		
21	-	TOR @ 21'	-	-	1				1	+
22		Grey to dark grey augen GNEISS		20 7 . 22 0					100	
23		with calcite laminations		20.7 - 23.3				0 ee 11 sea	1.00	×
20									8 B	

SOUT	HERN COMP	GEOLOGICA	GEOLOGICAL SERVICES						
SITE		Plant Wansley	1.9 + 2.4	99 1	TOTAL DEPTH	41.3	SURF.ELEV.	7	
Depth	Élev	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	
25		Grev to dark grey, hard augen GNEISS		23.9-28.9		ан — ж- Ц	8	92	
26		with calcite laminations		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		-	10 10 10 10 10 10 10 10 10 10 10 10 10 1		
20		ೆ ನೆಯ ಸ್ಥಿಗೆ ಕಿಂಡ				1.5		-	
27	1				а ¹ а 50				
28					144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144			2	
29	1 - <u>-</u>			23*		-	a	- 20	
30	1000		- a *	28.9-33.9	10		*	96	
31				9 - Try	8 978525 - 12				
32				40 	=	* 8			
33					57		2 19 19	8	
34	A				8 - 19	-			
35		1				1.00	10 B		
36	21			33.9-38.9	N		4) (5)	100	
37					8 			1.1	
38	1.1				÷	s s	×		
20	- 8 F	a di se ante de la companya de la compan					0	-	
39		2 4 2 24		38 9-41 3			3	10	
40									
41						13 m	е		
42	ä	BOH @ 41.3		-			*		
43							а ^ж		
44							6 g	12	
45							43 18	111	
46					1	- 1885 - 14 - 1			
47							54 ¹² .	18	
48									
49			1		13				
50							30. 21		
51	6			8 8 8				5	
52	1-3 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-						18 ¹⁸ 2		
53				-					
54		1			- C				
55					8		20 20		
56			-				8 <u> </u>		

	COMP	GEO GEO	LOGIC	AL SEP	RVICES	4 2004 - B	2	HOIE IN	Sheet 1	of 2	東
nergy to	Serve You	Plant Wansley			in the second		40.1	15	SURF.ELEV.	710	0.5
SILE		Gynsum Storage Facility	3450 T	COORD		123920	5.2	F	202	9067.9	-
OCATIO	UN 1	Gypsull Storage Facility	1	CONTR		SCS			CM	E 550	
ANGLE			CANE: 54	CONTRA			TO SAME	FS	1	2	E
DRILLIN	g method		. SAWPLES		0	HO 100	TOTAL	* BEC		97%	141
CASING	SIZE		TH			24 bre		TE TAKEN	10/1	9/2006	
WATER	TABLE DE	PTH ELEV	III		ч сомр	24 1115			10/1	8/2006	8
TYPE GI	ROUT		40000	M	*			NO DATE	10/1	19/2006	1
DRILLEP	R	M. Hugnes HECONDER A. Grissom	АРРНО	Sample	Stand	lard Penetration Test				10/2000	Ē
Depth	Elev.	Material Description, Classification and Remarks	1	No.	From To	Blows	N	Cor	nments	% Rec	+
0	710.50	Topsoil to 0.5'							11 - 12 12	MAN -	
-	110.00	Reddish brown, sandy slightly sandy SILT,	. IC		0.1.5	105		1	March 1	1.14	5
1	····	fairly dry, firm		1	0-1.5	1-3-5	l °			4	
2					34		2. 2P		32		
3		입 문제 문제 문제 문제 문제							3. ³ . 1		
-				8.				108		1.124	
4	-						8 53	UD taker	0	:470	
5								4.0 - 6.0	feet in		
6		Very stiff, reddish brown and yellowish orange	8	2	5-6.5	6-12-14	26	offset no	e		1
0	-	trace of pebbles								1.59	
7						825 SZ			N		
8	3 8										
	p.									tin (v.	
9		ಇನ್ನು ಸ್ಮಾರ್ತ್ಯ	- +2		18						
10	2	Chiff blook/brown to vollow fairly day sitty SAND			- 2					1	
11		and weathered rock (layered)	-	3	10-11.5	4-5-6	11		909		
					- n.					-	
12								UD take	n @	- a- 1	
13	×		1 1					12.0 - 14 offset bo	.0 feet in	1. 2	
14								Shoothe		121 12	1
			Ť		-					2	
15		Very loose, tan to light yellowish brown, slightly				19			1.		
16		moist, silty fine grained SAND		4	15-16.5	WOH-2-2	4				
17		0 ¹¹² 111 111 111 111		-			1 x			12	
			4							-	
18									3	2 - 1 - ³	
19	8								Ĵ		
20	1					× .					
20		SAA, loose			1		220	a ³⁴	(144) 	1 23	
21				5	20-21.5	3-2-5	7		- 19 ¹		
22					1					6	
23					A)			12	1 1 1	e 1 🚞	

OUT	HERN	DRILLI GEOLOGICA				61	Hole No. ( Sheet 2 of 2	GS-16	_
ITE	Serve You	Plant Wansley	- 12.97 - 12.96	5 - C	TOTAL DEPTH	40.1	SURF.ELEV.	710	
Depth	Elev	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
Depui	LIOV.		a 1973 2	0.57.57			1	1 A 1	54
25	- 4	Very dense, gray and dark brown layers, slightly moist, weathered rock and clayey fine sand	6	25-26.5	26-50/3	ref		a -	
27	8. j.j.(†	Begin coring @ 26.9'			4. 		/ 		
28	a Tarihan	Medium gray, hard mica SCHIST with multiple fractures and iron stains in the first	е ¹² 19 ₂ .	26.9-30.1	a la		3.2/3.0	93	25
29	6	2' with small quartzite veins			e ant 0120 - 21			25 12	1
30									
31	31 o			5 - C	ant di ^{or}		6 - ⁶ -		- 14
32				00 4 05 4	a 19		5 0/4 0	08	50
33		SAA, less fractured	1	30.1-35.1			0.0/4.0	30	
34	ан 11			a u	8		÷.,		
35	28		_	-					-
36				- 2.,					). I±l
37	24				A REAL ME		а — стра		
38				35.1-40.1			5.0/5.0	100	30
200		I ANY IS IN ANY IS IN INC.			1808 19		11 8		P
39					-				
40			10						10
41	1		1		*				
42			1						
43	-								
44				20 - 24 24				1 .	
45		-		2			8 K		2
46				14	16/5481	1	53 -	13	
47	22	17 A 18 A 50		3	8.3 N		2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
48					41				
49		2 2 2 2 1 1	a ^{ft}		1. 15				
50		2 # 2 #				41	52		
51						1			3
52					- 11 - ₁		25 ⁰⁴		
53							а 2		
54					1 I.		14 II 10		
55							5 S. a		T
		tate de la recta desta en electrica. It	11112		8	1.14	15 11 15 11	1	

TUOS	COMP	BNY GEOLOGI		RVICES		88	Hole No.	Sheet 1	GS-17 of 2	
arry to	o serve You	Plant Waneley		the second	HOLE DEPTH	50.4	SI	JRF.ELEV.	756	6.1
SITE	NH .	Guneum Storage Escility	00000	INATES N	123707	1.7	\$ F	2027	7569.5	
LUCATI	UN	aypsum storage Facility		ACTOP				CM	E 550	Ţ
ANGLE		BEARING		7	000	D. SAL	LE6~	0	1	iller.
URILLIN	NETHOD	NO. SAMP.		/	NO. L				4%	
CASING	SIZE		C(	B CONT	n <b>u</b>			10/5	5/2006	
WATER	TABLE DE	ELEV.	IIME AFTL			D/	ART DATE	10/	5/2000	-
TYPE G	ROUT	OUANTITY	h	Alm.	DR	LING S	MP DATE -	10/	3/2000	-
DRILLE	R	B. HIIPOVICI RECORDER I. Millet/R. Mudd APF	HOVED _		dard Peneteri	LING C	JUNE'. DATE	10/		T
Depth	Elev.	Material Description, Classification and Remarks	Sampk No.	Sta. From To	Blows	N	Comme	ints	% Rec	Ļ
0	756 10	2. /	Γ		2		10 - H			ſ
	. 50, 10	0.2" Topsoil Pod Sil T with cond (MIN-Instantion	1.	0.15	2.2.2					T
1	L	pebbles, trace mica	1	0-1.5	2-3-3	l ° I		·	it:	ľ
2					1	1 1	LL-55 PI-22	s _ 3		I
3	2	and a start the second		10		1 )	gravel - 0.3%	6	T. h	1
-		1		н. П. 1	-	$\left  \right $	sand - 18.19	%		1
4	10 22	SAA		1			clay - 40.1%		6.2	1
5			2	4-5.5	4-4-6	10			alan seta	
6	* 18 C			1.55		1				1
-						1 1			1 ²¹	-
7						1 - 1	1			1
8					V B V	1 1				
9					2 1122 IN		t			
4.7		Orange & tan sandy SILT (ML), dry, trace mica,		9-10 F	2-2-4	7	6121	8 - 14 1	dia ar	1
10			3	0-10.5	2-0-4	E.			÷	
11		its a fighter set	Γ	1					1	
12								8 J.		1
10		a la anti di secondo di	1		and the c		2			1
13				n 8.)	· · · · · · · · · · · · · · · · · · ·			T		
14		SAA, black, mottled		-	8 -			i Barra	-	
15			4	14-15.5	1-2-3	5	non-plastic		-	1
16				1						
10	-				1					
17				1	8					1
18										1
10							1			
19	1	Orange & white clayey SILT, dry, trace mica,	<b>—</b>	10.00-	0.00		1 a a - 1			
20		Ineavy black mottled	5	19-20.5	2-2-2	4				
21	11 1						1			1
22					1					
-6	1						1 2		. ¹	
23		- 1 - A - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			17 W 27					
24								1.14		

SOUT	HERN	DRILLI GEOLOGICA		OG RVICES		0	Hole No. Sheet 2 of 2	GS-17	_
SITE	Serve You	Plant Wansley			TOTAL DEPTH	50.4	SURF.ELEV.	756	C
E	1954		Sample	Standa Erom To	ard Penetration Test	N	Commente	% Par	BOD
Depth 25	Elev.	White & tan sandy silt (ML), moist, trace mica, trace residual schist form, black, mottled	6	24-25.5	2-2-5	7 n	ion-plastic and - 42.9%		
26				1	n an an faitheac an an an	S	silt 51.5% lay - 5.6%	1.11 1.11 1.11	
27				to a chi		22			
28								8 889 - 10	1
29	2010	Brown & white SILT. saturated, then	-	F I	<u>.</u>		2 C C C C C C C C C C C C C C C C C C C	*	1
30		fractured gneiss last 1" TOR @ 30' - Begin Coring	7	29-30.5	6-50-6	ref	an -		Ļ
31			in test	1			8 8	100	5
32	÷.	Grey very weathered fractured GNEISS		30-33.4	3.4/3.4	(2.048). ∦ ≋			
33							1 a *		
34							8 2	1.15	
35					N - N	- × 1			
36				33.4-38.4	4.3/5		1	86	95
37				12			24		-
38	1.1								
39	4) (C. 19) (C. 19)			-	建花 选	$\square$	**		Γ
40		Grey augen SCHIST hard, fresh, iron staining along fractures	1		(		9		8
41				38.4-43.4	4.9/5			100	9
42							10		
43	13						20 ⁻²³		L
44	<b> </b>	-	Γ				1		
45	. <u>x</u>						7 8		
46	-		$]^{(n)}$	43.4-48.4	5/5		283 12	100	6
47									
48	11 A.		L						L
49		SAA		48.4-50.4	2.3/2			00	
50	-	BOH @ 50.4	1			-		86	
51	-				ж		2 a. 2		1
52	$\mathbf{T}$	- "5 a 34 - 1			1		10 10 10 10 10 10 10 10 10 10 10 10 10 1		
53	1	144					94 		6
54	1								T
00	+			1		1	5 S	1	1

-	SOUT	HERN COMP	DRIL Borld GEOLOG		G LO SEF	OG RVICES	1, 1 - A -		Hole N	lo. Sheet	G t 1 o	S-18 f 2	
1	SITE	and the second	Plant Wansley		12 5		HOLE DEPTH	32.5'	1	SURF.E	LEV.	731.	.6
	LOCATIO	ON	Gypsum Storage Facility	C	DORD	NATES N	123834	2.8	E		20276	638.3	
	ANGLE		BEARING -	C	ONTRA	ACTOR	SCS	0	RILL NO.		CME	550	
-	DAILLIN	G METHOL	NO. SAME	LES		2		D-SAMPL	ES	-	. 0_		
	CASING	SIZE	LENGTH		COF	RE SIZE	HQ	TOTAL	%'REC.		. 95	%	
	WATER	TABLE DE	отн 15.2' ELEV	TIME	AFTER	COMP.		DAT	E TAKEN		1	an l	1
1	TYPE G	ROUT	QUANTITY		M	x	DRIL	LING STA	RT DATE	0 	10/4/	2006	
	DRILLE	R	B. Filipovich RECORDER L. Millet AP	PROVE	D		DRIL	LING CO	MP. DATE		10/5/	2006	
ł		1.5	the stat Residution Of collection and Permitia	S	ample	Stand:	ard Penetration Test Blows		Cor	nments	tertingse (H	% Bec	ROD
ł	Depth	Elev.	Material Description, Glassification and Hemarks	-		rion to	Diowa				6.5	70 1100	
.0	0	731.60	Topsoil removed by bulldozer Bed and Tap silty CLAY, dry	$\rightarrow$	_		110 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	811			-	-	- 7
	1		ned and ran sity ochr, dry		1	0-1.5	2-5-2	ref		С. у. — .	-	-	
-	0			H							<u> </u>		11 - 200
ł	-										-	14	
1	3			1	-	2.1		1.1			С. 1994	(h)	
ł	4	101	100 H						50.a		a a	14	
	5								*w*				
0 <i>0</i> 8		-	SAA, abundant mica		2	5-6.5	12-17-30	47		201 43 1	. 3	a.	
ł	6				-	0 0.0	12 11 00					20	
	7	-		1	-					10	4	Mar. F	
-	8		Begin coring		2	5						and the	
12	a									=±0			
đ			Fractured, weathered black and white augen GNEISS			75.122			5	7/5 7		100	47
	10		fractures ~30°, 3-6" b/t fracs			7.5-12.2			J				
	11										1		1.11
	12	1			5					-5	÷Ĺ		
	10	<b>X</b> .		ŀ						2	1	1-1-1	-
	13										15	1.1	
	14			ž		2					1		81
. }	15		SAA	× 1		12.2-17.5	a		5	.3/5.3		100	73
	16	8									ł.	5 10	(tg.).
						do "			1		Î	· * * *	
	17	-							- E	1 H - 8		* 4	1
	18		Black and white fractured GNEISS ~30° fractures.	1				2		ц. 1	1	New Y	
1	19	- ⁴ 1	occ, thin clay rinds, no Fe stains			17.5-22.5			1 a a 1	5/4.8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	96	95
	20		pyrite calcite laminations										
	20	1.5					10	-					-
	21	-					. 96		10 III 10				
	22					22 5-27 5	48	19 (Q.)		5/4 9	14	98	10
	23		SAA			22.0-21.0				5, 1.5	144		
									× .	8		- ÷ *	

SOUT	HERN		NG L	.OG RVICES	a novel <b>jsk</b> e na stanovel ganj	s 98 - 11.	Hole No. Sheet 2 of 2	GS-18	
SITE		Plant Wansley			TOTAL DEPTH	32.5	SURF.ELEV.	73	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25				22.5-27.5			at al the	98	100
26	10 - 448 ⁻	a far and a second s	Sec. Sec.						
27		518 MSv					21.1		
28			-	n at in the second			- free		
29	- gane - da		Dep.	1			in the second second		3
20		Black and white augen GNEISS, 3-6" b/t fractures, ~30°, endote and pyrite in fractures	ng tanàn dia	27.5-32.5			lost circulation ~300 gallons	100	60
01	1.44				1997 - 1997 - 1998 - 1998 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	3	of water used to core 32'	₂₁	100000
31	1				in and the second s	Station -			8
32		вон @ 32.5'	-		e në la			21	9 1
33			1.	*				No at	
34			s - 4	19			5 im 2 H		
35							8		
36				an an the	direction of the	<u>,</u> 4		38	5 5
37	10				22 - 10 Ta			- 19 H	
38	- 11 - 14-1						s, a p ^a ser	(	
39					and the second				
40	-			l l l l l l			5		
41	*		1.1	the second					
42			$p^{2n}$		1. J				
43	1 64 2			1			а	9 J.	
44	1 (1 (1 (1 (1 (1 (1 (1 (1 ())))))))))))		100						
45								P.= -	227 126
46		le de la constante de la const	l.		1.2	a (	a .		5
47	1 * 9								
48			÷.						
49	* (m. 1. <b>%</b> )		8 8	a din di		-			
50	1		N H	2 3 SP 3	an a			1	0
51	1		1. A.	1.5		a			
52		a series and a series of the series of the						6	
53					-				
54			5	N C N				1	
55				2 × 3			20 単 日 11日 日		Γ
56	90) + 6 + 54 +	n an in the second s	-15-90 52 m	nieko osta ok V	and which and the second second	4 - M	. · · · ·	ne el ser la s Ten de la ser la ser la ser la se	

			ICAL SE	RVICES	3 ₁₂	a	Hole N	lo. G	iS-19 of 2	_
NTC NTC	Serve Tour	Plant Wansley	an adam		HOLE DEPTH	39.2	•	SURF.ELEV.	750	.0
		Gynsum Storage Facility	COORE	NATES N	123839	2.9	F	2028	069.8	
OCATIC	W	PEADING			· SCS	2.0		CME	550	
NGLE				3		D CAL	71 28	0		(a) -
1	OTT NOT			DE SIZE	HO	TOTA	BEC	- 94	4%	
ASING	SIZE				24 hrs			9/27	/2006	
					DBI			9/27	/2006	
TYPE GF					DRI			9/27	/2006	
JRILLEH			Sample	Stan	dard Penetration Test			t sept < t	-dus-	-
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Cor	nments	% Rec	1
0	750.00	Topsoil 3/10' deep								
		r		015	244		Bulk sam	ple taken'		
1	-	elastic SILT with sand (MH)		0-1.5	2-4-4		LL-54		in the second	
2	p.						PI-24	10/		4
3					-	2	sand - 15	.2%		
-		ive		19277			silt - 35.7	%	ne S	
4		1993 - 11					ciay - 46.	0%	sin (	
5	-							1		
6		Very firm, stratified red orange to tan to olive gray, dry sandy SILT (ML) (Sanrolite)	2	5-6.5	7-8-12	20	Bulk sam	ple taken'	τ. Υ	l
-			Ares a				at 6.0 - 7	0 feet	1.4	
7							aravel - 5	iic 5.0%	8 g	
8				11.11		10	sand - 37	.6%	1.8.	
0		Part Raw a res		· .			clay - 32.	5%	-	
3										
10	-	Dense, lavered dark red to greenish grav			43 - 8		8		4. 4.	
11		dry, clayey SAND (SC) & Saprolite	3	10-11.5	20-21-20	41	176 111			L
10		and the second second	***					• - F		L
12	6								E	L
13		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		- ² 9 -				i		l
14					0		-			
						82 	Screen	a series		
15	×	Auger refusal @ 15.2'				1	10	100		
16	_	Begin coring @ 15.2'			t					
17		Dark gray, hard, compettent GNEISS		67 - K			Water ta	ble at 17.25		
		Water stains at soil rock interface		15.2-19.2				2.9/4	73	
18		Fracture with water stains 6" below TOR			Ц, В			$\frac{1}{2} = 1 + \frac{1}{2} + $	2	
19	12				~				18	
20						-			1	+
20							10 Ja		d.	
21				1 et - ⁵⁵	8 g.		8		-	
22				19.2-24.2	21 B		9 3	5.1/5	100	þ
				1. S.			8		1	
23						1				
		10 III III III III III III III III III I							1.0	

Star Die

SOUT	HERN COMP	DRILLII GEOLOGICA	NG L	OG RVICES	* 1200 - 12 - 14* 18	2	Hole No. Sheet 2 of 2	GS-19	
SITE	Ne x - 75 a f	Plant Wansley	90	·	TOTAL DEPTH	39.2	SURF.ELEV	. 75	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	1				The Case of the State of the St			e Assertance	
26			887. D						
27	1		с. -	24.2-29.2		, a (	5/5	100	95
28	-		15	11		10 A)		=	
20		a a star a star		- ⁶ 5			¥0,		
29				47445 			2 6°		
30				5 8	o a u waxa a k	14 			
31				00.0.04.0	10 B B B B B B B B B B B B B B B B B B B		5/5	100	100
32			10	29.2-34.2	N.		5/5	100	100
33					ja.				
34									-
35				12			iii		
36			100	1		×.		0.07288	1
37				34.2-39.2	) [#] 6 28 =		5/5	100	100
38			1.	19 (1)					
39						30		1273	
40	1.0	BOH @ 39.2	-		1		37		
41	10								+-1
42			- 53		4 2				
43	-		55					( 2)	11
44					13			93 94	
45		. ¹²	-				6		1997 1997
46									2
47	1.00 C	а с с _{ата} "А ^р а	1		10 S		57 57		
41	-				6 				
40		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1	3	1	÷ž-			
50		a start						8	<u>(</u>
51									
52							1		20
53	1								
54				1		23			1
55									1
56						10			

OUT	COMP		GICA	L SER	VICES			Hole No.	G Sheet 1 c	iS-20	
tergy to	Serve You	Plant Wansley	5		A	HÖLE DEPTH	43.5'			713	3.8
			1	COORD	NATES N	123881	2.9	`	2028	418.9	
UCATIO	AC		/82	CONTRA	CTOP	SCS	 n	BILL NO	CMF	550	E I
NGLE	· · · · ·				10		D. SAMPI	ES	0		
RILLING	G METHOD	NU. SA	MILEO		E SIZE	NO. 0.	TOTAL	% BEC		1.1	5
ASING	SIZE		TIM	E AFTER		A THE S		E TAKEN			
VATER	TABLE DE		1 IV					RT DATE	10/3	2006	
TPE GF		B Filipovich BECORDER I Millet		W1/	·		LING COM	MP. DATE	10/4	/2006	
HILLEF				Sample	Stand	ard Penetration Test					
Depth	Elev.	Material Description, Classification and Remarks		No.	From To	Blows	N	Comm	ents	% Rec	R
0	713.80					а — 20 м. 1				121	
	10	Red stiff silty CLAY with organics, dry	E.C.	1	0-1.5	2-2-3	5		81 - E.J.	10 14	
-			2						1 - E	. P.	18
2			8 1 1						*1 10 12	ac [	
3			α.								
4	23		8		×:				97 <u>8</u>		
~					=	1 12 ¹⁰ - 11 ¹⁰ - 1			2		
5				-				18 en "	9. jul	1	1.
6			218) (d.	2	5-6.5	6-8-12	20		1. J.		
7	3		л: 52					+			
	2 - N - T								- 22/05	ger d	
8			90 - je 1 90		×	84					
9					۰. ۲	21.2			**		
10											2
		Yellow, stiff silty CLAY to clayey SILT		3	10-11 5	6-8-7	15			n g	
11		נסמטיטונצי דווכם מום טכנמסוטומי טומנא דוטננוויט		Ŭ					i in at	1.1.1.1	
12			1	1						4	
13											
14										1	100
14					*	22 O				40 × 1	
15		Vellowish tan SILT w/occasional organics and		-		:18	8. 18	×			
16		black mottling, abundant mica, crumbly	(***	4	15-16.5	1-1-2	3				
17					2 20	5 × 3		×.,	S. I. S. States	1 1 1 S	
17	ti e				e *						
18				100	8					i se doit	
19								1 A.			
20						- ²	1				
20	-	Reddish orange SILT, wet		F	20.01 5	4.4.4	0				ľ
21		black mottling, trace mica, crumbly		5	20-21.5	1-1-1	2			8 B	
22								8		2.33° 	
22				57	ä	2015			1		
23									가락 비		
24					- 6	12		8	100		

SOU	THERN COMP	DRILLI GEOLOGICA	NG L	.OG RVICES	NATION AT A J	4 2 4	Hole No. Sheet 2 of 2	GS-20	
SITE		Plant Wansley	a a		TOTAL DEPTH	43	.5' SURF.ELEV.	71	3
Depth	l Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
- 95	(虎)			· · · · ·		- A 12		1	- 11
20		White and brown SILT, residual schist form,	6	25.26.5	1.2.2	5	Water table @ 26'		
26		abundant mica, black motiled, saturated	0	20-20.0	1-2-3	3			
27	-						2 W 25		
28	•	M BAR H BRA M	-90 ¹⁸			¹² = 1		2	
29		a a second a	2 	(mytria (gricia))	1	6			
30				8		1.0			
31		Grayish tan SIL I	7	30-31.5	1-2-3	5	0	a i	
32		a a a a a a a	-			u.			
33				53			21 	1.1	
00	1 11			5	8	e en	ν.,	6	
34		and the second							
35			-	8.4	46			5	
36		trace mica	8	35-36.5	2-5-8	13			- 30
37	1				e .				
38	1			a a	100 gC	8 2 2	. ¹⁰ 11 11	s _r	P
39					18 a 1	1. 10	5 5 5 S	1	
40	1				N	10	+ 3 0+0 1050 2	8	1 52
41	Ť	SAA, including mica content	9	40-41.5	30-30-50/2	ref	*	$[n, N_{i}]$	
42	-			ж				a	1
42			10	43.3	50		s. ¹⁹		
43	1	bonnon e 40.0	10	-	11	1		3	1
44	4 ¹		9 - 15				-		- 25
45		-							7
46				11 17	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -				27
47	I.	- <u>-</u>					1 °		
48	-				6			40	
49	-				8		752		
50		a							
51				d 8 *	17		31		25
52			1	20 14					
53							* (1) (2) (2)		
54				R!	e		2	(	
55				φ.	÷		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Γ
55		10 100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4. 10	1 5	- 0. N	- 22			
56	00004 7 7		_		22	-		_	10

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inergy	COMP	DRILLI GEOLOGICA	NG L	OG RVICES	n n ar arce a	8	Hole No.	Sheet 1	GS-21 of 3	
SITE		Plant Wansley	44 B	n in dian	HOLE DEPTH	77.5	S	URF.ELEV.	78	9.4
LOCAT	ION	Gypsum Storage Facility	COORD	INATES N	123810	01.4	E	202	8695.2	
ANGLE		BEARING	CONTR	ACTOR	SCS		DRILL NO.	CN	IE 550	
DRILLI		HSA/HQ Core NO. SAMPLES		13	NO. L	J.D. SAMP	LES	and many second and and	2	
CASIN	G SIZE	LENGTH	CO	RE SIZE	HQ	TOTAL	% REC.	. (	92%	H L
WATER	R TABLE DE		ME AFTE	R COMP.	2 hrs	DA	TE TAKEN -	10/	3/2006	
TYPE (	GROUT	QUANTITY	м	IX	DRI	LLING ST	ART DATE	10/	2/2006	1
DRILLE	ER	S. Milam RECORDER L. Millet APPRO	VED		DRI	LLING CO	MP. DATE	10/	4/2006	
		Unterial Dependence Classification and Remote	Sample	Stan	dard Penetration Test		Comm	inte interior	N Pee	
Depth	Elev.	Material Description, Classification and Hernarks	NO.	From TO	Diows		- Comme	anto	% H8C	
0	789.40	Topsoil removed to flatten area for rig				80 Ur		-	1 84	1
1	-	D. J. Wheeler and Consultant day								
2	a - 8	Hed silty clayey SAND and Saprolite, dry,	1	1-2.5	1-2-3	5		3.00	- <del>-</del> - ²⁰	4-
-				P. 2	12	10		ส		
3	0 73				5		×.,	- 	1.14	No. S
4			1.2	1.84	-	5.4			18 S. A	
5	-	Red silty SAND and schist Saprolite, dry, crumbly,		1,2,2	Les ^a ls R es		UD taken @	2		1
6		silty SAND		4.5-6	4-8-14	22	4.0 - 6.0 fee offset hole	et in	56	1
0					1997 A. 11 A. 12		2 2022 1223 22 1		1.1.1	
7	2.1					$(13^{\circ})$			and the second	
8			-			14			17 17 1. 17	
9								5 0 m i i K 1 1	a da da	
10	1.1	Brown and orange clay and highly weathered	-		10 ¹⁰ - 10		UD taken @			1
10	1	schist, with black mottling, dry,	2	9.5-11	8-12-13	25	9.0 - 11.0 fe	et in	14-	1
11							onset hole	0.00	1	i.
12					-3			1	1 - HE	
13				64	- 2 x		-	6.00	1	
				15			÷		Ba	
14	ţ.			Traff Decision				*	1.14	
15	-	Saprolite schist with some silty sand, Fe staining and black mottling, dry, silty SAND, saprolite	3	14.5-16	5-12-18	30	<i>D</i>		1	
16		statistical and an and a statistical			a arcada		23 10	1		
17			1					8 : 11	1	AND
										-
18	27.0	-	1	1			5	i picciese	l va .	1
19				DWE.	21	18 P (8)		- 5 - 100		
20		SAA	-	L.	8 1920-11 - 11-11	autors.		1 1		
01			4	19.5-21	4-6-14	20	** 		-	
21			-			2 2	Č. 6			
22								e v e	12 e	
23						1.1	24		18	
1.04					94				)= 113	

OUT	HERN COMP	DRILLIN GEOLOGICA	IG L L SEI	OG RVICES	and the state of the	el la contra la portar e	Hole No. Sheet 2 of 3	GS-21	0
SITE	Service State	Plant Wansley	719779. 		TOTAL DEPTH	77.5	SURF.ELEV.	789	)
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	ard Penetration Test Blows	N	Comments	% Rec	RQD
25		Saprolite with some silly SAND , Fe staining and	191					50	
26	alt Anna Anna Anna Anna Anna Anna Anna	black mottling, moist	5	24.5-20	8-10-43	59		an the	4
27	alter mender Mille	and the second secon	and the second second	der gegenntener (* 1	inne da di ¹⁶ 1 di la c	inter bener 190		34 - 16	100
28		<ul> <li>State of the state of the state</li></ul>		ener Al- altra di	( 17) akt av	antonis Maria antoni	Enc.	a - a -	1.12016.20
29		all all the second seco	en de la compañía La compañía		and a second second	25.28 1.28 1. arrive		Gardida.	-
30		Saprolite, silty SAND,	1. A.	WERG (SS)	and a second sec	5	and a second sec	60	
31	and the second	occ Fe staining, black mottling, moist, more cohesive	6	29.5-31	8-17-33	50	21	00	
32				5	(Wides)	and the		1.15	
33							de la c		
34	47 C			24.2	111 A		a	1	
35		Black/green schist Saprolite, decomposed, some clay, dry	-	04 5 26	50/4	ref		10	1
36		some Fe staining, occ black mottled	1 - 66 - 1 - 74 - 2	34.3-30 10 1010	<b>30/4</b>	arna (inge	4. 1		a ^{tor} at.
37		sind and some set of the set		No. 1	a - 2		10	*	
38				ind)	en en	1			O
39			al ¹⁸	•				5	1
40	fu stan	Gray clay and highly weathered Saprolite schist, crumbly,	8	39 5-41	41-50/4	ref		30	
41	1 - S				a ya shini ya shi ya	esinen A	pine 19 Program de		-
42	Le Male	JH CHAR		est.			a a		
43		_						ling on	10
44	3 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	_	-				a h		1
45	14. 14.	Gray clay and highly weathered schist Saprolite,	9	44.5-46	12-18-24	42		90	
46	1		40	- Contraction Contraction	1	Ar	20. (1 )	1947 - A	
47						1.	*		
48	and the second s	-	a ar			1	-8 	igan in	2
49			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- 18 E			non-plastic		
50		SAA wit silty SAND (SM) with more Fe staining	10	49.5-51	8-16-50/4	ref	gravel - 3.8% sand - 57.3%	50	
51	a sing in	- Andrew Stellar			43 A.S.	- 10 g	silt - 33.7% clay - 5.2%		
52									
53			24. 1.1.1		1.7.	1		-	C
55		Gray-brown saprolite	1 (1995) 1 (1995) 1 (1995) 1 (1995)				4 ¹⁴ ^{2,0}		
55	29. Mar	and the second	11	54.5-56	8-24-27	51	······································	30	

1. A.

sou	HERN	DRILLI	NG L	.OG	11 - X		Hole No.	GS-21	1 S.
Energy	o Serve Yo	ur World GEOLOGICA	AL SE	RVICES		- A	Sheet 3 of 3		
SITE _		Plant Wansley	Sample	Stan	TOTAL DEPTH		5' SURF.ELEV.		9.4
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	ويبعرين		4	- 16	1 . T				
58	t)						* a -	l == fil	
59	1			2 1	14		d	8 S	
00					107 #1			. ²	
60		Sinty weathered schist Saprolite, dry	12	59.5-61	50/4	ref		(A., 1)	1.1
61								- 100 C	
62	1								
63						1	2		1
64									
65	ŧ	Gray silty SAND with highly weathered schist Saprolite.	-						
66	0.8	wet, Fe staining, occ black mottling (silty SAND)	13	64.5-66	50/4	ref	water table at 64'	a a	
00	4.0		-		1	3.*	water table at or	1	
67	8		(Her can			-		N	8
68		Dark gray and black SCHIST, regular fractures heavy Fe staining		66-70				87	49
69					2			a coatra	
70	Ref							18	
71	8 <u>6</u>	SAA, with garnets		70-75	3¥			100	88
72								8	р. ^а
73				20 ₂₅			1 8 194 - 1		5
74		Silver gray SCHIST, hard. little to no Fe staining in fractur							
74		iew gamers			~		in dia de		
75		20 20							-
76		-		75-77.5				90	100
77								1.13	
78									
79									ω.
80			6 - H		10 ⁸⁶		8 ₈ H		
81					1 × 1		2 s.	S	
92									
02	-			13	a 11				
83									2
84				141			25 24 21		
85	1-			s - 1.					
86		-			93 - 54 1		- 14-1 -		
87							10 ¹⁹	101 14	
88			2	1			2		

OUT	HERN COMP	ANY r World GE	DRILLIN	IG L	OG RVICES		tio	Hole No. She	GS-2 eet 1 of 3	3
SITE	200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200 - 200	Plant Wanslev	1			HOLE DEPTH	75.0	SURF	ELEV.	729.3
OCATIO	ON	Gypsum Storage Facility		COORD	INATES N	123861	0.8	E	2029031	.2
NGIE		REARING		CONTR	ACTOR	SCS	121 - 129 - 162	PRILL NO.	CME 55	0
		HSA			16	NO. U	D. SAMP	PLES	0	
OACING					BE SIZE		тота	L % BEC.		
CASING			TIM			TOD	D/		a. 10	11
WATER				- M	IX				10/3/200	06
TYPE GI	HOUT	S Nilom processor I Millet		W	···				10/4/200	06
DRILLEF	1			Sample	Stand	dard Penetration Test	LEING O			T
Depth	Elev.	Material Description, Classification and Remarks	3 I.	No.	From To	Blows	N	Comments	% R	lec I
0	729.30	Topsoil removed to flatten area for rig				i di na	$\tau = \frac{1}{2} \sum_{i=1}^{n+1}$	n de la composition de la comp	1	
1	12					¥C.23			and the second	1
1		Tan silty SAND and schist Saprolite, dry	- 195 - I		2			÷ 52	· · · · · · · ·	194 ( ) 204
2				1	1-2.5	3-9-16	25			
3										
, i	8	" dag baran i	34 1.5 M S	1.00				10 A		
4			n in ind	No.				a Charles de la	Section 22	120
5	14 - L	Light brown SILT with sand (ML), crumbly	1 A	1 22) 889	autorian (	2012 N.G. D.	1.54	non-plastic		10 44
0	25 1 12 1			2	4.5-6	9-18-29	47	sand - 20.8%	: mela se	
6								clay - 13.6%		4
7	and the second		64				24		i da	
8		a ang E 👷 👘	a a second	- 23				s fir		1
			8			C .		-	the state	123 IW-2
9							100	lar di an	.a	÷.,
10	- 198 M	Brown silty SAND and schist Saprolite, dry,	. a .	2	05.11	1.0.20	46	*	12	
11		Fe staining and black mottling		3	5.5-11	4-0-30	40	28	1 N. 10 N	
1					1	2010			1	4
12			а,			2	35		1	
13				6 - 6	*)			÷ 1		1
14				a				14		
14		and the second	M are .		for free	a	1 .	4 - X	- 57 .	1
15		SAA, less Fe staining	er ⁸ 1	4	14.5-16	10-17-41	58		- 1 C	
16	6		*							
47			-						u n po	
17		1 · · · · · · · · · · · · · · · · · · ·		²	11	4 8 p				
18			, e 11			5 5		19.5	1	
19			1 1 V	1	ats.				6.1	
			1		-		1 de			÷.,
20		Contains abundant rock tragments		5	19.5-21	10-16-22	38	· · · · ·	-2015	
21		a tak a		-	a		3		÷.	<u>.</u> e =
22								8 G	1	
								- 0 		
23						9.8				
24	17 - TAS				1.00	- 15 F	2 N	1 m		$X^{(0)}_{i_{i_{1}}}$
OUT	HERN COMP	DRILLIN GEOLOGICA	IG L L SE	OG RVICES	Provide St.		Hole No. Sheet 2 of 3			
-------	-----------------------	---------------------------------------------------------	---------------	-----------------	-----------------------------------------	----------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------			
SITE		Plant Wansley	N.S.		TOTAL DEPTH	75.0	SURF.ELEV.			
Denth	Elev	Material Description. Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments			
05	14. 14. 14. 14.	Top citty SAND and schist Sanrolite dry								
20		some Fe staining and black mottling	6	24.5-26	12-36-50/4	ref	20 III III			
26			-i	a I	2 		2 ¹⁵ 2 ⁶			
27	-		1	* * *	1 MBR 1		· ·			
28										
29	1		12		20402 N 196		ii.			
30		Schist Saprolite with brownish gray CLAY,	-	5. 		11073aa				
21	T	dry, Fe staining and black mottling, firm	7	29.5-31	15-21-36	57	100 M 100 100 M 100 M			
31							10 38 ₆₂ 12 21			
32					19-1 ·	2	n.94 			
33	- 04 - 7									
34		an an an				35.) 20. 10	- 1. s			
35	1	Tan gray silty SAND with residual schist, dry, crumbly,	8	34 5-36	15-25-50/4	ref				
36		black mouning	Ľ		10 20 000					
37	1				. S	- 19	55			
38	- 1981 - 1997 - 19			131	.a	1. E				
00	-			1	5 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5					
39		-		4	5					
40	MAGE:	occ organics and heavy black mottling	9	39.5-41	50/4	ref	10			
41	-				3 B					
42					10 C	18				
43				1.1.1						
44										
45	8 19 11	Light tan and gray silty SAND with schist Saprolite	-	1	01 10 50/4					
46	n e W	dry, occ organics and black mottling	10	44.5-46	31-43-50/4	Ier				
47					10 N		ži ži			
40					e ¹⁷					
40		1 6 2 a ⁿ 6 2 a ⁿ 6					. i .			
49		Sobiet Saprolite with sith SAND dry Fe staining		-	1.1					
50			11	49.5-51	24-23-19	42				
51			-		1		3 (†			
52		* * **				18	*			
53				0	Š. o. e.					
54										
55	-	Highly weathered schist Saprolite with tan silty SAND	12	54.5-56	50/4	ref	water table at 55'			
56		10000, 10 Stanning, Slack motuning, Saturated	1				2 E			

SOUT	HERN COMP	ANY			OG RVICES	* # ⁸	, '×,	Hole No. Sheet 3 of	GS-22 3	+ 65 - 5 -
SITE		Plant Wansley			2	TOTAL DEPTH	75.0	SURF.ELE	v. <u>72</u> 9	9.3
Depth	i Elev.	Material Description, Classification and Re	emarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57					an					
50	3						±	a 8 -	8	
50	1				· ·	W			-	
59			18 ¹⁶ 18 19		-	ыстан 1918 - 19		с Цар		
60	10 H	Highly weathered schist Saprolite with gra Fe staining	ay silty SAND	13	59.5-61	23-50/4	ref			1- ×
61		3	5 5			Concession and the second				
62						F1			- 1. C	
63		M 8 8							1	÷., •
64				14 - L			2			* 1. 5 18
65		SAA, less Fe staining				48	100	10 51	1	
66	- (C.			14	64.5-66	15-50/2	ref	4		
00							2		8) 118	Č.,
67			- 10 20		10.00 m				9 g -	12 102
68					- 92					<u> </u>
69		and the state		12	U	10				1
70		SAA		15	69 5-71	50/4	ref		đ	1 8
71		ne e l'Alle e			00.071		10.		»_ 1	
72						5 60 ¥1.			10.00	
73		18 C		÷.,	6)		12			
74	1	8.5 B						2. 2.20		
75		Heavy Fe oxide staining						51 EV	1.0	
75	9 - <b>9</b> - 9 - 9 - 9 - 9	BOH/TOR @ 75'		16	74.5-76	50/1	ref	and the second second	-	
76		8 8						8	-	
77										12.12
78			8			10 10		*	1000	
79			28			e.			1.	
80		2			14 01			8		
81		N							1,1,00	3
82			8							
83								naf -		
84	1.1				2 ⁰		a.	2 SP 1		1
85		8.8						<i>v</i> .		
86			12			3		45 A	ite)	i K
87						6			n e	
0/	100				1	-				3.9

SOL Energ	THERN COMP	DRILLIN GEOLOGICA	IG L	OG RVICES	28) 4		Hole No	Sheet 1	GS-23 of 3	
SITE		Plant Wanslev	5 gr.	- <u>1</u> - 1	HOLE DEPTH	60.0	1. L. 1	SURF.ELEV.	697	7.9
LOCA	TION	Gypsum Storace Facility	COORD	INATES N	123768	2.9	. E	202	9786.7	
ANGL	E	BEARING	CONTR	ACTOR	SCS	-1.1.	DRILL NO.	СМ	E 550	
DRILL	ING METHO	D HSA NO. SAMPLES	11 2	13	NO.U	D SAME	LES	C	ł	1
CASI	NG SIZE	LENGTH		RESIZE		TOTA	L % REC.		1	-
WAT	R TABLE DE	 РТН 12.6' ELEV. ТІМ	E AFTE	R COMP.	TOD	D4	TE TAKEN		a' 1	
TYPE	GROUT	QUANTITY	м		DRI	LLING ST	ART DATE	10/-	4/2006	
DRILL	ER	S. Milam RECORDER L. Millet APPROV	/ED		DRI		OMP. DATE	1	la presenta	4
	1		Sample	Stan	dard Penetration Test				1	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comm	ents	% Rec	RO
0	697.90	a de la competencia d		-			÷	1		
4			1			÷ _				10 10
12		Reddish brown elastic SILT with sand (MH)	-		8		LL-54 PI-18	1 . In 1		Î
2			1	1-2.5	3-6-8	14	gravel - 0.3 sand - 19.3	% %	14 ¹	
3	er.			63			silt - 46.6%	Ee	5.	
4							clay - 33.8%	•	lag na	
-	- v - 5				<i>a</i>			8 S	100	- 30
5		Orange and light orange SILT, dry, dark red mottling, firm	2	4.5-6	3-3-4	7	• • • • • • • •			
6	14							18 11		
7						2.0			;	
								thi	*	
8						$\gamma = -1$				
9							" 8 			
10		SAA, occasional black mottling		*				÷ 1	× .	1
			3	9.5-11	2-2-2	4		Å: S		
11	use							e a		
12					v _y				~	
13			- 42		8					- ii
	1			2.			1			
14								3	1 52	
15	-	Light gray and tan SILT with sand, orange and black		14 5 10	106		non-plastic	2		
16		motuing, iim	4	14.0-10	1-2-0	°	silt - 58.2%	10	×	
	100 g.			8 N.			clay - 12.8%	•	1	
17				т. с				1 - 44	×	
18	· ·	le fra gi a sa a taga s	2	28	0		23		F	
19							*		a a	102
1			- 2221	1.1		-10	10 10			1
20	-	I an and brown SILT, residual schist, dry, crumbly, orange and black mottling	5	19.5-21	9-20-25		77		80	-
21	- 8,			1. 	Charlenger 27, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,		1 2		1	
22	3		8		X C		12		<i>4</i> 0	
									2 2	
23								ŧ۲	1	
24		20 NO 10 NO			2 		2	19 19	100	

SOUT	HERN COMP	DRILLI GEOLOGICA		OG RVICES	erente per la la 2 al 2 al	:* 3 *	Hole No. Sheet 2 of 3	GS-23
SITE	- ) e se (1,4/- 10	Plant Wansley	19.7 <b>%</b>	2 (1997) - 1998 2 (1997) - 1998 2 (1997) - 1998	TOTAL DEPTH	60.0	SURF.ELEV.	6
Depth	i Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec RQD
25	1 400 july 10	SAA, residual chert form						an a
26	1		6	24.5-26	9-14-21	35	e sa l ^{je} al	- 1
27		a di na na nalitan na sana na s			a			
28		6 R 20 C 20				1. A.	20 A A	
29	in an	್ ಸ್ಟ್ರಾಮ್ ಮತ್ತು ಸ್ಮಾನ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್ರಾಮ್ ಸ್ಟ್	4.	tinat (€ 1 de la constante 1 de la constante				
30		Highly weathered schist with red silty SAND, dry.	- 7-	CHIN .				
30	1	black mottling	- 7	29.5-31	9-14-28	42		
00					· * .	1	с о ж ,	
32	5.01 - 10			20 20	540 9 44 1 5 1 1		22 资源	- 2
33	- 11 - 12 - 11 - 12		æ .		A 183		ы с 1963 М.А.	
34						dia 1	, ²	
35	* +	mica, residual schist, occasional black mottling	8	34.5-36	50/5	ref		a an an
36					₩ 1. ~	1		a. 1
37				e es:	la c			
38	1000 C			2	149 ₁₂ - 227 ₁₂	41 AN		LΨ
39								
40		Brown, tan and green silty SAND, dry, black mottling, trace mica	9	39.5-41	0-24-29	53	gravel - 6.9%	
41			-		F = 122		sand - 50.0% silt - 30.0%	a -
42					15 ^{\$1}		clay - 13.1%	
43			• • • •	e 1	• •		2	
44			19 ×	42		21	13 1	
45		SAA, Schist Saprolite	10	44.5-46	22-50-3	ref		
46				23		Sau		
47							92 20 <u>1</u>	
48		-		8			2 a ⁰	× .
49	1. 10				Ξ		88 - 10	1
50		Green, orange and white SILT , dry, with mica, schist Saprolite	11	49.5-51	20-50-2	ref	×	
51			-			-		
52			***		v c ²⁸ a	52) II	a 174	
53	-			134				
54							51 82 - 89	
55	And the second second	SAA, some red mottling	12	54.5-56	50/2	ref	sec a sec a	
56	P				and the second se			

SOUT	HERN COMP	DRILL GEOLOGIC	ING L	.OG RVICES	a 8		Hole No. Sheet 3 of 3	GS-23	
SITE		Plant Wansley		0	TOTAL DEPTH	60.0	SURF.ELEV.	697	.9
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57	~ ~			- 1.400 - <b>146</b>			ten per ¹ M		ya nany sati
58	11	nin a an a			r Bi				
50		residual schiet Saprolite, abundant mica, dry		59.5-61	50/4	ref	2		
59								e., 5.	
60			13	1	2+				T
61			- #*_*			- c	an 1		
62		a to a	19 C	1.0C _M .	1	93 (ř.			1
63					( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )				100
64	3			12	× .			2	<b>*</b> #3
65		4			14 K.		. e	1	
66				2 - R		100			λ.,
67								22	1.5
68					0.000			*	. g
69			-		d p		at 11 5.	21	
70			1.3		8 N	*			4
71			÷1				a ⁸ H		
72	*			- ca.	5		9 8 ⁸	5	
73				2 g U 18		25		8	
74				2X 24	1.5				
75				9 	1.000		а. ¹⁸ а ¹⁸		
76								1.00	
77					38		2 U	12	
78	1			22				1	
70		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		25 - ₂₁	S 1 8				
79					NU I		° . 5		
80	12			-				-	
80			-						
82	18			1.1.1	0		.*		5
84	1.12						8 ¹⁰ 11		
04 0F							ц ² п		
60			1		14 ¹⁵		8 I B	6	
00							824	1	
87			-				0 12		0.13

SOUT	COMP	GEO			OG RVICES	17 2. e	м в же о	Hole No	o. Sheet 1	GS-24 of 3	
SITE	- 24 100	Plant Wansley	and the	- e 1		HOLE DEPTH	65.5'		SURF.ELEV	72	5.0
LOCATI	ION	Gypsum Storage Facility	and the second	COORD	NATES N	12382	255.5	E	202	29589.1	
ANGLE	•	BEARING	A Net 12	CONTR	ACTOR	SCS	D	RILL NO.	C	<b>/E 550</b>	
DRILLIN	NG METHO	D HSA N	O. SAMPLES	21 m ( 11)	14	NO.	U.D. SAMPL	ES		0	1 1.59
CASING	SIZE	LENGTH		со	RE SIZE		TOTAL	% REC.	19 L.		3.9
WATER	TABLE DE	PTH 39.5' ELEV	TIM		R COMP.	TOD	DAT	ETAKEN	10	/5/2006	).
TYPE G	ROUT	QUANTITY		M	lix	DF	RILLING STA	RT DATE	10	/5/2006	
DRILLE	R	S. Milam RECORDER R. Mudd	APPROV	ED	1	DF	ILLING CON	IP. DATE	. 10/	11/2006	1
Depth	Fley	Material Description Classification and Remarks		Sample No.	Stan Erom To	dard Penetration Test		Comm	ents	W Rec	BO
Doput			1		1101110	DIONS	1	Comm		76 Hec	
0	725.00		-						B T R	1 (4) (4) (4) (4) (4)	14
1		Pod SILT, with pieces of weathourd	1							ing i es	1
2	30	rock - dry, very stiff	- 8 ^{- 11} 1	1	1-2.5	3-6-12	18		1		
0			1								
3					÷	10			ж 13	61	
4	2						1.5				X
5		Reddish tan micaceous SILT, with pieces			Marine de la composición de la Composición de la composición de la comp	10.523	ic of the second se				
6	100 m - 1 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	of weathered rock - dry, very stiff		2	4.5-6	5-9-16	25				1.5
										1.10	
7			2								
8	- (a)			111		25				-	
9	100				o"						1 8
10		Tappich silver missessus clavey SILT, dry	- 1 - 1		54						1
10		very stiff	- 45	3	9.5-11	12-17-25	42		а. Т.	25	
11					εī.	1000000 /0000				1	
12		404-1 1/4 1	* * * *	32		8					
13				1		27 - B					
10										i i cara	
.14			- 4 1		35					- 34.5	
15	-	Light brown micaceous clayey SILT, with large	12 J ^a (			0.15.01				1	
16	1	black & gold), dry, very stiff	е 11 р 19 р	4	14.5-16	6-15-24	39		10		
4-7						N 11			\$1)	-	
17	26 6		0		25	19 oct 5 oct 5					
18			291 D. 2 - 2	8						n 2-1	
19			a 1	8	2 - X-1		÷ .			1.	
20		SAA		-			a				
20	1		1.11	5	19.5-21	10-15-50/4	Ref	*	S-16439	. 5	× .
21					-	1 N				× .	1
22										1. P	
23						No.	8	2	0		
20					11	144			8	1.1	
24				10000			1		19	4.4 - 11-	1

SOU1	HERN COMP		LING L	.OG RVICES	antoriana ant Sa	an a	Hole No. Sheet 2	GS- of 3	24
SITE		Plant Wansley	ante constante a Ganto del Statuto Ganto del Statuto		TOTAL DEPTH	65	.5' SURF.	ELEV.	72
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Star From To	ndard Penetration Test Blows	N	Comments	%	Rec
C.C.	en antes Notes	CAA							
20	5		6	24.5-26	19-21-34	58			
26	in verterie			10, 46			10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	н ж.	
27	withat Colorantester		ar y Mar			14	li en la c	æ	
28	N ^e	a star and a star and a star and a star and a star a st	-		¹ 1;4			2	-
29	1. 	and the second	erg <mark>e</mark> r in		The laws in the	13 1940 1940			• .
30	and a second second	SAA		20 5-31	22-27-42	80		25°e	1
31		and a sense of the same	iter	29.0-01	22-31-43	00	en e		
32			2		a la Factoria	$\mathbb{R}^{n}_{a}$ :			
33	1.1			107 101			os aser o e		
34			n an	1.2		17	а 1.	cone 1	
35		Large seams of black as well	-	. 33			10	-31 	
36	-		8	34.5-36	20-27-38	65	52 a 1		
00			121-12	5 . L		u <u>ti</u> r T	* d [*] ;		а -
37	1.5		at 1976	n arga, /	×,			0.01	
38	1.0				a			2	1
39	en en Re st rictor		10 mar - 10 -		16 B			- 1 ²	-
40	-	SAA, mostly silver & gold, no black seams, still dry	9	39.5-41	20-19-36	55		. I.	8
41			-		1944 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 -				s.
42			- 8 A I	ж. ж. к И	1		12	a g	
43	10		÷.,	- 2 - 2 ¹ 0 - 10		12	2 (DE		
44						6059	1 KAT - 22 C - 0	0.12	
45	8. A.		8 × 19		3 			* 1 	
46	5. 1917	Tan, silver & white SILT with pieces of weathered rock, moist - iron staining on faces	10	44.5-46	19-21-29	50	Å	а 	ł
47			-		1997	the search			
48	10.00			1					
49	a: • *		in the	1.00					-
50		Orangish CLAY with tan & silver SILT with	1	. S.					
51		SAPROLITE, seams of very dark brown silt throughout - moist, iron staining	11	49.5-51	12-22-26	48			
52					4 <u>8</u>			e (a	1
53			28	15.5			1	8 - 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	15
54				1	a ne A			۰, e	.(
55			-	-				n te	
		SILT (ML), some black areas - all breaks apart easily	12	54.5-56	13-22-37	59			

SOUT	HERN			OG RVICES	8 #0	9.2* o 2	Hole No. Sheet 3 of 3	GS-24	
SITE	Serve You	Plant Wansley			TOTAL DEPTH	65.5	SURF.ELEV.	72	25
Depth	, Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57			11				al - than a star		
58	+			22	6		3 15 1	×	
59	*.				10 at	1		27	
60		SAA. iron staining, moist	-	1 ndi 1		1		÷.	τ.
61	- e		13	59.5-61	12-26-29	55		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
62	-							n 6 -	
63	e.		5000 C		NA PER	23		19 1	
64				1.1					- 8
04		SAA more powdeny dny	-	Mar 13	1		er A	* ¹²	
66			14	64.5-66	50/4	Ref			-
00	12					5			-
67					10 m in in			*	2
08			E E	1 ° - 1				34 1.9	¥.
69	1.5		÷.,	. s	-	2		d n	1
70	·		2	ш.,	12 ¹²			17	2
71	10				6	1		÷.	
72				P.,			8 10		
73			-			25.		*	э.
74	_						20 20 20 20 20 20		
75		and a first house house	165		20	1 87		22 E	
76	-			1			7		14
77			- 		1			-	4
78	-				15 15		2		34
79					×				
80	2		81) 		-		8	211	
81								11	
82	30		-		0.0			×	
83	6		1	a.	(A)				
84				×			21	1	
85				<u>12</u>	N			1	-
86							2.22	8 1911 - 1	
87		ter in a second							2
88				L.					-

-	SOUT	COMP	DRILLI DRILLI GEOLOGIC	NG L	OG RVICES		5 8 -	Hole N	lo. Sheet 1	GS-25 of 2	
٦	SITE		Plant Wansley	46.74	10.	HOLE DEPTH	43.7'	a adada	SURF.ELEV.	78	5.7
	LOCATI	ION	Gypsum Storage Facility	COORD	INATES N	12378	63.9		202	8247.1	1
	ANGLE		BEARING	CONTR	ACTOR	SCS	· .	ORILL NO.	CN	1E 550	
-i	DRILLIN	NG METHO	D HSA/HQ Core NO. SAMPLE	S	6	NO. L	J.D. SAMPI	LES		0	
	CASING	SIZE	LENGTH	col	RE SIZE	HQ	TOTAL	. % REC.		98%	
	WATER	TABLE DE	ртн <u>20.2'</u> ELEV ті	ME AFTE		24 hrs.	DAT	TE TAKEN	. 9/2	7/2006	0
	TYPE G	ROUT	QUANTITY	м	IX	DRI	LLING ST	ART DATE	9/2	6/2006	N.C. MIC
	DRILLE	R	B. Filipovich RECORDER A. Grissom APPRO		a - 4	DR	LLING CO	MP. DATE	9/2	7/2006	0
	Depth	Elev.	Material Description. Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows		Com	ments	% Rec	RQD
	Copin										
.0	0	785.70	Topsoil 4/10' deep				-				10-10-
	1	- 	Soft, reddish brown, moist,	1	0-1.5	2-2-2	4		0.4 	i sva	
	2	11					· *		N. Company	1. +	a a
					(	2			1 - Mar	to dia 199	1
	3	- A.		1.1						도 말 봐?	1
	4		Very stiff light brown to red (lavered) fairly dry						A State	. F	1
	5		sandy SILT & Saprolite	2	4-5.5	7-10-18	28		5 8 5 99 8		-
	6					72. E					
-	<u> </u>								in and a		
-14	7	-					11 (2)				I .
	8	1			. M 0						5
	9	1	and a star		1.1	4 U 4					
	10		Very stiff, yellow to orange red, dry, sandy clayey	2	9-10.5	7.15.19	27			e e	
×	10	2		Ľ	5-10.5	7-13-12	21				
	11	1									
	12	1 12				· · · · ·			па ^н , 1	Geo.	
2	13	1	te bilanti tenti interi				0.20	- (a			
		n 5	n	120		1					-
Ì	14	1	Yellowish brown to dark gray, dry,	-	а - П	_		14		1 10 10	
	15	1.	clayey SILT & weathered schist Saprolite	4	14-15.5	8-50/2	Ref	12		15	×
	16					38 U				i e etc. Ising i na	
											$i = n_{ij}^{ij}$
	17									- B	
	18		- Para Reference		5	¥0	×		- 	1.20	1.1
1	19				1						
- MAG	20	k.	SAA	5	19-20.5	12-27-32	59	water tat	le at 20.2'	A.	
	20			Ľ							1
	21	1. 1			5			2		- 2.5	1
-3	22									17	
-	23							14	5 IN		1.1
1	20		2 2 2 2			-4				81. yı	
	24	20001 7.25	2004	1			<u></u>		4 3 ·····	-	

SOUT	HERN COMP	DRILLII GEOLOGICA	NG L	.OG RVICES	2404 I		Hole No. Sheet 2 of 2	GS-25	
	an San an Anna an An San an Anna Anna Anna Anna Anna Anna	Plant Wansley	# +	t di Fara	TOTAL DEPTH	43.	7' SURF.ELEV.	785	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
-25		SAA for 4", then light gray, dry, soft-highly weathered Saprolite	6	_24-25.5	-19-50/5	Bef		Eranov and	
26			a 141		1. V	1.121.121	NG2 G CNI 1922	1	
20					a 94	1.1			
21		a sector a sector a			5.8		î		
28					н				
29		Auger refusal @ 29.0' Begin coring @ 29.0'	-			$\vdash$		1	
30	- 10 m - 1	Dark gray mice SCHIST weathered	1.14	18 B	20 F	2			
31	4 I	with many rust stains/water fractures			0 ± 129				
32				29-33.7		4	1.4/4.7	93	25
33			8		¥4				
34	1.7					-			
04							20 12	- 12 C	
35			6 22	00.7.00.7	5) 5)			-	
36				33.7-38.7	0 6	6	CNC	100	45
37		Dark gray , hard mica SCHIST with		20 C					
38		iron staining along fractures			2. (14)				2
39	-	SAA					11%		
40				e 8 ³			1 ¹⁰ #		10
41	× 1.			38.7-43.7	54	5	5/5	100	95
42	5				.14			. 1	
43	1				4.				R
44	10420 - 10 (B) 101	BOH @ 43.7'	1					1	9 m
AF			~				ನ ಹೆಸ್ಟ್ ಚ		2
40				ji t	e na e				- 41
46	-				8	15	() 	10	
47							а 		
48	11 J. 12 P.				57 B)				
49							2		
50						5			
51	<u>, (*</u>				*		a		Si .
52	<u> </u>			а 1				т. 1 1 1 2	
53	1 T 190							1	
54					4 0 - ₂		N		2
55	10				ь				
56	2 - 16 18 12 1			-	10.000	100			

1	Plant Wanslov								-ordin .
			4			60.0'	SUBE ELEV	744	1.7
ON	Gypsum Storage Facility	4	COORD	INATES N	123726	3.4	E 202	8878.0	, f
	BEADING	and the state of the	CONTR	ACTOR	SCS	<u>.,</u>	DBILL NO. CN	E 550	. 32
	HSA/HO Core			11	NO U	D SAMP	LES	2	There are
		NO. SAMPLES			HO NO. 0.	TOTAL	% BEC.	84%	3
3 SIZE		TIM					TE TAKEN 9/2	7/2006	-
			M	IX	DBIL	LING ST	ART DATE 9/2	7/2006	-
:0	B Eilipovich BECOBDER A Grissom	APPBON	/		DRIL	LING CO	MP. DATE 9/2	7/2006	
.n			Sample	Stan	dard Penetration Test		tinin (da		
Elev.	Material Description, Classification and Remarks	1 4 2	No.	From To	Blows	N	Comments	% Rec	RC
744.70	Topsoil 2/10' deep					1 x 1 3			1
	Stiff reddish brown very dry sandy SILT		1	0-1.5	4-7-7	14	с ¹ , *	12	作り
	with some mica fragments			10			UD taken @		
			1				offset hole	14 - K	
10		- 87 - C				8	1		1.t
t		2					usin.	an galanti	1.5
		1	1.1		-			1.1.1.1	1
	Hard, light gravish brown, dry, clayey SILT	19.A.			- 11		9 AN	1. K	
12	& weathered Saprolite	manning.	2	5-6.5	10-14-21	35		- E 85	Ŧ
1.		1.1		- 27					
1			,						100
<u>- 1</u>			1.	1		55. 			
-								1 1. A	
1	discussion of the second			- 10 ^{- 81}	* a i		- C - T	1	i.
	SAA, increase in Saprolite	1	3	10-11.5	8-16-32	48	UD taken @ 10.0 - 12.0 feet in		
-							offset hole	14 · · ·	intr-
100		1 1 1 1 1 1		1					
9 - <del>9</del>		i sheet	N B		With Here and the second s			4	
1.1					a		1993 1993	1	
1								1	
	SAA	V. I.	1			1.	2 a 11	1.	
_			4	15-16.5	11-25-32	57	54 10		
2					. *				1
1						-	1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 -		
1								1.15	-
		1							
-1					2	1.1		-	
14	SAA, layers of light gray, black, & red brown	1. 	5	20-21 5	12-13-22	35	10 Jan 19		
10		10 A.						1.	
		- R		8		1.5	0 151 G		
C							a 1940		
					· · · · ·		- 11 A.		
	G METHOD SIZE TABLE DE ROUT R 	G METHOD HSA/HQ Core SIZE LENGTH TABLE DEPTH ELEV. ROUT QUANTITY B. Filipovich RECORDER A. Grissom Elev. Material Description, Classification and Remarks 744.70 Topsoil 2/10' deep Stiff, reddish brown, very dry, sandy SILT with some mica fragments Hard, light grayish brown, dry, clayey SILT & weathered Saprolite SAA, increase in Saprolite	G METHOD HSA/HQ Core NO. SAMPLES SIZE LENGTH	G METHOD       HSA/HQ Core       NO. SAMPLES         SIZE        LENGTH          SALE        LENGTH          TABLE DEPTH        DUANTITY          ROUT       OUANTITY	BATHOD HSA/HO Core NO. SAMPLES 11 SIZE LENGTH CORE SIZE TIME AFTER COMP ROUT OLANTITY MIX A B. Fillpovich RECORDER A. Grissorn APPROVED MIX MIX A B. Fillpovich RECORDER A. Grissorn APPROVED MIX	BARNA         Correction         Out           G METHOD         HSA/HC Core         NO. SAMPLES         1         NO. U.           SZE         LENGTH         CORE SIZE         1         NO. U.           TABLE DEFTH         ELEV.         TIME AFTER COMP.         DRL           ROUT         QUANTITY         MIX         DRL           3         B. Filipovich         Recorder         A. Grissom         APPROVED         DRL           Ew.         Maated Descripton, Classification and Remarks         Sancted Permittion Test         DRL         DRL           Z44.70         Topsoil 2/10' deep         I         0-1.5         4-7.7           With some mica fragments         1         0-1.5         4-7.7           With some mica fragments         2         5-6.5         10-14-21           Image: Sandard Permitson Test         1         0-1.5         4-7.7           With some mica fragments         2         5-6.5         10-14-21           Image: Sandard Permitson Test         1         0-1.5         4-7.7           With some mica fragments         3         10-11.5         8-16-32           Image: Sandard Permitson Test         1         11-15.5         11-25-32           Image	BARMEN         DOULD.           BARHOD         HSA/HQ Core         NO. SAMPLES         11         NO. U.D. SAMP           SZE         LENGTH         CORE SZE         HQ         TOTAL           TABLE DEPTH         ELEV.         TIME AFTER COMP.         DA           ROUT         OUANTTY         MX         DRILLING ST.           3         B. Filipovich         RECORDER         A Crissom         APPROVED           Exe.         Material Deception, Classification and Remarks         Sample         Standard Periodition Test           Stiff, reddish brown, very dry, sandy SILT         1         0-1.5         4-7.7         14           with some mica fragments         1         0-1.5         4-7.7         14           Hard, light gray/ish brown, dry, clayey SILT         2         5-6.5         10-14-21         35           SAA, increase in Saprolite         3         10-11.5         8-16-32         48           Image: SAA, increase in Saprolite         3         10-11.5         11-25-32         57           Image: SAA, layers of light gray, black, & red brown         5         20-21.5         12-13-22         35	OVERTROD         HSA/HQ Core         NO. BAR/LES         1         NO. U.D. SAMPLES         1           SIZE         LENGTH         CORE SIZE         HQ         TOTAL % REC.         1           TABLE DEPTH         ELEV         TIME AFTER COMP.         DATE TAKEN         9/2           ROLT         OUANTTY         Max         DRILLING STARTATOR         9/2           ROLT         Gridsom         APPROVED         DRILLING STARTATOR         9/2           Em.         Material Decretion. Classification and Remarks         No.         Second Function Treit         9/2           Statt, reddish brown, very dry, sandy SILT         1         0-1.5         4-7.7         14         UD taken @           SAA, increase in Seprofite         2         5-6.5         10-14-21         35         10-3.0 feet in offset hole           SAA, increase in Seprofite         3         10-11.5         8-16-32         48         10.0 - 12.0 feet in offset hole           SAA         4	BLEHOD         HSAHO Core         NO.U.D. SAMPLES         2           SIZE         LENGTH         CORE SIZE         HQ         TOTAL % REC.         94%           SIZE         LENGTH         CORE SIZE         HQ         TOTAL % REC.         94%           ROUT         CORE SIZE         HQ         TOTAL % REC.         94%         94%           ROUT         COUNTITY         MIX         ORELLING STATTORE         927/2006           3         B. Filipovich         Rescal Decription Classification and Remarks         No.u.D. SAMPLES         1         0.1.5           3         B. Filipovich         Rescal Decription Classification and Remarks         Stimulae Prevalues 140         927/2006           3         B. Filipovich         Rescal Decription Classification and Remarks         No.u.D. SAMPLES         1         0.1.5         14         10         0.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.5         10.1.4.21         35           1         Hard, light gray, block, dy, clayey SILT         2         5-6.5         10.1.4.21         35         10.1.5         11.1.5         11.1.5         10.1.2.2         37         10.0.1.2.0 feet in Other in 0.0.5

NOU1	COMP Serve You	GEOLOGICA	IL SEI	RVICES	te and the second s		Hole No. Sheet 2 of 2	GS-26	1
SITE	ane	Plant Wansley	100 - 10 47 	Sector States		60	.0' SURF.ELEV.	744	1
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	Idard Penetration Test Blows	N	Comments	% Rec	
25			1.4	1985 (1. 1. 2018-04) 1985 (1. 1. 2018-04)				·,	
26		Ver stiff, light gravish brown, slightly moist,	-in)	25-26 F	12-12-15	20	** * ** **		1
20			0	20-20.5	12-13-15	20		ai c	
27	n, n, -		- 60 20%			3.0			
28			147	n de la composición d la composición de la co la composición de la c	· (代白) . (代白) .				
29	•10		olas, John	na a serie da entre la serie da entre la serie da entre	a ya a a a a a a a a a a a a a a a a a				
30	- dian -		in ages in a	$\begin{array}{c} \left( \begin{array}{c} 1 & a & b a \end{array} \right) \\ \left( \begin{array}{c} a & b a \end{array} \right) \\ \left( \begin{array}{c} a & b a \end{array} \right) \\ \left( \begin{array}{c} a & b \end{array} \right) \\ \left( \begin{array}{c} a & b \end{array} \right) \\ \left( \begin{array}{c} a & b \end{array} \right) \end{array} \right) \end{array}$	$\frac{d^2 + \alpha_{\rm s}}{d \alpha_{\rm s} d \beta_{\rm s}} = \frac{d d^2 \lambda_{\rm s}}{d \beta_{\rm s}} + \frac{1}{2} \frac{d \lambda_{\rm s}}{d \beta_{\rm s}} + $	ally in a	74	5	
31	din di	SAA, abundant mica	7-	30-31.5	25-50/5	Ref			
32	$x_{l=u}$		-		1	1	uk ver av	8 2	
39	E				94 C 24013	ৰা ন	2 ^{10,20}	[]	
	En al an				* ¹		2. 		
34					orden it and an an	=	a se a la su	·	
35	1	SAA				14			-
36	Ť,		.8	35-36.5	14-35-50/5	Ref	n an	É LE	1
37			100 Star	17		an ar		5 8	1
38						6 ⁰	i data		
39	Ť.				e tê e te		75 0 000 6 11 1	19	
40			* 14		a 8 mi	*	್ಷ ವ್ಯಾಸ ಹ	6	
41	1 1	SAA	9	40-41 5	20-29-30	59	Reached water table		
40							1.		
42									
43	4		1			en sag			
44		-	8				50 St		
45		SAA	119	¹⁰		1 2 13			
46	1		10	45-4.5	10-14-20	34	1.00		
47					j Ťa				
48	1. x ^a				1 ¹²			2	
49	- A APP		2 1	1992) 19	-		Е		
50	1			32.1		E	1 ×		
51		SAA	11	50-51.5	50/5	Ref			
52	i di per	Auger refusal @ 50.5' Begin coring at 50.5'		$\partial_x \langle S_{2_n} \rangle$			1 e 24		
53.0		Grey, weathered mica SCHIST, iron staining along	12 M	50.5-55			8	7,	7
54 55				1				1 - 4	(
56 57.0				1.1				p Sta	1
58 59.0	91 911 - 11 - 1191	extremely weathered to 60'	-		an a			90	D
60	1. Sec	BOH @ 60'	1.	55-60.0	and the second	1	40 	1 1 1 1 2	6

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1

SOU	THERN COMP	ANY TWorld GE	DRILLIN	IG L	OG RVICES	n si Ruman nan Haitan	R	Hole No	. GS Sheet 1 of	-27 2	and and
SITE	- 058 F	Plant Wanslev	in the standing	14		HOLE DEPTH	35.0		SURF.ELEV.	699	.7
LOCA	TION	Gypsum Storage Facility		COORD	INATES N	123722	4.5	E	202968	87.5	Exe Car
ANGI	F	BEARING	1	CONTR	ACTOR	SCS		DRILL NO.	CME 5	50	the second se
DBILL		HSA	NO. SAMPLES		7	NO. U	.D. SAMP	LES	. 0	6 <b>1</b> -6	e
CASI	IG SIZE	LENGTH		COF	RESIZE	1	TOTA	L % REC.	ine en	10 E - 10 - 10 - 10 - 10 - 10 - 10 - 10	10 N
WATE			TIM		COMP.	0 Sa 1 a	DA	TE TAKEN	ka gira a	-	111 1214
TYPE	GROUT	QUANTITY		м	x	DBI	LING ST	ART DATE	10/3/2	006	10
DBILL	FR	B. Filipovich RECORDER L. Millet	APPRON	/ED		DRI		MP. DATE	10/3/2	006	120
Drifte			_	Sample	Stand	ard Penetration Test			1		
Depth	Elev.	Material Description, Classification and Remarks		No.	From To	Blows	N	Comm	nents %	Rec	RQC
0	699.70		- <u>k</u>		ж. I ter	- 34				34	14
		Red SILT, dry, stiff, trace mica	$[\mathbb{P}_{ma} _{1}]$	4	0-1.5	2-3-4	7				32 - 42
-	1					2				- 44 F	
2	P		1.	1		ā.			34 		
3			5.1		-					i de Te	59
	\$		# # ₂ ]		×						57
4					5.4.4	17 H		1. 1	1.1.1.1.1	244 2011 - 10 10	6
5		Bed and tan SILT schist Saprolite	20 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			15	1.2			. B.,	rt, e
6	1 (M. 141)	black mottlrd, dry, firm, trace mica	5 C	2	5-6.5	2-2-3	5	_2* T	5.15M		4.1
-					1 . S			-			à.
1			×21		512 I D	G _{eo}					
8	-		a en		a		1		and and		-
9					11 - 11 11						-
10					8						1.
10		Brown SILT, residual schist form, red and		1					1000		
11	-	black mottling, moist, including mica content	ar 21	3	10-11.5	1-2-2	4	0	energi se a		1
12						3.			1		12
10			an an an	- 	848				1		L.
13	2 - 1		1.1.20	1	1 a 1	12	1.1		7 -		
14				Ĩ.					4		
15									6	5	100
10	a 7 7 9	Brown and yellow-brown fine sandy SILT, satu	urated,	4	15-16.5	1-1-2	3			10	
10			56 2			1.1050	2020	2	( Chernel		
17						10 III				, ⁵ , 5	
18	16 A		8 82	2					1.		
			36 H. ₁₄				$\lambda_{a} \approx$	1	-		
19				-							
20	)	CAA sobiet Seprelite	5 N 1		-	· · ·					1
21		SAA, schist Saprolite		5	20-21.5	2-2-3	5	1 × 1	-		
555	ç							Fe Fe	Sec.		
22								65		11. 12. 13	-
- 23	3		4	74	1. 1	84	*C			114465-11	100
	1. 12		, š	9						-	1

	COMP	GEOLOGICA	LSE	RVICES	ata a	13 ¹ 1	Sheet 2 of 2	65-27
SITE	Serverio	Plant Wansley	1.00		TOTAL DEPTH	35.0	SURF.ELEV.	699
0	Flou	Natarial Description Classification and Remarks	Sample No.	Stan Emm To	dard Penetration Test	N	Comments	% Bec
Depth	Elev.	material Description, classification and remains		Pion To	Lions		Commonia	701100
25 1		Gray SILT and highly decomposed schist Saprolite,					gradata tota - Neve	
26		brown mottling, wet, quartz vein (1/4") at end of run	6	25-26.5	5-5-12	17	5	an na A
27	1		8	1004	sector de la		gica a ji	2
28	E ann				8		1	a. "a
29			1972 - 1972 1972 - 1972	8			2 ¹⁹ 2 2	ų.
30			- 10					
31	19	Gray SILT and highly decomposed schist Saprilote occasional black mottling, saturated	7	30-31.5	7-6-13	19	31 (21)	2
32	<u>†</u> .					 *	2 4	
33	4							
	T alle			8	ē.		100 C	1
34	1-			-	17.05.5010			. 7
35		SAA BOH @ 35'	- 20	1.1.2	17-35-50/3	rer	· · · · · ·	
36			lan."		Register from			×.,
37				0 25	= ⁸¹	19 A		
38	81				(3. v)			di ej
39	10				1 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	×.	2 <u>1</u> 2	
40	Б. –				10 10 10			
41	9	a a a a a a a a a a a a a a a a a a a		. *	1.1.2	5	1	N I
42		et and a start a			anti in Maji M Manazarta di Anti	6	а а ⁻⁰	
43								
44				19339		100		1.12
47	đ.		08 T				а. Ж.	
45	4		1	15 ¹⁶				
46	14				9 II 8	10	i K Re	
47	7				·* 9*			
48						x a	E.	8
49								100
50					e			1
51			841		e đ			
52				1				
53	1.15							2
54							10 ¹⁰	
55	-	-	2				2.3	
56	ALL ALLAN	the product of the second s	1.8.3	2 12 11 23 1 44	5 10 10		200 12	

	erve Your	ANY GEOLO	GICA	L SEF	IVICES	a a Talan sa sa		Hole N	o. Sheet 1	GS-28 of 3	1
TE		Plant Wansley			1	HOLE DEPTH	64	0'	SURF.ELEV	813	3.4
)CATIC:		Gynsum Storage Facility	A	COOPE	NATES N	123734	4,9		202	8007.0	
	·	BEADING		CONTR	CTOP	SCS		E -	202 CM	E 550	1
+OLE -	(BALLAND P.		Viere	JUNIR			.D. 84	- UNILL NO		2	-
ACUNGI	metHCD 75	пэа NO, Si	-168-		E SIZE	NOC	JAN		1	- 194	5
NOING SL	DI T			_ COF	COMP			ATE TOUR	0/1	2/2000	1
ATER TA	NOLE DEI	ELEV	. TIM	AFTER	x		[	TART DUE	9/1	2/2006	Ţ
rre GRO	JUL	QUANTITY	ADOCT	MI	·	DRI	LING S	CARI DATE	9/1	2/2000	13
HILLER		B. FIIIPOVICII RECORDER S. Bearce	APPROV	Sample	Chart	DRI lard Penetration Test		JOMP, DATE	9/1	T	T
epth	Elev.	Material Description, Classification and Remarks		No.	From To	Blows	N	Comr	nents	% Rec	4
0 8	13.40	Surface raked by bulldozer					L				J
Ţ	+	approx 1" of slightly humic rod hours to "		1	0-1.5	2-2-4	-		1	250/	J
<u>-</u>		else red-brown, very soft CLAY	4		5-1.5	2-0-4		1 - 1		20%	1
2	6		<u> </u>				1	ů.		Sec.	
3			1 a 1 a	1		10	ē.*	2	·	$\sum_{\mu=1}^{N} \frac{2i}{2}$	
			3			1		115	<b>n</b>	2	1
4	-+		<u> </u>				- 201	UD taken 4.0 - 6.0 fe	et in		
5	11	Reddish brown SILT, schist Saprolite with					1.5	offset hole	t	10.00	J
e T		gray mica plates 4 mm to 1 cm		2	4.5-6	11-12-16	28	moist :	anter 2" 9/13/06	50%	1
<u> </u>		a Contraction and the Contraction of the	<u>an 1</u>	-		11. BBU/9		aman			1
7		And the second sec	5				1		•		
8		a state of the second sec	1				2	20		· Contractor	-
	a water					5		8	1	245 C	
9			- 1			<i>n</i>		κ. α. I		el _a	
10	194 194	Tan SILT coating of soft gray mica schist			95.11	11-10-04	1	1 <u>1</u>	TV.	600	
11		Sapronte		3	9.0-11	11-18-24	42		<b>.</b> . [i	00%	1
			, is		- a			UD taken	@	1.1	
12			1	1	ч I		1	offset hole		1	Sec. 1
13					Ч I	-		8	1	14 - A	1000
IA T				1	( )		7	. *	i	5	199
			. 1			The contractor			1 a 1	E p	
15		SAA	т. 	4	14.5-16	10-20-24	1		rv .	40%	
6			. 1				1		inter de la		
					t . )			8		E F	ilâ
1		in 📲 fod of the second			(-)	× ~	1	Ľ .			
18					Ç]		1			1	
9	85				<u>(</u> )		1		6 - <u>F</u>		
-	1		1		1.1.1.1	Set 1	1	1941 - 1943 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 1945 - 19		12.	
20		Less tan SILT - mostly soft light gray, olive sheened	$\frac{1}{2} \propto$	5	19.5-20	12-20-29	40		'ry	5 B	
21	10				.0.0-20	.2.20-23	49				
			£.,		( )					1.2	
1 12					l > l						
		•	· •	• · · · · · ·	e 1		1	1	1904	1 B	
3	100		1	1 /	C 2						

SITE Depth 26	Serve You Elev.	Plant Wansley	L JE				Sheet Z th -3	
Depth 25 26	Elev.	Fiant transiey	-1.5 -0.5		TOTAL DEPTH	64	.0' SURF.ELEV.	8
25 26	Elev.		Sample	Stand	dard Penetration Test		Ī	100
2526		Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Re
26	100	<u>SAA, tan SILT staining, gray to olive matrix,</u> black MnO oxide stained relic fractures	6	24.5-26	11-16-26	42	Black MnO stained relic fractures	1 <b>a.</b>
07			1.1			- 2		
21					1			
28			0	222065				
29	d" .		-	1 a 1 a 1	el de la		n na na seo	•
30		SAA, hard		**	a a R A Succession	3	• 2	
31	* 1		7	29.5-31	15-55/6	ret	relic fracture faces	/12
- 51	1			100 M	a ⁵ 5			1
32			5		а -	1		
33	C- (R)	* ***		æ				
34				8				
35		SAA, hard	8	34 5-36	18-24-32	56		100
36	21 			01.000	-	1	- ¹⁶ -	NCECE.
37					-57			1
38	2900 Ca			1		13/2	2 27 12 22	
00							- 20	1
39							-	
40		SAA, all light olive, hard & gray	9	39.5-41	23-35-38	ref	24 hr	50
41	2 A 4		-				11 N	
42					2			
43			9 829-11		- 4 - 15	la -		- 97 534
44	-			3				
45		SAA, soil damp, hard but spoon saturated - most						135
46		likely a saturated relic fracture or schistocity	10	44.5-46	25-50/6	ref	saturation @ 45.5	
40				j s				
47			3					
48	1		3	ľ				
49		2017 - 122 - 129 2017 - 120 - 121 - 12 2017 - 120 - 121 - 120 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 - 121 -			80			
50		SAA, Saprolite fully saturated, dark olive brown when fully saturated, hard	11	49.5-51	20-50/5.5	ref	Auger refusal	
51			-		× 4.8	-	at 50.5' Stopped auger	
52	<u> </u>	14 L			27		9/13/06	5
53		Set casing/started coring		52 4-54			Start core 9/20/06	
54			_	02.4-04	1. M.	-		-
55		Too soft to core - rock/hard soll lenses - resume rotary w/casing & water (not H.S.A.) at 54'				12	easily broken apart	1

COMP/	DRILLI GEOLOGIC	NG L	OG RVICES	# d		Hole No. Sheet 3 of 3	GS-28	100
SITE	Plant Wansley		3	TOTAL DEPTH	64.	0' SURF.ELEV.	813	3.4
Depth Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RC
57			1		12.1 4.7 194	· · · · · · · · · · · · · · · · · · ·	an see an	
58			56.5-59	20 blows no movement	(	jumping cathead) 1.5" recovery		
59		<u>.</u>	B		h. 1		10 52	
60			8	R.			= 10#11 88	35
61		3					Å.	2
62	Set well @ 62.0'			6	а ^н т		a.	
63			64	20 blows	-	10		
64	BOH @ 64.0'			nomovement	¥		6	
65				1		18. a ¹⁸	1	
66						и _е	16 94	
67							0	
58			19.10	3 8 4				
30			$\mu = a$	4.0. C			38 10	
70							he l	
70		1		C 8		2 No.		ř
/1				64 H K			257	
72	- 1	e .	30 - ¹⁸ 0	14 ₁ 11		10 I.		
73	29. II							
74								
75			8 9		100	* ** **		ł
76		ļ., .	2	2				
77	the state of the second se							346
78	2 1 a 1 a 18 a	1		16. 17		10 es		
79				C 80		60), 100		
80						2000 S	1	
81						R N		
82	a			10			80	
83			×			a an a		
84			9. P					
85						10		
86	KIR 18			8				۰.
87		-		15		2.4		
00		1					1	

SOU1	COMP	DRILLIN FWorld [®] GEOLOGICA	NG L	RVICES	u.	13	Hole No.	leet 1 d	6S-29 of 2	
SITE	N.C.	Plant Wansley	(a ²⁾	ж <u>ғ</u> ар	HOLE DEPTH	50.0	SUR	F.ELEV.	746	.7
	ON	Gyosum Storage Facility	COORD	INATES N	123655	4.0	E State	2028	298.2	×
ANGLE		BEADING	CONTR	ACTOR	SCS		DRILL NO.	CM	E 550	
DEUL			JONIN		NO :1	D. SAMP		0		122
MILLIN				E 817E	NU. U	TOTAL	% BEC			-
JASING	SIZE					- 014		9/14	/2006	
WATER	TABLE DE		IC AFTE	- COMP				9/14	/2006	
I YPE G	ROUT	QUANTITY	M	·				9/14	/2006	Ū
DRILLEI	н <u>л. н.</u>	D. THIPOVICTI HECORDER S. BEAICE APPROV	Sample	Stand	DRI			1		-
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	in the	% Rec	RC
0	746.70								1	
,	iii		1			4		1	41 G	82
÷	8				8			8.0	8 8	
2				1			5 J		1	
3	×							e se ne	1. A.	
4		Red sitty, clayey SAND (SM), stiff, with mixtured relict	2	3-4.5	5-6-6	12	LL=43 PI=12 gravel - 7.2%	4.6	30%	1
-		highly weathered Saprolite or colluvium mixture; damp			2.50		sand - 48.5%		-	5
5	5						siit - 23.9% clay - 20.4%	100		19.0
6	6						Bulk sample ta	aken		1
7							6.0 to 8.0 ft	1) 10   10   1		
-	1		1		22				4	
8		Firm. mottled, red-brown silty SAND/sandy SILT and		51			영역단	A South		
9		yellow-brown SILT, with traces of biotite and relict	3	8-9.5	3-4-5	9	2 Dolé	1000 - 100 E	50%	
10		metamorphic bonding; damp						8		i.
	295	8						1	24	
11			. 34							1
12								1		
13	100								88 9312 XX	
1		Firm, silvery, light gray to olive sandy SILT (ML),	1. A.	19145	0.4.0	10	non-plastic		100%	
14	h.	with relict muscovite schist Saprolite, texture very apparent and very thin black streaks; dry	4	13-14.5	2-4-8	12	sand - 43.4%		100 /	
15				12 C			silt - 49.1%		litera e	1
16				r i			oidy - 0.2 /0			
	(4) 8			*		1.0			-	
17				k j		- *F	с. 		100	
18	е	2001	5	18-19.5	3-3-6	9				
19	5.1	ary	5			1.20	20 25	1	-3 ⁻²	1
	1	and the second					<u>1</u>		-	
20							а с ^н		1	1
21	(* 									1
22			-				a a			
		Firm, band light olive (2") w/2" of red-brown 2" of					fracture	1	1.1	
23		It. olive SILT as above and relic schist textures in each section, relic fractures cross-	-				wet @ 23.0'	e	- Pr	
24	-	cut relic schistocity and have black MnO coating	6	23-24.5	2-3-5	8	soil is moist	-1.4	-	

SOUT	MERN COMP		NG L	OG RVICES			Hole No. Sheet 2 of 2	GS-29	
SITE _	n shires ye	Plant Wansley		11 M	TOTAL DEPTH	50.	0' SURF.ELEV.	74	6
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	4 4		-	u on or	10. 11 • • • • • •				e "
26				the de traite		-		=	
97	21 21	and the second sec	- 14		н. "А			. *	
	1	NA	a						
28	a di secondo Secondo Sacondo NET e secondo Sacondo	Very stiff, light olive silt & clay mixture (ML-CL),	100	P States	n (1997) 17. julio - Bar Mai	11 12	water on spoon	10 1. 11	
29		maybe some graphite mixed in, schistocity present, highly weathered rock	7	28-29.5	6-9-11	20	moist soil soil very slippery	<u>_</u>	
30	1						when rubbed		
31					n realer for en lost er		between migers		
32			1	sh	3				1.3
33				<i></i>	2 8 6				
00	5 100 S	Stiff, reddish brown SILT, one black MnO		33.94 5	7-6-8	14	wet	2	
34	1			100-04.0	1 216 NO 100				
35	100			el Attende des In la la	4	121		1 - 11 - 11 - 11	
36	1.40		1.000		R 0				
37		Land usethered applet Correlite w/skundant museouite	1	2.04		98	e. R		
38	1.1	graphite and silty SAND (SM) (white & red) from	9	38-39.5	13-36-50/5"	ref	non-plastic		$\bigcirc$
39		weathered feldspar, relic fractures w/black MnO coating and fill organics; moist				anerer .	sand - 59.1%		
40			Contraction of the second	en entrante 198	Robert de las las	1947 T 24	silt - 28.0% clay - 4.0%		
41	6 Qe								
41				1 °.		M	2		1.
42	1.1		in s	54	118 NI 88		5 ⁰ 51		
43			1000		a	0 34	over weekend	$= a^n$	
44			10	43-44.5	16-25-50/6"	ref	came back and had		е.
45			1		are da la c	1. 19 19 96			2
46	0		1 T		a, 1,			. 10	×
47			- E				Re ac		
48			L. Le				5 5 5 E		
49	11	Hard, brown Saprolite, flakey-micaceous with silty sand properties	11	48-49.5	50/5"	ref	20' water	· · · ·	
50	N.	BOH @ 50.0'			1		set well		
50	-			1	12			11.0	
51			100				9 10 10		
52	-				1 E		1 28 		
53	5. 1917 - 1917 -		3	1		, caxi	24.5 B		6
54		if i set		in . Nation 11 - 11 -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3		1	P
55	1	a second a second s	inger Station of the	1		- 835	- ¹² ≈ 2	-	
56	4 A 8 ¹⁰ 1		-				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	195	12

SOU	THERN COMP	DF GEOLO	RILLI OGIC/	NG L	OG RVICES	*	4 4 ³	Hole No. Sheet 1	GS-30 of 2	and Sector
SITE		Plant Wansley			, the second	HOLE DEPTH	56.5'	SURF.ELEV	. 714	4.6
LOCAT	ION	Gypsum Storage Facility	2 ¹⁰ 19	COORD	INATES N	1236619	9.1	E 20	28993.8	
ANGLE		BEARING	21414	CONTR	ACTOR	SCS	D	RILL NO. CI	VE 550	2
DBILLI		HSA NO. S	AMPLES		10	NO. U.	D. SAMPL	ES	0	)) (m. m
CASIN	G SIZE	LENGTH	8	co	RE SIZE		TOTAL	% REC.	Sec. 2 mile	71
WATER			TI		B COMP.		- DAT	E TAKEN 9/	9/2006	
TYPE			1	M	IX	DBIL	ING STA	BT DATE 9/	9/2006	1
TTPEC	GHOUT	P Eilipovich process P Mudd		M	···				9/2006	1
DHILLE	^{сн}	B. Filipovicii Heconden A. Mudu	APPRO	Sample	Stan	dard Penetration Test			T	-
Depth	Elev.	Material Description, Classification and Remarks	1	No.	From To	Blows	N	Comments	% Rec	RQ
0	714 60				1			8 PL 51		1
	114.00	Organics top 3"					R	Rain last night	4	1116
1		Ped SILT modium stiff moist		1	0-1.5	1-2-3	5			1 a'
2	1	Hed SILT, medium sun, moist			* e		al.			
ш. 1910								1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	12 1	
3	-			. "ić		30 - 28.			ar n	1.1
4	1			- 8	322 TU	29	1.000			and the second s
	-		1		3			4 N	1.11	
5		Sandy red & tan mottled SILT		-				St. 12.	1	1.0
6		medium stiff, moist	23 A	2	5-6.5	2-4-5	9			1
							2		17 27 17 D	
7	-		۰ ٤		8 8 9 i			1	E ale	1
8						an ni jiwa	1 00		1.3.94	
-	1 84		24	1.0	1. 4. a.e.	× 18 - 12	1. 1			
9					a.,		1.0		200	
10		<b>H</b> ere				12		杰	1	
11		Sandy, mottled orange & tan SILT, fine sand portion	on,	3	10-11.5	1-2-2	4		234 (1962) 	
	1		1	Ľ					4 a	1
12			£						1	
12					a che	a sh		A. 18-3-4		100
10	1		41		1. 19					See 12
14						n 7		5	1.4	1
15					-			A*		
	1.	Light tan SILT w/interbedded layers of white			1				2	
16		weathered schist, large angular quartz pebble		4	15-16.5	WOH-WOH-1	'			A
17										
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1000					
18	-				- ⁶⁴				1.	offer
19	1.0	5 V .							10 10 10 10 10 10 10 10 10 10 10 10 10 1	!
		а 11 — В ж. ¹								2
20		Tan sandy SILT with fine to medium sand portion		-	4	8		water table at 20		1
21	- 12	pieces of weathered rock, some as large as small		5	20-21.5	1-1-2	3	and and a second se	1	
-		pebbles & black in color, soft & very wet	1						1	
22	-							14.25	1977	
23		$m_{2} = \frac{1}{m_{m_{1}}} + \frac{1}{m_{1}} = \frac{1}{m_{1}} = \frac{1}{m_{1}} + \frac{1}{m_{1}} = $						£1		
0580						s				
24			13						100-25	

Form GS9901 7-26-2004

SOU1	HERN COMP	DRILLIN GEOLOGICA	IG L	OG RVICES		6 - ² 9	Hole No. Sheet 2 of 2	GS-30	
SITE	98 - 46 100 (1999) (1997) (1997) - 1997) (1997) (1997) (1997)	Plant Wansley	atta a	2 - 1 - 2	TOTAL DEPTH	56.5	SURF.ELEV.	714	4
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25			:15 		n in the second s				
26		Light tan sandy SILT w/black weathered schist intrusions, some mica flecks, medium stiff, moist	6	25-26.5	3-4-7	11	1. IL		75
07			_				×.		
21	6 N	a an					ж v.	1	
28			5				$a = m_{\mu}^{2\lambda}$		125
29				1	4. ×		1 ×	22	
30		SAA, with white schist layers	<i>n</i>			9 R			
31			7	30-31.5	5-6-10	16			*
32	14 8 11 - 11 - 14	. на _с ля			μ ¹		2		
33	<u>1</u>		41		ж.		6	÷ .	
34	R g						2 8	2	
35	24 13				9 2 224				
36		Gray & tan sandy SILT, w/mica intrusions, weathered in place with obvious bedding planes	8	35-36.5	5-9-22	31		8	100
07		(Saprolite), very stiff, moist			NE II				
- 3/						- * ² .		2 8	
38			12 10	22 12 10	81 - 1954K				-
39				а ^н а,		-	2 0 8		53
40		Layered red, yellow, orange SILT, very stiff,		81	0 /003				1
41		moist-bedding planes	9	40-41.5	8-19-50	69			
. 42	-			1	icees l				
43								-	6 80
44					a as a				-
45		Set well @ 44.5'			an Sandha sa		1		a
46		Clayey SILT Interbedded, layered orange, red, yellow & white	10	45-46.5	18-50/3"	ref	Si - Si	4	10
47	1.0	heavily weathered Saprolite, very stiff, moist	-	2 ¹⁰	90 92 - 12 - 16 - 16 - 17 - 17 - 17 - 17 - 17 - 17	+	P. D	+	-
49		ВОН @ 46.5'						4	
49			1						1
50				1		15			
51						200			
51	1	A state of the second		1		s., 2	24 12	5 92 92	
52				5.89					
53					5				0
54		-							1
55				043426200		1			
56								14	1

SOUT	COMP	DRILLI GEOLOGIC	NG L	.OG RVICES		5 (F)	Hole No. Shee	GS-31	1
ITE		Plant Wansley		rund it.		43.5	SUBE	ELEV 8	43.5
0041	ON	Gypsum Storage Facility	COOR	NATES N	- 12379	96.6	60111.	20252121	8
		BEADING	CONTE		505			CME 550	0 )
			CONTR	5	1000			0	
				DE SIZE	HO. U	TOTAL	* PEC	00%	-
WATED					24 bre	- 014		3378	1 :
			MEAFIE		24113			10/21/200	6
	B	S Milam RECORDER K Hobbs APPR		····				10/21/200	6
UNICCE		o. Milding incompany incompany incompany	Sample	Stan	dard Penetration Test			10/21/200	T
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Red	c R
0	843.50						NOTA -	1	
4				345				No.	- 316 
		Light brown/reddish sandy SILT, organic matter,							4
2		stiff	1	1-2.5	5-4-6	10		100	
3	010000								100
4	ě.							P	-
					ti rogen e		- B ₂		Y 1
5	1	Very stin, bun. SIL1	2	4.5-6	11-13-13	26	- - -	- 35	1
6					8 6 8			- E	
7	<u>u</u> -			C - 50					
•	14				10	÷	t de seller	1 11 14 14	en ao
0	+		1.1	₩ . •			^	<u>A</u> -4	
9					3			1 30	E.
10		Very stiff, yellowish orange SILT ,			-	0.22		1 Str.	
11	-	relic gneissic features	3	9.5-11	8-9-8	17		10 15 011 (111) 10	
	1						8	$(1+\frac{1}{2})^{-1} = (1+\frac{1}{2})^{-1} = (1+\frac{1}{2})$	
12			- ×	1 S S					1
13	1.1.1.1		* J?		908			6 81 4	
14	-		12	11	× 5				5) 5)
45		Madium atiff vollowish arange SILT		a			8		
15		gneissic banding, dark oxidized stains	4	14.5-16	4-4-5	9		1	
16			<u> </u>						
17				80	1.8			1	
18	6 ⁵ 61		3 100	× *	с.			- 16 1	
									1
19					· . · ·		92 - CENT	e. 14	
20		Buff Saprolite with gneissic mineral bands, stiff,	-	1.05.04	70.00			#1	
21		sandy SILT	5	19.5-21	7-6-13	19		go es d	
				1					
22									2
23					3		i da	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
04		TOH @ 23.5'	+						2

SOU1	HERN COMF	DRILLI GEOLOGICA		OG RVICES	940 ² 5 x 8	o ^{est} Be	Hole No. Sheet 2 of 2	GS-31	-
SITE _	IG.	Plant Wansley	1. A.	KA E BOSPING	TOTAL DEPTH	43.5	SURF.ELEV.	84:	
Depth	l Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N ·	Comments	% Rec	RQD
25 -		Pink and gray, hard, slightly weather	1.4						
26		GNEISS	i.	23.5-28.5			gʻi n	98	90
27	1.55 ⁽¹⁶⁾				a a		8 9 8		
28				isa 12 juli	380				
20		iron staining along fractures		i k	12 B			18 M.	
29	(4/3h) - 4				1 in 1		а 		
30	-			29 5.33 5		-	¥ 1	100	02
31				20.0-00.0	i catego i	- a - T	°	100	52
32				e gi	- 11 - 11 - 11 - 11		2 ca * . }		* 3
33	18				1	÷			
34	-		1.1	00 E 00 E	8 C		8	100	70
35	2 2			- 33.5-36.5		-		100	^
36				102 32434 32623					5
37	190			с е.			12 98		
38					0e) 51.553 cm		i.		P
39			-						
40				38.5-43.5			а 2 ⁷ 7 Х. А	100	7
41					in Marine - 19 Note			- 14	-
42	1				10 		80 B.	1	
43				'n					
44		BOH @ 43.5'	0.2		8 ¹⁰ i		2		
45				14.50			a ² e		
46	30				xist os de				1
47					17 39				
48		-				(E)	1	a a	
49								1973	
50					e e				
51	-			18	а,				1
52						() +	2 - 2 - 3	E	
53			1	2				1 . (	
54					10		di nan		T
55	(6 			C		2.00			

## WELL CONSTRUCTION LOG

WELL CONSTRUCTION LOG		Souther	n Company Ge	neratio	n À
Elevation: Logger: A. Grissom Dates drilled: 10/17/06		Drilling Co: SCS Driller: M. Hughes Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Core No. SPT: 8 No. UD:	Page 1 of Total depth: 54	¹ We (	ll Name 3S-1
	9 - 1 15			DEPTH	ELEV.
				- - 	
			TOP OF CASING	-2.6	850.3
			GPOIND SUPEACE	0.0	8177
			GROUND SURFACE		<u>    847.7                               </u>
		BACKFILL MATERIAL TYPE: Bentonite Chips RISER CASING			
		DIA: 2" TYPE: PVC	2 9 - 100 2		
			TOP OF SEAL	NA	NA
		ANNULAR SEAL TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK		809.0
	-	- FILTER PACK TYPE: #2 Filter Sand	a 8 3 8 ⁹ a 2 4		
l de la desta de la desta de la d		воттом	OF RISER/TOP OF SCREEN	39.7	808.0
		- SCREEN DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted	8		
	E	فكالم معركة فكأكر معرو	BOTTOM OF SCREEN	49.7	798.0
					2
	L		BOTTOM OF CASING	54.7	793.0
Uncontrolled	Copy 3/2	24/2017 1.16:28 PM	BUTTOM OF HOLE	<u>54.7</u>	<u> </u>

ELL CONSTRUCTION LOG	Southern	Company Generation 🔺			
ject: Gypsum Storage Facility ation: Plant Wansley vation:	Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA/HO	Page 1 of 1	Well N GS-	lar -2	
ger: S. Bearce es drilled: 10/23/06 to 10/24/06	Sampling methods: SPT & Core No. SPT: 5 No. UD:	Total depth: 45.7			
nanati nana na bi		D	EPTH	ELEV.	
			2 2 4 2		
	n a sad, e	TOP OF CASING	-2.9 8	37.1	
	u vi d _a a m	GROUND SURFACE	0.0 8	34.2	
	•	. ".		#5	
	the states		8 100 0		
		ен н та		10	
	BACKFILL MATERIAL	а ^{ай} а и	s aj		
	TYPE: Bentonite Chips		N U ⁸	5 P.	
	RISER CASING	а. 	1		
	DIA: 2" TYPE: PVC	92 27 29		- 0	
	ne ^m erences ^{in er}	-	"36") 2 2 4 09		
			×2		
				2 70	
		TOP OF SEAL	28.0	805.2	
	ANNULAR SEAL TYPE: 1/4" Bentonite Pellets				
		TOP OF FILTER PACK	. <u>31.0</u> 8	803.2	
	FILTER PACK		а 212 (р.		
	I I FE, #2 FIRE Sabu				
	воттом	OF RISER/TOP OF SCREEN	35.7	<u>798.5</u>	
				0	
	SCREEN DIA: 2* TYPE: Schedule 40 PVC				
	OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted	5 5 5		10	
		BOTTOM OF SCREEN	44.7	789.5	
			15.5	700	
		BOTTOM OF CASING BOTTOM OF HOLE	45.7	788.5	

		boutiern	company de		
st: Gypsum Storage Facility on: Plant Wansley evation: ogger: K. Hobbs ates drilled: 10/23/06		Drilling Co: SCS Driller: M. Hughes Rig type: CME 550 Drilling method: HSA Sampling methods: SPT	Page 1 of	Wel	ll Name 3S-3
		No. SP 1; 3	Total deput. 40.	3	14 14 14 14 14 14 14 14 14 14 14 14 14 1
		, ²		DEPTH	ELEV.
			17 1	ь <u>в</u> і	
				<u>81</u>	
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	п <u> </u>		TOP OF CASING	<u>3.1</u>	806.3
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			GROUND SURFACE	0.0	803.2
			a ²	: 11 ::	
			a 19 10 10 10 10 10 10 10 10 10 10 10 10 10	з ^в	U.
		- DACKETI I MATEDIAL	2 ²¹ 22		
		TYPE: Bentonite Chips	а ^{с ж} . ж	<pre>.</pre>	
				8	
	99	RISER CASING	-		
		DIA: 2" TYPE: PVC	2		
			1.1	2 5	с. 
аа т., ² а е			5		
		s .	_ X		84
a ¹ a ⁸ a					7/0 5
			TOP OF SEAL		. /68.5
		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	37.2	766.0
		- A - 4			-
			5 ²⁶	a ili	12 ⁽¹⁾
		BOTTOM OF	RISER/TOP OF SCREEN	38.5	764.7
		SCREEN	x ⁹	8	* 1
		DIA: 2" TYPE: Schedule 40 PVC Pre-Pack OPENINGS WIDTH: 0.01"	22	8	
		OPENING TYPE: Slotted	si e	÷	
			BOTTOM OF SCREEN	48.5	754.7
			DOTTON OF CASDIC	10 5	7547
A CARACTER AND A			BUTTOM OF CASING	48.3	- 154.1

WELL CONSTRUCTION LOG	ny (L'altern	Souther	n Company G	eneratio	on 🔼
Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: K. Hobbs	n gada 1. osta Ingenin Kasan	Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA/HQ	Page 1 of	¹ We	ll Na GS-4
Jates drilled: 10/25/00		No. SPT: 5 No. UD:	Total depth: 35	.5'	
and the strand	raata S			DEPTH	ELEV.
				#3	
			. A.	a j	
	*) <u>-00000-504</u>	n Artenas includes	TOP OF CASING		809.0
and of and and a state	an a	and the second	GROUND SURFACE	0.0	805.9
	1		13		
	1	A Sec		a	
	12				
	1		V. C	÷	· · ·
	1	BACKFILL MATERIAL     TYPE: Bentonite Chips	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100		18 - 1 E
	1				
	1	RISER CASING	2. L. 5.		1.00
	1	DIA: 2"	JI has a		C
		TIFETYC	e		
	1		1993 - N		
	1		s î "		
		(a)	· ·		
A10-1	1		TOP OF SEAL	20.5	785.4
		ANNULAR SEAL	5 5 ⁵ 85 ⁵		a
	88		TOP OF FILTER PACK	23.0	782.9
				× ° *	
en e		TYPE: #2 Filter Sand	54 51 - 51	. * = 2 2	12 P.
			8		
a da ser a la ser a l	<u></u>	воттом с	OF RISER/TOP OF SCREEN	25.5	780.4
		A STATE			
		SCREEN			5
		OPENINGS WIDTH: 0.01"			¥.
		OPENING TYPE: Slotted			
			BOTTOM OF SCREEN	34.5	- 7/1.4
			POTTOM OF CASENC	25.2	770
	<u>-</u>		BOTTOM OF HOLE		770 4

	Drilling Co: SCS			r company u	of 1 W.IIN	
Levation: Logger: K. Hobbs Dates drilled: 10/22/06		Drilling Co: SCS Driller: M. Hughes Rig type: CME 550 Drilling method: HS. Sampling methods: S No. SPT: 5	A/HQ Core SPT & Core No. UD:	Page 1 of Total depth: 30	We	II Name GS-5
	24 2 12 12 12 12 12 12 12 12 12 12 12 12 1	2795.	(apple)	11 Mar 10	DEPTH	ELEV
				3 a .		
		8 ₂₂ 10	1			£
				TOP OF CASING	-2.9	776.0
					<b>^</b>	772 1
				GROUND SURFACE		<u></u>
			i <del>t</del>			
		1. No.	\$ ×			
						=
		- BACKFILL MATERIAL				$\kappa_{c}^{12} \rightarrow \pi^{2}$
		TYPE: Bentonite Chips		e de la constitución de la constitu		
		RISER CASING DIA: 2"		· .		d* 57
		TYPE: PVC				
				28 -		В ^н а
		and second				
				TOP OF SEAL	14 3	758.8
		ANNULAR SEAL				- 150.0
		TYPE: 1/4" Bentonite Pe	llets	TOP OF FILTER PACK	19.3	753.8
		FILTER PACK TYPE: #2 Filter Sand		80 BK		* *
		1. N		3 ¹³		
			BOTTOM C	F RISER/TOP OF SCREEN	20.6	752.5
<ul> <li>Milag &amp; South Street Str</li></ul>			مر بندر میں _{میں}			- <u></u>
4		- SCREEN		3		
		DIA: 2" TYPE: Scher	dule 40 PVC			H ^{ar} to
		OPENING TYPE: Slotted	• 22	343		
A Carl Martin				BOTTOM OF SCREEN	30.6	742.5
				10 III		1
				BOTTOM OF CASING		- 742.5
·····································				BOTTOM OF HOLE		142.5

WEEL CONSTRUCTION		3 	Southern	company Gen	eration
Project: Gypsum Storage Facility			Drilling Co: SCS Driller: M. Hughes	Page 1 of 1	Well Nar
Elevation: Logger:			Rig type: CME 550 Drilling method: HSA	2	GS-6
Dates drilled: 10/21/06	and the second	·	No. SPT: No. UD:	Total depth: 41.5'	
				I	DEPTH ELEV.
			20 20 20	· · · · · · · · · · · · · · · · · · ·	13
	9 		11 12 12 12 12 12 12 12 12 12 12 12 12 1	1 ²⁴ - 1	
は 11 - 12 - 22 市 - 20	0 2 2 2 2 2 2	<u> </u>		TOP OF CASING	-2.6 769.7
ана на селото на село Поста на селото на сел Поста на селото на се		12		GROUND SURFACE	0.0 767.1
* A.					
8 31				80 254	8
	2 X				
	8		· · · · · · · · · · · · · · · · · · ·	÷.,	21 - 12 /s
	10. 1940 1. 1940	99-	- BACKFILL MATERIAL TYPE: Bentonite Chins	*** X	
na n					· · · · · · · · · · · · · · · · · · ·
	а. а. ^в		DISED CASING		
	2020 ()	10	DIA: 2"		
			TYPE: PVC	а	-
	с. "2.				
				2	2.5
			6		
20 	2 H U			TOP OF SEAL	26.0 741.1
	2 		ANNULAR SEAL	z ⁿ	
	41		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	
					2
*			TYPE: #2 Filter Sand		19 C
2			· · · · · · · · · · · · · · · · · · ·	2	
5 M 8	· · · · · ·		воттом с	OF RISER/TOP OF SCREEN	30.0 737.1
2901 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10				*
			SCREEN		
			DIA: 2" TYPE: Schedule 40 PVC Pre-Pa OPENINGS WIDTH: 0.01"	ck	
17 년 18일 - 19			OPENING TYPE: Slotted	en a la companya da l	12 
2				BOTTOM OF SCREEN	40.0 727.1
			2 8 ₁ 8 ²⁶ 8	POTTOL OF CLEDIC	41.5
а _н а ак				BOTTOM OF LOUE	41.5 725.6

## WELL CONSTRUCTION LOG

Ct: Gypsum Storage Facility ion: Plant Wansley Elevation:	6.15 6.15		Drilling Co: SCS Driller: M. Hughes Rig type: CME 550	Page 1 of 1	We	Il Name GS-7
Logger: R. Mudd Dates drilled: 10/11/06	1. ja 11.	975 	Sampling methods: SPT No. SPT: No. UD:	Total depth: 66.	5'	
				e need to be an of	DEPTH	ELEV.
					ε,	ж. ^а
	-		1 0 <u>1</u>	TOP OF CASING	<u>-2.7</u>	<u> </u>
				GROUND SURFACE	0.0	794.7
	Ø	2				and a second
	0	0		12 940		
	0	1		10 E		
	0			· · ·	12	
	1	13	BACKFILL MATERIAL	20 - 20		£ 2 .
	1	1	TTTE. Benome Cinps			
100 Barrier (100 B		1	BISED CASENC		5 a 🗸	
	0	Ø	DIA: 2"		885	e *
		1	TYPE: PVC			11 1
	1		5. 15 15	*	а С	1.1
	2	0	and the second second			÷
	1		1.00	33 ³²		
	0	1		TOP OF SEAL	÷ 1	0
			ANNULAR SEAL		19 J.	
			TYPE: Bentonite Pellets	TOP OF FILTER PACK	54.7	740.0
				34	¥ 1	
			FILTER PACK TYPE: #2 Filter Sand, 6 bags			
				a		(*
· · · · · · · · · · · · · · · · · · ·			BOTTO	OF RISER/TOP OF SCREEN	55.0	739.7
**************************************					ī.	
			SCREEN	-		5 M - M
* 19 me :			DIA: 2" TYPE: Schedule 40 PVC Pre OPENINGS WIDTH: 0.01"	Pack		
			OPENING TYPE: Slotted	n	in the second	
				BOTTOM OF SCREEN	65.0	<u>129.7</u>
				DOTTOM OF CLODIC	(5.0	720.7
	. I			BOTTOM OF HOLE		728.2
						- 120.2
		lon	HOLE DIA. 8"	2		
Cheorition	Su C	, db y		9 K.		

WELL CONSTRUCTION LOG			Sc	outhern	Company G	eneratio	n 🔼
roject: Gypsum Storage Facility ocation: Plant Wansley levation: .ogger: R. Mudd		5 - 5 x	Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA/H	Q	Page 1 of	¹ We	ll Nar GS-8
Dates drilled: 10/12/06	5 10 000 000 000 000 000 000 000 000 000	en e s	Sampling methods: No. SPT:	No. UD:	Total depth: 37	7.4'	* <mark>2</mark> 55
n an an an an Alfred Carl and Anna an A Statistical Statistical Statistica						DEPTH	ELEV.
a 5 ¹⁸			. ⁵	i	3 0 ²⁴	83 -	
ар к. а а		* * _*	<b>截</b> 時			De	
	N. 22		2		TOP OF CASING		769.4
a <b>a a</b> a a a a a a a a a a a a a a a	с ⁷⁶ а 1916 - 1916		и 	а а н	GROUND SURFACE	0.0	766.5
	Ø	0	1				3
с (1) — — — — — — — — — — — — — — — — — — —		0	2004 8 10 12		(†)	3	M. 24
0 8 8 8 10 8 0 8 8 10		Ø					e e
e		0				1.24	
		1	BACKFILL MATERIAL     TYPE: Bentonite Chips		20 20 20 20 20 20 20 20 20 20 20 20 20 2		
e 15		12			ae s la g		1 1
			RISER CASING				1
		0	DIA: 2" TYPE: PVC	10 T			
2 88						98 (G	18 194
2 ¹⁰ 10 ¹⁰ 2							
4 44 40 A A A A A A A A A A A A A A A A	BB				TOP OF SEAL	<u> </u>	<u> </u>
			TYPE: Bentonite Pellets		TOP OF FILTER PACK	15.5	751.0
			FILTER PACK TYPE: #2 Filter Sand, 2 bags		8 8 ²		
а д () #			- 100 · · · · · · · · ·		42 N		
				BOTTOM O	F RISER/TOP OF SCREEN	17.4	749.1
		=					
х С., 8			SCREEN		а У		
			DIA: 2" TYPE: Schedule OPENINGS WIDTH: 0.01"	40 PVC			,
			OPENING TYPE: Slotted	* n	DOTTON OF SOLE	07.4	720.1
					BOTTOM OF SCREEN	$-\frac{27.4}{-}$	739.1
8 K 8 8			14 69 ₅		BOTTOM OF CASING	37.4	729.1
					BOTTOM OF HOLE	37.4	729.1



WELL CONSTRUCTION LOG	Southern	Company	Generatio	on 💫
Project: Gypsum Storage FacilityDrilling Co: SCSLocation: Plant WansleyDriller: M. HughesElevation:Rig type: CME 550Logger:Drilling method: HSDates drilled: 10/21/06Sampling methods:No. SPT:	SA/HQ SPT & Core No. UD:	Page 1 Total depth:	of 1 We	ll Nar JS-10
			DEPTH	ELEV.
			18 2	
	10 10	TOP OF CASING	-2.8	764.2
		GROUND SURFACE	0.0	761.4
	T	24		
		÷	*	10 1
		** * * *	(e) (e)	SI.
BACKFILL MATERIAL TYPE: Bentonite Chips	L		90 200 - 21	19 ^{- 1} - 1 ⁰
	10			12 ¹⁰
DIA: 2" TYPE: PVC		8 8 8	2 11	
			38 10	*
	42. IO 38		1	19
ANNULAR SEAL		TOP OF SEAL		
TYPE: 1/4" Bentonite P	ellets	TOP OF FILTER PAC	<u> </u>	735.4
FILTER PACK				
1 TPC: #2 Filler Sanu	647 #11	2 A		
	BOTTOM OF	RISER/TOP OF SCREI	<u>27.7</u>	733.7
SCREEN	21			
DIA: 2" TYPE: Schu OPENINGS WIDTH: 0.0	edule 40 PVC 01"	- ₁₂ 12 - 10		1
OPENING TYPE: Slotte	d	BOTTOM OF SCRE	en <u>37.7</u>	723.7
		DOTTOM OF CASE	38.0	72
		BOTTOM OF HO	LE 51.8	709.6

evation: ogger: G. McWhorter ates drilled: 10/20/06		Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA Sampling methods: SPT No. SPT: 13 No. UD:	Page 1 of 1 ⁻ Total depth: 60.5	We C	ll Name 3S-11
A CONTRACTOR OF A CONTRACTOR O				DEPTH	ELEV.
	-	·	- 121 - 2 - 121 - 2	2	*1 07
	с ⁸ б.	an te te	TOP OF CASING	-2.7	776.6
			GROUND SURFACE	0.0	773.9
		The second second			45400 (12)
				8	1.1
			50 1	18	
		BACKFILL MATERIAL		n R	×
		TYPE: Bentonite Chips	a sala		1. n. 1
		a * 1100	14	94	
		DIA: 2"		2 0	^м Ж.н.
		TYPE: PVC	-		× .
			77 1 -		
					50
			5.1 2010 - 10.0	о 	
		ANNULAR SEAL	TOP OF SEAL	_4 <u>5.5</u>	728.4
		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	48.0	. 725.9
		EII TED BACK			102 M
		TYPE: #2 Filter Sand			a a
1999 - 20 19 19 19 19 19 19 19 19 19 19 19 19 19					
		BOTTO	M OF RISER/TOP OF SCREEN	_ <u>50.5</u>	723.4
		SCREEN			с Г
		DIA: 2" TYPE: Schedule 40 PVC Pro	-Pack		
		OPENING TYPE: Slotted	8		
and the second second			BOTTOM OF SCREEN	_60.5	713.4
			BOTTOM OF CASING	60.5	713.4
			BOTTOM OF HOLE	60.5	713.4

VELL CONSTRUCT	ON LOG	A SATE For		147	Southe	rn Company G	eneratio	n A
oject: Gypsum Storage Facility ocation: Plant Wansley levation: ogger: G. McWhorter ates drilled: 10/19/06				1	Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA Sampling methods: SPT	Page 1 of	¹ We	ll Nar iS-12
					NO. 5P1: 17 NO. OD:	Total depui. 81	DEPTH	ELEV.
	*				80 18 2			
		14	ner V			a u		STA:
16 (16 <u>7</u> 5) 2	* s					TOP OF CASING		<u>775.7</u>
	1.	2		8		GROUND SURFACE	0.0	773.2
8					1 La 20			
					2 ¹⁷ 189		び、 第 数	ан. 1
	25				*	e a ^r u n _g		$(-\infty^{2})$
				1	- BACKFILL MATERIAL	2 A A	1.0 N	
		1220 - 11			TYPE: Bentonite Chips	22	e n ^{om b} e	²⁰
					DICED CACDIC	27. 27		
а ан			Űŧ	1	DIA: 2"	-		
					TYPE: PVC			
					ing a suite	75		
н		2						
3		8					2	
				4		TOP OF SEAL	65.5	707.7
	3				TYPE: 1/4" Bentonite Pellets	- TOP OF FILTER PACK	68.0	705.2
						e dan		
1. 3. 3					FILTER PACK TYPE: #2 Filter Sand	7 ⁻ *		1.31
13 T					95 - 13			
				<u></u>	BOTTO	M OF RISER/TOP OF SCREEN	69.5	703.7
4 B						M	21	·
a o n					- SCREEN DIA: 2" TYPE: Schedule 40 PVC Pr	e-Pack		
	8				OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted	8 8 8		
а ^р на Хе. ¹¹ ² 0						BOTTOM OF SCREEN		693.7
		11 11						6
				<b>_</b>		BOTTOM OF CASING		693.7
						BOTTOM OF HOLE	81.0	692.2

## CONSTRUCTION LOG

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ELL CONSTRUCTION LOG		- -	Southern	Company	Gener	ration 🗖
t: Gypsum Storage Facility on: Plant Wansley vation: gger: R. Mudd tes drilled: 10/10/06		Drilling Co: SCS Driller: M. Hughes Rig type: CME 550 Drilling method: HSA Sampling methods: SI No. SPT:	/HQ Core T & Core No. UD:	Page 1 Total depth:	of 1 : 37.5'	Well Name GS-13
		2.45			DEP	TH FLEV
	а " а	s e e e	10 			
	· .	1973 - 1973 - 1974 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 - 1975 -		TOP OF CASING	-3.4	4
				GROUND SURFACE	E 0.0	0780.6
				- 	- N 	
				77 - E.S 80	65	a (1
		— BACKFILL MATERIAL TYPE: Bentonite Chips		9 8 R R	a _g t Po	
		RISER CASING				
		DIA: 2" TYPE: PVC			2	
			्य य स		2 2	
		2 (1) 2 (1)		TOP OF SEAI	L P	u di a Vini i
		ANNULAR SEAL TYPE: Bentonite Pellets		TOP OF FILTER PA	<u>ск 8</u>	.0 772.6
11 (P)		FILTER PACK TYPE: #2 Filter Sand, 2.5	bags	* ************************************	1	
1.2420			BOTTOM OF	RISER/TOP OF SCRE	<u>en 12</u>	
		<u>SCREEN</u>				
	-	DIA: 2" TYPE: Sched OPENINGS WIDTH: 0.01	ue 40 PVC	е а п		S 1 - 2
	-	OPENING TYPE: Slotted		BOTTOM OF SCR	EEN 22	758 1
				BOTTOM OF CAS	ING37	7.5 743.1
				BOTTOM OF HO	DLE 37	7.5 743.1
WELL CONSTRUCTION LOC	STRUCT	14. 	Southe	ern Company Ge	neration	
-------------------------------------------------------------------------	--------	---------	--------------------------------------------------------------------------------------------	---------------------------	---------------	------------
roject: Gypsum Storage Facility ocation: Plant Wansley flevation:	4		Drilling Co: SCS Driller: S. Milam Rig type: CME 550 Drilling method: HSA/HO Core	Page 1 of 1	Well GS	Nar -14
Dates drilled: 10/19/06		-	Sampling methods: SPT No. SP1: 2 No. UD:	Total depth: 45.5	Ben s	
					DEPTH	ELEV.
			l.	12 12 1	22	
				TOP OF CASING		740.8
			- 	GROUND SURFACE	0.0	737.7
					÷.	9 - 1 2
			- BACKFILL MATERIAL			
			- RISER CASING		- 	
			DIA: 2" TYPE: PVC	а на 19 20		
		18_		TOP OF SEAL	15.5	722.2
			ANNULAR SEAL TYPE: 1/4" Bentonite Pellets		_1 <u>8.0</u>	719.2
			- FILTER PACK TYPE: #2 Filter Sand			
			BOTTO	OM OF RISER/TOP OF SCREEN	_2 <u>0.5</u>	717.2
			- <u>SCREEN</u>			
a V A			DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted			
	5			BOTTOM OF SCREEN	_30.5	707.2
	a 			BOTTOM OF CASING	45.5	692.2

# WELL CONSTRUCTION LOG

WELL CONSTRUCTION LOG		0		Southern	Company G	eneratio	eration 🕰	
Project: Gypsum Storage Facility ion: Plant Wansley Levation: Logger: Dates drilled: 10/20/06		Dril Dril Rig Dril San No.	ling Co: SCS ler: B. Filipovich type: CME 550 ling method: HS. pling methods: S SPT:	A/HQ Core SPT & Core No. UD:	Page 1 of Total depth: 41	11 We	ll Name S-15	
	n de la cela de la cel N	999 - 199 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 19 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 - 198 -	201 - 201 (17	1		DEPTH	ELEV.	
				1		85		
		9		N	TOP OF CASING	_2.9	722.6	
		a a	1 1		GROUND SURFACE		719.7	
				: ²⁷	tor _p or 4			
			ş.		1		1	
		BA TY	CKFILL MATERIAL PE: Bentonite Chips					
0			SER CASING A: 2" PE: PVC	5. 		*		
					н 1 - с	н _в и		
					TOP OF SEAL	8 		
- Track			VULAR SEAL PE: 1/4 " Bentonite Pe	llets	TOP OF FILTER PACK	18.0	701.7	
		<u>FIL</u> TY	TER PACK PE: #2 Filter Sand		- a N		* 8 N	
				BOTTOM OF	RISER/TOP OF SCREEN	2 <u>0.0</u>	699.7	
		SCR	EEN		21 25		а. 	
		DIA OPE	2" TYPE: Sched NINGS WIDTH: 0.01 NING TYPE: Slotted	ule 40 PVC "	m			
shirt a share te		×	n ²		BOTTOM OF SCREEN	30.0	689.7	
					lái	60	а 10	
		\$			BOTTOM OF CASING		689.7	
	1	×			BOTTOM OF HOLE	41.3	678.4	
Ur	ncontrolled Cop	→ H oy 3/24/2	<b>dle dia. 4"</b> 2017 1:16:	28 PM				

# WELL CONSTRUCTION LOG

Project Sporan Stange Facility Location: Plant Waneby Bereford: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Description: Descri	WELL CONSTRUCTION LOG	Southern	Company Ge	eneratio	n 🔁
DEFTH         ELEV.           TOP OF CASING         -2.6         713.1           GROUND SERVACE         0.0         710.5           GROUND SERVACE         0.0         710.5           BACKFUL MATERIAL           TOP OF CASING         0.0         710.5           BACKFUL MATERIAL           TOP OF SERVACE         0.0         710.5           TOP OF SERVACE         0.0         710.5           TOP OF SERVACE         24.2         686.3           ANNULAR SEAL         TOP OF FLITER FACK         26.7         683.8           TYPE: IS addeed FRide:         TOP OF FLITER FACK         26.7         683.8           TYPE: IS ADDE 40/TVC         TOP OF FLITER FACK         26.7         680.5           STER MAKE         BOTTOM OF RESERVACE         30.0         680.5         GOTOM OF SCREEN         30.0         680.5         GOTOM OF SCREEN         40.0         670.5         BOTTOM OF SCREEN         40.0         670.5         BOTTOM OF CASING         40.0         670.5         GOTOM OF CASING         40.0         670.5	Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: Dates drilled:	Drilling Co: SCS Driller: M. Hughes Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Core No. SPT: No. UD:	Page 1 of 1 Total depth: 40.	1 Wel G	ll Na S-16
TOP OF CASING         2.6         7[3.1]           GROUND SUPPACE         0.0         7[0.5]           BACKFILI MATERIAL         700 OF SEAL         0.0         7[0.5]           TYPE: Bedicalia Calge				DEPTH	ELEV.
TOP OF CASING         -2.6         713.1           GROUND SUBFACE         0.0         710.5           BACKPILL MATERAL         TYPE         0.0         710.5           TYPE Belowing Case         0.0         710.5         0.0         710.5           MACKPIL MATERAL         TYPE Belowing Case         0.0         710.5         0.0         70.0           MACKPIL MATERAL         TYPE Belowing Case         0.0         666.3         0.0         666.3           TYPE INF Busing Policy         TYPE INF Based Police         TYPE INF Based Police         0.0         680.5           MACKPIL MATERAL         TYPE INF Based Police         TYPE INF Based         0.0         680.5           MACKPIL MATERAL         TYPE INF Based         BOTTOM OF RESERTION OF SCREEN         0.0         680.5           MACKPIL MATERAL         TYPE INF Based         BOTTOM OF RESERTION OF SCREEN         40.0         670.5           MACKPIL MATERAL         BOTTOM OF RESERTION OF SCREEN         40.0         670.5           BOTTOM OF ROLE         40.0         670.5         670.5           BOTTOM OF ROLE         40.0         670.5         670.5			N		ta 1
TOP OF CASING         -2.6         7[31]           GROUND SUBFACE         0.0         7[0.5]           BACKFELI MATERAL         -0.0         7[0.5]           TYPE: Bolinois: Calips         -0.0         7[0.5]           DA. 2°         TYPE: Bolinois: Calips         -0.0           DA. 2°         TYPE: PTC         -0.0           DA. 2°         TYPE: PTC         -0.0           TYPE: PTC         -0.0         -0.0           DA. 2°         TYPE: PTC         -0.0           TYPE: PTC         -0.0         -0.0           DA. 2°         TYPE: PTC         -0.0           TYPE: PTC         -0.0         -0.0           DA. 2°         TYPE: PTC         -0.0           TYPE: PTC         -0.0         -0.0           DA. 2°         TYPE: PTC         -0.0           DA. 2°         TYPE: Standale 60 PVC         -0.0           OPRIMON TYPE: Standale 60 PVC			8	-	30 ⁽³⁾
GROUND SUFFACE         0.0         710.5           INCRTIL MATERAL           TYPE: Execute Cape           TYPE: Execute Cape           DA 27           TYPE: CASING           DA 27           TYPE: FVC           TOP OF SEAL           ALL 24.2           OB 27           TYPE: FVC           TYPE: FVC           TYPE: FVC           TYPE: Standare Folics           TOP OF FULTER PACK           TYPE: Standare Folics           TYPE: Standare Folics           DIG 7           SCREEN           DIG 7           OFENING TYPE: Standare MPYC           OFENING TYPE: Standare MPYC           OFENING TYPE: Standare MPYC		8 (E	TOP OF CASING	-2.6	713.1
GROUND SURFACE         0.0         710.5           BACKFILL MATERAL         TYPE. IAMARKAL         1           TYPE. IAMARKAL Claps         0.0         70.2           BACKFILL MATERAL         1         0.0         70.2           TYPE. IAMARKAL Claps         0.0         70.2         0.0           BACKFILL MATERAL         1         0.0         686.3           TYPE. IAMARKAL Claps         0.0         686.3         0.0           TYPE. IAMARKAL Claps         100.0         683.8         0.0           TYPE. IAMARKAL Claps         100.0         680.5         0.0           MALTER PACK         10.0         680.5         0.0           SCREEN         DAL 2"         TYPE. Schedule 40 FVC         00.0         670.5           OPENING TYPE Select         BOTTOM OF SCREEN         40.0         670.5           BOTTOM OF CLASSING         40.0         670.5         670.5           BOTTOM OF CLASSING         40.0         670.5         670.5           BOTTOM OF CLASSING         40.0         670.5         670.5					
BACKFILL MATERIAL TYPE: Restance Cape           PRSER CASING DA. ?? TYPE: PVC           DA. ?? DA. ??			GROUND SURFACE		
BACKFIL MATERAL           TYPE: Resolut Cops           - RISER CASING           DM.2"           TYPE: PVC           - ANNULAZ SEAL           - TYPE: PVC           - ANNULAZ SEAL           - TYPE: IA'T Beavaile Felles           - BOTTOM OF SCREEN           BOTTOM OF SCREEN           BOTTOM OF CASINO           BOTTOM OF HOLE           BOTTOM OF HOLE           BOTTOM OF HOLE				19	54 18
BACKFILL MATERIAL           TYPE: Benavire Cajes           DA.2           TYPE: FVC           TYPE: IVC           BOTTOM OF RISER/TOP OF SCREEN           30.0           G80.5           SCREEN           DA.2"           TYPE: Standel 60 PVC           OPENINGS WITH: 00"           OPENING WITH: 00"           OPENING WITH: 00"           OPENING WITH: 00"           OPENING TYPE: Standel           DUTCONOF SCREN <td></td> <td></td> <td></td> <td>8 3</td> <td></td>				8 3	
BACKFILL MATERIAL           TYPE: Benoine Cdips           PRISER CASING           DAA: 2"           TYPE: IVC           TOP OF SEAL           24.2           686.3           ANNULAR SEAL           TYPE: I/4" Benoine Relies           TOP OF FILTER PACK           PILTER PACK           TYPE: I/4" Benoine Relies           TOP OF FILTER PACK           PILTER PACK           TYPE: Stadel 40 FYC           OPPAINGS WIDTH: 601"           OPPAING TYPE: Stadel 40 FYC           OPPAING TYPE: Stadel 40 FYC <t< td=""><td></td><td></td><td></td><td></td><td>8.</td></t<>					8.
International Color           TYPE: Benknine Color           DLk.2"           TYPE: PVC			19	- 40 10	
EXERCASING           DiA: 2*           TYPE: PVC             ANNULAR SEAL           TYPE: 14* Bendate Piles           TOP OF SEAL           26.7           683.8           -           FILTER PACK           TYPE: 14* Bendate Piles           TOP OF FILTER PACK           26.7           683.8           -           BOTTOM OF RISER/TOP OF SCREEN           30.0           680.5           SCREEN           DA: 2*           TYPE: 53.60464: 40 PVC           OPENING WIDTH: 601*           OPENING TYPE: Standal: 40 PVC		TYPE: Bentonite Chips			
NISER CASING           DA: 2"           TYPE: PVC		5 S			
Dix: 2" TYPE: PVC           TOP OF SEAL		RISER CASING		27	-
TYPE PVC           TOP OF SEAL         24.2         686.3           ANNULAR SEAL         TOP OF FLITER PACK         26.7         683.8           FILTER PACK         TOP OF FLITER PACK         26.7         683.8           FILTER PACK         TYPE: #7 Files Said         00         680.5           SCREEN         DIA: 2"         TYPE: Said         30.0         680.5           SCREEN         DIA: 2"         TYPE: Said         00         670.5           OPENING TYPE: Slead         BOTTOM OF RISER/TOP OF SCREEN         40.0         670.5           BOTTOM OF CASING         40.0         670.5         670.5           BOTTOM OF FLOE         40.0         670.5         670.5		DIA: 2"		238	
TOP OF SEAL         24.2         686.3		TYPE: PVC	्र	(j)	
TOP OF SEAL         24.2         686.3           -ANNULAR SEAL         TOP OF FILTER PACK         26.7         683.8           -FILTER PACK         TOP OF FILTER PACK         26.7         683.8           -FILTER PACK         TYPE: #2 Filter Sand         30.0         680.5           -SCREEN         BOTTOM OF RISER/TOP OF SCREEN         30.0         680.5           -SCREEN         DIA: 2"         TYPE: Stokedule 40 PVC         00 680.5           -SCREEN         BOTTOM OF SCREEN         40.0         670.5           -SCREEN         BOTTOM OF CASING         40.0         670.5           -SCREEN         BOTTOM OF CASING         40.0         670.5					×
TOP OF SEAL         24.2         686.3           ANNULAE SEAL         TYPE: I/4* Bedionite Peliets         TOP OF FILTER PACK         26.7         683.8           FILTER PACK         TYPE: I/4* Bedionite Peliets         TOP OF FILTER PACK         26.7         683.8           SCREEN         BOTTOM OF RISER/TOP OF SCREEN         30.0         680.5           SCREEN         DIA. 2*         TYPE: Schedule 40 PVC         0PENINGS WIDTH: 001*           OPENING TYPE: Schedule 40 PVC         0PENING TYPE: Schedule 40 PVC         670.5           BOTTOM OF SCREEN         40.0         670.5           BOTTOM OF CASING         40.0         670.5           BOTTOM OF FLOIP         60.0         670.5           BOTTOM OF FLOIP         670.5         670.5           BOTTOM OF FLOIP         40.0         670.5		a ⁿ a			17.2
TOP OF SEAL         24.2         686.3           -ANNULAR SEAL         TYPE: 14" Benoaite Pellets         TOP OF FILTER PACK         26.7         683.8           -FILTER PACK		a di Anna			10. C
ANNULAR SEAL TYPE: 14" Bentonite Pellets TOP OF FILTER PACK 26.7 683.8 FILTER PACK TYPE: #2 Filter Sand SCREEN DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01" OPENING SWIDTH: 0.01" OPENING TYPE: Sloted BOTTOM OF SCREEN 40.0 670.5 BOTTOM OF CASING 40.0 670.5 BOTTOM OF HOLE 40.0 670.5			TOP OF SEAL	24.2	686.3
Image: Second control of the second control		ANNULAR SEAL			
SCREEN         BOTTOM OF RISER/TOP OF SCREEN         30.0         680.5           SCREEN         DLA: 2" TYPE: Schedule 40 PVC         OPENINGS WIDTH: 0.0"         OPENINGS WIDTH: 0.0"           OPENINGS WIDTH: 0.0"         OPENING TYPE: Schedule 40 PVC         Group         670.5           DIA: 2" TYPE: Schedule 40 PVC         OPENING TYPE: Schedule 40 PVC         Group         670.5           OPENING TYPE: Schedule 40 PVC         Group         BOTTOM OF SCREEN         40.0         670.5           HOLE DIA: 4"         BOTTOM OF CASING         40.0         670.5         670.5		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	26.7	683.8
FILTER PACK         TYPE: #2 Filter Sand         BOTTOM OF RISER/TOP OF SCREEN         30.0       680.5         SCREEN         DIA: 2"       TYPE: Schedule 40 PVC         OPENINGS WIDTH: 0.01"         OPENING TYPE: Sloted         BOTTOM OF SCREEN         40.0       670.5         BOTTOM OF CASING         40.0       670.5         BOTTOM OF CASING       40.0         GTOM OF HOLE       40.0			ы	14	
BOTTOM OF RISERTOP OF SCREEN         30.0         680.5           SCREEN         DIA: 2"         TYPE: Schedule 40 PVC         0           OPENINGS WIDTH: 0.01"         OPENING TYPE: Sloted         BOTTOM OF SCREEN         40.0         670.5           BOTTOM OF CASING         40.0         670.5         670.5         670.5         670.5           Uncontrolled         Copy         3/24/2017         116:28 PM         670.5         670.5		FILTER PACK TYPE: #2 Filter Sand	e .		20 21 12
BOTTOM OF RISERTOP OF SCREEN 30.0 680.5 SCREEN DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01" OPENING TYPE: Sloted BOTTOM OF SCREEN 40.0 670.5 BOTTOM OF SCREEN 40.0 670.5 BOTTOM OF CASING 40.0 670.5 BOTTOM OF HOLE 40.0 670.5			8 B		154
SCREEN DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted BOTTOM OF SCREEN 40.0 670.5 BOTTOM OF CASING 40.0 670.5 BOTTOM OF HOLE 40.0 670.5 Uncontrolled Copy 3/24/2017 1:16:28 PM		BOTTOM OF	RISER/TOP OF SCREEN	30.0	680 5
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<u>воттом оf ноце</u> 40.0 670.5 Uncontrolled Copy 3/24/2017 1:16:28 PM			BOTTOM OF CASING	40.0	670.
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roject: Gypsum Storage Facility ion: Plant Wansley .evation: ogger: L. Millet/R. Mudd ates drilled: 10/5/06 to 10/9/06		Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA to 30', Sampling methods: No. SPT: No. U	Page 1 o Rock core to 50.4' JD: Total depth: 5	f1 We 0.4'	11 Name 3S-17
and the particular of the second s	Mercia		and the second second	DEPTH	ELEV.
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	12	- BACKFILL MATERIAL	1 a		
	T	TYPE: Bentonite Chips	11 A A	12	
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		RISER CASING			s. Singe
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	0	- <u> </u>	TOP OF SEAL		
		ANNULAR SEAL			24
		TYPE: Bentonite Pellets	TOP OF FILTER PACK	38.8	717.3
		North State			
		- FILTER PACK			123
		1 YPE: #2 Filter Sand, 1.5 bags	29	8	an a
		1 an - 1		10	1 - M.
	<u></u>	<u>B0'</u>	TTOM OF RISER/TOP OF SCREEN	40.4	715.7
			162	ų.	
		- SCREEN		1.1.1	10 I
		DIA: 2" TYPE: Schedule 40 PVC	3		195
		OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted	a 11 0 a ⁸¹		
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			BOTTOM OF CASING	50.4	705 7
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			BUTTOM OF HOLE		+ 105.1
	102			5 24	

WELL CO	NSTRUC	CTIO	n LO	G			3		Sout	hern Company (	Generatio	on 🔁
Project: Gypsum Location: Plant V Elevation: Logger: Dates drilled:	Storage Facil Vansley	lity		5 . 					Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA to 7.4', Sampling methods: -No. SPT: - No. U	Page 1 o Rock core to 32.5' D: Total cepth: 3	f1 We 2.5'	ll Na JS-18
And the second se			8							2	DEPTH	ELEV.
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	19 19		10	-	e (4		16	1	RISER CASING			6
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14時 - N		141	12			8	8 8			IOP OF FILTER PACK	<u> </u>	_ 123.4_
									FILTER PACK		-	
									TYPE: #2 Filter Sand, 3 bags			9 <u>-</u>
									- 2 8 8 ²			
	ar ^R ain M								<u>BO</u>	TTOM OF RISER/TOP OF SCREEN	7.5	724.1
27 H.S.								29999	2. K			
a ^g eora e									- SCREEN DIA: 2" TYPE: Schedule 40 PV/	3		-
						1000			OPENINGS WIDTH: 0.01"	e 11 12 11		1
		107	13 11	шт.					OPENING TYPE: Slotted	DOWING LOD COL	124	714.1
										BOTTOM OF SCREEN	-17.5	+ <u>/14.1</u>
2 ×		er er								BOTTOM OF CARD	225	600
						-	ظ			BOTTOM OF LIGHT	22.5	600 1

roject: Gypsum Storage Facility tion: Plant Wansley nevation: ogger: A. Grissom			Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA		Page 1 c	of 1 W	/ell Name GS-19
Dates drilled: 9/27/2006			Sampling methods: No. SPT: N	lo. UD:	Total depth: 3	39.2'	
	Se . (6.5)	27 V 140 ² 92		1 431 - sige	€ e 80°	DEPTH	ELEV
• • • • •	3			i	a a a	÷ *	1.0
					TOP OF CASING	20	752.0
	ſ	.02	1 P	9.1 10	IOF OF CASING		
and the second s					GROUND SURFACE	0.0	750.0
	2				15	2 mm	Landard ( Hell
с						- 188 B	
		E			-1	- 1 ₀ - 1	and the
						22 23	1.5
	1	1	- BACKFILL MATERIAL			10	
	0		· · · · · · · · · · · · · · · · · · ·				
							a a
and the second sec	Ø	-	DIA: 2"		2 × 1		- 1 - 1
	12		TYPE: PVC			1 a 2	1
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					R		
4 X	Ø		4				
. The second second second					TOP OF SEAL	<u> </u>	
			TYPE: Bentonite Pellets		TOD OF FILTER DACK	12.2	726.0
	22				TOT OF FILTER FACE	- 15.2 -	130.0
*		<b>**</b>	- FILTER PACK			105	1 Ka
			TYPE: #2 Filter Sand, 3 bags			2 - E	
					s I a .		
and the second second				BOTTOM OF F	JSER/TOP OF SCREEN	14.2	735.8
			- SCREEN	DI/C			
		-	OPENINGS WIDTH: 0.01"				1. 1.
e e e en ante en altre e	0	-	OPENING TYPE: Slotted				
			·		BOTTOM OF SCREEN	24.2	725.8
	i.				BOTTOM OF CASING	<u></u>	$-\frac{710.8}{710.0}$
		······			BOTTOM OF HOLE	<u>39.2</u>	$- + \frac{710.8}{10.8}$

WELL CONSTRUCTIO	IT LOU		Southe	rn company G	reneratio	
Project: Gypsum Storage Facility Location: Plant Wansley Revation:	а — « [—]		Drilling Co: SCS Driller: Rig type: CME 550	Page 1 o	f1 We	ll Na
Logger: L. Millet ' Dates drilled: 10/4/06			Drilling method: HSA/HQ Sampling methods: SPT & Core			18-20
tinger option		and a second sec	NO. SP1: NO. UD:	Total cepth: 4.	3.5'	EI EV
5 g 10 85				8	DEITI	ELEY.
6. W		8 8 8 ₀	52) 26		10	
	а. П		2 2			
	2 2			TOP OF CASING		<u>716.6</u>
	8			GROUND SURFACE		713.8
					89	8
	18 43			88	×	
	2			Č.		
10 E E E E E E E E E E E E E E E E E E E	20	12	BACKFILL MATERIAL	11 ²⁵ et 1	2	
			TYPE: Bentonite Chips		- #	
0 0 87	2					1 B¥
			RISER CASING	a 10	14	6
e s i fige e			DIA: 2" TYPE: PVC	10 (9) *0		
					-0.1	
· /						
						~
and the second s	2 X			TOP OF SEAL	24.0	689.8
			ANNULAR SEAL		к н	100 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	a. 20 1/2		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK		687.8
10 N	541 201			3	1	
			FILTER PACK			
			8 A		20.2	
				OF RISER/TOP OF SCREEN	2 <u>8.5</u>	685.3
· · · · · ·						
5 H			DIA: 2" TYPE: Schedule 40 PVC Pre-	Pack		
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			OPENINGS WIDTH: 0.01"	an a		
n geo _ 3 _ 100			OPENING TYPE: Slotted		<b>10</b> C	1000
				BOTTOM OF SCREEN		0/5.3
				DOTTOLOGICAL	12.5	(70
				BUTTOM OF CASING	43.3	010.5

		Souther	n company G	eneralio		
on: Plant Wansley evation: ogger: L. Millet	n anda a anda a p	Drilling Co: SCS Driller: Rig type: CME 550 Drilling method: HSA/HQ	Page 1 of		GS-21	
ates drilled: 10/3/06	ν 1. (ζ ² .	Sampling methods: SPT & Core No. SPT: No. UD:	Total depth: 72	5'	- 141 - 15 - 15 	
			145	DEPTH	ELEV	
	12	5 A 8			2. 8	
			17 ¹⁶ 11		5- K	
- J . P			TOP OF CASING	-2.7	792.1	
i Barticias			2		700 4	
		2	GROUND SURFACE			
				-		
		- BACKFILL MATERIAL	# 0	1.55		
		TYPE: Bentonite Chips		eraet in Mies		
=2 ≠ ³ =	88		2.1		1 N .	
	11	RISER CASING DIA: 2"		47 	$\hat{\boldsymbol{\alpha}}=\boldsymbol{\alpha}$	
		TYPE: PVC	- me		75	
	38		# :			
					14	
7. 8. 8.		A			100 M	
				52.0	726 4	
		ANNULAR SEAL	IOP OF SEAL		<u></u>	
$(S_{22}, S_{2}^{(n)}, \mathcal{A}^{(n)}) = \mathcal{A}^{(n)}$		TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	55.0	734.4	
*		FILTER PACK TYPE: #2 Filter Sand	1540			
			· · · · ·		2 I I I	
		BOTTOM	OF RISER/TOP OF SCREEN	57.5	731.9	
e la construction de la construc					T	
<ul> <li>Mathematical Sciences</li> </ul>		SCREEN			1 - 13 Auri	
		DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01"				
		OPENING TYPE: Slotted				
			BOTTOM OF SCREEN	67.5	721.9	
			BOTTOM OF CASING	67.5	721.9	

	butter	n company Gel	
Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: L. Millet' Dates drilled: 10/4/06	Drilling Co: SCS Driller: Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Core	Page 1 of 1	GS-22
	No. of 1. No. UD:	Total depth: 72.0'	1. ozna (1. ozna)
		I	DEPTH ELEV.
	м. н. с 3	2 ¹⁰ - 4	
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ರ್ ಶಿ ಶಿ ಶಿ ಶಿ ೮. ಲಕ್ಷಣವರ ಶ್ ಶ ಶ ಶಿ ಶಿ ಶ್		TOP OF CASING	-3.4 732.7
= 13 	an terra	GROUND SURFACE	0.0 729.3
		52 23 23	8
		м: 	20 5
	BACKFILL MATERIAL	2.5	a - 120 - 70
	TYPE: Bentonite Chips	i di second	- 7
		12	
	RISER CASING		
8 1 ^{2 2} 1 2	TYPE: PVC	12 225 ⁷	
		- 3	
		· .	
2		25	
e e s ^a s ^a e e s		TOP OF SEAL	53.0 676.3
	ANNULAR SEAL		
* 23	TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	55.0 674.3
		and an	2)
	FILTER PACK TYPE: #2 Filter Sand	20. 70 10	2
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	воттом	OF RISER/TOP OF SCREEN	57.0 672.3
		40	At 14
a -	SCREEN	i i i i i i i i i i i i i i i i i i i	
* * * * * * * *	OPENINGS WIDTH: 0.01"	a ^{se}	3
	OPENING TYPE: Slotted	BOTTOM OF SCREEN	67.0 662.3
		OUTOMOL SCREEN	
		BOTTOM OF CASING	
		BOTTOM OF HOLE	72.0 657.3

roject: Gypsum Storage Facility on: Plant Wansley wation: .ogger: L. Millet Dates drilled: 10/5/06			Drilling Co: SCS Driller: Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Core	Page 1 of Total depth: 50	Well Name GS-23	
·	1	18. F.) 1907 -		Total depth. 50.	DEDTU	FIEV
		2			DEIII	ELEV.
	10			1	1	
		15		2	δ), +1	a
	, . 			TOP OF CASING	-2.8	700.7
1911 - 1911 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 19						(07.0
2	V P	1		GROUND SURFACE		<u>697.9</u>
		3				
		1		8. ¹⁰		
		2		22	8	
		1		*		13th I
		1	BACKFILL MATERIAL	2. 		
	E P	1	TYPE: Bentonite Chips		*	10 m m
		2				
	12	1	RISER CASING			
	AR	2	DIA: 2" TVDE: PVC	a u		
8. 	12 P	1	THETT			1
		2			2	
	RE	1				1. A. A.
		2				20 10 1
		1		0.	9	а •
franciska di Ka		4	and the second	TOP OF SEAL	26.0	671.9
			ANNULAR SEAL TYPE: 1/4" Bentonite Pellets		a California Sector	
adam de Artan		8		TOP OF FILTER PACK	28.0	669.9
a (1 ¹¹		**		-	2	
			TYPE: #2 Filter Sand			
				81 - K.		
					10.0	((7.0
			<u>BOTTOM C</u>	OF RISER/TOP OF SCREEN		+ 667.9
				~		
24		-	DIA: 2" TVDE: Schadula 40 DVC D-2 Do	sk.		
			OPENINGS WIDTH: 0.01"	ii.		
5 8			OPENING TYPE: Slotted	19 ²		1
and the second				BOTTOM OF SCREEN	40.0	657.9
2						1
The set of the set of the set		***		BOTTOM OF CASING	40.0	657.9
				DOTTON OF HOLE	50.0	(170

	U		denerati	
Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: R. Mudd Dates drilled: 10/5/2006	Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA Sampling methods:	Page 1	of I We	GS-24
د <mark>مسالم مسلم م</mark> راجا این این این این این این این این این ای	No. SPT:	No. UD: Total depth:	65.3	a * - 5
	194 - O 12	10	DEPTH	ELEV
N 77 N 20				
a a constante de la constante				
	1000 E	TOP OF CASING		728.2
		GROUND SURFACE	0.0	725.0
				12 12 1
			a sta	
			23	
	BACKFILL MATERIAL			
	The believen curps			10
	RISER CASING		l a	
	DIA: 2" TYPE: PVC	Sa a		
			<i>"</i> "	
	8	TOP OF SEAL	51.0	674.0
	ANNULAR SEAL			+
		TOP OF FILTER PAC	<u>- 53.5</u>	671.5
	FILTER PACK	a a		8
	TYPE: #2 Filter Sand, 3 bags	N 84 84		
		BOTTOM OF RISER/TOP OF SCREI	EN 55.5	669.5
				- <u></u>
	SCREEN	40 PVC Pro. Pack		
	OPENINGS WIDTH: 0.01"	TO FYC FIC-FACK		
	OPENING TYPE: Slotted	BOTTOM OF SCREE	EN 65.5	659.5
	<b>     </b>	BOTTOM OF CASI	NG	659.
		BOTTOM OF HOL	LE65.5	659.5

WELL CONSTRUCTION LOO	V 1. 1 +		Southern	n Company G	eneratio	n 44
evation: ogger: A. Grissom acts drilled: 9/26/2006 to 9/27/2006			Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA Sampling methods: No. SPT: No. UD:	Page 1 of Total depth: 43.	¹ Wel G	l Name S-25
	<b>.</b>	- F (2. 10 ² )	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	19 · · · 8 · 6	DEPTH	ELEV.
	а., 1 м.					
		* 9 		TOP OF CASING	-2.8	788.5
				GROUND SURFACE		785.7
				8 * 1	е Д	
			TYPE: Bentonite Chips	a ²		i. T
			RISER CASING DIA: 2" TYPE: PVC	a.	* * * **	
					N ^a	
				TOP OF SEAL		
			ANNULAR SEAL TYPE: Bentonite Pellets	TOP OF FILTER PACK	32.0	753.7
a		-	FILTER PACK TYPE: #2 Filter Sand, 2 bags			
			DOTTOM		22.7	752.0
				OF NEED TOT OF BERLEY		152.0
			SCREEN DIA: 2" TYPE: Schedule 40 PVC			25
5			OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted	a		
		= 		BOTTOM OF SCREEN	<u>   43.7    </u>	742.0
				BOTTOM OF CASING	43.7	742 0
				BOTTOM OF HOLE	43.7	742.0

WELL CONSTRUCTION	LOG	10	Sout	nern Company	Generatio	on À
roject: Gypsum Storage Facility ocation: Plant Wansley levation: ogger: L. Millet bates drilled: 10/2/06			Drilling Co: SCS Driller: Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Co No. SPT: No. U	Page 1 ore D: Total depun:	of 1 We 60.0	ll Na iS-26
	in an			-	DEPTH	ELEV.
	* * *			21 12 13	4 1 1 1 1 1 1	53 X3
	100 M	<u>п</u>	10 pa +1	TOP OF CASING		<u>748.1</u>
	90 ^{- 1} e		200 0 2 2 3 2	GROUND SURFACE	0.0	
				*** ***	3 .8 .9 ³	
	" = 3 * == = = = = = =		BACKFILL MATERIAL TYPE: Bentonite Chips	1	13 ²³ 1 11	
	1 ar - 5 ar - ²		RISER CASING DIA: 2" TYPE: PVC	8 	3 38 	
	ہ بر بر					
					41.0	703.7
			ANNULAR SEAL TYPE: 1/4* Bentonite Pellets	TOP OF FILTER PACE	<u> </u>	701.7.
	2 		FILTER PACK TYPE: #2 Filter Sand		2	22 22 - 78
	a 100 an 100 a		<u>B0</u>	TOM OF RISER/TOP OF SCREE	N _45.0 _	<u>_ 699.7</u>
	8 5 ₁ m ^{33 - 13}		DIA: 2" TYPE: Schedule 40 PVC OPENINGS WIDTH: 0.01"		1. 1. M.	
			OPENING TYPE: Slotted	BOTTOM OF SCREE	N 55.0	689 7
	2 8 8 ¹⁰ 1 8 2			BOTTOM OF CASIN	<u> </u>	684.7
				BOTTOM OF HOL	E60.0	684.7

Project: Gypsum Storage Fa	acility	n (1997)	Drilling Co: SCS	Page 1 of	1 We	ll Name
bn: Plant Wansley Aevation: Logger: L. Millet		بر بر بر الرو	Driller: Rig type: CME 550 Drilling method: HSA/HQ Sampling methods: SPT & Cor			<del>}</del> S-27
Dates drilled: 10/5/00			No. SPT: No. UD	: Total depth: 40	<b>0</b> '	
1 - Virada 1		er e e e e e e e e e e e e e e e e e e	state in a second	- *** / * [*]	DEPTH	ELEV.
			а н ^с м.		c n'i 1	
	4			3	2 M	3
3 -	2/7/ 8	· <u> </u>	a let ar	TOP OF CASING		<u>702.7</u>
	Three is a second second second second		n 1 B 1 P ge with th	GROUND SURFACE	0.0	<u>699.7</u>
12 I.			1. U. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.			
				88 U U	a i	*
				К	8288 21	
			- BACKFILL MATERIAL			
			TYPE: Bentonite Chips	i Kina		
	*					
			RISER CASING DIA: 2"			
			TYPE: PVC	X.		
					Za en ja	
			2			
4				5		2007 C
	U5 4			TOP OF SEAL	21.0	6787
a R ^{as} and a	a di la sua		ANNULAR SEAL			- <u>078.7</u> -
- 11 m			TYPE: 1/4" Bentonite Pellets	TOP OF FILTER PACK	23.0	676.7
						12
			FILTER PACK TYPE: #2 Filter Sand			
				2 A 8		ato zi oli con
			BOTT	OM OF RISER/TOP OF SCREEN	25.0	674.7
	4		- SCREEN			5
			DIA: 2" TYPE: Schedule 40 PVC I	re-Pack		
			OPENING TYPE: Slotted	10		
9 Jan 1 19 14				BOTTOM OF SCREEN		664.7
						3.
-	and the second s			BOTTOM OF CASING	40.0	659.7
		······		BOTTOM OF HOLE	40.0	659.7

	2	Dulling Car SOS	n company Ge		
Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: S. Bearce Dates drilled: 9/12/2006		Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA Sampling methods:	rage 1 of 1	G	ll Nar S-28
	- 25	No. SPT: No. UD:	Total depth: 64.0	ፓ	
	and a	2 2	12 PZ	DEPTH	ELEV
2		i	N: 10	16 17	÷.
		52 X.		и 3 жал у	
	<u>п</u>		TOP OF CASING		<u>816.4</u>
			GROUND SURFACE	0.0	<u>81</u> 3 <u>.4</u>
					9
				ΰŧ	
а а ^{ль} ж с					
		BACKFILL MATERIAL	-	35 8 00	
a a 1900 a 1 1900 a 1900 a		TYPE: Bentonite Chips	#1 15	+	R.
		NOTE CARBIC			
		DIA: 2"	12		
		TYPE: PVC		*	
		8 27 - 8 28		9	
			*		
			TOP OF SEAL		
		TYPE: Bentonite Pellets	TOP OF FILTER PACK	52.2	761.2
*					
9 9 9 9		FILTER PACK TYPE: #2 Filter Sand, 2 bags	14 M		
		9			
		BOTTOM	OF RISER/TOP OF SCREEN	54.0	759.4
					11
		DIA: 2" TYPE: Schedule 40 PVC	6		a
8 ⁵ F 337		OPENINGS WIDTH: 0.01" OPENING TYPE: Slotted			
			BOTTOM OF SCREEN	64.0	749.4
					0
			BOTTOM OF CASING	64.0	749

Project: Gypsum Storage Facility ion: Plant Wansley vation: Logger: S. Bearce Dates drilled: 9/14/2006	8		Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA Sampling methods: No. SPT: No. UD:	Page 1 of Total depth: 49	1 We 0	ll Name iS-29
		- 20° di - 1		a segura de	DEPTH	ELEV.
				56		5
					10	na menan
	Г			TOP OF CASING	<u>-3.0</u>	<u>749.7</u>
				GROUND SURFACE	0.0	746.7
	2		The R other	-1 XXX.		
an a 1 a s						
	0				2	
	Ø		- BACKETLI MATERIAL		2	а 1 — П
n a fan	0		TYPE: Bentonite Chips			
	2			9		100.08
	2	1	RISER CASING	a o a		÷
	2		DIA: 2" TYPE: PVC	• L		15
				59 - 51 - 53 34		
	1		1	-	* 	
						*
an a	2					
a a ser the set of the set of the			ANNIILAR SEAL			
			TYPE: Bentonite Pellets	TOP OF FILTER PACK	37.4	709.3
			FILTER PACK TYPE: #2 Filter Sand, 7 bags	1 - J. J.		
				21 24		
			BOTTO	A OF RISER/TOP OF SCREEN	39.0	707.7
			SCREEN	-		~
e v v [*] *********************************			DIA: 2" TYPE: Schedule 40 PVC Pre- OPENINGS WIDTH: 0.01"	Pack		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			OPENING TYPE: Slotted		10.0	(0.8.5
		=		BOITOM OF SCREEN	49.0	697.7
				BOTTOM OF CASING	49 በ	697.7
	r					- CO7 7

WELL CONSTRUCTIO	IN LOG					Southern	Company	Generati	on 🗖
Project: Gypsum Storage Facility Location: Plant Wansley Elevation: Logger: R. Mudd '	ा ^म 111 म क 19	e ⁴¹	1 1941 - 194 20	a ha	Drilling Co: SCS Driller: B. Filipovich Rig type: CME 550 Drilling method: HSA	Ā	Page 1	of 1 W	ell Nar GS-30
Dates drilled: 9/19/2006	- 		Re in		Sampling methods: No. SPT:	No. UD:	Total depth:	56.5'	
			10. L	100 B				DEPTH	ELE
2	10 +0			÷	а н Т				-
·					2 		TOP OF CASING	-2.9	717.5
9 mg			Γ				()*)		
		5 (a 192). 	V		- Angle State	a a i	GROUND SURFACE	<u>0.0</u>	714.6
4 <u>6</u> 8							a ¹⁰	(1) (1)	38
28 B 11			1					1.1	
				0	8	÷	а ⁷ х. ₁₀		245
				12	- BACKFILL MATERIAL			12	
	5 ¹ 2 (2005)			T	TYPE: Bentonite Chips	8	N 8 8		
			2		л е	20			12
		- 	1	2	RISER CASING		8	12	
				Ø	DIA: 2"		N 10 N 12		
			Ø		a 70		2		9
		10	0						
		13			8 8 ² 0	đi t		92 1	
			1			6			
			0	1	11 A		TOP OF SEAL		
			<b>B</b>		ANNULAR SEAL				
					TYPE: Bentonite Pellets		TOP OF FILTER PAC	ж 33.5	681.1
	(C, C) = 22								
22 2. 1		12			- FILTER PACK	1		8	Ť.
					1 YPE: #2 Filter Sand, 7.	bags		19 •	
2						92 21			
	25					BOTTOM OF	RISER/TOP OF SCREE	<u> 34.5</u>	680.1
81							81	<u> </u>	14. 1 - 11. 1 - 11. 52
58					- SCREEN	iule 40 PVC Pre-Pack	8		
е _н «					OPENINGS WIDTH: 0.0	l"			
$n = \frac{m}{m_{\rm e}} n_{\rm e}^{\rm G}$	а Р ₁₀				OPENING TYPE: Slotted	19 19	N.		1000
							BOTTOM OF SCREE	<u>en 44.5</u>	670.1
							BOTTOM OF CASIN	NG 44.5	670.1
							BOTTOM OF HOL	LE 56.5	658.1

Project: Gypsum Storage Facility				61	Drilling Co: SCS		Page 1 d	of 1	Wel	l Name
on: Plant Wansley Levation: Logger: T. Hartsfield Dates drilled: 10/21/06					Driller: S. Milam Rig type: CME 550 Drilling method: HS Sampling methods: S	A/HQ Core SPT		-	G	S-31
Dates united for 21/00				8 2	No. SPT: 6	No. UD:	Total depth: 4	43.5'		
	i i				1 1	* ²¹	51 gt.	DEPT	TH	ELEV.
40 m						а 6 К 9				
						- 1				
a			_				TOP OF CASING	-2.9		846.4
				e . *			GROUND SURFACE	0.0		843.5
			7				8 a		- 1	
		ł				19				5. ⁶
		ŧ	2					(4) 4)		
· · · · · ·			3	2	13 14					
			2	1	BACKFILL MATERIAL					
			1		TTL. Denome Cups			6	[	
n n n n			12	0	RISER CASING				- 14	£ 
			1		DIA: 2"			1	1.11	
			1		TYPE: PVC				3	
			1	2				1 8		
				13				1	8	
	8 <b>9</b>		1	1						
8 8		°		1			TOP OF SEAL	15.0		828.5
		°.,			ANNULAR SEAL	llate			10	
		° n ¹⁰ e	88	<u>188</u>			TOP OF FILTER PACK	18.5	-+	825.0
		8 il			FILTER PACK			-		т. т. Аст. 24
					TYPE: #2 Filter Sand, 6	bags				й Э
8 E		8			" = 0 _a					
12 A			<u></u>			BOTTOM O	F RISER/TOP OF SCREEN	120.5	·	823.0
2								15.00		
					DIA: 2" TYPE: Sche	schule 40 PVC	³⁶	1.1		
					OPENINGS WIDTH: 0.0	)]"		2	50	
	14 10	x		-	OPENING TYPE: Slotte	d	BOTTOM OF SCREEN	204		812.0
		14					BUTTOM OF SCREEM	<u> </u>	'-+	_ 013.0
							BOTTOM OF CASING	30.4	5	813.0
			Ľ				BOTTOM OF HOLE	43	5-1	800.0





		15		SOIL DATA				
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	1 (1.12) N	S-2 (Jar)	4.0 - 5.5		33	55	22	MH
					50	e:	ii ii	

LIQUID AND PLASTIC LIMITS TEST REPORT	Client: SCS - Terri Hartsfield			
CONTREDN COMPANY	Project: Plant Wansley Gypsum Disposal Facility			
SOUTHERN COMPANY	Project No.: EWO - 3186DE	Lab#	1	$\square$





























# **COMPACTION TEST REPORT**

Curve No.: 10 Date: 10/29/06 Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility Location: GYP-2 Sample No. Bulk Elev./Depth: -1.0 -2.5----Remarks: MATERIAL DESCRIPTION -Description: Light Reddish Brown Sandy lean clay AASHTO: USCS: CL Classifications -Sp.G. = Nat Moist = Plasticity Index = 21 Liquid Limit = 47 % < No.200 = 66.5 % % > 3/4 in. = % TEST RESULTS Maximum dry density = 96.9 pcf Optimum moisture = 22.7 % 140 **Test specification:** ASTM D 698-91 Procedure C Standard 130 **100% SATURATION CURVES** 120 FOR SPEC. GRAV. EQUAL TO: 2.8 2.7 Dry density, pcf 001 2.6 90 80 70 35 10 15 20 25 30 40 5 Water content, % Lab# SOUTHERN COMPANY-



## **COMPACTION TEST REPORT**

Curve No.: 11

Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility

Location: GYP-2 Elev./Depth: 3.0 4.5 Remarks:

Sample No. Bulk

### MATERIAL DESCRIPTION

USCS: ML

Description: Light Brown Sandy silt

Classifications -Nat. Moist. = Liquid Limit = NP % > 3/4 in. = % AASHTO: Sp.G. = Plasticity Index = NP % < No.200 = 50.1 % Date: 10/29/06


Curve No.: 12 Date: 10/29/06 Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility Location: GYP-7 Elev./Depth: 2.0 - 3.0 Sample No. Bulk Remarks: Permeability -1.4x10-6----Dey Density - 100.9pcf @ 21.3% Moisture MATERIAL DESCRIPTION Description: Light Brown AASHTO: **Classifications** -USCS: Sp.G. = Nat. Moist. = Plasticity Index = Liquid Limit = % < No.200 = % > 3/4 in. = % TEST RESULTS Maximum dry density = 104.2 pcf Optimum moisture = 19.8 % Test specification: 121 ASTM D 698-91 Procedure C Standard 116 **100% SATURATION CURVES** 111 FOR SPEC. GRAV. EQUAL TO: 2.8 2.7 2.6 pcf 106 Dry density, 101 96 91 86 25 30 35 10 15 20 Water content, % Lab# SOUTHERN COMPANY

12







Curve No.: 14 Date: 10/29/06 Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility Location: GYP-13 Sample No. Bulk Elev./Depth: -1.3-3.8-Remarks: MATERIAL DESCRIPTION Description: Light Reddish Brown Elastic silt with sand AASHTO: USCS: MH **Classifications** -Nat. Moist. = Sp.G. = Liquid Limit = 50 Plasticity Index = 17 % < No.200 = 78.5 % % > 3/4 in. = % TEST RESULTS Maximum dry density = 90.1 pcf Optimum moisture = 28.3 % **Test specification:** 140 ASTM D 698-91 Procedure C Standard 130 120 **100% SATURATION CURVES** FOR SPEC. GRAV. EQUAL TO: 2.8 2.7 Dry density, pcf 100 2.6 90 80 70 25 30 15 20 10 5 Water content, %

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-SOUTHERN COMPANY-

35

Lab#

40

14



Curve No.: 15

Date: 10/29/06

Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility

Location: GYP-13 Elev./Depth: 5.0 - 6.0 Remarks:

Sample No. Bulk

#### MATERIAL DESCRIPTION

Description: Light Brown Sandy silt

Classifications - USCS: ML AASHTO: Nat. Moist. = Sp.G. = Liquid Limit = NP Plasticity Index = NP % > 3/4 in. = % % < No.200 = 59.1 % TEST RESULTS Maximum dry density = 91.1 pcf Optimum moisture = 24.8 %







 LIQUID AND PLASTIC LIMITS TEST REPORT
 Client: SCS - Terri Hartsfield

 SOUTHERN COMPANY
 Project: Plant Wansley Gypsum Disposal Facility

 Project No.: EWO - 3186DE
 Lab# 16

Curve No.: 16

Date: 10/29/06

Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility

Location: GYP-19 Elev./Depth: 1.5 - 3.0 Remarks:

Sample No. Bulk

#### MATERIAL DESCRIPTION





#### Curve No.: 17

Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility Date: 10/29/06

Location: GYP-19 Elev./Depth: 6.0 - 7.0 Remarks:

Sample No. Bulk

#### MATERIAL DESCRIPTION

Description: Light Reddish Brown Sandy silt

Classifications -	USCS: ML	AASHTO:	
Nat. Moist. =		Sp.G. =	
Liquid Limit = NP		Plasticity Index = NP	
% > 3/4 in. = 2.8 %		% < No.200 = 57.4 %	
	т	EST RESULTS	10

Maximum dry density = 77.1 pcf Optimum moisture = 34.4 %



Curve No.: 18

Project No.: EWO - 3186DE Project: Plant Wansley Gypsum Disposal Facility

Location: GYP-29 Elev./Depth: 1.0 - 2.5 Sample No. Bulk Remarks: Permeability - 1.7x10-7 Dry Density - 98.2pcf @ 23.3% Moisture

USCS:

MATERIAL DESCRIPTION

Description: Light Brown

Classifications -Nat. Moist. = Liquid Limit = % > 3/4 in. = %



Date: 10/29/06



Curve No.: 19

Date: 10/29/06

AASHTO:

1 State Manya Project No.: EWO-3186DE Project: Plant Wansley Gypsum Disposal Facility Location: GYP-29 Sample No. Bulk Elev./Depth: 6.0 - 8.0 Remarks: Permeability - 5.7x10-7 Dry Density - 98.9pcf @ 22.2% Moisture MATERIAL DESCRIPTION Description: Light Brown Classifications -USCS: Sp.G. =

Dry density,

70

n

10

20

Nat. Moist. = Plasticity Index = Liquid Limit = % < No.200 = % > 3/4 in. = % TEST RESULTS Maximum dry density = 101.5 pcf Optimum moisture = 20.6 % **Test specification:** 140 ASTM D 698-91 Procedure C Standard 130 **100% SATURATION CURVES** 120 FOR SPEC. GRAV. EQUAL TO: 2.8 2.7 2.6 <u>ଅ</u> 110 100 90 80

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30

40

Water content, %

SOUTHERN COMPANY-

50

Lab#

















SOUTHERN COMPANY

Project: Plant Wansley Gypsum Disposal Facility

Project No.: EWO - 3186DE

Lab# 25




























0.1 Normalized Head (ft/ft) 00 00 0.01 000 D 00 D 000 000 00 0.001 0. 28. 42. 14. 56. 70. Time (sec) WELL TEST ANALYSIS Data Set: T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\2006\slugtests\GS4in.aqt Date: 12/08/06 Time: 10:12:47 **PROJECT INFORMATION** Company: SCS Client: GPC Project: 3186DE Location: Plant Wansley Test Well: GS27in Test Date: 11/8/2006 AQUIFER DATA Saturated Thickness: 11.99 ft Anisotropy Ratio (Kz/Kr): 1. WELL DATA (GS4in) Initial Displacement: 0.535 ft Static Water Column Height: 11.99 ft Total Well Penetration Depth: 11.49 ft Screen Length: 9. ft Casing Radius: 0.0833 ft Wellbore Radius: 0.125 ft SOLUTION Aquifer Model: Unconfined Solution Method: Bouwer-Rice K = 0.03621 cm/sec y0 = 0.6561 ft























***** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL ENVIRONMENTS ***** *****

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***** DEVELOPERS: M. BONAZOUNTAS, ARTHUR D. LITTLE INC. ,(617)864-5770,X5871

****** J. WAGNER ,DIS/ADLPIPE, INC. ,(617)492-1991,X5820 *****

***** MODIFIED EXTENSIVELY BY:

***** D.M. HETRICK ***** OAK RIDGE NATIONAL LABORATORY ***** (615) 576-7556 ***** VERSION : JANUARY 1995

#### ****** MONTHLY SESOIL MODEL OPERATION ****** MONTHLY SITE SPECIFIC SIMULATION

REGION : CARROLLTON SOIL TYPE : Gypsum COMPOUND : Selenium WASHLOAD DATA : APPLICATION AREA: Wansley Gypsum Basic Run

**GENERAL INPUT PARAMETERS** 

-- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):1.36INTRINSIC PERMEABILITY (CM**2):.000DISCONNECTEDNESS INDEX (-):12.0POROSITY (-):.100ORGANIC CARBON CONTENT (%):.000CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):.000FREUNDLICH EXPONENT (-):1.00

-- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML): .384E+06 DIFFUSION COEFFICIENT IN AIR (CM**2/SEC): .000 HENRYS LAW CONSTANT (M**3-ATM/MOLE): .000 ADSORPTION COEFFICIENT ON ORGANIC CARBON(KOC): .000 ADSORPTION COEFFICIENT ON SOIL (K): 1.00 MOLECULAR WEIGHT (G/MOL): 79.0 VALENCE (-): :000 NEUTRAL HYDROLYSIS CONSTANT (/DAY): .000 BASE HYDROLYSIS CONSTANT (L/MOL-DAY): .000 ACID HYDROLYSIS CONSTANT (L/MOL-DAY): .000 DEGRADATION RATE IN MOISTURE (/DAY): .000 DEGRADATION RATE ON SOIL (/DAY): .000 LIGAND-POLLUTANT STABILITY CONSTANT (-): .000 NO. MOLES LIGAND/MOLE POLLUTANT (-): .000

# LIGAND MOLECULAR WEIGHT (G/MOL):

# -- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS:		4	863				
YEARS TO BE SIMULATED:		_ 100	)		. Q.		an a
AREA (CM**2):	0.810	E+08					
APPLICATION AREA LATITUDE (I	DEG.):		33.6				18
SPILL (1) OR STEADY APPLICATIO	ON (0):		0	91 ₁₆₁			
MODIFIED SUMMERS MODEL USE	ED (1) OR N	IOT (0)	FOR GW	R. CON	NC.: 0		
INITIAL CHEMICAL CONCENTRA	<b>FIONS GIV</b>	EN (1)	OR NOT	GIVEN	(0) 1		<i>₽</i> 2
DEPTHS (CM):	0.30E	E+04 1.	.0 1.0	0.30E-	+03		
NUMBER OF SUBLAYERS/LAYER			10	10	10	10	с. 1 С
PH (CM):	0.00 0.	00 0	.00 0.00				94
INTRINSIC PERMEABILITIES (CM ³	**2):		0.50E-08	3 0.50E	-08 0.50	E-08 0	.50E-08
KDEL RATIOS (-):	1.0	1.0	1.0			25	
KDES RATIOS (-):	1.0	1.0	1.0				
OC RATIOS (-):	1.0	1.0	1.0			29	
CEC RATIOS (-):	1.0	1.0	1.0				
FRN RATIOS(-):	1.0	1.0	1.0				
ADS RATIOS(-):	1.0	1.0	0.23E+04	4			
2 - 1 552							(W)

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

#### UPPER SOIL ZONE:

SUBLAYER 1

# SOIL MOISTURE (UG/ML) 1.031E-08 ADSORBED SOIL (UG/G) 1.031E-08

#### SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.413E-08 ADSORBED SOIL (UG/G) 2.413E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.366E-08 ADSORBED SOIL (UG/G) 4.366E-08

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 6.603E-08 ADSORBED SOIL (UG/G) 6.603E-08

# SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.689E-07 ADSORBED SOIL (UG/G) 1.689E-07

#### SUBLAYER 6

SOIL MOISTURE (UG/ML) 9.741E-07

## ADSORBED SOIL (UG/G) 9.741E-07

SUBLAYER 7

SOIL MOISTURE (UG/ML) 5.450E-06 ADSORBED SOIL (UG/G) 5.450E-06

SUBLAYER 8

SOIL MOISTURE (UG/ML) 2.620E-05 ADSORBED SOIL (UG/G) 2.620E-05

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.092E-04 ADSORBED SOIL (UG/G) 1.092E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.015E-04 ADSORBED SOIL (UG/G) 4.015E-04

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.016E-04 ADSORBED SOIL (UG/G) 4.016E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.018E-04 ADSORBED SOIL (UG/G) 4.018E-04

SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.019E-04 ADSORBED SOIL (UG/G) 4.019E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.020E-04 ADSORBED SOIL (UG/G) 4.020E-04

SUBLAYER 7

# SOIL MOISTURE (UG/ML) 4.021E-04 ADSORBED SOIL (UG/G) 4.021E-04

State of the Provide States and

·教师主义、正确实践领导公司的社会和主义。

Marine Para Montena 1949 - Julio Para State

SUBLAYER 8

# SOIL MOISTURE (UG/ML) 4.022E-04 ADSORBED SOIL (UG/G) 4.022E-04

#### SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.023E-04 ADSORBED SOIL (UG/G) 4.023E-04

#### SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.024E-04 ADSORBED SOIL (UG/G) 4.024E-04

#### SOIL ZONE 3:

#### SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.025E-04 ADSORBED SOIL (UG/G) 4.025E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.026E-04 ADSORBED SOIL (UG/G) 4.026E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.027E-04 ADSORBED SOIL (UG/G) 4.027E-04

SUBLAYER 4

SCIL MOISTURE (UG/ML) 4.028E-04 ADSORBED SOIL (UG/G) 4.028E-04

SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.029E-04 ADSORBED SOIL (UG/G) 4.029E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.030E-04 ADSORBED SOIL (UG/G) 4.030E-04

The Market Market and Shares

SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.031E-04 ADSORBED SOIL (UG/G) 4.031E-04

SUBLAYER 8

# SOIL MOISTURE (UG/ML) 4.032E-04 ADSORBED SOIL (UG/G) 4.032E-04

SUBLAYER 9

# SOIL MOISTUPE (UG/ML) 4.033E-04 ADSORBED SOIL (UG/G) 4.033E-04

SUBLAYER 10

# SOIL MOISTURE (UG/ML) 4.034E-04 ADSORBED SOIL (UG/G) 4.034E-04

LOWER SOIL ZONE:

SUBLAYER 1

# SOIL MOISTURE (UG/ML) 5.945E-01 ADSORBED SOIL (UG/G) 1.394E+03

# MAX. POLL. DEPTH (M) 3.051E+01

***** ***** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL

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ENVIRONMENTS

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***** DEVELOPERS: M. BONAZOUNTAS, ARTHUR D. LITTLE INC. ,(617)864-5770,X5871

****** J. WAGNER ,DIS/ADLPIPE, INC. ,(617)492-1991,X5820

*************

***** MODIFIED EXTENSIVELY BY:

***** D.M. HETRICK

***** OAK RIDGE NATIONAL LABORATORY ***** (615) 576-7556 ***** VERSION : JANUARY 1995

****

# ***** MONTHLY SESOIL MODEL OPERATION ****** MONTHLY SITE SPECIFIC SIMULATION

REGION : CARROLLTON SOIL TYPE : Gypsum COMPOUND : Selenium WASHLOAD DATA : APPLICATION AREA: Wansley Gypsum Basic Run - 1000 yr

#### GENERAL INPUT PARAMETERS

#### -- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):	1.3	36		
INTRINSIC PERMEABILITY (CM**2):	51 M	.000	<b>8</b> 5	
DISCONNECTEDNESS INDEX (-):		12.0	a	·* +-
POROSITY (-):	.100			
ORGANIC CARBON CONTENT (%):		.000		586
CATION EXCHANGE CAPACITY (MIL	LI EQ./100	G DRY S	OIL):	.000
FREUNDLICH EXPONENT (-):		1.00		

-- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML):	.384E+06	
<b>DIFFUSION COEFFICIENT IN AIR (CM**2/S</b>	SEC): .000	
HENRYS LAW CONSTANT (M**3-ATM/MO	0LE): .000	
ADSORPTION COEFFICIENT ON ORGANIC	CARBON(KOC):	.000
ADSORPTION COEFFICIENT ON SOIL (K):	1.00	
MOLECULAR WEIGHT (G/MOL):	79.0	
VALENCE (-): .000	6 A 4 4	
NEUTRAL HYDROLYSIS CONSTANT (/DAY	Y): .000	9
BASE HYDROLYSIS CONSTANT (L/MOL-D	AY): .000	
ACID HYDROLYSIS CONSTANT (L/MOL-D.	AY): .000	
DEGRADATION RATE IN MOISTURE (/DAY	r): .000	
DEGRADATION RATE ON SOIL (/DAY):	.000	
LIGAND-POLLUTANT STABILITY CONSTA	ANT (-): .000	
NO. MOLES LIGAND/MOLE POLLUTANT (-	-): .000	
LIGAND MOLECULAR WEIGHT (G/MOL):	.000	

-- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS: YEARS TO BE SIMULATED: 1000 AREA (CM**2): 0.810E+08 **APPLICATION AREA LATITUDE (DEG.):** 33.6 SPILL (1) OR STEADY APPLICATION (0): 0 MODIFIED SUMMERS MODEL USED (1) OR NOT (0) FOR GWR. CONC .: 0 INITIAL CHEMICAL CONCENTRATIONS GIVEN (1) OR NOT GIVEN (0) 1 DEPTHS (CM): 0.30E+04 1.0 1.0 0.30E+03 10 NUMBER OF SUBLAYERS/LAYER 10 10 10 0.00 0.00 0.00 0.00 PH (CM): 0.50E-08 0.50E-08 0.50E-08 0.50E-08 **INTRINSIC PERMEABILITIES (CM**2): KDEL RATIOS (-):** 1.0 1.0 1.0 **KDES RATIOS (-):** 1.0 1.0 1.0 OC RATIOS (-): 1.0 1.0 1.0 CEC RATIOS (-): 1.0 1.0 1.0 FRN RATIOS(-): 1.0 1.0 1.0 1.0 0.23E+04 ADS RATIOS(-): 1.0 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO 11 VALUES ARE PRINTED --

#### UPPER SOIL ZONE:

SUBLAYER 1

# SOIL MOISTURE (UG/ML) 1.010E-08 ADSORBED SOIL (UG/G) 1.010E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.340E-08 ADSORBED SOIL (UG/G) 1.340E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.450E-08 ADSORBED SOIL (UG/G) 1.450E-08

SUBLAYER 4

SOIL MOISTURE (UG/ML) 1.480E-08 ADSORBED SOIL (UG/G) 1.480E-08

SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SUBLAYER 6

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SUBLAYER 7

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SUBLAYER 10

SOIL MOISTURE (UG/ML) 1.490E-08 ADSORBED SOIL (UG/G) 1.490E-08

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 2

# SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

#### SUBLAYER 3

# SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

#### SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

# SUBLAYER 6

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

#### SUBLAYER 7

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

#### SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 10

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SOIL ZONE 3:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08 SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 4

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 6

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 7

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

SUBLAYER 10

SOIL MOISTURE (UG/ML) 1.000E-08 ADSORBED SOIL (UG/G) 1.000E-08

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 5.944E-01 ADSORBED SOIL (UG/G) 1.394E+03

MAX. POLL. DEPTH (M) 3.057E+01

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***** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL **** **ENVIRONMENTS** ***** *****

++++

***** DEVELOPERS: M. BONAZOUNTAS, ARTHUR D. LITTLE INC. ,(617)864-5770, X5871 ****

*****

***** MODIFIED EXTENSIVELY BY: ***** D.M. HETRICK ***** OAK RIDGE NATIONAL LABORATORY ***** (615) 576-7556 ***** VERSION : JANUARY 1995

*****

# ***** MONTHLY SESOIL MODEL OPERATION ***** MONTHLY SITE SPECIFIC SIMULATION

CARROLLTON REGION SOIL TYPE Gypsum COMPOUND Selenium ٠ WASHLOAD DATA : APPLICATION AREA: Wansley Gypsum Basic Run

# **GENERAL INPUT PARAMETERS**

-- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3): 1.36 **INTRINSIC PERMEABILITY (CM**2):** .000 **DISCONNECTEDNESS INDEX (-):** 12.0 .100 POROSITY (-): **ORGANIC CARBON CONTENT (%):** .000 CATION EXCHANGE CAPACITY (MILLI EO./100G DRY SOIL): .000 FREUNDLICH EXPONENT (-): 1.00 1

#### -- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML): .384E+06 .000 DIFFUSION COEFFICIENT IN AIR (CM**2/SEC): HENRYS LAW CONSTANT (M**3-ATM/MOLE): .000 ADSORPTION COEFFICIENT ON ORGANIC CARBON(KOC): .000 ADSORPTION COEFFICIENT ON SOIL (K): 1.00 MOLECULAR WEIGHT (G/MOL): 79.0 VALENCE (-): .000 .000 NEUTRAL HYDROLYSIS CONSTANT (/DAY): BASE HYDROLYSIS CONSTANT (L/MOL-DAY): .000 ACID HYDROLYSIS CONSTANT (L/MOL-DAY): .000 DEGRADATION RATE IN MOISTURE (/DAY): .000 DEGRADATION RATE ON SOIL (/DAY): .000 LIGAND-POLLUTANT STABILITY CONSTANT (-): .000

# NO. MOLES LIGAND/MOLE POLLUTANT (-): LIGAND MOLECULAR WEIGHT (G/MOL):

.000 .000

#### -- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS: YEARS TO BE SIMULATED: 100 AREA (CM**2): 0.810E+08 APPLICATION AREA LATITUDE (DEG.): 33.6 SPILL (1) OR STEADY APPLICATION (0): 0 MODIFIED SUMMERS MODEL USED (1) OR NOT (0) FOR GWR. CONC .: 0 INITIAL CHEMICAL CONCENTRATIONS GIVEN (1) OR NOT GIVEN (0) 1 DEPTHS (CM): 0.30E+04 1.0 1.0 0.30E+03 NUMBER OF SUBLAYERS/LAYER 10 10 10 10 PH (CM): 0.00 0.00 0.00 0.00 INTRINSIC PERMEABILITIES (CM**2): 0.50E-08 0.50E-08 0.50E-08 0.50E-08 KDEL RATIOS (-): 1.0 1.0 1.0 **KDES RATIOS (-):** 1.0 1.0 1.0 OC RATIOS (-): 1.0 1.0 1.0 CEC RATIOS (-): 1.0 1.0 1.0 FRN RATIOS(-): 1.0 1.0 1.0 ADS RATIOS(-): 1.0 1.0 0.47E+04

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

# SOIL MOISTURE (UG/ML) 1.031E-08 ADSORBED SOIL (UG/G) 1.031E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.413E-08 ADSORBED SOIL (UG/G) 2.413E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.366E-08 ADSORBED SOIL (UG/G) 4.366E-08

SUBLAYER 4

SOIL MOISTURE (UG/ML) 6.603E-08 ADSORBED SOIL (UG/G) 6.603E-08

SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.689E-07 ADSORBED SOIL (UG/G) 1.689E-07

SUBLAYER 6

# SOIL MOISTURE (UG/ML) 9.741E-07 ADSORBED SOIL (UG/G) 9.741E-07

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NY - 网络帕尔尔 - 电影

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2011年8月11日中国新闻的公司任何日本公司

SUBLAYER 7

# SOIL MOISTURE (UG/ML) 5.450E-06 ADSORBED SOIL (UG/G) 5.450E-06

#### **SUBLAYER 8**

SOIL MOISTURE (UG/ML) 2.620E-05 ADSORBED SOIL (UG/G) 2.620E-05

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.092E-04 ADSORBED SOIL (UG/G) 1.092E-04

# SUBLAYER 10

# SOIL MOISTURE (UG/ML) 4.015E-04 ADSORBED SOIL (UG/G) 4.015E-04

#### SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.016E-04 ADSORBED SOIL (UG/G) 4.016E-04

# SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

## SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.018E-04 ADSORBED SOIL (UG/G) 4.018E-04

#### SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.019E-04 ADSORBED SOIL (UG/G) 4.019E-04

#### SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.020E-04 ADSORBED SOIL (UG/G) 4.020E-04

# SUBLAYER 7

# SOIL MOISTURE (UG/ML) 4.021E-04 ADSORBED SOIL (UG/G) 4.021E-04

SUBLAYER 8

SOIL MOISTURE (UG/ML) 4.022E-04 ADSORBED SOIL (UG/G) 4.022E-04

SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.023E-04 ADSORBED SOIL (UG/G) 4.023E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.024E-04 ADSORBED SOIL (UG/G) 4.024E-04

## SOIL ZONE 3:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.025E-04 ADSORBED SOIL (UG/G) 4.025E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.026E-04 ADSORBED SOIL (UG/G) 4.026E-04

#### SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.027E-04 ADSORBED SOIL (UG/G) 4.027E-04

SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.028E-04 ADSORBED SOIL (UG/G) 4.028E-04

SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.029E-04 ADSORBED SOIL (UG/G) 4.029E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.030E-04 ADSORBED SOIL (UG/G) 4.030E-04

SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.031E-04 ADSORBED SOIL (UG/G) 4.031E-04

# SUBLAYER 8

# SOIL MOISTURE (UG/ML) 4.032E-04 ADSORBED SOIL (UG/G) 4.032E-04

动性型 动脉的 建甲酸合金

AGARE - GROWING STRUCTURE

SUBLAYER 9

# SOIL MOISTURE (UG/ML) 4.033E-04 ADSORBED SOIL (UG/G) 4.033E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.034E-04 ADSORBED SOIL (UG/G) 4.034E-04

LOWER SOIL ZONE:

SUBLAYER 1

*****

SOIL MOISTURE (UG/ML) 2.968E-01 ADSORBED SOIL (UG/G) 1.392E+03

#### MAX. POLL. DEPTH (M) 3.050E+01

***** ****

***** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL ***** ENVIRONMENTS ···· *****

***** DEVELOPERS: M. BONAZOUNTAS, ARTHUR D. LITTLE INC. ,(617)864-5770,X5871

J. WAGNER , DIS/ADLPIPE, INC.

,(617)492-1991,X5820

*****

************EXECUTION COMPLETE*********

***** MODIFIED EXTENSIVELY BY: ***** D.M. HETRICK ***** OAK RIDGE NATIONAL LABORATORY ***** (615) 576-7556 ***** VERSION : JANUARY 1995 *****

# ***** MONTHLY SESOIL MODEL OPERATION ***** MONTHLY SITE SPECIFIC SIMULATION

REGION : CARROLLTON SOIL TYPE : Gypsum n in he was a start with the COMPOUND : Selenium WASHLOAD DATA :

APPLICATION AREA: Wansley Gypsum Low Kd

# GENERAL INPUT PARAMETERS

用机构的方法。

-- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):1.36INTRINSIC PERMEABILITY (CM**2):.000DISCONNECTEDNESS INDEX (-):12.0POROSITY (-):.100ORGANIC CARBON CONTENT (%):.000CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):.000FREUNDLICH EXPONENT (-):1.00

-- CHEMICAL INPUT PARAMETERS --

DIFFUSION COFFEICIENT IN AIR (CM**2/SEC): 000	
DITUSION COLITICIENT IN AIR (CM 2/SEC).	
HENRYS LAW CONSTANT (M**3-ATM/MOLE): .000	
ADSORPTION COEFFICIENT ON ORGANIC CARBON(KOC): .0	00
ADSORPTION COEFFICIENT ON SOIL (K): 1.00	
MOLECULAR WEIGHT (G/MOL): 79.0	
VALENCE (-): .000	
NEUTRAL HYDROLYSIS CONSTANT (/DAY): .000	
BASE HYDROLYSIS CONSTANT (L/MOL-DAY): .000	
ACID HYDROLYSIS CONSTANT (L/MOL-DAY): .000	
DEGRADATION RATE IN MOISTURE (/DAY): .000	
DEGRADATION RATE ON SOIL (/DAY): .000	
LIGAND-POLLUTANT STABILITY CONSTANT (-): .000	
NO. MOLES LIGAND/MOLE POLLUTANT (-): .000	
LIGAND MOLECULAR WEIGHT (G/MOL): .000	

-- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS:		4				
YEARS TO BE SIMULATED:		100	)			
AREA (CM**2):	0.81	0E+08				
APPLICATION AREA LATITUDE (I	DEG.):		33.6			đ.
SPILL (1) OR STEADY APPLICATIO	ON (0):		0			
MODIFIED SUMMERS MODEL USE	ED (1) OR	NOT (0)	FOR GV	R. CON	C.: 0	
INITIAL CHEMICAL CONCENTRAT	<b>FIONS GIV</b>	/EN (1)	OR NOT	GIVEN (	(0) 1	10
DEPTHS (CM):	0.30	E+04 1.	.0 1.0	0.30E+	03	
NUMBER OF SUBLAYERS/LAYER	**	199	10	10	10 10	
PH (CM):	0.00 (	0.00	.00 0.0	C		
<b>INTRINSIC PERMEABILITIES (CM*</b>	**2):		0.50E-0	8 0.50E-0	08 0.50E-08	0.50E-08
KDEL RATIOS (-):	1.0	) 1.0	1.0			
KDES RATIOS (-):	1.0	) 1.0	1.0			
OC RATIOS (-):	1.0	1.0	1.0			
CEC RATIOS (-):	1.0	1.0	1.0			
FRN RATIOS(-):	1.0	1.0	1.0			
ADS RATIOS(-):	1.0	1.0	0.23E+0	)3		

-- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO 1 VALUES ARE PRINTED --

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#### UPPER SOIL ZONE:

1

SUBLAYER 1

# SOIL MOISTURE (UG/ML) 1.031E-08 ADSORBED SOIL (UG/G) 1.031E-08

SUBLAYER 2

# SOIL MOISTURE (UG/ML) 2.413E-08 ADSORBED SOIL (UG/G) 2.413E-08

#### SUBLAYER 3

3 SOIL MOISTURE (UG/ML) 4.366E-08 ADSORBED SOIL (UG/G) 4.366E-08 SUBLAYER 4

4 SOIL MOISTURE (UG/ML) 6.603E-08 ADSORBED SOIL (UG/G) 6.603E-08 5 SOIL MOISTURE (UG/ML) 1.689E-07 ADSORBED SOIL (UG/G) 1.689E-07 6

SUBLAYER 5

# SUBLAYER 6

SOIL MOISTURE (UG/ML) 9.741E-07 ADSORBED SOIL (UG/G) 9.741E-07

SUBLAYER 7

SOIL MOISTURE (UG/ML) 5.450E-06 ADSORBED SOIL (UG/G) 5.450E-06

SUBLAYER 8 SOIL MOISTURE (UG/ML) 2.620E-05 ADSORBED SOIL (UG/G) 2.620E-05 SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.092E-04 ADSORBED SOIL (UG/G) 1.092E-04

SUBLAYER 10

# SOIL MOISTURE (UG/ML) 4.015E-04 ADSORBED SOIL (UG/G) 4.015E-04

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.016E-04 ADSORBED SOIL (UG/G) 4.016E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.017E-04 ADSORBED SOIL (UG/G) 4.017E-04

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.018E-04 ADSORBED SOIL (UG/G) 4.018E-04

SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.019E-04 ADSORBED SOIL (UG/G) 4.019E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.020E-04 ADSORBED SOIL (UG/G) 4.020E-04

SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.021E-04 ADSORBED SOIL (UG/G) 4.021E-04

SUBLAYER 8

SOIL MOISTURE (UG/ML) 4.022E-04 ADSORBED SOIL (UG/G) 4.022E-04

SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.023E-04 ADSORBED SOIL (UG/G) 4.023E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.024E-04 ADSORBED SOIL (UG/G) 4.024E-04

SOIL ZONE 3:

## SUBLAYER 1

# SOIL MOISTURE (UG/ML) 4.025E-04 ADSORBED SOIL (UG/G) 4.025E-04

。此来10年1月6日,1963年1月8日。 1月19日(1月18日)(1963年1月1日) 1月19日(1月18日)(1月18日)(1月19日)

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.026E-04 ADSORBED SOIL (UG/G) 4.026E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.027E-04 ADSORBED SOIL (UG/G) 4.027E-04

SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.028E-04 ADSORBED SOIL (UG/G) 4.028E-04

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## SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.029E-04 ADSORBED SOIL (UG/G) 4.029E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.030E-04 ADSORBED SOIL (UG/G) 4.030E-04

SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.031E-04 ADSORBED SOIL (UG/G) 4.031E-04

SUBLAYER 8

SOIL MOISTURE (UG/ML) 4.032E-04 ADSORBED SOIL (UG/G) 4.032E-04

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第二日的 机开始加速度 化铁合金铁

SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.033E-04 ADSORBED SOIL (UG/G) 4.033E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 4.034E-04 ADSORBED SOIL (UG/G) 4.034E-04

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.862E+00

## ADSORBED SOIL (UG/G) 1.143E+03

#### SUBLAYER 2

# SOIL MOISTURE (UG/ML) 1.068E+00 ADSORBED SOIL (UG/G) 2.510E+02

#### MAX. POLL. DEPTH (M) 3.087E+01



#### ****** MONTHLY SESOIL MODEL OPERATION ****** MONTHLY SITE SPECIFIC SIMULATION

REGION : CARROLLTON SOIL TYPE : Gypsum COMPOUND : Selenium WASHLOAD DATA : APPLICATION AREA: Wansley Gypsum High Perm Run

# GENERAL INPUT PARAMETERS

#### -- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):1.36INTRINSIC PERMEABILITY (CM**2):.000DISCONNECTEDNESS INDEX (-):12.0POROSITY (-):.100ORGANIC CARBON CONTENT (%):.000CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):.000

## FREUNDLICH EXPONENT (-):

1

# 1.00

#### -- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML): .384E-	+06	2	
DIFFUSION COEFFICIENT IN AIR (CM**2/SEC):	.000		
HENRYS LAW CONSTANT (M**3-ATM/MOLE):	.000		
ADSORPTION COEFFICIENT ON ORGANIC CARBO	ON(KOC):	.0	00
ADSORPTION COEFFICIENT ON SOIL (K):	1.00	i.	
MOLECULAR WEIGHT (G/MOL):	79.0	1	
VALENCE (-): .000			
NEUTRAL HYDROLYSIS CONSTANT (/DAY):	.000		
BASE HYDROLYSIS CONSTANT (L/MOL-DAY):	.000		
ACID HYDROLYSIS CONSTANT (L/MOL-DAY):	.000		
DEGRADATION RATE IN MOISTURE (/DAY):	.000		
DEGRADATION RATE ON SOIL (/DAY):	.000		
LIGAND-POLLUTANT STABILITY CONSTANT (-):	.000	)	
NO. MOLES LIGAND/MOLE POLLUTANT (-):	.000		
LIGAND MOLECULAR WEIGHT (G/MOL):	.000	1	

#### -- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS: 100 YEARS TO BE SIMULATED: AREA (CM**2): 0.810E+08 **APPLICATION AREA LATITUDE (DEG.):** 33.6 SPILL (1) OR STEADY APPLICATION (0): 0 MODIFIED SUMMERS MODEL USED (1) OR NOT (0) FOR GWR. CONC .: 0 INITIAL CHEMICAL CONCENTRATIONS GIVEN (1) OR NOT GIVEN (0) 1 0.30E+04 1.0 1.0 0.30E+03 DEPTHS (CM): NUMBER OF SUBLAYERS/LAYER 10 10 10 10 PH (CM): 0.00 0.00 0.00 0.00 **INTRINSIC PERMEABILITIES (CM**2):** 0.50E-07 0.50E-07 0.50E-07 0.50E-07 **KDEL RATIOS (-):** 1.0 1.0 1.0 **KDES RATIOS (-):** 1.0 1.0 1.0 OC RATIOS (-): 1.0 1.0 1.0 CEC RATIOS (-): 1.0 1.0 1.0 FRN RATIOS(-): 1.0 1.0 1.0 ADS RATIOS(-): 1.0 1.0 0.23E+04 1

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

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# UPPER SOIL ZONE:

# SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.081E-08 ADSORBED SOIL (UG/G) 1.081E-08

#### SUBLAYER 2

# SOIL MOISTURE (UG/ML) 2.284E-08 ADSORBED SOIL (UG/G) 2.284E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.086E-08 ADSORBED SOIL (UG/G) 4.086E-08

SUBLAYER 4

SOIL MOISTURE (UG/ML) 6.046E-08 ADSORBED SOIL (UG/G) 6.046E-08

SUBLAYER 5

SOIL MOISTURE (UG/ML) 9.167E-08 ADSORBED SOIL (UG/G) 9.167E-08

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.016E-07 ADSORBED SOIL (UG/G) 4.016E-07

SUBLAYER 7

SOIL MOISTURE (UG/ML) 2.205E-06 ADSORBED SOIL (UG/G) 2.205E-06

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.072E-05 ADSORBED SOIL (UG/G) 1.072E-05

SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.544E-05 ADSORBED SOIL (UG/G) 4.544E-05

SUBLAYER 10

SOIL MOISTURE (UG/ML) 1.701E-04 ADSORBED SOIL (UG/G) 1.701E-04

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.702E-04 ADSORBED SOIL (UG/G) 1.702E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.702E-04 ADSORBED SOIL (UG/G) 1.702E-04

# SUBLAYER 3

#### 医动脉 的复数财富的公司 自己的 SOIL MOISTURE (UG/ML) 1.702E-04 ADSORBED SOIL (UG/G) 1.702E-04

SUBLAYER 4

SOIL MOISTURE (UG/ML) 1.702E-04 ADSORBED SOIL (UG/G) 1.702E-04

SUBLAYER 5

ANT CONTRACTOR SOIL MOISTURE (UG/ML) 1.703E-04 ADSORBED SOIL (UG/G) 1.703E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 1.703E-04 ADSORBED SOIL (UG/G) 1.703E-04

#### SUBLAYER 7

SOIL MOISTURE (UG/ML) 1.703E-04 ADSORBED SOIL (UG/G) 1.703E-04

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.704E-04 ADSORBED SOIL (UG/G) 1.704E-04

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SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.704E-04 ADSORBED SOIL (UG/G) 1.704E-04

SUBLAYER 10

Strate Parts of the SOIL MOISTURE (UG/ML) 1.704E-04 ADSORBED SOIL (UG/G) 1.704E-04

SOIL ZONE 3:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.704E-04 ADSORBED SOIL (UG/G) 1.704E-04

SUBLAYER 2

1997年1月1日日 SOIL MOISTURE (UG/ML) 1.705E-04 ADSORBED SOIL (UG/G) 1.705E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.705E-04 ADSORBED SOIL (UG/G) 1.705E-04

# SUBLAYER 4

# SOIL MOISTURE (UG/ML) 1.705E-04 ADSORBED SOIL (UG/G) 1.705E-04

SUBLAYER 5-

SOIL MOISTURE (UG/ML) 1.706E-04 ADSORBED SOIL (UG/G) 1.706E-04

SUBLAYER 6

SOIL MOISTURE (UG/ML) 1.706E-04 ADSORBED SOIL (UG/G) 1.706E-04

SUBLAYER 7

SOIL MOISTURE (UG/ML) 1.706E-04 ADSORBED SOIL (UG/G) 1.706E-04

SUBLAYER 8

SOIL MOISTURE (UG/ML) 1.706E-04 ADSORBED SOIL (UG/G) 1.706E-04

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.707E-04 ADSORBED SOIL (UG/G) 1.707E-04

SUBLAYER 10

SOIL MOISTURE (UG/ML) 1.707E-04 ADSORBED SOIL (UG/G) 1.707E-04

LOWER SOIL ZONE:

SUBLAYER 1

ENVIRONMENTS

*****

SOIL MOISTURE (UG/ML) 5.946E-01 ADSORBED SOIL (UG/G) 1.394E+03

MAX. POLL. DEPTH (M) 3.051E+01

** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL

***** DEVELOPERS: M. BONAZOUNTAS,ARTHUR D. LITTLE INC. ,(617)864-5770,X5871
*****
***** J. WAGNER ,DIS/ADLPIPE, INC. ,(617)492-1991,X5820 *****
*****
***** MODIFIED EXTENSIVELY BY:
***** *****
****** D.M. HETRICK *****
******
OAK RIDGE NATIONAL LABORATORY
****** (615) 576-7556 ******
******
****** VERSION : JANUARY 1995 *****

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REGION : CARROLLTON SOIL TYPE : Gypsum COMPOUND : Selenium WASHLOAD DATA : APPLICATION AREA: Wansley Gypsum Low Perm Run

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# **GENERAL INPUT PARAMETERS**

*****

1

-- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):1.36INTRINSIC PERMEABILITY (CM**2):.000DISCONNECTEDNESS INDEX (-):12.0POROSITY (-):.100ORGANIC CARBON CONTENT (%):.000CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):.000FREUNDLICH EXPONENT (-):1.00

# -- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML): .384E+	06	
DIFFUSION COEFFICIENT IN AIR (CM**2/SEC):	.000	
HENRYS LAW CONSTANT (M**3-ATM/MOLE):	.000	
ADSORPTION COEFFICIENT ON ORGANIC CARBO	N(KOC):	.000
ADSORPTION COEFFICIENT ON SOIL (K):	1.00	
MOLECULAR WEIGHT (G/MOL):	79.0	80 g
VALENCE (-): .000		
NEUTRAL HYDROLYSIS CONSTANT (/DAY):	.000	
BASE HYDROLYSIS CONSTANT (L/MOL-DAY):	.000	
ACID HYDROLYSIS CONSTANT (L/MOL-DAY):	.000	19
DEGRADATION RATE IN MOISTURE (/DAY):	.000	
DEGRADATION RATE ON SOIL (/DAY):	.000	
LIGAND-POLLUTANT STABILITY CONSTANT (-):	.000	
NO. MOLES LIGAND/MOLE POLLUTANT (-):	.000	


#### LIGAND MOLECULAR WEIGHT (G/MOL):

.000

#### -- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS: 4 YEARS TO BE SIMULATED: - - - 100 AREA (CM**2): 0.810E+08 APPLICATION AREA LATITUDE (DEG.): 33.6 0 SPILL (1) OR STEADY APPLICATION (0): MODIFIED SUMMERS MODEL USED (1) OR NOT (0) FOR GWR. CONC.: 0 INITIAL CHEMICAL CONCENTRATIONS GIVEN (1) OR NOT GIVEN (0) 1 DEPTHS (CM): 0.30E+04 1.0 1.0 0.30E+03 NUMBER OF SUBLAYERS/LAYER 10 10 10 10 PH (CM): 0.00 0.00 0.00 0.00 **INTRINSIC PERMEABILITIES (CM**2):** 0.50E-09 0.50E-09 0.50E-09 0.50E-09 **KDEL RATIOS** (-): 1.0 1.0 1.0 KDES RATIOS (-): 1.0 1.0 1.0 OC RATIOS (-): 1.0 1.0 1.0 CEC RATIOS (-): 1.0 1.0 1.0 FRN RATIOS(-): 1.0 1.0 1.0 ADS RATIOS(-): 1.0 1.0 0.23E+04 1

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

#### SOIL MOISTURE (UG/ML) 7.386E-04 ADSORBED SOIL (UG/G) 7.386E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 9.074E-03 ADSORBED SOIL (UG/G) 9.074E-03

SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.504E-02 ADSORBED SOIL (UG/G) 5.504E-02

SUBLAYER 4

SOIL MOISTURE (UG/ML) 2.200E-01 ADSORBED SOIL (UG/G) 2.200E-01

SUBLAYER 5

SOIL MOISTURE (UG/ML) 6.527E-01 ADSORBED SOIL (UG/G) 6.527E-01

## SUBLAYER 6

#### SOIL MOISTURE (UG/ML) 1.539E+00 ADSORBED SOIL (UG/G) 1.539E+00

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SUBLAYER 7

## SOIL MOISTURE (UG/ML) 3.014E+00 ADSORBED SOIL (UG/G) 3.014E+00

# SUBLAYER 8 SOIL MOISTURE (UG/ML) 5.057E+00 ADSORBED SOIL (UG/G) 5.057E+00

SUBLAYER 9

#### SOIL MOISTURE (UG/ML) 7.463E+00 ADSORBED SOIL (UG/G) 7.463E+00

#### SUBLAYER 10

SOIL MOISTURE (UG/ML) 9.903E+00 ADSORBED SOIL (UG/G) 9.903E+00

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SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 9.903E+00 ADSORBED SOIL (UG/G) 9.903E+00

#### SUBLAYER 2

SOIL MOISTURE (UG/ML) 9.904E+00 ADSORBED SOIL (UG/G) 9.904E+00

SUBLAYER 3 SOIL MOISTURE (UG/ML) 9.905E+00 ADSORBED SOIL (UG/G) 9.905E+00

SUBLAYER 4

SOIL MOISTURE (UG/ML) 9.906E+00 ADSORBED SOIL (UG/G) 9.906E+00

SUBLAYER 5

SOIL MOISTURE (UG/ML) 9.907E+00 ADSORBED SOIL (UG/G) 9.907E+00

SUBLAYER 6

SOIL MOISTURE (UG/ML) 9.908E+00 ADSORBED SOIL (UG/G) 9.908E+00

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#### SUBLAYER 7

#### SOIL MOISTURE (UG/ML) 9.908E+00 ADSORBED SOIL (UG/G) 9.908E+00

#### SUBLAYER 8

SOIL MOISTURE (UG/ML) 9.909E+00 ADSORBED SOIL (UG/G) 9.909E+00

SUBLAYER 9

SOIL MOISTURE (UG/ML) 9.910E+00 ADSORBED SOIL (UG/G) 9.910E+00

SUBLAYER 10

#### SOIL MOISTURE (UG/ML) 9.911E+00 ADSORBED SOIL (UG/G) 9.911E+00

#### SOIL ZONE 3:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 9.912E+00 ADSORBED SOIL (UG/G) 9.912E+00

SUBLAYER 2

SOIL MOISTURE (UG/ML) 9.912E+00 ADSORBED SOIL (UG/G) 9.912E+00

SUBLAYER 3

SOIL MOISTURE (UG/ML) 9.913E+00 ADSORBED SOIL (UG/G) 9.913E+00

SUBLAYER 4

SOIL MOISTURE (UG/ML) 9.914E+00 ADSORBED SOIL (UG/G) 9.914E+00

#### SUBLAYER 5

SOIL MOISTURE (UG/ML) 9.915E+00 ADSORBED SOIL (UG/G) 9.915E+00

SUBLAYER 6

SOIL MOISTURE (UG/ML) 9.916E+00 ADSORBED SOIL (UG/G) 9.916E+00

SUBLAYER 7

SOIL MOISTURE (UG/ML) 9.917E+00

#### ADSORBED SOIL (UG/G) 9.917E+00

#### SUBLAYER 8

#### SOIL MOISTURE (UG/ML) 9.917E+00 ADSORBED SOIL (UG/G) 9.917E+00

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SUBLAYER 9

### SOIL MOISTURE (UG/ML) 9.918E+00 ADSORBED SOIL (UG/G) 9.918E+00

#### SUBLAYER 10

#### SOIL MOISTURE (UG/ML) 9.919E+00 ADSORBED SOIL (UG/G) 9.919E+00

#### LOWER SOIL ZONE:

SUBLAYER 1

#### SOIL MOISTURE (UG/ML) 4.662E-01 ADSORBED SOIL (UG/G) 1.093E+03

#### MAX. POLL. DEPTH (M) 3.050E+01

## ****** **** ***** **** ***** SESOIL-84 : SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL ENVIRONMENTS ***** ***** **** ***** DEVELOPERS: M. BONAZOUNTAS,ARTHUR D. LITTLE INC. ,(617)864-5770,X5871 *****

*** J. WAGNER , DIS/ADLPIPE, INC. ,(617)492-1991,X5820

***** ***** MODIFIED EXTENSIVELY BY: ***** D.M. HETRICK

***** OAK RIDGE NATIONAL LABORATORY

***** (615) 576-7556

*****

***** VERSION : JANUARY 1995

## 

REGION : CARROLLTON SOIL TYPE : Gypsum COMPOUND : Selenium

Sten Balline

#### WASHLOAD DATA : APPLICATION AREA:

Wansley Gypsum High Selenium

#### GENERAL INPUT PARAMETERS

#### -- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):1.36INTRINSIC PERMEABILITY (CM**2):.000DISCONNECTEDNESS INDEX (-):12.0POROSITY (-):.100ORGANIC CARBON CONTENT (%):.000CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):.000FREUNDLICH EXPONENT (-):1.00

#### -- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML):	.384E+06	
DIFFUSION COEFFICIENT IN AIR (CM**2/SI	EC): .00	00
HENRYS LAW CONSTANT (M**3-ATM/MOI	LE):	.000
ADSORPTION COEFFICIENT ON ORGANIC	CARBON(KOC)	.000
ADSORPTION COEFFICIENT ON SOIL (K):	1.00	S. S
MOLECULAR WEIGHT (G/MOL):	79.0	
VALENCE (-): .000		
NEUTRAL HYDROLYSIS CONSTANT (/DAY	): .()	000
BASE HYDROLYSIS CONSTANT (L/MOL-DA	AY):	.000
ACID HYDROLYSIS CONSTANT (L/MOL-DA	AY):	.000
DEGRADATION RATE IN MOISTURE (/DAY	): .0	00
DEGRADATION RATE ON SOIL (/DAY):	.000	
LIGAND-POLLUTANT STABILITY CONSTA	NT (-):	.000
NO. MOLES LIGAND/MOLE POLLUTANT (-)	): .00	00
LIGAND MOLECULAR WEIGHT (G/MOL):	.00	0

#### -- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS: 4 YEARS TO BE SIMULATED: 100 AREA (CM**2): 0.810E+08 APPLICATION AREA LATITUDE (DEG.): 33.6 SPILL (1) OR STEADY APPLICATION (0): 0 MODIFIED SUMMERS MODEL USED (1) OR NOT (0) FOR GWR. CONC .: 0 INITIAL CHEMICAL CONCENTRATIONS GIVEN (1) OR NOT GIVEN (0) 1 DEPTHS (CM): 0.30E+04 1.0 1.0 0.30E+03 NUMBER OF SUBLAYERS/LAYER 10 10 10 10 0.00 PH (CM): 0.00 0.00 0.00 **INTRINSIC PERMEABILITIES (CM**2):** 0.50E-08 0.50E-08 0.50E-08 0.50E-08 KDEL RATIOS (-): 1.0 1.0 1.0 **KDES RATIOS (-):** 1.0 1.0 1.0 OC RATIOS (-): 1.0 1.0 1.0 CEC RATIOS (-): 1.0 1.0 1.0

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FRN RATIOS(-): ADS RATIOS(-): 1.0 1.0 1.0 1.0 1.0 0.23E+04

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.182E-08 ADSORBED SOIL (UG/G) 1.182E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.846E-08 ADSORBED SOIL (UG/G) 2.846E-08

#### SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.043E-08 ADSORBED SOIL (UG/G) 5.043E-08

SUBLAYER 4

SOIL MOISTURE (UG/ML) 1.815E-07 ADSORBED SOIL (UG/G) 1.815E-07

SUBLAYER 5

SOIL MOISTURE (UG/ML) 1.412E-06 ADSORBED SOIL (UG/G) 1.412E-06

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## SUBLAYER 6

SOIL MOISTURE (UG/ML) 9.649E-06 ADSORBED SOIL (UG/G) 9.649E-06

SUBLAYER 7

SOIL MOISTURE (UG/ML) 5.457E-05 ADSORBED SOIL (UG/G) 5.457E-05

SUBLAYER 8

SOIL MOISTURE (UG/ML) 2.621E-04 ADSORBED SOIL (UG/G) 2.621E-04

SUBLAYER 9

SOIL MOISTURE (UG/ML) 1.092E-03 ADSORBED SOIL (UG/G) 1.092E-03

## SUBLAYER 10

## SOIL MOISTURE (UG/ML) 4.014E-03 ADSORBED SOIL (UG/G) 4.014E-03

SOIL ZONE 2:

SUBLAYER 1

## SOIL MOISTURE (UG/ML) 4.015E-03 ADSORBED SOIL (UG/G) 4.015E-03

SUBLAYER 2

## SOIL MOISTURE (UG/ML) 4.016E-03 ADSORBED SOIL (UG/G) 4.016E-03

SUBLAYER 3

## SOIL MOISTURE (UG/ML) 4.017E-03 ADSORBED SOIL (UG/G) 4.017E-03

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.018E-03 ADSORBED SOIL (UG/G) 4.018E-03

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SUBLAYER 5

SOIL MOISTURE (UG/ML) 4.019E-03 ADSORBED SOIL (UG/G) 4.019E-03

### SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.020E-03 ADSORBED SOIL (UG/G) 4.020E-03

SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.021E-03 ADSORBED SOIL (UG/G) 4.021E-03

SUBLAYER 8

SOIL MOISTURE (UG/ML) 4.022E-03 ADSORBED SOIL (UG/G) 4.022E-03

SUBLAYER 9

SOIL MOISTURE (UG/ML) 4.023E-03 ADSORBED SOIL (UG/G) 4.023E-03

SUBLAYER 10

## SOIL MOISTURE (UG/ML) 4.024E-03 ADSORBED SOIL (UG/G) 4.024E-03

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#### SOIL ZONE 3:

SUBLAYER 1

#### SOIL MOISTURE (UG/ML) 4.025E-03 ADSORBED SOIL (UG/G) 4.025E-03

#### SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.026E-03 ADSORBED SOIL (UG/G) 4.026E-03

#### SUBLAYER 3

617 M. ... SOIL MOISTURE (UG/ML) 4.027E-03 ADSORBED SOIL (UG/G) 4.027E-03

2857 M 14

#### SUBLAYER 4

SOIL MOISTURE (UG/ML) 4.027E-03 ADSORBED SOIL (UG/G) 4.027E-03

#### SUBLAYER 5

Strate Me Marth SOIL MOISTURE (UG/ML) 4.028E-03 ADSORBED SOIL (UG/G) 4.028E-03

SUBLAYER 6

SOIL MOISTURE (UG/ML) 4.029E-03 ADSORBED SOIL (UG/G) 4.029E-03

#### SUBLAYER 7

SOIL MOISTURE (UG/ML) 4.030E-03 ADSORBED SOIL (UG/G) 4.030E-03

#### SUBLAYER 8

20 11 . 2014 SOIL MOISTURE (UG/ML) 4.031E-03 ADSORBED SOIL (UG/G) 4.031E-03

#### SUBLAYER 9

1、加速式14月2日,1月1日(1993)。 SOIL MOISTURE (UG/ML) 4.032E-03 ADSORBED SOIL (UG/G) 4.032E-03

#### SUBLAYER 10

and the party of SOIL MOISTURE (UG/ML) 4.033E-03 ADSORBED SOIL (UG/G) 4.033E-03

#### LOWER SOIL ZONE:

#### SUBLAYER 1

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## SOIL MOISTURE (UG/ML) 5.943E+00 ADSORBED SOIL (UG/G) 1.394E+04

MAX. POLL. DEPTH (M) 3.051E+01

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